

**STATE OF NEW HAMPSHIRE  
BEFORE THE  
PUBLIC UTILITIES COMMISSION**

Docket No. DG 17-048

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities  
Distribution Service Rate Case

**REBUTTAL TESTIMONY**

**OF**

**ROBERT B. HEVERT**

January 25, 2018

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## ATTACHMENTS

<b>Attachment</b>	<b>Title</b>
Attachment RBH-Rebuttal-1:	Constant Growth DCF Model
Attachment RBH-Rebuttal-2:	Retention Growth Estimate
Attachment RBH-Rebuttal-3:	Multi-Stage DCF Model
Attachment RBH-Rebuttal-4:	Ex-Ante Market Risk Premium Estimate
Attachment RBH-Rebuttal-5:	Beta Coefficient
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Attachment RBH-Rebuttal-8:	Capital Structure
Attachment RBH-Rebuttal-9:	Summary of Adjustment Clauses
Attachment RBH-Rebuttal-10:	Dr. Woolridge's Implied ROE with M/B at Unity
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1 **I. INTRODUCTION**

2 **Q. Please state your name, affiliation, and business address.**

3 A. My name is Robert B. Hevert. I am a Partner of ScottMadden, Inc. (“ScottMadden”).  
4 My business address is 1900 West Park Drive, Suite 250, Westborough, Massachusetts  
5 01581.

6 **Q. On whose behalf are you submitting this testimony?**

7 A. I am submitting this testimony before the New Hampshire Public Utilities Commission  
8 (“Commission”) on behalf of Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a  
9 Liberty Utilities (“EnergyNorth” or the “Company”).

10 **Q. Have you previously submitted testimony in this proceeding?**

11 A. Yes. I submitted prefiled testimony as part of the Company’s April 28, 2017, filing for  
12 an increase in distribution rates. My professional background and qualifications are  
13 contained in the prior testimony.

14 **II. PURPOSE AND OVERVIEW OF TESTIMONY**

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my Rebuttal Testimony is to respond to the direct testimony of Dr. J.  
17 Randall Woolridge on behalf of the Commission Staff (“Staff”) and the direct testimony  
18 of Pradip K. Chattopadhyay on behalf of the New Hampshire Office of Consumer  
19 Advocate (“OCA”, collectively, the “Opposing Witnesses”), as their testimonies relate to  
20 the Company’s Return on Equity (“ROE” or “Cost of Equity”). Consistent with the  
21 Opposing Witnesses’ use of current financial data and to address that information, my

1 rebuttal testimony also updates many of the analyses contained in my Direct Testimony,<sup>1</sup>  
2 and provides several additional analyses developed in response to Dr. Woolridge's and  
3 Dr. Chattopadhyay's testimony.

4 **Q. Please provide a summary overview of the recommendations contained in your**  
5 **Rebuttal Testimony.**

6 A. As a baseline observation, the Opposing Witnesses' recommendations are below any  
7 reasonable measure of the Company's Cost of Equity. For example, the Opposing  
8 Witnesses assert that authorized returns of 8.55 percent and 8.40 percent are supported by  
9 current market conditions. As discussed throughout my Rebuttal Testimony, those  
10 recommendations are far below those authorized for other utilities nationally and in New  
11 Hampshire. Other analyses presented by the Opposing Witnesses are similarly flawed.

12 In my Direct Testimony, I concluded an ROE of 10.30 percent represents the Cost of  
13 Equity for EnergyNorth, within a range of 10.00 percent to 10.60 percent.<sup>2</sup> As my Direct  
14 Testimony discussed, my ROE recommendation considers a variety of factors, including  
15 capital market conditions in general and certain risks faced by EnergyNorth. Because the  
16 application of financial models and the interpretation of their results are often sources of  
17 disagreement among analysts in regulatory proceedings, I believe it is important to  
18 review and consider a variety of data points; doing so enables us to put in context both  
19 quantitative analyses and the associated recommendations. Consistent with the Opposing

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<sup>1</sup> See, Attachment-RBH-Rebuttal-1 to Attachment-RBH-Rebuttal-9.

<sup>2</sup> Direct Testimony of Robert B. Hevert, at Bates 482.

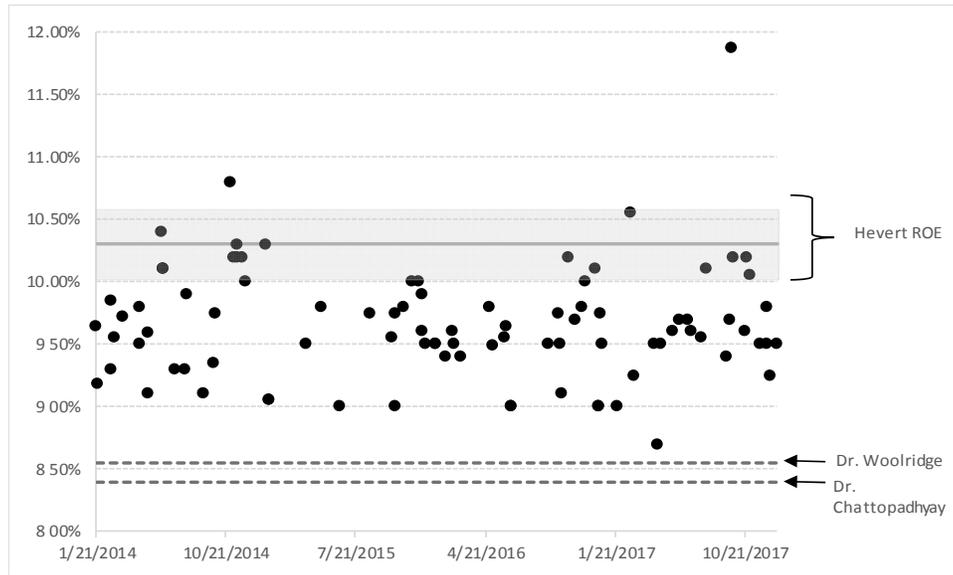
1 Witnesses' use of current financial data and to address that information, I have updated  
2 many of the analyses contained in my Direct Testimony, and I have provided several new  
3 analyses in response to issues raised by Dr. Woolridge and Dr. Chattopadhyay. As  
4 discussed throughout the balance of my Rebuttal Testimony, those analyses continue to  
5 support my ROE range and recommendation.

6 Lastly, I continue to find the Company's capital structure consisting of 50.00 percent  
7 common equity and 50.00 percent long-term debt is reasonable relative to its peers.

8 **Q. Please now provide an overview of your response to the ROE recommendations**  
9 **made by the Opposing Witnesses.**

10 A. Although the Opposing Witnesses believe their recommendations are reasonable and  
11 support the Company's financial integrity, all authorized ROEs for natural gas utilities  
12 over the last four years have been well above their recommendations. My recommended  
13 range (10.00 percent to 10.60 percent), on the other hand, is consistent with the returns  
14 authorized for other natural gas utilities (see Chart 1, below).

1 **Chart 1: Authorized Natural Gas Distribution ROEs and**  
2 **Opposing Witnesses' Range<sup>3</sup>**



3  
4 For example, Dr. Chattopadhyay's ROE recommendation ranges from 8.20 percent to  
5 8.50 percent, with a recommendation of 8.40 percent.<sup>4</sup> Dr. Woolridge recommends an  
6 ROE in the range of 7.90 percent to 8.55 percent, with a recommendation of 8.55  
7 percent.<sup>5</sup> Because the Opposing Witnesses primarily rely on their DCF results, their  
8 recommendations depend on ROE estimates that are below the lowest ROE ever  
9 authorized for a natural gas utility.<sup>6</sup> Putting aside the methodological concerns with their  
10 DCF analyses, the Opposing Witnesses' emphasis on that model is a case-in-point as to  
11 why it is important to fully consider multiple methods and to assess the reliability of

<sup>3</sup> Source: Regulatory Research Associates.

<sup>4</sup> See Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 146.

<sup>5</sup> See Direct Testimony of Dr. J. Randall Woolridge, at Bates 000007.

<sup>6</sup> See Attachment RBH-Rebuttal-7.

1 individual model results in the context of current market conditions when estimating the  
2 Cost of Equity.

3 In light of the emphasis that the Opposing Witnesses place on their DCF results, it is not  
4 surprising that their recommendations fall far below the returns authorized for gas  
5 utilities in other jurisdictions. Other regulatory authorities have been reluctant to give  
6 undue weight to models and methods that produce unreasonably low results. Because  
7 authorized returns are publicly available to investors,<sup>7</sup> it is difficult to imagine that such  
8 data is not reflected, at least to some degree, in their return expectations and  
9 requirements. Consequently, it is reasonable to assume that over time, authorized returns  
10 represent a reasonable (although not the only) measure of investor-required returns. The  
11 Opposing Witnesses, however, argue that because Market-to-Book (“M/B”) ratios have  
12 exceeded unity, regulatory commissions have consistently authorized returns in excess of  
13 the Cost of Equity. Regardless of how they develop their recommendations, DCF  
14 estimates of 8.55 percent and lower fail to meet the *Federal Power Comm’n v. Hope*  
15 *Natural Gas Co.*, 320 U.S. 591 (1944) (“*Hope*”) and *Bluefield Water Works and*  
16 *Improvement Co. v. Public Service Comm’n.* (“*Bluefield*”) “end result” standard and  
17 should be given no weight in determining EnergyNorth’s ROE.<sup>8</sup>

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<sup>7</sup> See, for example, Atmos Energy Group, SEC Form 10-K for the period ending September 30, 2017, at 8; Northwest Natural Gas Company, SEC Form 10-K for the period ending December 31, 2016, at 7; ONE Gas Inc., SEC Form 10-K for the period ending December 31, 2016, at 28-29; Southwest Gas, 2016 Annual Report, at 22; Spire Inc., SEC Form 10-K for the period ending September 30, 2017, at 129-130.

<sup>8</sup> The highest of the Opposing Witnesses’ DCF recommendations is Dr. Woolridge’s DCF estimate of 8.55 percent. See Direct Testimony of J. Randall Woolridge, at Bates 000033-000034. See also, *Hope*, 320 U.S. at 603.

1 Dr. Chattopadhyay acknowledges that his 8.20 percent to 8.50 percent recommended  
2 range falls below recently authorized returns.<sup>9</sup> That is the case: the high end of the  
3 Opposing Witnesses' recommended ranges, 8.55 percent, falls below all ROEs  
4 authorized for natural gas utilities since January 1980. The Opposing Witnesses,  
5 however, do not explain why the Company is so less risky than its peers that investors  
6 would be willing to accept such a low return.

7 The significant departure from the returns available to other utilities raises two concerns.  
8 First, the Company must compete with other companies, including utilities, for the long-  
9 term capital needed to provide utility service. Given the choice between two similarly  
10 situated utilities, one with a return that falls far below industry averages, and another with  
11 a return that more closely aligns with industry averages, investors will choose the latter.  
12 If the Commission were to approve an ROE in the ranges recommended by the Opposing  
13 Witnesses, investors would receive a lower return with greater risk than would be  
14 available from other utilities. A likely outcome would be increasing reluctance on the  
15 part of investors to provide capital at reasonable costs and terms.

16 Although no regulatory commission sets returns solely by reference to those authorized  
17 elsewhere, authorized returns do provide observable and measurable benchmarks against  
18 which return recommendations may be assessed. In my experience, regulatory  
19 commissions generally consider the same types of market, methodological, and risk  
20 factors at issue in this proceeding. They recognize that financial models are important

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<sup>9</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 182, footnote 32.

1 tools in determining returns, but appreciate that because all models are subject to  
2 assumptions, no one method is most reliable at all times, and under all conditions.

3 As discussed throughout my Rebuttal Testimony, that holds true in this case. Even if we  
4 focus on a single method, it remains critically important to apply reasoned judgment to  
5 determine where the Cost of Equity falls within that model's range of results. Just as  
6 investors consider company-specific and general market factors, we should do the same.  
7 Those considerations, and that judgment, leads to the conclusion that the Opposing  
8 Witnesses' ROE recommendations are unduly low.

9 **Q. Have other regulatory commissions recognized the importance of considering**  
10 **multiple methods to set authorized ROEs?**

11 A. Yes. For example, in its recent order in Baltimore Gas and Electric Company's rate case,  
12 the Maryland Public Service Commission ("MPSC") discussed the importance of  
13 considering multiple analytical methods, given the complexity of determining the  
14 required ROE:

15 The ROE witnesses used various analyses to estimate the appropriate  
16 return on equity [...] including the DCF model, the IRR/DCF, the  
17 traditional CAPM, the ECAPM, and risk premium methodologies.  
18 Although the witnesses argued strongly over the correctness of their  
19 competing analyses, we are not willing to rule that there can be only one  
20 correct method for calculating an ROE. Neither will we eliminate any  
21 particular methodology as unworthy of basing a decision. The subject is  
22 far too complex to reduce to a single mathematical formula. That  
23 conclusion is made apparent, in practice, by the fact that the expert  
24 witnesses used discretion to eliminate outlier returns that they testified

1           were too high or too low to be considered reasonable, even when using  
2           their own preferred methodologies.<sup>10</sup>

3           Similarly, in Opinion No. 531, the Federal Energy Regulatory Commission (“FERC”)  
4           noted the anomalous nature of prevailing capital markets makes it more difficult to  
5           determine the rate of return needed to satisfy the *Hope* and *Bluefield* standards. FERC  
6           further expressed concern that economic anomalies may have affected the reliability of  
7           DCF analyses.<sup>11</sup> FERC concluded that a mechanical application of the DCF method  
8           would be inappropriate and found it necessary to review alternative benchmark  
9           approaches, including the Bond Yield Plus Risk Premium and CAPM methods, to gain  
10          insight into the effect of market conditions on the Cost of Equity.<sup>12</sup> After reviewing the  
11          evidence in that case, including economic conditions and the results of multiple ROE  
12          methods, FERC determined it would be appropriate to set the ROE at the midpoint of the  
13          upper half of the zone of reasonableness established by the DCF methodology.<sup>13</sup>

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<sup>10</sup> In the matter of the application of Baltimore Gas and Electric Company for adjustments to its electric and gas base rates, Public Service Commission of Maryland, Case No. 9406, Order No. 87591, at 153. Citations omitted.

<sup>11</sup> See, *Martha Coakley v. Bangor Hydro-Electric Company*, Opinion No. 531, 147 FERC ¶ 61,234 (2014), at P 41 and P 145.

<sup>12</sup> *Ibid.*, at P 142 and PP 145-146.

<sup>13</sup> *Ibid.*, at PP 145-146 and P 152. In April 2017 the United States Court of Appeals for the District of Columbia Circuit issued an opinion in *Emera Maine (formerly known as Bangor Hydro-Electric Company), et al., v. FERC* which vacated and remanded Opinion No. 531 because “FERC did not meet the first requirement of Section 206 that it demonstrate the unlawfulness of transmission owners’ base ROE” and because FERC had relied on the midpoint of the upper half of the zone of reasonableness without adequately “citing record evidence” demonstrating the resulting ROE was a just and reasonable. Importantly, the D.C. Circuit decision did not suggest FERC was wrong to consider alternative methods, or that the alternative methods used, or their results, were inappropriate.

1 Both the MPSC and FERC have recognized that no single model is most reliable under  
2 all market conditions, and the application of reasoned judgment is important in  
3 developing ROE estimates. Commissions in other regulatory jurisdictions, such as  
4 Hawaii, Massachusetts, and North Carolina, have reached similar conclusions.<sup>14</sup> As  
5 discussed throughout the balance of my testimony, I applied those principles in  
6 developing my recommendation.

7 **Q. Are you aware of recent market developments that also should be considered in**  
8 **setting the Company's ROE in this proceeding?**

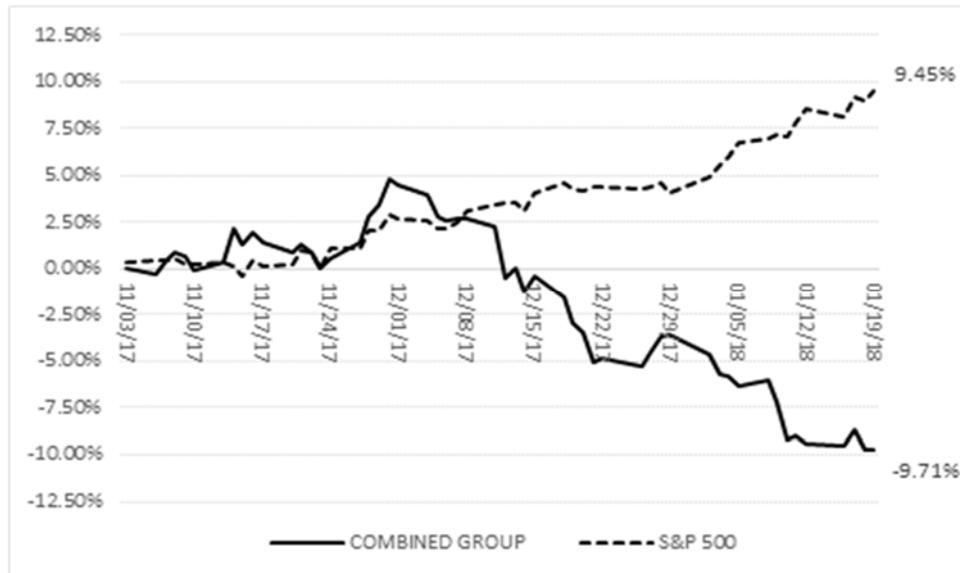
9 A. Yes. On December 22, 2017, the President of the United States signed into law Pub L.  
10 115-97 (H.R. 1—115th Congress: An Act to provide for reconciliation pursuant to titles  
11 II and V of the concurrent resolution on the budget for fiscal year 2018, referred to herein  
12 as the “Act”). Shortly before the Act was signed, natural gas utilities, as measured by the  
13 companies in my and the Opposing Witnesses’ proxy groups (the “Combined Proxy  
14 Group”), significantly underperformed the overall market. As Chart 2 (below)  
15 demonstrates, from November 1, 2017, through January 19, 2018, the S&P 500 gained  
16 about 9.50 percent in value. In stark contrast, the Combined Proxy Group lost about 9.70  
17 percent, underperforming the overall market by approximately 19.00 percent.

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<sup>14</sup> See, for example: (1) Public Utilities Commission of the State of Hawaii, Order No. 13704 in Docket No. 7700, December 28, 1994, at 92; (2) The Commonwealth of Massachusetts Department of Public Utilities, Order in Docket D.P.U. 15-155, September 30, 2016, at 376-378; and (3) State of North Carolina Utilities Commission, Order in Docket No. G-5, Sub 565, October 28, 2016, at 35-36.

1

**Chart 2: Relative Performance Since November 2017<sup>15</sup>**



2

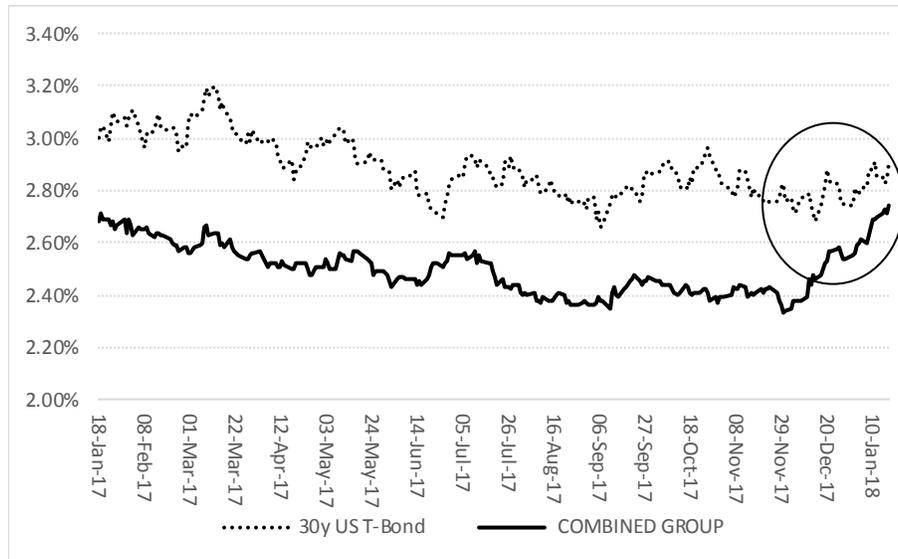
3 **Q. Have the proxy companies' dividend yield increased coincident with the Act?**

4 A. Yes, since the beginning of December 2017, the Combined Proxy Group's dividend yield  
5 has increased 40 basis points. Interestingly, the difference between the Combined Proxy  
6 Group's dividend yield and the 30-year Treasury yield has considerably narrowed (*see*  
7 Chart 3, below). Again, that data suggests the fall in price among natural gas utility  
8 stocks may be a matter of relative value. Regardless of the reason, there is no question  
9 dividend yields have increased significantly since the Act became law.

<sup>15</sup> Source: S&P Global Market Intelligence. Combined Proxy Group calculated as an index.

1

**Chart 3: Proxy Group Dividend Yield vs. 30-Year Treasury Yield<sup>16</sup>**



2

3 As discussed in my Direct Testimony, the Constant Growth DCF model is based on  
4 several assumptions that together assume current market conditions essentially will  
5 remain in place, unchanged, in perpetuity.<sup>17</sup> With the changes in capital markets  
6 discussed in Section III, and seeing the effect of tax law changes on utility valuations,  
7 that assumption does not hold. We therefore should recognize that the mean DCF results  
8 likely are not reliable indicators of the Company's Cost of Equity.

9 **Q. Do you agree with the Opposing Witnesses' assessments of recent trends of**  
10 **authorized returns?**

11 A. No, I do not. First, taken in isolation, annual trends in the average authorized returns are  
12 not particularly meaningful. Further, the Opposing Witnesses' use of annual averages

<sup>16</sup> Source: S&P Global Market Intelligence. Combined Proxy Group calculated as an index.  
<sup>17</sup> Direct Testimony of Robert B. Hevert, at Bates 496.

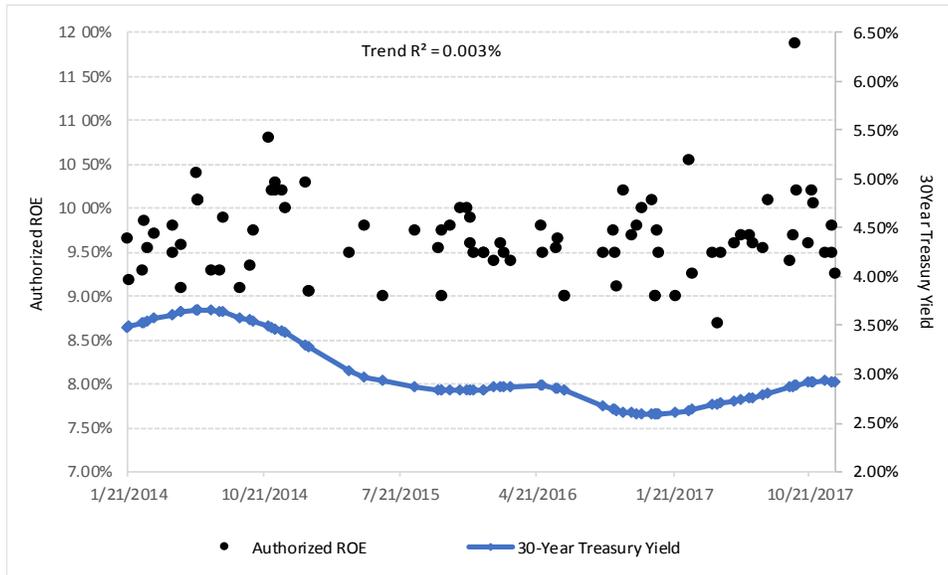
1 obscures the variation in returns and suggests a recent downward trend where none exists.  
2 Simple averages also do not address the number of cases in a given year, or the number  
3 of jurisdictions issuing orders within that year. For example, one year may have fewer  
4 cases decided, and a relatively large portion of those cases decided by a single  
5 jurisdiction. If all authorized ROEs are considered, such potential distortions are  
6 mitigated.

7 Although the Opposing Witnesses suggest that the Cost of Equity has fallen,<sup>18</sup> observable  
8 data does not support that position. As Chart 4 (below) demonstrates, since January  
9 2014, there has been essentially no trend in authorized returns for natural gas utilities  
10 (that is, the slope of the trendline essentially is zero, and time explains less than 1.00  
11 percent of the variation in returns).

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<sup>18</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 182, footnote 32; Direct Testimony of J. Randall Woolridge, at Bates 000045.

1 **Chart 4: Authorized Natural Gas Distribution ROEs and**  
2 **30-Year Treasury Yield<sup>19</sup>**



3

4 Equally notable, there was no trend in returns even though the average 30-year Treasury  
5 yield somewhat declined. That finding is important in two respects. First, Dr. Woolridge  
6 argues that after the March and June 2017 Federal Funds rate increase, “the yield on 30-  
7 year Treasury bonds decreased.”<sup>20</sup> Despite the decline in yields (which subsequently  
8 increased), regulatory commissions have not been inclined to reduce authorized returns.  
9 The constancy of authorized returns as interest rates fell also is consistent with the  
10 widely-accepted principle that the Equity Risk Premium increases as interest rates fall.  
11 That point, which is discussed in more detail later in my Rebuttal Testimony, is an

<sup>19</sup> Sources: Regulatory Research Associates and Bloomberg Professional.  
<sup>20</sup> Direct Testimony of J. Randall Woolridge at Bates 000009-000010.

1 important consideration not reflected in Opposing Witnesses analyses and  
2 recommendations.

3 It is important to keep in mind that no one financial model is more reliable than others at  
4 all times and under all market conditions. As discussed above, at times some model  
5 results simply do not make sense. Determining the Cost of Equity is not always a strict  
6 mathematical exercise; it requires the application of reasoned judgment in vetting the  
7 models and assumptions used by various analysts, and in assessing the reasonableness of  
8 their recommendations. As discussed throughout the balance of my Rebuttal Testimony,  
9 the Opposing Witnesses' recommendations cannot be supported by the reasonable  
10 application of financial models, nor can they be justified by current or expected market  
11 conditions. Rather, their unduly low recommendations would only serve to increase  
12 EnergyNorth's regulatory and financial risk and diminish its ability to compete for  
13 capital.

14 **Q. Please now summarize the updated analyses contained in your Rebuttal Testimony.**

15 A. Consistent with the Opposing Witnesses' use of current financial data and to address that  
16 information, I have updated the Constant Growth and Multi-Stage forms of the DCF  
17 model, CAPM, and Bond Yield Risk Premium analyses based on data through January  
18 12, 2018, and applied those analyses to the Combined Proxy Group, which consists of the  
19 proxy group contained in my Direct Testimony, but including OneGas, Inc (OGS).<sup>21</sup>

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<sup>21</sup> See Attachment RBH-Rebuttal-1 through RBH-Rebuttal-9.

1 Since the filing of my Direct Testimony, OGS has been added to the Value Line natural  
2 gas utility universe.

3 **Q. How is the remainder of your testimony organized?**

4 A. The remainder of my testimony is organized as follows:

- 5 • Section III – Contains my response to issues common to the Opposing Witnesses;
- 6 • Section IV – Contains my response to Dr. Woolridge;
- 7 • Section V – Contains my response to Dr. Chattopadhyay; and
- 8 • Section VI – Summarizes my updated analyses, conclusions, and  
9 recommendations.

10 **III. ISSUES COMMON TO THE OPPOSING WITNESSES**

11 **Q. Before addressing witness-specific issues, are there issues that are common to Drs.**  
12 **Woolridge and Chattopadhyay that you would like to address?**

13 A. Yes. Because it underlies so many of the analyses involved in estimating the Cost of  
14 Equity, I will address current and expected capital market conditions as a common issue.  
15 In addition, because Drs. Woolridge and Chattopadhyay believe Market-to-Book ratios  
16 are important measures of investor return requirements, I will address their arguments,  
17 also as a common issue.

1        **A. Current Capital Market Environment**

2        **Q. Are there capital market measures that are helpful to observe in assessing ROE**  
3        **recommendations?**

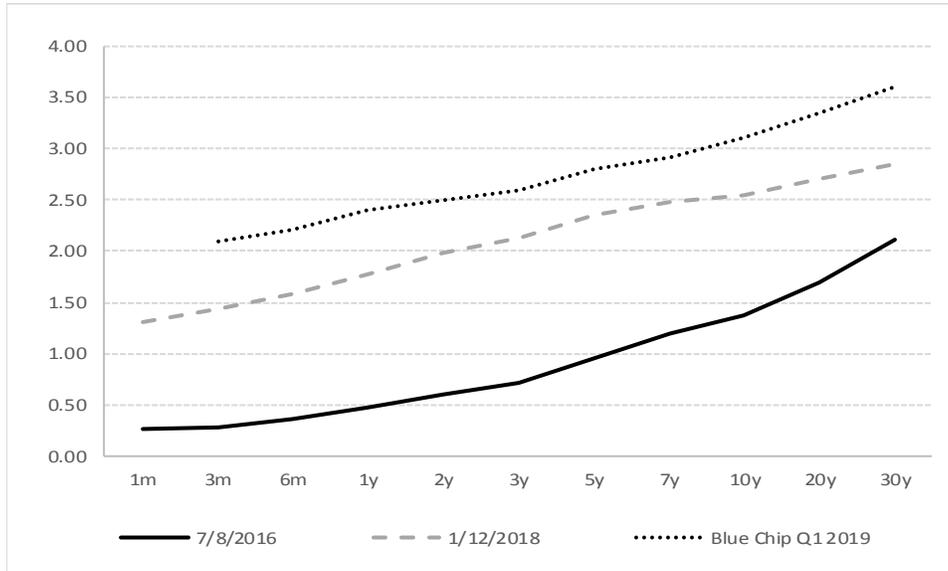
4        A. Yes, there are. As discussed earlier, natural gas utilities<sup>22</sup> have underperformed the  
5        market, dividend yields have risen, and the spread between the dividend yield and the 30-  
6        year Treasury yield has narrowed in recent months. Additionally, recent and expected  
7        changes in interest rates in response to Federal Reserve monetary policy normalization is  
8        particularly important in the current market environment. Contrary to Dr. Woolridge's  
9        assertion, as the Federal Reserve increased the Federal Funds target rate four times since  
10       July 2016 to 1.25 percent to 1.50 percent, short-term and long-term interest likewise  
11       increased<sup>23</sup> (*see* Chart 5 below.)

---

<sup>22</sup> Measured as the Combined Proxy Group, calculated as an index.

<sup>23</sup> Source: Federal Reserve Board Schedule H.15. six-month and one-year Treasury yields increased by 123 and 130 basis points, respectively, from July 8, 2016, to January 12, 2018; the ten-year and 30-year Treasury yield increased by 118 and 74 basis points, respectively. *See*, Direct Testimony of J. Randall Woolridge, at Bates 000119.

1 **Chart 5: Treasury Yield Curve: 7/8/2016, 1/12/2018, and Projected Q2 2019<sup>24</sup>**



2

3 With respect to expectations of future interest rates, consensus projections gathered by  
4 *Blue Chip Financial Forecasts* suggest a 30-year Treasury yield of 3.60 percent by the  
5 second quarter of 2019, an 81 basis point increase over the 2.79 percent yield as of mid-  
6 January.<sup>25</sup>

7 Further, the market anticipates additional rate increases in 2018, even after the Federal  
8 Reserve’s three rate hikes in 2017. As shown in Table 1, (below) the market expects at  
9 least one additional rate hike (98.70 percent probability) and possibly two or three (87.90  
10 percent and 56.80 percent probability, respectively) by December 2018. Importantly, the  
11 potential for rising rates represents risk for utility investors.

<sup>24</sup> Sources: Federal Reserve Board Schedule H.15.; Blue Chip Financial Forecasts, Vol. 37, No.1, January 1, 2018, at 2.

<sup>25</sup> Blue Chip Financial Forecasts, Vol. 37, No. 1, January 1, 2018, at 2.

**Table 1: Probability of Federal Funds Rate Increase<sup>26</sup>**

Target Rate (bps)	Federal Reserve Meeting Date							
	1/31/18	3/21/18	5/2/18	6/13/18	8/1/18	9/26/18	11/8/18	12/19/18
125-150	98.50%	26.30%	25.80%	6.40%	5.90%	2.30%	2.10%	1.30%
150-175	1.50%	72.60%	71.60%	37.20%	34.80%	17.10%	16.10%	10.80%
175-200		1.10%	2.60%	54.30%	53.00%	41.80%	40.20%	31.10%
200-225				2.00%	6.20%	34.80%	35.30%	37.10%
225-250					0.20%	3.80%	5.90%	17.00%
250-275						0.10%	0.30%	2.40%
275-300								0.10%

In fact, investors see only a 1.30 percent chance of no increases in 2018; the probability of a 125-basis point increase is higher than the probability of no increase.

**Q. Do you have any additional observations regarding the current capital market environment?**

A. Yes, I do. As rising yields have provided higher returns to investors, utilities have become less attractive investments. As shown in Chart 2 above, since November 2017 natural gas utilities lost approximately 9.70 percent of value, while the broad market gained nearly 9.50 percent in value.<sup>27</sup> As noted in my Direct Testimony, the risk of losses in the utility sector remains a consideration in light of further interest rate increases.<sup>28</sup>

<sup>26</sup> Source: <http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html>, accessed January 18, 2018.

<sup>27</sup> Source: Bloomberg Professional.

<sup>28</sup> Direct Testimony of Robert B. Hevert, at Bates 546.

1 **Q. What do you conclude from those analyses?**

2 A. As interest rates continue to rise, it is reasonable to expect lower utility valuations, higher  
3 dividend yields, and higher expected growth rates as we have seen over recent months.

4 In the context of the Discounted Cash Flow model, those variables combine to indicate  
5 increases in the Cost of Equity.

6 Lastly, it is important to keep in mind that although estimating the Cost of Equity is an  
7 empirical exercise, the rote application of a specific analysis, or the mechanical use of  
8 specific model inputs, may produce misleading results. Consequently, the methods used  
9 to estimate the Cost of Equity, and the weight given to any one method, may change from  
10 case to case as market conditions evolve. Even as those factors change, the returns  
11 authorized in other jurisdictions provide a relevant, observable, and verifiable benchmark  
12 for assessing the reasonableness of analytical assumptions, results, and conclusions.

13 With those points in mind, I continue to believe that a reasonable range of ROE estimates  
14 is from 10.00 percent to 10.60 percent.

15 **B. Market to Book Ratios**

16 **Q. Please summarize the Opposing Witnesses' position regarding the Market/Book  
17 ratio for utilities, and its implications for estimating the Cost of Equity.**

18 A. Dr. Woolridge and Dr. Chattopadhyay suggest Market/Book ("M/B") ratios in excess of  
19 unity (*i.e.*, 1.00 or 100.00 percent) indicate that the earned Return on Equity exceeds the

1 investor-required Cost of Equity.<sup>29</sup> The implication of their position is that regulatory  
2 commissions consistently have authorized ROEs well in excess of those required by  
3 investors. For the reasons discussed below, I strongly disagree Drs. Woolridge and  
4 Chattopadhyay on that point.

5 Dr. Woolridge provides a series of three regression analyses reflecting the relationship  
6 between the Return on Equity and M/B ratios for electric, natural gas, and water utilities,  
7 respectively, and concludes there is a “strong positive relationship” between M/B ratios  
8 and ROE.<sup>30</sup> Although the earned Return on Equity may be one factor explaining M/B  
9 ratios, it is not the only factor. If it were, the regression equations presented in Dr.  
10 Woolridge’s Exhibit JRW-6 would produce reasonable ROE estimates when the M/B  
11 ratio approximates unity. Based on Dr. Woolridge’s Exhibit JRW-4, an M/B ratio of 1.10  
12 is associated with an ROE of just 1.95 percent.<sup>31</sup>

13 I performed a similar analysis using Dr. Chattopadhyay’s exhibits. If we take at face  
14 value the proposition that M/B ratios will equal 1.00 when the expected ROE equals the  
15 Cost of Equity, we can use the data provided in Dr. Chattopadhyay’s Schedules to

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<sup>29</sup> See, Direct Testimony of Pradip K. Chattopadhyay, at Bates 147; Direct Testimony of J. Randall Woolridge, at Bates 000127-000129.

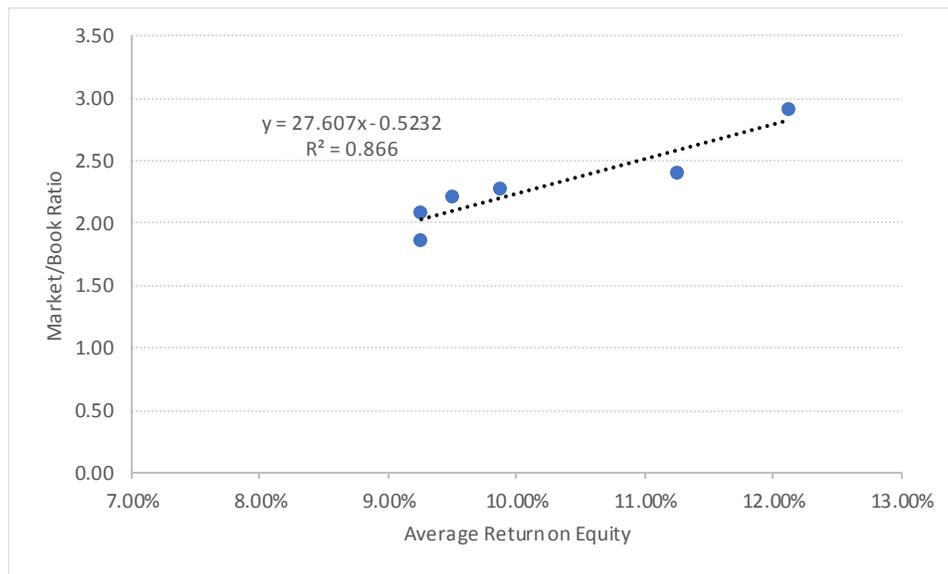
<sup>30</sup> Direct Testimony of J. Randall Woolridge, at Bates 000128-000129 and Exhibit JRW-6. Please note that there were only nine observations for the water group and twelve for the gas company group.

<sup>31</sup> I have updated the chart contained in Exhibit JRW-6 including the regression coefficients, using recent data from Value Line as of December 15, 2017 (Value Line’s three- to five-year projected return on shareholder’s equity). See Attachment RBH-Rebuttal-10. The resulting regression equation is:  $1.10 = 0.848 + (1.95 \times 0.1293)$ . I have assumed a M/B ratio of 1.10 to reflect Dr. Chattopadhyay’s assumption.

1 estimate the relationship between the expected ROE and M/B ratios. The data provided  
2 in Schedules PKC-6 and PKC-7 produce the equation provided in Chart 6, below.

3 **Chart 6: Market/Book Ratio as a Function of Expected ROE:**

4 **Dr. Chattopadhyay's Proxy Group<sup>32</sup>**



5  
6 The regression equation in Chart 6, which explains about 86.60 percent of the variation in  
7 the Market/Book ratios included in Dr. Chattopadhyay's exhibits, suggests the  
8 Market/Book ratio would equal 1.10 when the expected ROE equals 5.89 percent.<sup>33</sup>

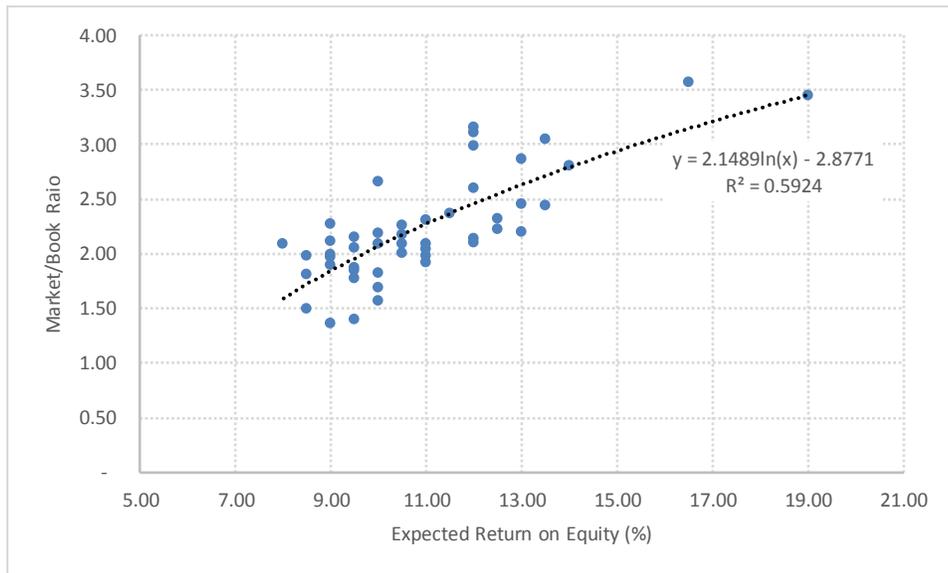
9 I then applied the same approach, this time using the larger data set underlying Dr.  
10 Chattopadhyay's Ordinary Least Squares ("OLS") regressions discussed at Bates 160 to

<sup>32</sup> Source: Schedules PKC-6 and PKC-7. I recognize this analysis includes only six observations. The analyses discussed below, which include considerably larger samples, support the general conclusion that the ROE required to support a Market/Book ratio of 1.00 to 1.10 is implausibly low.

<sup>33</sup>  $1.10 = (5.89\% \times 27.607) - 0.5232$

1 165 of his Direct Testimony (*see* Chart 7 below). The regression equation in Chart 7  
2 explains about 59.00 percent of the variation in the Market/Book ratios, and implies a  
3 Market/Book ratio of 1.10 when the expected ROE equals 6.36 percent.<sup>34</sup> That is,  
4 including all Value Line electric and gas utilities and taking the semi-log regression, the  
5 expected ROE when the Market/Book ratio equals 1.10 is 47 basis points higher than the  
6 result based on Dr. Chattopadhyay’s proxy companies, but still under 7.00 percent. In  
7 both cases the results are clearly unreasonable, and the implications implausible.

8 **Chart 7: Market/Book Ratio as a Function of Expected ROE:**  
9 **Value Line Utilities Excluding Outliers<sup>35</sup>**



10

<sup>34</sup>  $1.10 = (\ln(6.36) \times 2.1489) - 2.8771$

<sup>35</sup> Source: Attachment LU 1-2. Excludes AGR, SCG, WGL. I performed both linear and semi-log regressions, however, in response to Dr. Chattopadhyay’s semi-log regression analysis, I show the semi-log results here. Using the Park Test, the null hypothesis of homoscedasticity cannot be rejected.

1 Dr. Woolridge's data result in Cost of Equity estimations that are nearly 250 basis points  
2 *below* the Company's cost of debt (*i.e.*, 4.43 percent). In other words, for the M/B ratio  
3 to equal 1.10, the Cost of Equity would be well below the cost of debt, a condition that is  
4 highly improbable and which would be financially threatening. Dr. Chattopadhyay's data  
5 result in Cost of Equity estimates that are about 146 basis points above the Company's  
6 cost of debt. There is no reason to conclude that equity investors would accept a return  
7 that is within roughly 150 basis points of the return they would receive from investing in  
8 utility debt.<sup>36</sup> Consequently, neither Dr. Woolridge's nor Dr. Chattopadhyay's data  
9 support their theory that ROEs greater than unity demonstrate the subject company's  
10 return exceeds investors' required returns. They certainly have not demonstrated that  
11 regulatory commissions have been very wrong over many years, as their positions  
12 suggest.

13 Nonetheless, Dr. Chattopadhyay believes there are three reasons why it is important to  
14 "investigate" M/B ratios. Dr. Chattopadhyay first argues that any divergence between the  
15 market value of equity (that is, the market price of a share of stock) and the book value  
16 (the account-based value of common equity) "is very telling" as to an implied difference  
17 between the expected return on equity, and the opportunity cost-based cost of equity.<sup>37</sup>  
18 He argues that M/B ratios greater than 1.00 indicate that expected returns exceed required  
19 returns. Dr. Chattopadhyay then states that M/B ratios greater than 1.00 have certain

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<sup>36</sup> As of January 12, 2018, the 30-day average Moody's Utility Baa Index yield was 4.15 percent. Source: Bloomberg Professional.

<sup>37</sup> Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 146.

1 implications for the Constant Growth DCF model, and that one of his applications of the  
2 DCF approach relies on M/B ratios as an input.<sup>38</sup>

3 Although I respond to all three issues below, the first – that M/B ratios greater than 1.00  
4 are indicative of expected returns exceeding the “true opportunity cost of equity”<sup>39</sup> – is a  
5 fundamental concern.

6 **Q. Before turning to that point, what is your response to Dr. Chattopadhyay’s position  
7 that your analysis is “devoid of any merits”?**<sup>40</sup>

8 A. Dr. Chattopadhyay pre-emptively responds to an analysis I performed in the Granite State  
9 Electric case, Docket No. DE 16-383. He argues my analysis is flawed because it  
10 analyzed the linear relationship between *actual* returns and the market-to-book ratio  
11 rather than *expected* returns.<sup>41</sup> Dr. Chattopadhyay then performs two semi-log  
12 regressions to estimate the relationship between the expected Cost of Equity and the  
13 market-to-book ratio.

14 Dr. Chattopadhyay’s view that my analysis is “devoid of any merits” is misplaced.

15 Although I performed one analysis using actual earned returns in Docket No. DE 16-  
16 383,<sup>42</sup> I also performed another analysis using Value Line’s expected ROEs from Dr.  
17 Chattopadhyay’s Schedules PKC-6 and PKC-7 in that docket.<sup>43</sup> That analysis, which is

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<sup>38</sup> Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 146 – 147.

<sup>39</sup> *Ibid.*, at Bates 147.

<sup>40</sup> *Ibid.*, at Bates 158.

<sup>41</sup> *Ibid.*, at Bates 158-159.

<sup>42</sup> *See* Rebuttal Testimony of Robert B. Hevert, Attachment RBH-Rebuttal-8 (Bates 516-517), New Hampshire Public Utilities Commission Docket No. DE 16-383, February 3, 2017.

<sup>43</sup> *Ibid.*, at Bates 370.

1 the same analysis illustrated in Chart 6 above, uses Value Line’s three- to five-year  
2 *expected* return on common equity. In my Rebuttal Testimony in Docket No. DE 16-383,  
3 I demonstrated that Dr. Chattopadhyay’s data suggested the Market/Book ratio would  
4 equal 1.00 when the *expected* ROE equals 4.20 percent. Whether actual earned ROEs or  
5 expected ROEs are applied in the regression, neither analysis produced a reasonable ROE  
6 when the Market/Book ratio equals 1.00. As demonstrated in Charts 6 and 7 above, that  
7 conclusion holds in this case, as well.

8 **Q. What is your response to Dr. Chattopadhyay’s assertion that your analysis is**  
9 **“overly simplistic and not informed at all by the importance of the true cost of**  
10 **equity inherent to the theoretical DCF construct”?**<sup>44</sup>

11 A. Here again, Dr. Chattopadhyay’s assertion is misplaced. His proposed remedy, which is  
12 to further complicate the analysis, contributes no meaningful information and provides no  
13 further insights beyond my approach. In fact, despite their additional complexity, Dr.  
14 Chattopadhyay’s analyses produce results that are nearly identical to those provided by  
15 my “overly simplistic” method. His criticism therefore should be given no weight, and  
16 his conclusion that M/B ratios greater than unity demonstrate authorized returns exceed  
17 required returns should be disregarded.

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<sup>44</sup> Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 159.

1 **Q. What is the basis of your conclusion that Dr. Chattopadhyay’s analyses provide no**  
2 **further insights and fail to support his assertions?**

3 A. I simply reproduced Dr. Chattopadhyay’s regression analyses and compared those results  
4 to my analyses. I found that Dr. Chattopadhyay’s approach does not meaningfully  
5 improve the regression analyses’ ability to explain changes in M/B ratios, and produces  
6 results that are very close to those produced by my analyses. As shown in Table 2  
7 (below), based on the sample excluding his three outliers,<sup>45</sup> Dr. Chattopadhyay’s  
8 regression analysis explains about 67.00 percent of the variation in M/B ratios (based on  
9 the Adjusted R-Squared), whereas mine explains about 58.00 percent. Both approaches  
10 are highly statistically significant (the F-Statistics are well above 2.00). Perhaps most  
11 important, the inferences drawn from our respective analyses are highly consistent: The  
12 ROE at a M/B ratio of 1.10 is in the range of 6.36 percent to 6.51 percent; the implied  
13 M/B ratio at an ROE of 8.40 percent is about 1.70; and the ROE associated with a M/B  
14 ratio of 2.20 is about 10.60 percent.<sup>46</sup>

15 Quite simply, Dr. Chattopadhyay’s more complex approach comes to the same  
16 conclusion as my simpler method: The implied ROE at a M/B ratio of 1.10 is implausibly  
17 low.

---

<sup>45</sup> *Ibid.*, at Bates 162. Dr. Chattopadhyay excludes Avangrid, Inc. (“AGR”), SCANA Corp. (“SCG”), and WGL Holdings (“WGL”).

<sup>46</sup> Variables other than the expected ROE were applied to the regression equation based on their sample averages.

1

**Table 2: Regression Analysis Comparisons<sup>47</sup>**

OUTLIERS OMITTED	AGR, SCG, WGL					
	OLS1	T-STAT	OLS2	T-STAT	RBH OLS	T-STAT
R-SQR	0.70		0.69		0.59	
ADJ. R-SQR	0.67		0.67		0.58	
F-STAT	25.37		32.62		66.84	
Dependent Variable	M/B		M/B		M/B	
Intercept	(3.97)	(6.13)	(3.69)	(5.96)	(2.88)	(4.59)
LN(EROE)	2.21	9.33	2.24	9.47	2.15	8.18
BETA	0.63	1.34	---	---	---	---
PVAR	3.38	2.18	4.05	2.73	---	---
RGA	0.25	1.85	0.26	1.88	---	---
EROE when M/B=1.10	6.45		6.51		6.36	
M/B when ROE = 8.40	1.68		1.67		1.70	
EROE when M/B=2.20	10.62		10.62		10.62	

2

3           The same findings hold using Dr. Chattopadhyay’s second sample (that is, the sample  
4           excluding only SCG; see Table 3, below).

5

**Table 3: Regression Analysis Comparisons (SCG omitted)<sup>48</sup>**

Outliers Omitted	SCG					
	OLS1	T-STAT	OLS2	T-STAT	RBH OLS	T-STAT
R-SQR	0.71		0.71		0.58	
ADJ. R-SQR	0.69		0.69		0.57	
F-STAT	27.78		37.11		66.08	
Dependent Variable	M/B				M/B	
Intercept	(3.54)	(6.05)	(3.48)	(6.02)	(2.35)	(4.16)
LN(EROE)	2.05	9.06	2.11	10.00	1.94	8.13
BETA	0.35	0.80	---	---	---	---
PVAR	4.59	3.06	4.88	3.36	---	---
RGA	0.27	1.96	0.28	2.06	---	---
EROE when M/B=1.10	6.13		6.23		5.93	
M/B when ROE = 8.40	1.75		1.73		1.77	
EROE when M/B=2.20	10.48		10.48		10.47	

<sup>47</sup> Source: Attachment LU 1-2.

<sup>48</sup> Source: Attachment LU 1-2.

1 **Q. Putting those analyses aside, as a general matter why is it that M/B ratios greater**  
2 **than 1.00 do not demonstrate actual returns have exceeded expected returns?**

3 A. It first is important to review the ratio itself, and to bear in mind what it does, and does  
4 not indicate. In very general terms, the M/B ratio equals the market value (or stock price)  
5 per share, divided by the total common equity (or the book equity) per share. Book value  
6 is an accounting construct, which reflects historical costs. In contrast, market value per  
7 share, *i.e.*, the stock price, is forward-looking, and is a function of many variables,  
8 including (but not limited to) expected earnings and cash flow growth, expected payout  
9 ratios, measures of “earnings quality,” the regulatory climate, the equity ratio, expected  
10 capital expenditures, and the expected return on book equity.<sup>49</sup> It follows, therefore, that  
11 the M/B ratio likewise is a function of numerous variables in addition to the historical or  
12 expected Return on Common Equity.

13 Dr. Chattopadhyay discusses the M/B ratio in the context of the Constant Growth DCF  
14 model. As Dr. Chattopadhyay notes, under certain restrictive assumptions, that model  
15 can be rewritten to express the M/B ratio as follows<sup>50</sup>

16 
$$\frac{P}{B} = \frac{ROE - g}{k - g} \quad \text{Equation [1]}^{51}$$

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<sup>49</sup> See for example, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 366. Dr. Morin cites several academic articles that address the various factors that affect the Market-to-Book ratio for utilities.

<sup>50</sup> B. Branch, A. Sharma, C. Chawla, and F. Tu, An Updated Model of Price-to-Book, Journal of Applied Finance, No. 1 (2014). *See also*, Dr. Chattopadhyay’s Direct Testimony at Bates 148, Equation (1).

<sup>51</sup> In Dr. Chattopadhyay’s Equation (1), the Market/Book (“M/B”) ratio is referred to as the Price/Book ratio (“P/B”).

1 where ROE is the return on book equity,  $k$  is the risk-adjusted discount rate, and  $g$  is the  
2 long-term growth rate in dividends per share. Rearranging Equation [1] produces the  
3 familiar Gordon Growth model:

$$4 \quad P = \frac{D}{k - g} \quad \text{Equation [2]}$$

5 and the Constant Growth DCF model:

$$6 \quad k = \frac{D}{P} + g \quad \text{Equation [3]}$$

7 That is, Dr. Chattopadhyay's assumed relationship between the accounting Return on  
8 Equity and the Cost of Equity simply falls from the Constant Growth DCF model, itself;  
9 one cannot be assumed without the other. As such, any inferences Dr. Chattopadhyay  
10 may draw from the relationships among M/B, ROE, and  $k$  noted in Equation [1] rely on  
11 the explicit acceptance of all assumptions underlying the Constant Growth DCF model,  
12 including a constant dividend growth rate in perpetuity, and the constancy of the DCF  
13 result. Equally important, Equation [1] only can be solved from the Constant Growth  
14 DCF model if we assume: (1) a constant dividend payout ratio in perpetuity; (2) no stock  
15 issuances or repurchases; and (3) that the firm is in a steady state, in which the book  
16 equity growth rate equals the dividend growth rate, in perpetuity. Taken together, those  
17 assumptions are quite restrictive, and call into question the definitive linkage between  
18 M/B, ROE, and  $k$  that Dr. Chattopadhyay assumes.

1 **Q. Are you aware of any published research that addresses the issue of M/B ratios in**  
2 **the context of the Constant Growth DCF model?**

3 A. Yes. As noted above, if we accept all the assumptions that underlie the Constant Growth  
4 DCF model, Equation [1] suggests that if M/B exceeds unity, then ROE exceeds  $k$ .  
5 Branch *et al.* point out that M/B is generally greater than or equal to one because the  
6 value of the firm as a going concern (price per share) generally exceeds the liquidation  
7 value (book value per share) and "...firms having going concern values greater than their  
8 liquidation values (most firms) and firms having finite prices (all firms) should have ROE  
9  $> R > G$ ."<sup>52</sup> Taken from that perspective, M/B ratios in excess of unity should not be  
10 surprising: if the liquidation value exceeds the market value, the company would be  
11 liquidated.

12 **Q. Have Market/Book values generally exceeded 1.00 for the broad equity market?**

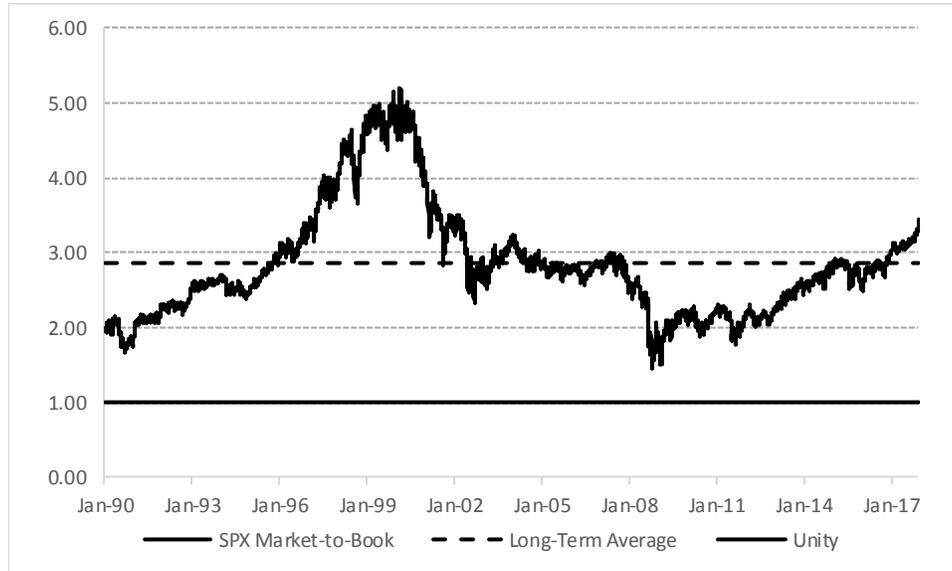
13 A. Yes, they have. As Chart 8 (below) demonstrates, since 1990 the average Market/Book  
14 ratio for the S&P 500 Index has been 2.86; it has never reached unity.

---

<sup>52</sup> Branch et al. (2014), at 78. [clarification added] Here, R = the Cost of Equity, and G = growth.

1

**Chart 8: S&P 500 Market/Book Ratio Over Time<sup>53</sup>**



2

3

If investors, over many years and across many companies, felt the returns they expected had so significantly exceeded the returns they required, they would adjust their requirements. In Dr. Chattopadhyay's construct, the disequilibrium between expected and required returns would dissipate, and take with it the disequilibrium between market and book values. But that has not occurred.

4

5

6

7

8

That finding also is consistent with the position that M/B ratios greater than 1.00 simply mean that firms are worth more as a going concern than the book value of their assets.

9

10

U.S. Generally Accepted Accounting Principles ("GAAP") and International Financial

11

Reporting Standards require firms to carry the value of assets on their books at the

<sup>53</sup> Source: Bloomberg Professional.

1 historical cost of those assets; only under specific circumstances may the value of certain  
2 financial investments be carried at market value.<sup>54</sup> As a result:

3 ...given market efficiency, the [M/B] ratio is intrinsically an accounting  
4 phenomenon; that is, on first order, [M/B] is determined by how  
5 accountants measure book value... If all assets and liabilities were  
6 accounted for using unbiased mark-to-market or “fair value”  
7 accounting, [M/B] would be equal to unity for all levels of risk....A  
8 good example is a pure investment fund where “net asset value”  
9 typically equals market value, since accountants apply mark-to-market  
10 accounting to these funds...For most other firms, accountants do not  
11 mark the net assets involved with operations to market. The application  
12 of historical cost accounting, exacerbated by the application of  
13 conservative accounting, introduces a difference between price and  
14 book value.<sup>55</sup>

15 **Q. Are you aware of research that has focused on the Market/Book ratios of regulated**  
16 **utilities?**

17 A. Yes, I am. Although Dr. Chattopadhyay and Dr. Woolridge suggest utility commissions  
18 have contributed to the divergence between market and book values, research focusing on  
19 utilities has long concluded that regulation may not necessarily result in M/B ratios  
20 approaching unity. As noted by Phillips in 1993:

21 Many question the assumption that market price should equal book  
22 value, believing that 'the earnings of utilities should be sufficiently high

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<sup>54</sup> Financial Accounting Standards Board Rule 157.

<sup>55</sup> S. H. Penman, S.A. Richardson, and I. Tuna, “*The Book-to-Price Effect in Stock Returns: Accounting for Leverage*”, *Journal of Accounting Research*, 45:2, May 2007. The authors use the reciprocal of the M/B and different notation. In the quote above, I have replaced B/P (where P denotes price per share) with M/B for ease of exposition.

1 to achieve market-to-book ratios which are consistent with those  
2 prevailing for stocks of unregulated companies.’<sup>56</sup>

3 In 1988 Bonbright stated:

4 In the first place, commissions cannot forecast, except within wide  
5 limits, the effect their rate orders will have on the market prices of the  
6 stocks of the companies they regulate. In the second place, whatever  
7 the initial market prices may be, they are sure to change not only with  
8 the changing prospects for earnings, but with the changing outlook of  
9 an inherently volatile stock market. In short, market prices are beyond  
10 the control, though not beyond the influence, of rate regulation.  
11 Moreover, even if a commission did possess the power of control, any  
12 attempt to exercise it ... would result in harmful, uneconomic shifts in  
13 public utility rate levels.<sup>57</sup>

14 As noted by Stewart Myers in 1972:

15 “In short, a straightforward application of the cost of capital to a book  
16 value rate base does not automatically imply that market and book  
17 values will be equal. This is an obvious but important point. *If*  
18 *straightforward approaches did imply equality of market and book*  
19 *values, then there would be no need to estimate the cost of capital. It*  
20 *would suffice to lower (raise) allowed earnings whenever markets were*  
21 *above (below) book [emphasis added].”<sup>58</sup>*

22 Finally, as Dr. Morin states, it is rarely the case in cost of service-based regulation that

23 M/B ratios equal 1.00:

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<sup>56</sup> Charles F. Phillips, The Regulation of Public Utilities – Theory and Practice (Public Utility Reports, Inc., 1993) at 395.

<sup>57</sup> James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), at 334.

<sup>58</sup> See, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 366, citing Stewart C. Myers, The Application of Finance Theory to Public Utility Rate Cases, The Bell Journal of Economics and Management Science, Vol. 3, No. 1 (Spring 1972), at 76.

1 The third and perhaps most important reason for caution and skepticism  
2 is that application of the DCF model produces estimates of common  
3 equity cost that are consistent with investors' expected return only when  
4 stock price and book value are reasonably similar, that is, when the M/B  
5 is close to unity. As shown below, application of the standard DCF  
6 model to utility stocks understates the investor's expected return when  
7 the market-to-book (M/B) ratio of a given stock exceeds unity. This  
8 was particularly relevant in the capital market environment of the 1990s  
9 and 2000s whose utility stocks are trading at M/B ratios well above  
10 unity and have been for nearly two decades. The converse is also true,  
11 that is, the DCF model overstates the investor's return when the stock's  
12 M/B ratio is less than unity. The reason for the distortion is that the  
13 DCF market return is applied to a book value rate base by the regulator,  
14 that is, a utility's earnings are limited to earnings on a book value rate  
15 base.<sup>59</sup>

16 Because the Constant Growth DCF model traditionally used in rate regulation assumes a  
17 M/B of unity, it would understate investors' required return rate when market value  
18 exceeds book value. It would do so because investors evaluate and receive their returns  
19 on the market value of a utility's equity, whereas regulators authorize returns on book  
20 common equity. Consequently, the market-based DCF model will result in a total annual  
21 dollar return on book common equity equal to the total annual dollar return expected by  
22 investors only when market and book values are equal, a rare and unlikely situation.

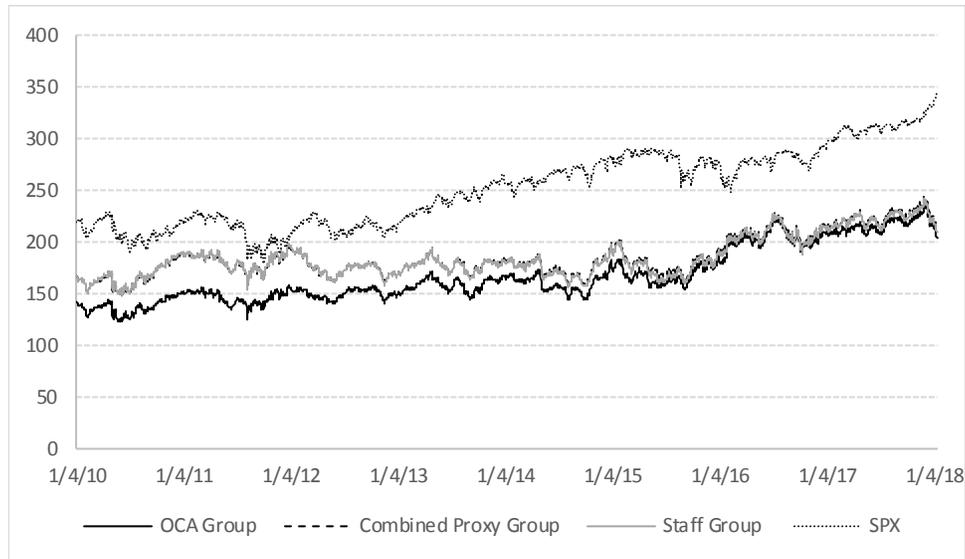
23 Just as M/B ratios for the S&P 500 have remained above 1.00, so have those of the  
24 Opposing Witnesses' and my proxy companies. Chart 9 (below) demonstrates that since  
25 2010 (generally the time frame used by Dr. Chattopadhyay), all three proxy groups' M/B  
26 ratios have exceeded unity and have generally moved in parallel with the S&P 500 M/B  
27 ratio. Although the broad market represents a cross section of risk and return profiles, of

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<sup>59</sup> Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 434. [emphasis added]

1 which the utility sector is just one, the observed variation in market-level M/B ratios  
2 speaks to the time-varying influence of general macroeconomic factors.

3 **Chart 9: Comparison Groups, S&P 500 Market Book Ratios (2010 – 2018)<sup>60</sup>**



4  
5 An interesting observation is that approximately 47.00 percent to 74.00 percent of the  
6 change in the comparison company groups' M/B ratios are explained by changes in the  
7 S&P 500 M/B ratio. That is, macroeconomic factors affect utilities as well as non-  
8 regulated entities.

<sup>60</sup> Source: Bloomberg Professional.

1 **Q. What would be the result if regulatory commissions did force M/B ratios toward**  
2 **unity?**

3 A. Looking at Dr. Chattopadhyay's comparison group, the average capital loss for equity  
4 investors would be about 56.00 percent.<sup>61</sup> Therefore, if investors believed that the extent  
5 to which M/B ratios exceed 1.00 is a measure of the difference between their expected  
6 and required returns, and that regulatory commissions would authorize returns that would  
7 set the market value equal to the book value of utility stocks, there would be a significant  
8 loss of value.

9 That loss would not just affect investors, it also would substantially diminish the ability  
10 of utilities to attract external capital. Moreover, such a significant departure from  
11 regulatory practice would introduce a degree of regulatory risk that would put pressure on  
12 credit ratings; that pressure would be exacerbated by the diluted cash flow resulting from  
13 the significantly lower authorized equity returns. Because utilities are so dependent on  
14 external capital to fund the long-term investments needed to provide safe and reliable  
15 service, the diminished access and increased cost would be to the detriment of customers,  
16 as well as investors. To summarize, if regulatory commissions were to set rates with an  
17 eye toward moving the M/B ratio toward unity, that practice may well impede the ability  
18 to attract the capital required to support its operations, especially in markets during which  
19 the M/B ratio for the overall market is significantly in excess of 100.00 percent.

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<sup>61</sup> Based on a 30-day average M/B of 225.27 for Dr. Chattopadhyay's proxy companies, calculated as an index.  
-53.00% = (100/225.27)-1

1 **Q. Do you have any other observations regarding this issue?**

2 A. Yes. It is important to keep in mind that in practice, the M/B ratio is used as a measure of  
3 relative, not absolute valuation. That is, it typically is used by investors to assess the  
4 value of an asset or enterprise relative to the prevailing M/B ratios of comparable assets  
5 or enterprises. That it is used in that manner simply reflects the practical understanding  
6 that no one model, including the Constant Growth DCF model, should be relied on as the  
7 sole measure of value. In that important sense, investors have been more likely to assess  
8 the market value of a natural gas utility relative to the M/B ratios of comparable firms  
9 than to assume that the market value should equal book value.

10 **IV. RESPONSE TO TESTIMONY OF DR. WOOLRIDGE**

11 **Q. Please provide a brief summary of Dr. Woolridge's testimony and ROE**  
12 **recommendation.**

13 A. Dr. Woolridge recommends an ROE range of 7.90 percent to 8.55 percent. Giving  
14 primary weight to his Constant Growth DCF results, Dr. Woolridge recommends a  
15 specific point estimate of 8.55 percent.<sup>62</sup> As to the Company's proposed capital structure  
16 Dr. Woolridge recommends a capital structure consisting of 49.85 percent long-term  
17 debt, 0.95 percent short-term debt, and 49.21 percent common equity. Lastly, he applies  
18 the Company's updated short-term and long-term debt cost rates.<sup>63</sup>

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<sup>62</sup> Direct Testimony of J. Randall Woolridge, at Bates 000007.

<sup>63</sup> *Ibid.*

1 **Q. What are the principal areas of disagreement between you and Dr. Woolridge?**

2 A. There are several areas in which I disagree with Dr. Woolridge. In particular, those areas  
3 include: (1) the reasonableness of an ROE recommendation far below recently authorized  
4 ROEs; (2) the composition and selection of the proxy group companies; (3) the growth  
5 rates applied in the Constant Growth DCF model; (4) the application of the Multi-Stage  
6 DCF model; (5) the application of the CAPM; (6) the reasonableness of the Bond Yield  
7 Plus Risk Premium analysis; (7) EnergyNorth's business risks (including its proposed  
8 decoupling mechanism and its relatively small size) and their implications for its Cost of  
9 Equity; (8) the relevance of flotation costs in determining the Company's Cost of Equity;  
10 and (9) his recommended capital structure. As a general matter, as discussed earlier in  
11 Section III, I disagree with Dr. Woolridge's presentation and interpretation of certain data  
12 relating to capital market conditions and the relevance of Market/Book ratios above 1.00.

13 **A. Recommended ROE**

14 **Q. Is Dr. Woolridge's 8.55 percent consistent with recently authorized returns for gas**  
15 **utilities?**

16 A. No. As shown in Chart 1 above, Dr. Woolridge's recommendation falls far below the  
17 returns recently authorized for natural gas utilities. Dr. Woolridge recognizes as much,

1 noting that his 8.55 percent ROE recommendation is 106 basis points below the recent  
2 average returns for natural gas utilities.<sup>64</sup>

3 **Q. Is Dr. Woolridge’s 8.55 percent recommendation consistent with returns recently**  
4 **authorized in New Hampshire?**

5 A. No, it is not. Although it was an electric rate case, the most recent ROE authorized by  
6 the Commission was 9.40 percent for Granite State Electric issued in April 2017 (Docket  
7 No. DE 16-383). The most recent ROE authorized for a gas utility was 9.50 percent for  
8 Northern Utilities (Docket No. DG 13-086), in April 2014. That is, within the past four  
9 years, the Commission authorized returns as much as 95 basis points above Dr.  
10 Woolridge’s recommendation (in this proceeding).

11 **Q. What is your conclusion regarding the reasonableness of Dr. Woolridge’s**  
12 **recommended ROE?**

13 A. Regardless of how Dr. Woolridge arrived at his recommendation, it is very difficult to  
14 reconcile his recommended 8.55 percent ROE with past, current, and expected market  
15 environments. The implications of Dr. Woolridge not reconciling his ROE  
16 recommendation with authorized returns, including the Commission’s recently authorized  
17 returns, are particularly acute since (as discussed below), his conclusion is based  
18 principally on a single model whose underlying assumptions are incompatible with

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<sup>64</sup> Source: Regulatory Research Associates. At Bates page 13 of his testimony, Dr. Woolridge refers to an average authorized return of 9.61 percent in 2017 for natural gas utilities, which excludes the 11.88 percent ROE authorized for ENSTAR Natural Gas in Alaska. Including the ENSTAR ROE, the average for 2017 is 9.72 percent.

1 prevailing market conditions, and for which his inputs are quite subjective, and his results  
2 cannot be replicated.

3 **B. Proxy Group Selection**

4 **Q. Please describe Dr. Woolridge's Proxy Group.**

5 A. Dr. Woolridge's Gas Proxy Group consists of the same companies in the proxy group I  
6 used in my Direct Testimony, with the exclusion of Chesapeake Utilities and the  
7 inclusion of One Gas, Inc.<sup>65</sup>

8 **Q. Do you agree with Dr. Woolridge's exclusion of Chesapeake Utilities from his proxy**  
9 **group?**

10 A. No, I do not. Dr. Woolridge states he excluded Chesapeake Utilities because it receives  
11 "the majority" of its revenues from regulated electric utility operations.<sup>66</sup> However, in  
12 2016, Chesapeake Utilities' natural gas operating revenue was \$181.5 million, versus  
13 reported electric operating revenue of \$84.1 million.<sup>67</sup> From that perspective, regulated  
14 natural gas revenues were approximately 68.00 percent of total regulated operating  
15 revenue in 2016. Further, Chesapeake Utilities passes my screening criterion of more  
16 than 60.00 percent of operating income from regulated natural gas operations.  
17 Consequently, Chesapeake Utilities appears to pass Dr. Woolridge's screening criterion,  
18 and should be included in his proxy group.

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<sup>65</sup> Direct Testimony of J. Randall Woolridge, at Bates 000017.

<sup>66</sup> *Ibid.*

<sup>67</sup> *See*, Chesapeake Utilities SEC Form 10-K, for the Fiscal Year ended December 31, 2016, at 4.

1 **Q. What is your concern with Dr. Woolridge’s use of revenue, rather than income, as a**  
2 **screening criterion?**

3 A. Measures of income are far more likely to be considered by the financial community in  
4 making credit assessments and investment decisions than are measures of revenue. From  
5 the perspective of credit markets, measures of financial strength and liquidity are focused  
6 on cash from operations, which is directly derivative of earnings, as opposed to revenue.  
7 For example, Moody’s assigns 40.00 percent weight to measures of financial strength and  
8 liquidity, of which 32.50 percent specifically relates to the ability to cover debt  
9 obligations with cash from operations.<sup>68</sup>

10 Just as rating agencies focus on measures of cash from operations, equity analysts rely on  
11 measures of income in assessing equity valuation levels; common measures of relative  
12 value include the Price/Earnings (“P/E”) ratio, and the ratio of Enterprise Value/EBITDA  
13 (Earnings Before Interest, Taxes, Depreciation, and Amortization). Revenue, however,  
14 may be several steps removed from the earnings and cash flows that form the basis of  
15 equity valuations.<sup>69</sup> Energy trading and marketing units, for example, often represent  
16 high revenue but low margin operations. Those operations may generate a comparatively  
17 large proportion of the combined entity’s revenue, but only a small percentage of  
18 operating income and cash flow. Focusing on revenue, therefore, may mislead the  
19 analyst into assuming that a given operating unit is the primary driver of expected

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<sup>68</sup> See Moody’s Investors Service, Rating Methodology, *Regulated Electric and Gas Utilities*, December 23, 2013, at 10-14.

<sup>69</sup> For example, revenues collected through a natural gas utility’s cost of gas adjustment clause increases revenue but do not contribute to earnings.

1 growth, when the majority of earnings and cash flows are derived from other business  
2 segments. Here, we are considering whether the underlying utility is the principal source  
3 of long-term growth and as such, focusing on revenue may obscure important elements of  
4 the analysis.

5 **C. Application of the Constant Growth DCF Approach**

6 **Q. Please summarize your concerns with the Constant Growth DCF model and Dr.**  
7 **Woolridge's application of the model.**

8 A. There are several aspects of Dr. Woolridge's DCF analyses and conclusions that are  
9 incompatible with market conditions and inconsistent with the practical interpretation of  
10 the models' results. For example, the market data used in Dr. Woolridge's DCF analyses  
11 conflict with the models' underlying assumptions. In particular, the market prices Dr.  
12 Woolridge used to calculate the dividend yield were taken from a period during which  
13 utilities in general, and the proxy companies in particular, traded at unusually high and  
14 likely unsustainable levels. In fact, during Dr. Woolridge's study period, utility P/E  
15 ratios exceeded their long-term average and the broad market's P/E ratio (as measured by  
16 the S&P 500).<sup>70</sup> The elevated P/E ratios are an important factor simply because the  
17 Constant Growth DCF model assumes constant P/E ratios in perpetuity. Consequently,  
18 the basis of Dr. Woolridge's recommendation – the Constant Growth DCF model –  
19 assumes data that are inconsistent with the model's fundamental assumptions.

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<sup>70</sup> Source: SNL Financial, Bloomberg Professional as of October 31, 2017 (Dr. Woolridge's study period).

1 Moreover, Dr. Woolridge’s application of the Constant Growth DCF model includes a  
2 degree of subjectivity that prevents us from replicating the fundamental inputs which  
3 drive his results. It is entirely possible analysts looking at the same data would come to  
4 different conclusions. For example, based on his review of historical and projected  
5 dividend, book value, earnings, and “sustainable” growth rates, Dr. Woolridge assumes a  
6 growth rate of 5.90 percent for the companies in his proxy group, although it is unclear  
7 how he arrives at that estimate.<sup>71</sup> Moreover, Dr. Woolridge’s judgment is to give  
8 “primary weight”<sup>72</sup> to growth rate projections produced by equity analysts, despite his  
9 position that those analysts knowingly and persistently produce biased forecasts.

10 **Q. What growth rates did Dr. Woolridge review in his Constant Growth DCF analysis?**

11 A. Dr. Woolridge reviewed a number of growth rates, including historical and projected  
12 dividend per share (“DPS”), book value per share (“BVPS”), and EPS growth rates as  
13 reported by Value Line; analysts’ consensus EPS growth rate projections from Yahoo!,  
14 Reuters, and Zacks; and an estimate of “Sustainable Growth” derived from data provided  
15 by Value Line. Dr. Woolridge states that in arriving at his 8.55 percent DCF estimates  
16 for his proxy group, respectively, he gave more weight to projected EPS growth rates.<sup>73</sup>

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<sup>71</sup> That is, his 5.90 percent estimate is not the result of any mathematical calculation. Direct Testimony of J. Randall Woolridge, at Bates 000031-000034.

<sup>72</sup> *Ibid.* at Bates 000033.

<sup>73</sup> *Ibid.*

**Table 4: Summary of Dr. Woolridge’s Growth Rate Estimates<sup>74</sup>**

	<b>Dr. Woolridge’s Gas Proxy Group</b>
Value Line Historical Growth Rates (DPS, BVPS, EPS)	5.70%
Value Line Projected Growth Rates (DPS, BVPS, EPS)	5.50%
Sustainable Growth	4.30%
Analyst Projected EPS Growth Rates (excl. Value Line) – Mean/Median	5.80%/6.00%
Dr. Woolridge’s Assumed DCF Growth Rate	5.90%

**Q. Do Dr. Woolridge’s analyses account for abnormally elevated P/E ratios?**

A. Not on a consistent basis. As discussed throughout my Rebuttal Testimony, DCF-based methods, such as the Constant Growth model on which Dr. Woolridge (and Dr. Chattopadhyay) relies, depend on recent stock prices as a principal input, and (in the case of the Constant Growth model) assume that Price/Earnings ratios and the resulting Cost of Equity will remain constant in perpetuity. As noted above, an important analytical issue is that utility sector P/E ratios recently have been well above their historical levels.<sup>75</sup> To support his Capital Asset Pricing Model analysis, Dr. Woolridge refers to

<sup>74</sup> *Ibid.*, at Bates 000028-000030, and Exhibit JRW-10, at 6.

<sup>75</sup> Since the beginning of 2000, the long-term average P/E ratio for Dr. Woolridge’s proxy group was 17.72. The 30-day average P/E ratio for the period ending January 12, 2018, was 27.48 for Dr. Woolridge’s proxy group. Source: SNL Financial. Looking forward, indicators suggest that the industry’s current valuation levels may not persist. Value Line, for example, expects a decline in the P/E ratio for all but one of the companies in Dr. Woolridge’s proxy group over the coming three to five years (*See* Attachment RBH-Rebuttal-11).

1 “Building Block” approaches as part of the studies that he uses to estimate the Market  
2 Risk Premium (*see* Exhibit JRW-11, pages 5 and 6). Among the “Building Block”  
3 studies included in that review are those produced by Ibbotson and Chen. The Ibbotson  
4 2017 SBBI Yearbook also discusses the “Building Block” model,<sup>76</sup> and in discussing the  
5 effect of increasing P/E ratios on the market return concludes that “reported earnings are  
6 affected not only by the long-term productivity, but also by ‘one-time’ items that do not  
7 necessarily have the same consistent impact year after year.”<sup>77</sup> Ibbotson therefore uses  
8 three-year average P/E ratios to develop its Supply-Side market return estimate.

9 In summary, Dr. Woolridge recognized and adjusted his analyses to reflect an abnormal  
10 expansion in P/E ratios in his Building Blocks calculation but did not acknowledge the  
11 same principle in his DCF analysis. That is, Dr. Woolridge relied on an analysis that  
12 adjusts abnormally high P/E ratios in a manner that reduced his CAPM estimate (the  
13 Building Blocks approach to developing the Equity Risk Premium),<sup>78</sup> but at the same  
14 time relied on DCF estimates that do not recognize or adjust for the abnormal expansion  
15 in P/E ratios for his proxy companies. If Dr. Woolridge were to adjust his DCF results  
16 for abnormal P/E ratios, stock prices would decrease, which would increase his dividend  
17 yields and DCF results. Given that the current 30-day average P/E ratio of Dr.  
18 Woolridge’s proxy group (27.48) is approximately 55.10 percent above its long-term  
19 average since the beginning of 2000 (17.72), adjusting his DCF estimates to reflect the

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<sup>76</sup> Ibbotson refers to the method as the “Supply Side” approach.

<sup>77</sup> Duff & Phelps, Ibbotson 2017 Yearbook, at 10-28.

<sup>78</sup> *See* Direct Testimony of J. Randall Woolridge, Exhibit JRW-11, at 5-6 and Duff & Phelps, Ibbotson 2017 Yearbook, at 10-28 to 10-29.

1 long-term average price levels would increase the dividend yield and his DCF ROE  
2 results by approximately 145 basis points.<sup>79</sup>

3 **Q. Please summarize Dr. Woolridge’s reference to a March 2015 report by Moody’s**  
4 **regarding the effect of ROEs on utilities’ near-term credit profiles.**

5 A. Dr. Woolridge points to the March 2015 Moody’s report and concludes (among other  
6 things) that lower authorized ROEs are not impairing utilities’ credit profiles and are not  
7 “detering them from raising record amounts of capital.”<sup>80</sup> Dr. Woolridge further argues  
8 the Moody’s article “supports the prevailing/emerging belief that lower authorized ROEs  
9 are unlikely to hurt the financial integrity of utilities or their ability to attract capital.”<sup>81</sup>

10 **Q. What is your response to Dr. Woolridge in that regard?**

11 A. The Moody’s article makes clear that utilities’ cash flow has benefited from increased  
12 deferred taxes, which themselves are due to bonus depreciation. As Moody’s noted, the  
13 rise in deferred taxes eventually will reverse.<sup>82</sup> That may be one reason that the Moody’s  
14 study refers to “near-term credit profiles;” in the longer-term, utilities will not have the  
15 benefits of bonus depreciation to offset lower authorized returns.

16 In addition, Moody’s observed that although interest rates remain at relatively low levels,  
17 they “will go up, eventually”, which “could spell trouble for utilities.” Moody’s

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<sup>79</sup>  $(3.95\% \times 1.0295) + 5.90\% = 10.00\%$ ;  $10.00\% - 8.55\% = 1.45\%$

<sup>80</sup> Direct Testimony of J. Randall Woolridge, at Bates 000046.

<sup>81</sup> *Ibid.*, at Bates 000047.

<sup>82</sup> Moody’s Investors Service, *Lower Authorized Returns Will Not Hurt Near-Term Credit Profiles*, March 10, 2015, at 4.

1 concludes, “[f]or now, utilities can enjoy their (historically) high equity valuations in  
2 terms of dividend yield and price-earnings ratios.”<sup>83</sup> That is, in March 2015 Moody’s  
3 observed that the prevailing valuations were unusual, and some degree of reversion  
4 toward long-term means was likely. For the utility sector, that was the case, as the Dow  
5 Jones Utility Index P/E ratio fell more than 13.00 percent from approximately 17.30 in  
6 early March 2015 to below 15.00 in September 2015, as the 30-year Treasury yield rose  
7 10.00 percent.<sup>84</sup> Because unusually high P/E ratios are unlikely to persist in perpetuity,  
8 Dr. Woolridge’s approach of giving primary weight to his Constant Growth DCF  
9 estimates should be viewed with considerable caution.

10 Regarding Moody’s expectation that interest rates “will go up, eventually”, as discussed  
11 in my Direct Testimony, the Federal Reserve has begun tightening monetary policy by  
12 raising the Federal Funds rate. Over the past year, the Federal Reserve increased the  
13 Federal Funds target rate by a total of 100 basis points to a current range of 1.25 percent-  
14 1.50 percent. As discussed earlier in Section III, both short and long-term interest rates  
15 are expected to further increase going forward.<sup>85</sup>

16 The Federal Reserve’s move toward interest rate “normalization” not only includes  
17 increases in the Federal Funds rate, it also addresses the “unwinding” of the securities  
18 acquired during Quantitative Easing. On September 20, 2017, the Federal Reserve

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<sup>83</sup> *Ibid.* at 5.

<sup>84</sup> Source: Bloomberg Professional.

<sup>85</sup> *Blue Chip Financial Forecast*, December 1, 2017, at 2 and 14.

1 announced that it will “initiate the balance sheet normalization program described in the  
2 June 2017 Addendum to the Committee’s Policy Normalization Principles and Plans.”<sup>86</sup>  
3 Those “Principles and Plans” call for reducing the reinvestment of principal payments  
4 received from its holdings of Treasury securities by up to \$30 billion per month, and  
5 mortgage-backed securities by up to \$20 billion per month.<sup>87</sup> At the same time, the  
6 Federal Reserve will continue considering increases to the Federal Funds target rate.<sup>88</sup>  
7 Although the market effects of unwinding some \$4 trillion of assets is uncertain, upward  
8 pressure on long-term interest rates could be expected as the Federal Reserve begins that  
9 process in the latter half of 2018.

10 **Q. Do you have any concerns with Dr. Woolridge’s belief that analysts’ earnings**  
11 **growth projections are consistently biased?**

12 A. Yes, I do. Dr. Woolridge argues analysts’ earnings growth estimates are “overly  
13 optimistic and upwardly biased,” and relying on such estimates is a methodological  
14 error.<sup>89</sup> He further asserts that because of that bias, “the DCF growth rate needs to be  
15 adjusted downward from the projected EPS growth rate.”<sup>90</sup> Dr. Woolridge’s position,  
16 however, is based on observations of the broad market; he has provided no evidence that  
17 any of the growth rates used in my (or his) DCF analyses are the result of a consistent and

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<sup>86</sup> Federal Reserve Press Release, September 20, 2017.

<sup>87</sup> Federal Reserve Addendum to the Policy Normalization Principles and Plans As adopted effective June 13, 2017.

<sup>88</sup> The market is anticipating at least one rate increase by December 2018 (98.70 percent probability) and possibly two or three (87.90 percent and 56.80 percent probability, respectively) by December 2018). See, <http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html/> accessed January 19, 2018.

<sup>89</sup> Direct Testimony of J. Randall Woolridge, at Bates 000050.

<sup>90</sup> *Ibid.*, at Bates 000031.

1 pervasive bias on the part of the analysts providing those projections. Notably, despite  
2 his view that they are biased, it was by “giving primary weight to the projected EPS  
3 growth rate of Wall Street analysts” that Dr. Woolridge arrived at his assumed growth  
4 rates.<sup>91</sup>

5 **Q. What is your response to Dr. Woolridge on that point?**

6 A. There is no reason to believe the analyst growth rates used in our DCF analyses are  
7 biased. As a practical matter, the October 2003 Global Research Analyst Settlement  
8 required financial institutions to insulate investment banking from analysis, prohibited  
9 analysts from participating in “road shows,” and required the settling financial  
10 institutions to fund independent third-party research.<sup>92</sup> I have reviewed the Letters of  
11 Acceptance, Waiver and Consent signed by financial institutions that were party to the  
12 Global Settlement, and found no reference to misconduct by analysts following the utility  
13 sector.

14 Moreover, pursuant to Regulation AC, which became effective in April 2003, analysts  
15 must certify that “...the views expressed in the report accurately reflect his or her  
16 personal views, and disclose whether or not the analyst received compensation or other  
17 payments in connection with his or her specific recommendations or views.”<sup>93</sup> I further

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<sup>91</sup> *Id.*, at 000030.

<sup>92</sup> The 2002 Global Financial Settlement resolved an investigation by the U.S. Securities and Exchange Commission and the New York Attorney General’s Office of a number of investment banks related to concerns about conflicts of interest that might influence the independence of investment research provided by equity analysts.

<sup>93</sup> Securities and Exchange Commission, 17 CFR PART 242 [Release Nos. 33-8193; 34-47384; File No. S7-30-02], RIN 3235-AI60 Regulation Analyst Certification.

1 understand industry practice is to avoid conflicts of interest by ensuring that  
2 compensation is not directly or indirectly linked to the opinions contained in those  
3 reports. Dr. Woolridge has not explained why any of the analysts covering our respective  
4 proxy companies would bias their projections despite those certification requirements.

5 **Q. Is the use of analysts' earnings growth projections in the DCF model supported by**  
6 **financial literature?**

7 A. Yes, it is. The relationship between various growth rates and stock valuation metrics has  
8 been the subject of much academic research.<sup>94</sup> As noted over 40 years ago by Charles  
9 Phillips in The Economics of Regulation:

10 For many years, it was thought that investors bought utility stocks largely  
11 on the basis of dividends. More recently, however, studies indicate that the  
12 market is valuing utility stocks with reference to total per share earnings, so  
13 that the earnings-price ratio has assumed increased emphasis in rate cases.<sup>95</sup>

14 Subsequent academic research has clearly and consistently indicated that measures of  
15 earnings and cash flow are strongly related to returns, and that analysts' forecasts of  
16 growth are superior to other measures of growth in predicting stock prices.<sup>96</sup> For  
17 example, Vander Weide and Carleton state that, "[our] results ... are consistent with the

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<sup>94</sup> See Harris, Robert, Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return, Financial Management (Spring 1986).

<sup>95</sup> Charles F. Phillips, Jr., The Economics of Regulation, at 285 (Rev. ed. 1969).

<sup>96</sup> See e.g., Christofi, Christofi, Lori and Moliver, *Evaluating Common Stocks Using Value Line's Projected Cash Flows and Implied Growth Rate*, Journal of Investing (Spring 1999); Harris and Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, 21 (Summer 1992); and Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

1 hypothesis that investors use analysts' forecasts, rather than historically oriented growth  
2 calculations, in making stock buy-and-sell decisions."<sup>97</sup> Other research specifically notes  
3 the importance of analysts' growth estimates in determining the Cost of Equity, and in  
4 the valuation of equity securities. Dr. Robert Harris noted that "a growing body of  
5 knowledge shows that analysts' earnings forecast are indeed reflected in stock prices."<sup>98</sup>  
6 Citing Cragg and Malkiel, Dr. Harris notes that those authors "found that the evaluations  
7 of companies that analysts make are the sorts of ones on which market valuation is  
8 based."<sup>99</sup> Similarly, Brigham, Shome and Vinson noted that "evidence in the current  
9 literature indicates that (i) analysts' forecasts are superior to forecasts based solely on  
10 time series data; and (ii) investors do rely on analysts' forecasts."<sup>100</sup>

11 To that point, the research of Carleton and VanderWeide demonstrates that earnings  
12 growth projections have a statistically significant relationship to stock valuation levels,  
13 while dividend growth rates do not.<sup>101</sup> Those findings suggest investors form their  
14 investment decisions based on expectations of growth in earnings, not dividends.  
15 Consequently, earnings growth, not dividend growth, is the appropriate estimate in the  
16 Constant Growth DCF model.

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<sup>97</sup> Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

<sup>98</sup> Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, Financial Management (Spring 1986).

<sup>99</sup> *Ibid.*

<sup>100</sup> Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management (Spring 1985).

<sup>101</sup> See Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

1 **Q. Do you agree with Dr. Woolridge’s assertion that “the DCF growth rate needs to be**  
2 **adjusted downward from the projected EPS growth rate to reflect the upward**  
3 **bias”?**<sup>102</sup>

4 A. No, I do not. If current stock prices (and therefore the dividend yield) already reflect  
5 analysts’ bias, it is unclear why it is necessary to adjust the growth rate. And as noted  
6 earlier, although Dr. Woolridge asserts “...long-term EPS growth rate forecasts of Wall  
7 Street securities analysts are overly optimistic and upwardly biased”<sup>103</sup> in general, he has  
8 not demonstrated that to be true for the natural gas companies in our proxy groups, in  
9 particular. To that point, I reviewed quarterly earnings presentations of the companies in  
10 Dr. Woolridge’s proxy group and found that if anything, the analysts’ growth rate  
11 projections were toward the lower end of the long-term growth rate ranges provided by  
12 the companies’ management teams (*see* Table 5, below). Therefore, I disagree that the  
13 earnings projections included in our respective analyses are likely to be systemically  
14 biased.

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<sup>102</sup> Direct Testimony of J. Randall Woolridge, at Bates 000031.

<sup>103</sup> *Ibid.*, at Bates 000053.

**Table 5: Analysts' Earnings Growth Projections  
Relative to Management Presentations<sup>104</sup>**

Company	Ticker	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Investor Presentation Earnings Growth
Atmos Energy Corporation	ATO	7.00%	6.50%	6.00%	6.00% - 8.00%
ONE Gas, Inc.	OGS	5.70%	6.00%	9.50%	5.00% - 7.00%
Spire, Inc.	SR	5.00%	4.52%	8.00%	4.00% - 6.00%

**Q. Do you agree with Dr. Woolridge that dividend and book value growth rates are appropriate measures of expected growth for the Constant Growth DCF model?<sup>105</sup>**

**A.** No, I do not. Earnings growth is the fundamental driver of the ability to pay dividends. As noted in my Direct Testimony, to reduce growth to a single measure we assume a fixed payout ratio, and a constant growth rate for EPS, DPS, and BVPS.<sup>106</sup> As Attachment RBH-Rebuttal-12 illustrates, under the Constant Growth DCF model's strict assumptions, earnings, dividends, book value, and stock prices all grow at the same, constant rate in perpetuity. Because earnings are the fundamental driver of dividends, and knowing that investors tend to value common equity on the basis of P/E ratios, the Cost of Equity is a function of the expected growth in earnings, not dividends. That is, earnings growth enables both dividend and book value growth.

<sup>104</sup> Source: Zacks, Yahoo! Finance, Value Line, and individual company fourth quarter 2017 and first quarter 2018 earnings presentations and investor presentations.

<sup>105</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000026.

<sup>106</sup> See Direct Testimony of Robert B. Hevert, at Bates 496.

1 Further, book value increases through the addition of retained earnings, or with the  
2 issuance of new equity. Both are derivative of earnings: retained earnings increases with  
3 the amount of earnings not distributed as dividends; and the price at which new equity is  
4 issued is a function of the EPS and the then-current P/E ratio. Similarly, earnings are the  
5 fundamental driver of a company's ability to pay dividends.<sup>107</sup>

6 In addition, Value Line is the only service on which Dr. Woolridge relies that provides  
7 DPS, BVPS, or Sustainable Growth projections. To the extent the earnings projections  
8 services such as Zacks and First Call represent consensus estimates, the results are less  
9 likely to be skewed in one direction or another as a result of an individual analyst.

10 **Q. Do you agree with Dr. Woolridge that historical growth rates are appropriate**  
11 **measures of expected growth for the Constant Growth DCF model?**<sup>108</sup>

12 A. No, I do not. The growth component of the Constant Growth DCF model is a forward-  
13 looking measure. To the extent historical growth influences investors' expectations of  
14 future growth, it already will be reflected in analysts' consensus earnings estimates.  
15 Carleton and Vander Weide found "overwhelming evidence that consensus analysts'  
16 forecast of future growth is superior to historically oriented growth measures in

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<sup>107</sup> See Direct Testimony of Robert B. Hevert, at 497-498; and Jing Liu, Doron Nissim, and Jacob Thomas, *Is Cash Flow King in Valuations?*, Financial Analysts Journal, Volume 63, Number 2, 2007.

<sup>108</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000026.

1 predicting the firm's stock price."<sup>109</sup> Consequently, I do not believe that historical  
2 growth rates are appropriate for the Constant Growth DCF model.

3 **Q. Have you conducted any analyses to determine which measures of growth are**  
4 **statistically related to the company stock valuation levels?**

5 A. Yes, I have. My analysis is based on the methodological approach used by Professors  
6 Carleton and Vander Weide, who (as noted earlier) compared the predictive capability of  
7 historical growth estimates and analysts' forecasts on the valuation levels of sixty-five  
8 utility companies.<sup>110</sup> I structured the analysis to understand whether projected earnings,  
9 dividend, or book value growth rates best explain utility stock valuations. In particular,  
10 my analysis examined the statistical relationship between the P/E ratios of companies  
11 found in the Value Line Electric and Gas Universe, and the projected EPS, DPS, and  
12 BVPS reported by Value Line. To determine which, if any, of those growth rates are  
13 statistically related to utility stock valuations, I performed a series of regression analyses  
14 in which the projected growth rates were explanatory variables and the P/E ratio was the  
15 dependent variable. The results of those analyses are presented in Attachment RBH-  
16 Rebuttal-13.

17 In that analysis, I performed three separate regressions with the P/E as the dependent  
18 variable, and projected EPS, DPS, and BVPS growth rates, respectively, as the  
19 independent variable. I also performed a single regression with the P/E as the dependent

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<sup>109</sup> Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

<sup>110</sup> *Ibid.*

1 variable and projected EPS, DPS, and BVPS growth rates as the independent variables. I  
2 then reviewed the T- and F-Statistics to determine whether the variables and equations  
3 were statistically significant.<sup>111</sup>

4 **Q. What did those analyses reveal?**

5 A. As shown in Attachment RBH-Rebuttal-13, the only growth rate that was statistically  
6 significant and positively related to the P/E ratio was projected Earnings Per Share.<sup>112</sup>

7 Because EPS growth is the only growth rate that is both statistically and positively related  
8 to natural gas utility valuation, earnings is the proper measure of growth in the Constant  
9 Growth DCF Model.

10 **Q. Is it possible to replicate Dr. Woolridge's DCF analysis?**

11 A. No. As noted above, Dr. Woolridge's analysis is based on his view as to what constitutes  
12 a reasonable long-term growth rate. Because different analysts may well come to  
13 different conclusions based on their review of his growth-related data, we cannot  
14 replicate Dr. Woolridge's analyses.

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<sup>111</sup> In general, a T-Statistic of 2.00 or greater indicates that the variable is likely to be different than zero, or "statistically significant." The F-Statistic is used to determine whether the model as a whole has statistically significant predictive capability.

<sup>112</sup> In the fourth regression scenario with the three growth rates combined as independent variables, while projected dividend growth was statistically significant at the 95.00 percent level, the coefficient was negative, indicating an inverse relationship such that an *increase* in dividend growth was related to a *decrease* in the P/E ratio.

1        **D. Application of Multi-Stage DCF Approach**

2        **Q. Please briefly summarize Dr. Woolridge’s observations regarding your Multi-Stage**  
3        **DCF analysis.**

4        A. First, Dr. Woolridge does not appear to disagree with the structure of the model itself.  
5        For example, in his Exhibit JRW-9, page 1 of 2 (Bates 000090), Dr. Woolridge describes  
6        the “dividend discount model,” which takes the same structure as my Multi-Stage DCF  
7        model. At Bates 000022 of his direct testimony, Dr. Woolridge explains that in the  
8        second, or “Transition” stage, the dividend payout ratio increases because there are fewer  
9        investment opportunities. The assumption that payout ratios increase as capital  
10       investment decline is consistent with my Multi-Stage analysis. Even though the  
11       dividend discount model is consistent in structure with my model, Dr. Woolridge argues  
12       the terminal growth rate (that is, the long-term growth rate in the third, or “terminal  
13       period”) applied in my model is overstated.<sup>113</sup>

14       **Q. Before responding to those points, please describe the Multi-Stage DCF model, and**  
15       **explain how the terminal growth rate is derived and applied.**

16       A. As discussed in my Direct Testimony, the Multi-Stage DCF model enables the analyst to  
17       model growth in three stages, rather than a single growth rate in perpetuity (as the  
18       Constant Growth DCF model assumes).<sup>114</sup> The terminal, or third stage growth rate,  
19       represents investors’ expectations for long-term (that is, perpetual) growth beginning in  
20       the third stage. Because the model assumes five-year periods for the first and second

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<sup>113</sup> Direct Testimony of J. Randall Woolridge, at Bates 000052.

<sup>114</sup> Direct Testimony of Robert B. Hevert, at Bates 509.

1 stage, the terminal stage (and, therefore, the terminal growth rate) begins in the eleventh  
2 year.

3 **Q. What is the basis of Dr. Woolridge’s concern with your assumed long-term growth**  
4 **rate based on expected gross domestic product (“GDP”) growth?**

5 A. As a preliminary matter, I note Dr. Woolridge’s 8.55 percent ROE recommendation relies  
6 on his assumed 5.90 percent growth rate, forty basis points *above* the 5.50 percent  
7 terminal growth rate in my Multi-Stage DCF analysis.<sup>115</sup> Even though his 5.90 percent  
8 growth rate extends in perpetuity, Dr. Woolridge argues “that nominal GDP growth in  
9 recent decades has slowed and that a growth rate in the range of 4.0% to 5.0% is more  
10 appropriate today for the U.S. economy.”<sup>116</sup> If Dr. Woolridge’s DCF analysis were to be  
11 constrained by his view of long-term growth, his result would be no higher than 7.63  
12 percent, 92 basis points below his recommendation.<sup>117</sup>

13 Nonetheless, to support his position, Dr. Woolridge reviews average nominal GDP  
14 growth over periods of 10 to 50 years, and concludes, “economic growth in the U.S. has  
15 slowed considerably in recent decades.”<sup>118</sup> However, as shown on Chart 10 (below),  
16 since 1990 (*i.e.*, in “recent decades”) the annual nominal growth rate in GDP has  
17 remained relatively stable, but for the period 2008 to 2016, which included the recent

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<sup>115</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000033; Exhibit JRW-10, at 1. Dr. Woolridge’s 8.55 percent ROE recommendation is based on his Constant Growth DCF analysis based on his proxy group. Both the Constant Growth DCF growth rate and the terminal growth rate in my Multi-Stage DCF analysis are assumed constant in perpetuity.

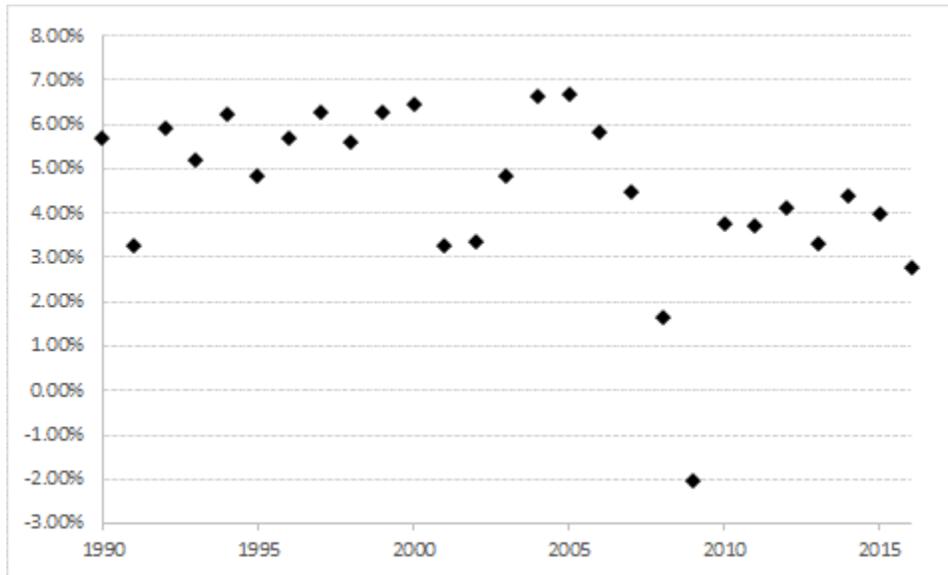
<sup>116</sup> Direct Testimony of J. Randall Woolridge, at Bates 000056.

<sup>117</sup>  $7.63\% = (2.55\% \times 1.0295) + 5\%$ . 2.55% is based on Dr. Woolridge’s dividend yield, as provided in his Exhibit JRW-10, page 1 of 6.

<sup>118</sup> Direct Testimony of J. Randall Woolridge, at Bates 55.

1 recession. Over that time, annual nominal GDP growth rates greater than the 4.00 to 5.00  
2 percent (Dr. Woolridge's suggested growth rate range) occurred in 12 of 27 years; growth  
3 rates of at least 5.50 percent occurred in 11 of 27 years.

4 **Chart 10: Annual Nominal GDP Growth Rates<sup>119</sup>**



5  
6 Moreover, historical nominal GDP growth rates since 1960 reflect periods of differing  
7 inflation rates. For example, the real GDP growth rates in 1980 and 2008 were nearly  
8 identical at negative 0.24 percent and negative 0.29 percent, respectively. On a nominal  
9 basis, however, the growth rates were vastly different, at 8.75 percent and 1.66 percent.  
10 Knowing that inflation was significantly higher in the 1970s and early 1980s than it was  
11 in 2008, it is not surprising that nominal GDP rates are lower when viewed within the

<sup>119</sup> Source: Bureau of Economic Analysis, December 21, 2017, update.

1 context of shorter term averages (*i.e.*, over the last ten or twenty years as Dr. Woolridge  
2 has done).

3 In addition, as shown in Table 6 (below), the recent economic downturn has had a  
4 significant effect on the real GDP growth rate calculated over shorter periods.

5 **Table 6: Average Real GDP Growth Rates<sup>120</sup>**

<b>Average Length</b>	<b>As Of 2016</b>	<b>As Of 2007</b>
10-Year Average	1.37%	3.04%
20-Year Average	2.34%	3.07%
30-Year Average	2.56%	3.12%
40-Year Average	2.76%	3.14%
50-Year Average	2.80%	3.38%

6  
7 As Table 6 demonstrates, the difference between the average GDP growth rates measured  
8 over varying time periods prior to the recent recession was minimal. Since the recession,  
9 the differences have been quite large. Because I apply the long-term growth rate  
10 beginning eleven years in the future, it would be inappropriate to give undue weight to  
11 short-term trends in the time series, as Dr. Woolridge suggests.

12 As to the inflation portion of the expected nominal growth rate, Dr. Woolridge does not  
13 seem to disagree with my expected inflation rate of 2.21 percent, as he noted that the  
14 current inflation is “in the 2% to 3% range.”<sup>121</sup> I also note that on Bates 000061 of Dr.

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<sup>120</sup> Source: Bureau of Economic Analysis, December 21, 2017, update.

<sup>121</sup> Direct Testimony of J. Randall Woolridge, at Bates 000063.

1 Woolridge’s Direct Testimony, he provides the average growth rates (since 1960) for  
2 nominal GDP, the S&P 500 Index, the S&P 500 earnings per share, and the S&P 500  
3 dividends per share. The average of those measures is 6.39 percent, which is 89 basis  
4 points above the 5.50 percent long-term GDP growth rate estimate included in my Direct  
5 Testimony. The 6.39 percent average growth rate noted above also is 25 basis points  
6 greater than the 6.14 percent long-term nominal GDP growth rate reported by the Bureau  
7 of Economic Analysis.<sup>122</sup> Therefore, I disagree with Dr. Woolridge’s view that my  
8 assumed terminal growth rates are excessive.

9 **Q. Are there examples in financial literature that support your calculation of the long-**  
10 **term growth rate based on GDP?**

11 A. Yes. The use of expected long-term GDP growth in the terminal period is consistent with  
12 practice and financial literature.<sup>123</sup> Morningstar, a source on which Dr. Woolridge relies  
13 for Market Risk Premium estimates, describes an approach for calculating the long-term  
14 growth estimate that is similar to the approach in my model.<sup>124</sup> As with my approach,  
15 Morningstar’s method combines the historical average real GDP growth rate with a  
16 measure of inflation calculated using the TIPS spread.<sup>125</sup>

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<sup>122</sup> Source: Bureau of Economic Analysis December 21, 2017, update.

<sup>123</sup> Dr. Roger Morin, for example, writes “[i]t is useful to remember that eventually all company growth rates, especially utility services growth rates, converge to a level consistent with the growth rate of the aggregate economy.” See Roger A. Morin, New Regulatory Finance, Public Utilities Report, Inc., 2006, at 308.

<sup>124</sup> See Ibbotson SBBi 2013 Valuation Yearbook, Morningstar, Inc., at 50-52.

<sup>125</sup> Implied Expected Nominal GDP =  $((1 + \text{Historical Real GDP Growth}) \times (1 + \text{Implied Forward Inflation})) - 1$ , or  $5.50\% = ((1 + 3.22\%) \times (1 + 2.21\%)) - 1$ . See Direct Testimony of Robert B. Hevert, at Bates 512-513.

1 **Q. Does Dr. Woolridge provide any other data that supports your terminal growth rate**  
2 **assumption?**

3 A. Yes, Dr. Woolridge cites a 2010 report by McKinsey & Company (“McKinsey”)<sup>126</sup> to  
4 support his view that analysts’ earnings estimates are “overly optimistic and upwardly  
5 biased.”<sup>127</sup> As the McKinsey report observes, “...long-term earnings growth for the  
6 market as a whole is unlikely to differ significantly from growth in GDP, as prior  
7 McKinsey research has shown.”<sup>128</sup> In a footnote to that sentence, McKinsey further  
8 states that “[r]eal GDP has averaged 3 to 4 percent over past (*sic*) seven or eight decades,  
9 which would indeed be consistent with nominal growth of 5 to 7 percent given current  
10 inflation of 2 to 3 percent.”<sup>129</sup> The McKinsey report therefore supports the terminal  
11 growth rate used in my Multi-Stage DCF model, in that it represents the combination of  
12 historical real GDP growth and expected inflation, and is toward the lower end of the  
13 5.00 percent to 7.00 percent range noted by McKinsey.<sup>130</sup>

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<sup>126</sup> *Equity Analysts: Still too bullish*, McKinsey & Company, McKinsey on Finance, Number 35, Spring 2010.

<sup>127</sup> Direct Testimony of J. Randall Woolridge, at Bates 000030.

<sup>128</sup> *Equity Analysts: Still too bullish*, McKinsey & Company, McKinsey on Finance, Number 35, Spring 2010, at 16-17.

<sup>129</sup> *Ibid.* at 17.

<sup>130</sup> Please also note that consistent with the McKinsey approach, the terminal growth rate used in my Direct Testimony Multi-Stage DCF model (*See* Attachment RBH-4) is the product of real GDP growth (3.22%) and expected inflation (2.21%). I am also aware of a January 2015 report by McKinsey & Company titled “Can Long-Term Growth be Saved?” My review of this report indicates that McKinsey suggests a shift in the factors that comprise GDP growth, and looking ahead to 2050 maintaining levels of GDP growth similar to those observed over the past 50 years will require an increased level of labor productivity.

1 **Q. What is your response to Dr. Woolridge’s reference to GDP forecasts provided by**  
2 **the Survey of Professional Forecasters, the Energy Information Administration**  
3 **(“EIA”), and the Congressional Budget Office (“CBO”)?<sup>131</sup>**

4 A. In the case of the *Survey of Professional Forecasters*, as Dr. Woolridge points out, it  
5 relates to the 2017 to 2026 period. That is, it does not apply to the terminal period, which  
6 begins in 2027. As to the CBO and EIA forecast, those projections cover only fifteen  
7 years of a perpetual period, and represent forecasts from single entities. As such, I do not  
8 agree that those sources invalidate the growth rate used in my analysis.

9 In addition, the CBO provides updates regarding its forecasting record. In that context,  
10 the CBO discusses comparisons to other forecasts, and notes that “[d]espite their value,  
11 comparisons of forecasting errors can be misleading when forecasts are made for  
12 different purposes.”<sup>132</sup> In essence, the CBO notes that comparisons to other forecasts are  
13 not always apt, at least in part because they may be based on different assumptions and  
14 used for different purposes. Moreover, the CBO states that it is required to assume that  
15 future fiscal policy will reflect current law, so that it may “provide a benchmark” against  
16 which proposed changes in law may be assessed.<sup>133</sup> Given that purpose and structure, I

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<sup>131</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000056-000057.

<sup>132</sup> *CBO’s Economic Forecasting Record: 2015 Update*, February 2015, at 4-5.

<sup>133</sup> “In particular, forecasters in the private sector attempt to predict the future stance of federal fiscal policy, and the Administration’s forecasts assume the adoption of the fiscal policy reflected in the President’s proposed budget. CBO, however, is required to assume that fiscal policy in the future will generally reflect the provisions in current law, an approach that derives from the agency’s responsibility to provide a benchmark for lawmakers as they consider proposed changes in law. Forecasting errors may be driven by those different assumptions, particularly when policymakers are considering major changes in the fiscal policy embedded in current law.”

1 disagree that the CBO's forecast invalidates the growth rate used in my Multi-Stage DCF  
2 analysis.

3 The CBO also notes that among its two-year forecasts (since the early 1980s), the  
4 forecast error for "real output growth" and inflation (measured by the Consumer Price  
5 Index) has been 1.40 percentage points and 0.80 percentage points, respectively.<sup>134</sup> That  
6 range of error, if applied to the 4.0 percent long-term CBO forecast noted by Dr.  
7 Woolridge, suggests that the 5.50 percent rate applied in my Direct Testimony is within  
8 the range of the CBO's projections.<sup>135</sup>

9 **Q. Do you have any other observations regarding Dr. Woolridge's position that you**  
10 **should rely on economists' forecasts of real GDP growth beginning ten years in the**  
11 **future?**

12 A. Yes, I do. Dr. Woolridge is quite critical of economists' projections of interest rates,  
13 noting that in hindsight they often are incorrect.<sup>136</sup> At the same time, he is critical of the  
14 fact that I do not rely on economists' real GDP growth rate projections, such as those  
15 produced by the Philadelphia Federal Reserve's *Survey of Professional Forecasters*.<sup>137</sup>  
16 Putting aside the fact that the Multi-Stage DCF model requires forecasts beginning ten

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<sup>134</sup> CBO's *Economic Forecasting Record: 2015 Update*, February 2015, at 1.

<sup>135</sup> As to the use of expected inflation, I note that the TIPS spread has been affected by low levels of inflation, which likely are affected by recently low oil prices. As noted at page 30 of the Federal Reserve's February 2016 *Monetary Policy Report*, "Inflation is expected to remain low in the near term, in part because of recent further declines in energy prices, but to rise to 2 percent over the medium term as the transitory effects of declines in energy and import prices dissipate and the labor market strengthens further."

<sup>136</sup> Direct Testimony of J. Randall Woolridge, at Bates 000116-000118.

<sup>137</sup> The Philadelphia Federal Reserve publishes the list of economists that provide forecasts with attribution. See <http://www.frbsf.org/economic-research/publications>.

1 years from now, not as of the present, Dr. Woolridge does not explain why economists'  
2 near-term interest rate projections are so improper that they should be given no weight,  
3 but their long-term real GDP growth rate projections are entirely sound.

4 **Q. Did you perform any analyses that consider Dr. Woolridge's contention that the**  
5 **currently elevated P/E ratios are expected to continue?**

6 A. Yes. As discussed in my Direct Testimony, I included a series of Multi-Stage DCF  
7 analyses that assume that the current P/E ratio will remain in place by calculating the  
8 terminal value in the Multi-Stage DCF analysis on the basis of the current 30-day average  
9 P/E ratio for the proxy group.<sup>138</sup>

10 **E. Application of the CAPM**

11 **Q. Please briefly describe Dr. Woolridge's CAPM analysis and results.**

12 A. Dr. Woolridge's CAPM analysis produces an estimated Cost of Equity of 7.90 percent  
13 based on his proxy groups.<sup>139</sup> As with Dr. Woolridge's DCF results, I strongly disagree  
14 that a CAPM result of 7.90 percent is a reasonable estimate of the Company's ROE. As  
15 discussed below, Dr. Woolridge's unduly low CAPM estimate primarily is the result of  
16 his estimated Market Risk Premium.

17 Dr. Woolridge combines a risk-free rate of 4.00 percent and a Market Risk Premium  
18 ("MRP") of 5.50 percent to the average Beta coefficient of his (0.70). In estimating his

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<sup>138</sup> Direct Testimony of Robert B. Hevert, at Bates 514. In response to Dr. Woolridge, I have updated that analysis based on more recent data and the Combined Proxy Group. The results of my Multi-Stage DCF analyses are shown on Table 10 in Section VI (*see also*, Attachment RBH-Rebuttal-3).

<sup>139</sup> Direct Testimony of J. Randall Woolridge, Exhibit JRW-11, at 1 (Bates 000098)

1 MRP, Dr. Woolridge reviews a series of studies that calculate the MRP using different  
2 methodologies; he also considers the results of his “Building Blocks” approach. Based  
3 on that review, Dr. Woolridge argues the MRP ranges from 4.00 percent to 6.00 percent  
4 and, within that range, 5.50 percent is reasonable.<sup>140</sup>

5 **Q. Does Dr. Woolridge express any concerns regarding your CAPM analysis?**

6 A. Dr. Woolridge’s principal disagreements with my CAPM analysis include: (1) the  
7 projected long-term Treasury yield as the risk-free rate; and (2) the Market Risk Premium  
8 component of the model.

9 **Q. What is your response to Dr. Woolridge regarding giving some weight to forward-  
10 looking bond yields in your analyses?**

11 A. The Cost of Equity is a forward-looking concept, and it is important that inputs used in  
12 Cost of Equity models reflect market expectations.<sup>141</sup> The Federal Reserve’s actions in  
13 the capital markets have put downward pressure on long-term interest rates, however the  
14 Federal Reserve recently announced it will soon begin to unwind its balance sheet.  
15 Although there remains uncertainty regarding the timing of the Federal Reserve’s actions  
16 and the future of interest rates, what is important is to reflect investor expectations. As  
17 FERC noted in Opinion No. 531, “the cost of common equity to a regulated enterprise  
18 depends upon what the market expects, not upon what ultimately happens.”<sup>142</sup>

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<sup>140</sup> *Ibid.* at Bates 000042; Exhibit JRW-11, at 1, 5-6 (Bates 000102-000103).

<sup>141</sup> Direct Testimony of Robert B. Hevert, at 516.

<sup>142</sup> Opinion No. 531, 150 FERC ¶ 61,165 at P 88 (2014).

1 My Direct Testimony relied on two estimates of the risk-free rate based on current and  
2 expected yield on the 30-year Treasury yield, including: (1) the 30-day average of 3.06  
3 percent; and (2) a near-term projection of 3.52 percent. The near-term projected yield  
4 used in my analyses is a consensus projection of over 50 economists gathered by *Blue*  
5 *Chip Financial Forecasts*.<sup>143</sup> As discussed in my Direct Testimony, market data such as  
6 forward yields implied by the yield curve and the trading prices of options to buy and sell  
7 the long-term Government bonds indicate investors are expecting Treasury yields to  
8 increase.<sup>144</sup>

9 Dr. Woolridge used a 4.00 percent estimate for the risk-free rate component of the CAPM  
10 based on the “recent range of yields and the possibility of higher interest rates.”<sup>145</sup>  
11 Because Dr. Woolridge uses a risk-free rate somewhat above the current 30-year  
12 Treasury yield, it is unclear why he is concerned with my use of a projected rate. In fact,  
13 the average of the two risk-free rate estimates used in my Direct Testimony is 3.29  
14 percent, which is 71 basis points *below* the risk-free rate used by Dr. Woolridge.

15 **Q. Please briefly summarize Dr. Woolridge’s concerns regarding your use of expected**  
16 **market returns.**

17 A. Regarding my use of expected market returns, Dr. Woolridge states that the result is  
18 “inflated due to errors and bias in [my] study.”<sup>146</sup> Dr. Woolridge also points to the long-

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<sup>143</sup> Direct Testimony of Robert B. Hevert, at Bates 518.

<sup>144</sup> Direct Testimony of Robert B. Hevert, at Bates 540-543.

<sup>145</sup> Direct Testimony of J. Randall Woolridge, at Bates 000036.

<sup>146</sup> *Ibid.*, at Bates 000063.

1 term EPS growth rates for the S&P 500 based on the data from Bloomberg and Value  
2 Line, respectively, and notes that they “are inconsistent with the historic and projected  
3 growth in earnings and the economy”.<sup>147</sup> To support his position that the expected  
4 market return included in my CAPM analysis is overstated, Dr. Woolridge cites the Duke  
5 Chief Financial Officers (“CFO”) survey, and the Philadelphia Federal Reserve Survey of  
6 Professional Forecasters.<sup>148</sup>

7 **Q. What is your response to Dr. Woolridge on those points?**

8 A. By referring to the survey by the Federal Reserve Bank of Philadelphia, Dr. Woolridge  
9 suggests my estimated market return is inconsistent with those used by professional  
10 forecasters.<sup>149</sup> On reviewing that survey, I note fewer than half of the survey participants  
11 (19 of 42) responded to the question regarding the expected return for the S&P 500 over  
12 the next ten years.<sup>150</sup> Similarly, 26 of 42 responded to the question regarding expected  
13 return on ten-year Treasury bonds. Because a considerable portion of the survey  
14 respondents did not answer those questions, it is difficult to have confidence that the  
15 estimates represent the market’s expected total return.

16 Even if all 42 economists provided expected market returns and Treasury yields, as noted  
17 earlier, Dr. Woolridge gives economists’ interest rate projections little weight, going so  
18 far as to note that in a Bloomberg survey, “100% of the economists were wrong.”<sup>151</sup> Yet,

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<sup>147</sup> *Ibid.*, at Bates 000061.

<sup>148</sup> *Ibid.*, at Bates 000064.

<sup>149</sup> *Ibid.*

<sup>150</sup> See Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters, First Quarter of 2017 at 17.

<sup>151</sup> Direct Testimony of J. Randall Woolridge, at Bates 000117. [emphasis included]

1 Dr. Woolridge gives economists' forecasts of market returns and interest rates  
2 considerable weight in supporting his expected Market Risk Premium. As such, there is  
3 no logical basis for his inconsistency.

4 As for the Duke CFO survey, Dr. Woolridge's 8.55 percent ROE recommendation, which  
5 applies to a company that is less risky than the overall market,<sup>152</sup> is 245 basis points  
6 above the expected market return suggested by the survey results. If the survey were a  
7 reasonable method of determining the expected market return, Dr. Woolridge's ROE  
8 recommendation would be no higher than 6.10 percent.<sup>153</sup> Moreover, as shown in Table  
9 7 below, the survey respondents have provided estimates that, on average, significantly  
10 underestimated actual market returns.

11 **Table 7: S&P 500 Market Return: Accuracy of Survey Estimates<sup>154</sup>**

	Actual	Graham Harvey Estimate
2016	11.96%	4.32%
2015	1.38%	6.07%
2014	13.69%	5.00%
2013	32.39%	3.40%
2012	16.00%	4.00%
2011	2.11%	5.30%
2010	15.06%	6.28%
Average	13.23%	4.91%

12  

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<sup>152</sup> Dr. Woolridge and I agree that Beta coefficients for our proxy companies are less than 1.0.

<sup>153</sup> 6.10 percent equals the expected annual average market return over the next 10 years suggested by the Duke CFO survey. Duke/CFO Magazine Global Business Outlook survey – U.S., Second Quarter 2017 at 99.

<sup>154</sup> Source: Duff and Phelps, 2017 SBBI Yearbook Appendix A-1; <http://www.cfosurvey.org> (1-year return estimates as of fourth quarter of the previous year).

1 Moreover, the Duke CFO Survey authors have noted a distinction between the expected  
2 market return on one hand, and the hurdle rate on the other. In prior surveys, the hurdle  
3 rate was significantly higher than the expected market return. For example, the authors'  
4 survey showed that the reported average hurdle rate, which is the return required for  
5 capital investments, was above 13.00 percent.<sup>155</sup> The authors further reported that the  
6 Weighted Average Cost of Capital (WACC) exceeded the expected market return, even  
7 though the WACC includes the cost of debt. In the 2017 survey, the reported median  
8 WACC was 9.80 percent, even though the expected market return was 6.10 percent.<sup>156</sup>  
9 Therefore, Dr. Woolridge's reference to a 4.32 percent expected Market Risk Premium  
10 estimate from the Duke CFO Survey should be given little weight.

11 **Q. Do any of the authors cited in Woolridge's Equity Risk Premium survey provide**  
12 **support for your approach to estimating the current MRP?**

13 A. Yes. A study by Pablo Fernandez titled "Discount Rate (Risk-Free Rate and Market Risk  
14 Premium) Used for 41 Countries in 2017: A Survey" discusses how the required Equity  
15 Risk Premium is commonly calculated using a Constant Growth DCF approach.<sup>157</sup> That  
16 study states:

17 [t]he [implied equity premium] is the implicit [required equity  
18 premium] used in the valuation of a stock (or market index) that  
19 matches the current market price. The most widely used model to  
20 calculate the [implied equity premium] is the dividend discount  
21 model: the current price per share (P0) is the present value of

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<sup>155</sup> Graham, John R. and Harvey, Campbell R, *The Equity Risk Premium* in 2016 (August 2, 2016), at 9, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2816603](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2816603).

<sup>156</sup> Duke/CFO Magazine Global Business Outlook survey – U.S., Second Quarter 2017 at 95, 99.

<sup>157</sup> Dr. Woolridge cites Pablo Fernandez's research; see Direct Testimony of J. Randall Woolridge, Exhibit JRW-11, at 5.

1 expected dividends discounted at the required rate of return ( $K_e$ ). If  
2  $d_1$  is the dividend per share expected to be received in year 1, and  $g$   
3 the expected long term growth rate in dividends per share:

4  $P_0 = d_1 / (K_e - g)$ , which implies:

5 [implied equity premium] =  $d_1/P_0 + g - R_f$ <sup>158</sup>

6 As discussed in my Direct Testimony, I calculated the *ex-ante* MRP in a similar fashion,  
7 using the market capitalization weighted Constant Growth DCF calculation on the  
8 individual companies in the S&P 500 Index.

9 **Q. Do you agree with Dr. Woolridge's inclusion of studies that report MRP estimates**  
10 **based on expected geometric returns?**

11 A. No, I do not. The MRP should reflect the expected arithmetic average return. The  
12 important distinction between the arithmetic and geometric averages is that the arithmetic  
13 mean assumes that each periodic return is an independent observation and, therefore,  
14 incorporates uncertainty into the calculation of the long-term average. By contrast, the  
15 geometric mean is a backward-looking calculation that essentially equates a beginning  
16 value to an ending value over a specific period of time. Therefore, geometric averages  
17 provide a standardized basis of review of historical performance across investments or  
18 investment managers. However, they do not reflect forward-looking uncertainty.

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<sup>158</sup> Pablo Fernandez, Vitaly Pershin, and Isabel F. Acín, *Discount Rate (Risk-Free Rate and Market Risk Premium) Used for 41 Countries in 2017: A Survey*, IESE Business School, at 11-12.

1 Because there is no uncertainty with respect to past returns, the use of geometric averages  
2 is appropriate when comparing investment performance on a retrospective basis.

3 However, on a prospective basis uncertainty exists and should be taken into consideration  
4 when developing return expectations and requirements. That is why investors and  
5 researchers commonly use the arithmetic mean when estimating the risk premium over  
6 historical periods for the purpose of estimating equity cost rates. Moreover, investment  
7 risk, or volatility, typically is measured on the basis of the standard deviation. The  
8 standard deviation, in turn, is a function of the arithmetic mean, as opposed to the  
9 geometric mean. In that regard, the Beta coefficients applied in CAPM analyses are a  
10 function of the standard deviation of returns.<sup>159</sup> In any case, Morningstar notes that:

11 The arithmetic average equity risk premium can be demonstrated to be the  
12 most appropriate when discounting future cash flows. For use as the  
13 expected equity risk premium in either the CAPM or the building block  
14 approach, the arithmetic mean or the simple difference of the arithmetic  
15 means of the stock market returns and the riskless rates is the relevant  
16 number.<sup>160</sup>

17 **Q. Do you have any other observations regarding Dr. Woolridge's Equity Risk**  
18 **Premium estimates?**

19 A. Yes. Many of Dr. Woolridge's Equity Risk Premium estimates assume market returns  
20 equal to or below the Company's required return and, as such, do not make either  
21 theoretical or practical sense. For example, Exhibit JRW-11, page 5 of 6 indicates that  
22 the average estimated Equity Risk Premium over all the articles included in the survey is

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<sup>159</sup> Direct Testimony of Robert B. Hevert, at 517.

<sup>160</sup> Morningstar, Inc., 2013 Ibbotson SBBI Valuation Yearbook, at 56.

1 4.66 percent. Combining that estimate with Dr. Woolridge's 4.00 percent estimated risk-  
2 free rate (Exhibit JRW-11, page 1 of 6) produces an estimated market return of 8.66  
3 percent, which is 11 basis points above Dr. Woolridge's 8.55 percent recommendation.

4 Dr. Woolridge observes that a regulated public utility "is less risky than the market," and  
5 should have a Beta coefficient less than 1.0.<sup>161</sup> Because his implied 8.66 percent market  
6 return is only eleven basis points above his 8.55 percent ROE recommendation, its  
7 relevance to investors' actual required returns is questionable. Even focusing on studies  
8 from the 2010 to 2016 period (Exhibit JRW-11, page 6 of 6), the expected market return  
9 would be approximately 8.94 percent, which is only 39 basis points above Dr.  
10 Woolridge's 8.55 percent recommendation for EnergyNorth. Because such important  
11 elements of his CAPM analyses contradict each other, Dr. Woolridge's CAPM results are  
12 not reliable.

13 **Q. Turning to Dr. Woolridge's position that the EPS growth rates used to develop your**  
14 **estimated market return are too high,<sup>162</sup> did you consider where your estimates fall**  
15 **within the range of historical observations?**

16 A. Yes. I gathered the annual capital appreciation return on Large Company Stocks reported  
17 by Morningstar for the years 1926 through 2016, produced a histogram of those  
18 observations, and calculated the probability that a given capital appreciation return  
19 estimate would be observed. The results of that analysis, which are presented in Chart 11

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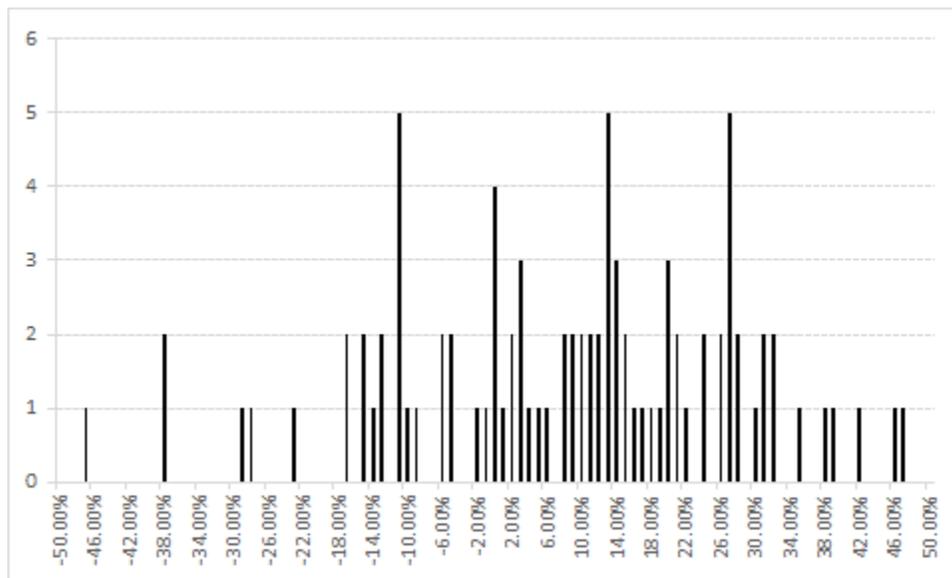
<sup>161</sup> Direct Testimony of J. Randall Woolridge, at Bates 000037.

<sup>162</sup> *Ibid.*, at 000060-000061.

1 (below), demonstrate that capital appreciation rates of 11.39 percent to 12.21 percent and  
2 higher actually occurred quite often.<sup>163</sup>

3 **Chart 11: Frequency Distribution of Observed Capital Appreciation Rates**

4 **1926 – 2016<sup>164</sup>**



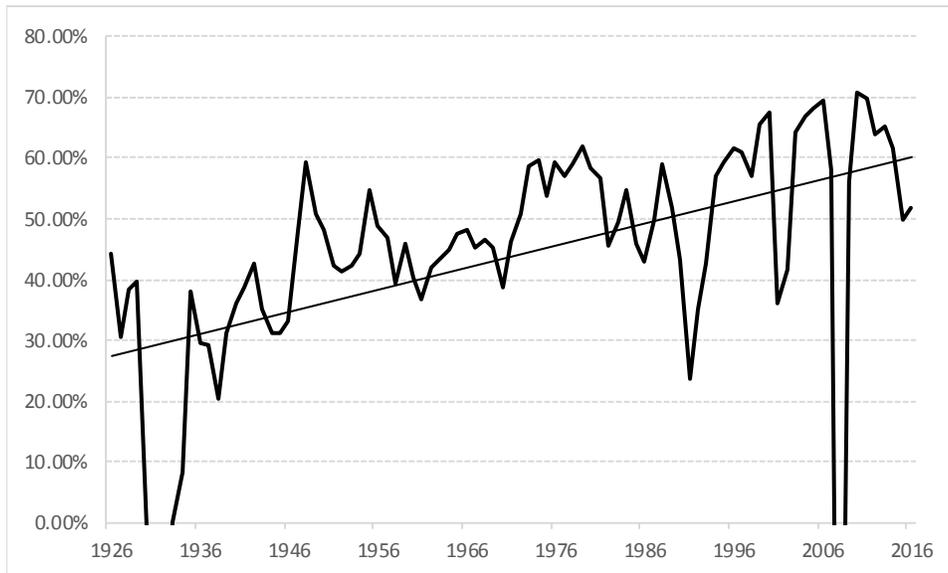
5  
6 In fact, the growth rates Dr. Woolridge asserts are “overstated” by historical standards  
7 both represent approximately the 53<sup>rd</sup> percentile of the actual capital appreciation rates  
8 observed from 1926 to 2016.

9 Further, under the Sustainable Growth model, if the retention ratio is higher now than it  
10 historically has been, there would be reason to believe that expected growth rates would  
11 be higher than historical growth rates. To determine whether that has been the case, I

<sup>163</sup> Under the Constant Growth DCF model’s assumptions, the growth rate equals the rate of capital appreciation.  
<sup>164</sup> Sources: Duff and Phelps, Inc., 2017 SBBI Yearbook, Appendix A-3.

1 calculated the annual retention ratio from 1926 to 2016 using earnings and dividends data  
2 published by Dr. Robert J. Shiller. As shown in Chart 12 (below), that data indicates the  
3 S&P 500 earnings retention has trended upward over time and is currently well above its  
4 historical average. Consequently, the Sustainable Growth model included in Dr.  
5 Woolridge's DCF analysis suggests that the future growth of the S&P 500 could outpace  
6 its historical growth.

7 **Chart 12: S&P 500 Annual Earnings Retention Ratio, 1926 – 2016<sup>165</sup>**



8

<sup>165</sup> Source: <http://www.econ.yale.edu/~shiller/data.htm>.

1 **F. Bond Yield Plus Risk Premium Analysis**

2 **Q. Please summarize Dr. Woolridge’s response to your Bond Yield Plus Risk Premium**  
3 **analysis.**

4 A. Dr. Woolridge believes the Risk Premium derived from the analysis is “inflated” and “is  
5 a gauge of *commission* behavior and not *investor* behavior.”<sup>166</sup> Dr. Woolridge further  
6 notes my Risk Premium approach and results reflect “other utility- and rate case-specific  
7 information in setting ROEs”<sup>167</sup> and points to what he views as a potential discrepancy  
8 between settled and litigated cases.<sup>168</sup> In addition, Dr. Woolridge suggests the analysis  
9 overstates the actual ROE because the estimated risk premium is based on historical  
10 Treasury yields, whereas the model is applied to current and expected yields.<sup>169</sup>

11 **Q. What is your response to Dr. Woolridge’s position that the Risk Premium analysis is**  
12 **a study of utility commissions’ behavior rather than investor behavior?**

13 A. Those cases, and their associated decisions, reflect the same type of market-based  
14 analyses at issue in this proceeding. Moreover, given that authorized returns are publicly  
15 available, it is difficult to imagine that such data is not reflected, at least to some degree,  
16 in investors’ return expectations and requirements (Atmos Corporation, one of Dr.  
17 Woolridge’s proxy companies, discloses authorized returns, by jurisdiction, in its 2016  
18 SEC Form 10-K). Consequently, it is reasonable to assume authorized returns are

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<sup>166</sup> Direct Testimony of J. Randall Woolridge, at Bates 000066 [emphasis included].

<sup>167</sup> *Ibid.*

<sup>168</sup> *Ibid.*

<sup>169</sup> *Ibid.* at Bates 000065-000066.

1 meaningful to investors, and a reasonable (although not the only) measure of required  
2 returns.

3 **Q. What is your response to Dr. Woolridge’s statement that your analysis applies an**  
4 **historical risk premium to projected rates and as such, overstates the Cost of**  
5 **Equity?**<sup>170</sup>

6 A. I applied both historical and projected interest rates to the regression coefficients  
7 developed in my Risk Premium analysis, not to an average historical risk premium. As  
8 discussed in my Direct Testimony, the regression coefficients specifically recognize that  
9 as interest rates decrease, the Equity Risk Premium increases.<sup>171</sup> A consequence of that  
10 relationship is that interest rates and the Cost of Equity generally move in the same  
11 direction, although not on a one-to-one basis. As projected interest rates increase, the  
12 Cost of Equity also will increase, but not to the same degree. Dr. Woolridge’s concern  
13 that I have applied projected interest rates to an historical risk premium is misplaced in  
14 that (1) my analysis does not rely on an historical risk premium; and (2) because the  
15 estimated risk premium does not increase in lock step with interest rates, the resulting  
16 ROE estimate does not overstate the Cost of Equity.

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<sup>170</sup> *Ibid.*

<sup>171</sup> *See* Direct Testimony of Robert B. Hevert, at Bates 521; Attachment RBH-8.

1 **Q. What is your response to Dr. Woolridge's position that your Risk Premium analysis**  
2 **must take into consideration the specific aspects of this proceeding relative to all**  
3 **others?**<sup>172</sup>

4 A. Every case has its unique set of issues and circumstances; there is no disagreement on  
5 that point. Reviewing over 1,000 cases over many economic cycles and using that data to  
6 develop the relationship between the Equity Risk Premium and interest rates mitigates  
7 that concern. However, I do agree that the Risk Premium model results should be  
8 considered an industry average ROE estimate. To the extent EnergyNorth's equity  
9 investors face incremental risks, the Company's ROE should be adjusted.

10 **Q. Is it a concern, as Dr. Woolridge argues, to include both fully litigated and settled**  
11 **rate cases in your Risk Premium analysis?**<sup>173</sup>

12 A. No, it is not. Of the rate cases in my Risk Premium analysis, 759 were fully litigated and  
13 317 were settled. More recently (from January 2012 through January 12, 2018), 68 cases  
14 were litigated and 78 were settled. The difference in average authorized returns between  
15 the two, however, was only eleven basis points (9.79 percent and 9.68 percent for  
16 litigated and settled gas cases, respectively). Further, the same inverse relationship  
17 between interest rates and the Equity Risk Premium is present, whether the analysis  
18 includes fully litigated rate cases, settled rate cases, or both.<sup>174</sup> I therefore disagree with  
19 Dr. Woolridge's concern.

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<sup>172</sup> Direct Testimony of J. Randall Woolridge, at Bates 000066.

<sup>173</sup> *Ibid.*

<sup>174</sup> *See*, Attachment RBH-Rebuttal-14.

1 **Q. What is your response to Dr. Woolridge’s position that your projected risk-free**  
2 **rates are “simply not reasonable”?**<sup>175</sup>

3 A. Dr. Woolridge argues my near-term and long-term projected interest rates of 3.52 percent  
4 and 4.35 percent are “simply not reasonable” because they are 50 to 150 basis points  
5 above the current yield.<sup>176</sup> However, I note that Dr. Woolridge assumes a 30-year  
6 Treasury yield of 4.00 percent as the risk-free rate in his CAPM analysis,<sup>177</sup> roughly the  
7 average of the projected risk-free rates I apply in my Direct Testimony. The highest of  
8 my risk-free rates, 4.35 percent, is only 35 basis points above Dr. Woolridge’s projected  
9 risk-free rate, whereas the near-term projected rate of 3.52 percent is 48 basis points  
10 below his estimate. As such, Dr. Woolridge’s criticism is misplaced.

11 **Q. Are authorized returns in other jurisdictions a relevant benchmark in assessing the**  
12 **reasonableness of ROE estimates and recommendations?**

13 A. Yes, they are. It is important to recognize that in establishing their return requirements,  
14 investors consider a broad range of data, including returns authorized in other  
15 jurisdictions. Equity investors have many options available to them, and allocate their  
16 capital based on the expected risks and returns associated with those alternatives.  
17 Because investors consider such data in framing their investment decisions, return  
18 recommendations that materially depart from observed industry norms – such as Dr.

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<sup>175</sup> *Ibid.*, at Bates 000065.

<sup>176</sup> *Ibid.*

<sup>177</sup> *Ibid.*, at Bates 000036.

1 Woolridge’s 8.55 percent recommendation – should be supported by clear and  
2 unambiguous reasons why.

3 I also disagree with Dr. Woolridge’s position that authorized returns are not meaningful  
4 because they are measures of “commission behavior” as opposed to measures of  
5 investors’ return expectations.<sup>178</sup> There is no reason to believe that other regulatory  
6 commissions do not consider the same type of market-related factors at issue in this  
7 proceeding. Nor is there reason to assume investors dismiss authorized returns in  
8 establishing their return expectations. Rather, the fact that companies such as Atmos  
9 Corporation – one of Dr. Woolridge’s proxy companies – report authorized returns in  
10 their annual Securities Exchange Commission Form 10-K indicates those returns are  
11 quite relevant to investors.

12 **G. Relative Risk**

13 **Q. Do you believe that credit ratings are an appropriate measure to determine the**  
14 **equity risk of EnergyNorth relative to the proxy group?**

15 A. Although I agree that in general, credit ratings (and therefore credit spreads) generally are  
16 directionally related to the Cost of Equity, I do not agree changes in one is a direct  
17 measure of changes in the other. Debt and equity are entirely different securities with  
18 different risk/return characteristics, different lives, and different investors. Debt investors  
19 have a contractual, senior claim on cash flows not available to equity investors and as  
20 such, equity investors bear the residual risk of ownership. Moreover, because the life of

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<sup>178</sup> *Ibid.*, at Bates 000066.

1 debt is finite, debt investors' exposure to business and financial risk likewise is finite. In  
2 contrast, equity is perpetual and as such, equity investors are exposed to residual risk in  
3 perpetuity. Because debt and equity are distinct securities with different risk and return  
4 profiles, debt and equity investors themselves have different risk tolerances and return  
5 requirements. As such, any inferences drawn from differences in credit ratings regarding  
6 the Companies' Cost of Equity should be drawn with caution.

7 A visible measure of the distinction of the risks to which debt and equity investors are  
8 exposed is the difference in their respective Beta coefficients. Although I disagree with  
9 his conclusions, Dr. Woolridge recommends an average Beta coefficient of 0.70 for his  
10 proxy group.<sup>179</sup> Duff & Phelps notes that as of December 2016, Beta coefficients for A-  
11 rated debt was negative 0.03,<sup>180</sup> far below the equity Beta coefficient assumed by Dr.  
12 Woolridge. In fact, debt Beta coefficients in the range of 0.45 to 0.55 are associated with  
13 B rated debt, which is considered below investment grade.<sup>181</sup> Those differences are a  
14 clear indication that the risks assumed by debt investors are far different than those  
15 assumed by equity investors.

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<sup>179</sup> Exhibit JRW-11, at 1.

<sup>180</sup> Duff & Phelps 2017 Valuation Handbook, John Wiley & Sons, Inc., 2017, at Appendix 3b.

<sup>181</sup> Duff & Phelps 2017 Valuation Handbook, John Wiley & Sons, Inc., 2017, at Appendix 3b. Debt Beta coefficients for BBB-rated companies were 0.08.

1 **Q. Did you perform any analyses to determine whether Dr. Woolridge’s data supports**  
2 **the assumption that there is a quantifiable difference in the Cost of Equity for**  
3 **companies with different bond credit ratings?**

4 A. Yes, I did. I first produced Constant Growth DCF results for each of the comparison  
5 companies using the growth rates and dividend yields reported by Dr. Woolridge. I then  
6 applied “credit scores” to Dr. Woolridge’s comparison companies by converting the S&P  
7 bond ratings reported in his Direct Testimony to a numerical value. If there is a  
8 quantifiable relationship between the proxy companies’ credit ratings and Cost of Equity,  
9 there should be a positive, statistically significant relationship between the credit score  
10 and the DCF results. That is, as credit quality deteriorates (resulting in a higher score),  
11 the Cost of Equity should increase. Therefore, I performed a regression analysis in which  
12 the dependent variable was the DCF result and the explanatory variable was the credit  
13 score. As shown in Attachment RBH-Rebuttal-15, the regression analysis showed no  
14 significant statistical relationship between the two. In fact, the highest R-squared of the  
15 regressions was only 0.125, which indicates that credit ratings accounted for, at most,  
16 12.50 percent of the change in the DCF-estimated Cost of Equity.

17 **Q. Did Dr. Woolridge address the Company’s proposed decoupling mechanism in his**  
18 **direct testimony?**

19 A. Yes. Dr. Woolridge disagrees with my assessment of the risk implications of the  
20 Company’s proposed decoupling mechanism, arguing that (1) a significant percentage of

1 the proxy companies' revenues are unregulated, and therefore are not associated with  
2 decoupling; and (2) that only three of the proxy companies have full decoupling.<sup>182</sup>

3 **Q. What is your response to Dr. Woolridge on those points?**

4 A. In his Table 6, Dr. Woolridge summarizes the proxy companies' percentage of regulated  
5 revenues reported in each company's SEC form 10-K and concludes the proxy group's  
6 average percentage of regulated revenues is 62.00 percent.<sup>183</sup> However, Dr. Woolridge's  
7 analysis is at the parent company level, whereas my analysis presented in Attachment  
8 RBH-11 is at the operating company level, all of which are rate regulated. Therefore, Dr.  
9 Woolridge's concern is inapt.

10 Dr. Woolridge also argues "only three" of the proxy companies have full decoupling,  
11 which suggests investors perceive a distinction between full and partial decoupling  
12 structures.<sup>184</sup> However, he has not proven that to be the case. As stated in my Direct  
13 Testimony, utilities have implemented various mechanisms to address the financial  
14 implications of declining use per customer. Those structures include full or partial  
15 decoupling, fixed monthly charges, rate adjustment mechanisms and return stabilization  
16 mechanisms.<sup>185</sup> Because no two companies are identical, the regulatory mechanisms  
17 adopted to address company-specific issues also are not likely to be identical.

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<sup>182</sup> Direct Testimony of J. Randall Woolridge, at Bates 000067-000070.

<sup>183</sup> *Ibid.*, at Bates 000068.

<sup>184</sup> *Ibid.*, at Bates 000069.

<sup>185</sup> *See* Direct Testimony of Robert B. Hevert, at Bates 529-530; *see also* Attachment RBH-11.

1 As noted earlier in my Rebuttal Testimony, investors are concerned with the ability to  
2 cover fixed obligations. That concern focuses on the presence of rate structures more so  
3 than differences across structures. As shown in Attachment RBH-Rebuttal-9 (which  
4 updates Attachment RBH-11 to include OGS and EnergyNorth), the proxy group has  
5 many revenue stabilization structures in place at the operating company level. Further,  
6 the Company currently has a partial decoupling mechanism in place (*i.e.*, its Lost  
7 Revenue Adjustment Mechanism) pursuant to the Energy Efficiency Resource Standard  
8 (“EERS”) Settlement Agreement.<sup>186</sup> As such, because the Company’s mechanisms are  
9 similar to those in place at the proxy group companies, the Company’s proposed  
10 decoupling mechanism does not reduce its relative risk.

11 Lastly, Dr. Woolridge takes issue with my responses to Staff 4-18 and Staff 4-19, which  
12 requested an analysis of the percentage of customers, revenues, and volumes covered by  
13 decoupling mechanisms for both the Company and the proxy group. As explained in my  
14 response, it is not possible to accurately determine the percentage of customers, revenues,  
15 and gas volumes covered by the proxy companies’ decoupling mechanisms from publicly  
16 available information. As explained above, investors are more concerned with the  
17 presence of revenue stabilization mechanisms than with the specific form. In any event,  
18 Dr. Woolridge has provided no evidence demonstrating the Company’s rate structures are  
19 so different than its peers’ that investors would require a lower return.

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<sup>186</sup> See Direct Testimony of Gregg H. Therrien, at Bates 300.

1 **Q. What is your response to Dr. Woolridge’s concern regarding your Small Size**  
2 **analysis?**

3 A. Dr. Woolridge argues that any risk associated with a company’s small size is accounted  
4 for in its credit rating and suggests that it is inappropriate to base a risk premium on one  
5 specific factor.<sup>187</sup> For the reasons discussed in my response to Dr. Chattopadhyay, I do  
6 not believe simply because credit rating agencies consider the Company’s size in  
7 determining its credit rating that it is not a relevant business risk when considering the  
8 ROE.

9 **H. Flotation Costs**

10 **Q. Did Dr. Woolridge address the issue of flotation costs in his direct testimony?**

11 A. Yes, Dr. Woolridge devotes several pages of his testimony discussing various reasons  
12 why he believes such an adjustment is not necessary.<sup>188</sup> Dr. Woolridge does not account  
13 for flotation costs, reasoning that flotation costs for stock issuances are not out-of-pocket  
14 costs and, even if they were, current market conditions suggest that a *reduction* to the  
15 Cost of Equity is required to account for flotation costs.<sup>189</sup>

16 **Q. Please respond to Dr. Woolridge in that regard.**

17 A. I disagree with Dr. Woolridge’s position that flotation costs for stock issuances are  
18 different than issuance costs associated with long-term debt. Companies pay the same

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<sup>187</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000072-000073.

<sup>188</sup> See Direct Testimony of J. Randall Woolridge, at Bates 000070-000072.

<sup>189</sup> *Ibid.*

1 types of fees (both direct and indirect) regardless of whether they are issuing equity or  
2 debt. As to Dr. Woolridge's observation that underwriter fees are not "out-of-pocket"  
3 expenses,<sup>190</sup> I view that to be a distinction without a meaningful difference. Whether paid  
4 directly or via an underwriting discount, the cost results in net proceeds that are less than  
5 the gross proceeds. I also disagree with Dr. Woolridge's position that flotation costs  
6 could represent a *reduction* in Cost of Equity. Flotation costs are true and necessary costs  
7 to the issuer, and represent funds that otherwise would be invested in long-lived assets.  
8 As explained in my Direct Testimony, to the extent flotation costs are not recovered, the  
9 issuing company is denied a portion of the opportunity to earn its expected (or required)  
10 return;<sup>191</sup> that point is further demonstrated in Attachment RBH-Rebuttal-16.

11 **I. Capital Structure**

12 **Q. Please briefly summarize Dr. Woolridge's recommendation regarding the**  
13 **Company's capital structure.**

14 A. Dr. Woolridge recommends a capital structure consisting of 49.85 percent long-term  
15 debt, 0.95 percent short-term debt, and 49.21 percent common equity.<sup>192</sup> For the reasons  
16 discussed below, I disagree with Dr. Woolridge's recommended capital structure.

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<sup>190</sup> *Ibid.*, at Bates 000071.

<sup>191</sup> *See* Direct Testimony of Robert B. Hevert at Bates 531.

<sup>192</sup> Direct Testimony of J. Randall Woolridge, at Bates 000007.

1 **Q. Are common equity and long-term debt the two sources of capital commonly**  
2 **considered in establishing a utility’s ratemaking capital structure?**

3 A. Yes, they are.

4 **Q. Why is that the case?**

5 A. The principal reason is that the assets included in rate base are long-lived, and they are  
6 financed with correspondingly long-lived securities. That is, utilities generally follow the  
7 financing practice commonly referred to as “maturity matching,” which matches the lives  
8 of assets being financed with the maturity of the securities issued to finance those assets.  
9 Under that practice, the overall term structure of the utility’s long-term liabilities—  
10 including both debt and equity—correspond to the life of its long-term assets. As noted  
11 by Brigham and Houston:

12 In practice, firms don’t finance each specific asset with a type of  
13 capital that has a maturity equal to the asset’s life. However, academic  
14 studies do show that most firms tend to finance short-term assets  
15 from short-term sources and long-term assets from long-term  
16 sources.<sup>193</sup>

17 Whereas short-term debt has a maturity of one year or less, long-term debt may have  
18 maturities of 30 years or longer. Although there are practical financing constraints, such  
19 as the need to “stagger” long-term debt maturities, the general objective is to extend the  
20 average life of long-term debt. Still, long-term debt has a finite life, which is likely to be

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<sup>193</sup> Brigham, Eugene F. and Joel F. Houston, Fundamentals of Financial Management, Concise 4<sup>th</sup> Ed., Thomson South-Western, 2004, p. 574.

1 less than the life of the assets included in rate base. Common equity, on the other hand,  
2 is perpetual—its life is indefinite.

3 The perpetual nature of common equity makes it an important component of the capital  
4 structure. Because even long-term debt has a duration shorter than the average life of the  
5 rate base, common equity is needed to extend the capital structure's duration to more  
6 closely match that of the rate base. Short-term debt, on the other hand, will shorten the  
7 capital structure's average life, contrary to the practice of maturity matching. It would be  
8 unusual, therefore, for a natural gas utility such as EnergyNorth to fund its long-lived  
9 assets with short-term debt.

10 **Q. In your view, should short-term debt be included in the Company's ratemaking**  
11 **capital structure?**

12 A. No, there are several reasons why short-term debt should be excluded. First, short-term  
13 debt generally is used to fund working capital requirements. Those requirements have a  
14 strong seasonal pattern; they are not permanent as are the assets included in rate base.  
15 Because short-term debt funds those short-term working capital needs, it should not be  
16 included in the ratemaking capital structure.

17 Second, prudent financing practice calls for long-term assets (such as rate base items) to  
18 be financed with long-term securities. Doing otherwise would expose the Company's  
19 customers to both refinancing risk (that is, the risk of not being able to roll-over short-  
20 term debt as it comes due), and interest rate risk (incurring higher interest costs as  
21 maturing short-term debt is refinanced). Although short-term debt may be used as an

1 interim source of financing (that is, until a sufficiently large balance has been  
2 accumulated to be efficiently financed by long-term securities), it should not be seen as a  
3 permanent source of capital.

4 Lastly, even though short-term debt is not in the ratemaking capital structure, customers  
5 still realize the benefit of the lower interest rates in the Allowance for Funds Used During  
6 Construction (“AFUDC”) rate that is applied to CWIP. That approach, which matches  
7 short-term funding requirements with short-term sources of funds, reduces costs to  
8 customers, and mitigates the refinancing and interest risks noted above.

9 **V. RESPONSE TO THE DIRECT TESTIMONY OF DR. CHATTOPADHYAY**

10 **Q. Please briefly summarize Dr. Chattopadhyay’s recommendation regarding the**  
11 **Company’s Cost of Equity.**

12 A. Dr. Chattopadhyay recommends an ROE of 8.40 percent, within a recommended range of  
13 8.20 percent to 8.50 percent.<sup>194</sup> While he does undertake a CAPM analysis, Dr.  
14 Chattopadhyay instead uses his CAPM estimate as a check on reasonableness, which  
15 (under his assumptions) produces two estimates ranging from 8.89 percent to 9.55  
16 percent, with an average of 9.22 percent.<sup>195</sup>

17 Aside from discussing methodological issues, much of Dr. Chattopadhyay’s testimony  
18 speaks to his position that Market-to-Book ratios in excess of unity indicate that expected  
19 returns exceed required returns; that position affects several aspects of his analyses and

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<sup>194</sup> See Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 145-146.

<sup>195</sup> *Ibid.*, at Bates 191-192.

1 recommendations. Dr. Chattopadhyay further suggests that his 8.40 percent ROE  
2 recommendation is reasonable because the proxy companies' equity values have been  
3 and continue to be in excess of book value. As discussed in more detail in Section III,  
4 Dr. Chattopadhyay's position regarding the implications of market values in excess of  
5 book values is misplaced and cannot be used to support an ROE recommendation that is  
6 so far removed from prevailing levels.

7 **Q. What are the principal areas of disagreement between you and Dr. Chattopadhyay?**

8 A. There are several areas in which I disagree with Dr. Chattopadhyay's approach and  
9 conclusions, including: (1) the composition of our respective proxy groups; (2) the  
10 growth rates applied in the Constant Growth DCF model; (3) the relevance and  
11 application of Multi-Stage DCF models; (4) the application of the CAPM; (5) the  
12 relevance and application of the size premium; (6) the relevance of flotation costs in  
13 determining the Company's Cost of Equity; and (7) the effect of the Company's proposed  
14 decoupling mechanism on the Cost of Equity. I discuss each of those issues in turn,  
15 below.

16 **A. Proxy Group Composition**

17 **Q. Please briefly describe the method by which Dr. Chattopadhyay developed his proxy**  
18 **group.**

19 A. Dr. Chattopadhyay began with the same universe of companies from which I developed  
20 my proxy group, and applied similar screening criteria. The difference between our  
21 approaches is that Dr. Chattopadhyay focused on revenue, rather than income as a

1 screening criterion; specifically, he required at least 50.00 percent of the proxy  
2 company's total revenues over the period of 2014-2016 on average be attributable to  
3 regulated gas operations. He also required at least 75.00 percent of the subject  
4 company's assets to be associated with regulated operations.<sup>196</sup> His screening criteria  
5 resulted in a proxy group of six companies, shown below in Table 8:

6 **Table 8: Dr. Chattopadhyay's Proxy Group<sup>197</sup>**

Company	Ticker
Atmos Energy Corporation	ATO
Chesapeake Utilities Corporation	CPK
ONE Gas, Inc.	OGS
Northwest Natural Gas Company	NWN
Spire Inc.	SR
Southwest Gas Holdings, Inc.	SWX

7  
8 **Q. What is your concern with Dr. Chattopadhyay's use of revenue, rather than income,**  
9 **as a screening criterion?**

10 A. As discussed in my response to Dr. Woolridge, measures of income are far more likely to  
11 be considered by the financial community in making credit assessments and investment  
12 decisions than are measures of revenue. From the perspective of credit markets,  
13 measures of financial strength and liquidity are focused on cash from operations, which is  
14 directly derivative of earnings, as opposed to revenue.

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<sup>196</sup> Direct Testimony of Dr. Pradip K. Chattopadhyay, at Bates 169.

<sup>197</sup> *Ibid.*, at Bates 171.

1 **Q. What are your conclusions regarding the composition of your respective proxy**  
2 **groups?**

3 A. As noted earlier, the Combined Proxy Group includes OneGas, Inc. Because New Jersey  
4 Resources meets my screening criterion of 60.00 percent of operating income attributable  
5 to natural gas operations, I continue to believe it is an appropriate proxy group company.

6 **B. Application of the Constant Growth Discounted Cash Flow Model**

7 **Q. Please briefly summarize Dr. Chattopadhyay's DCF analysis and results.**

8 A. In terms of its structure, Dr. Chattopadhyay and I generally rely on the same form of the  
9 DCF model, which calculates the expected ROE as the sum of (1) the expected dividend  
10 yield, and (2) the expected growth rate.<sup>198</sup> Rather than calculating an expected dividend  
11 yield based on current prices and annualized dividends, Dr. Chattopadhyay relies on  
12 recent prices and Value Line's projected dividend for 2018.<sup>199</sup> While I do not entirely  
13 disagree with that approach, as noted below, Dr. Chattopadhyay's DCF analysis is  
14 heavily dependent on Value Line as the principal source of data. In my view, relying on  
15 actual dividends and expected growth rates from consensus estimates serves the dual  
16 benefit of reflecting market expectations and reducing the risk of biased results that could  
17 arise from relying so heavily on a single source of data and growth rate assumptions. In  
18 any case, the difference in our expected dividend yield estimate does not explain the  
19 difference in our results or recommendation.

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<sup>198</sup> See also, Direct Testimony of Robert B. Hevert, at Bates 495.

<sup>199</sup> See Schedule PKC-4.

1 **Q. What growth rates did Dr. Chattopadhyay review in his Constant Growth DCF**  
2 **analysis?**

3 A. Dr. Chattopadhyay reviewed a number of growth rates, including projected DPS, BVPS,  
4 and EPS growth rates as reported by Value Line; consensus EPS growth rate projections  
5 from Yahoo! and Zacks; and an estimate of “sustainable growth” derived from data  
6 provided by Value Line.<sup>200</sup> Dr. Chattopadhyay is of the view that it is improper to rely  
7 solely on measures of earnings growth, preferring instead to include Value Line’s  
8 projections of growth in BVPS and DPS in calculating his DCF results.

9 **Q. Do you agree with Dr. Chattopadhyay’s position that the dividend and book value**  
10 **growth rates are appropriate measures of expected growth for the Constant Growth**  
11 **DCF model?**

12 A. No, I do not. As discussed in my response to Dr. Woolridge, the only growth rate that has  
13 a positive statistically significant relationship to valuation was the projected EPS growth  
14 rate. That is, neither projected DPS nor BVPS growth rates has a positive statistically  
15 significant relationship to valuation levels.

16 As Dr. Chattopadhyay recognizes, Value Line is the only service that provides DPS,  
17 BVPS, or sustainable growth projections.<sup>201</sup> The fact that services such as Zacks and  
18 First Call choose to provide earnings, but not dividend or book value growth estimates  
19 indicates that they see little investor demand for such data. As Dr. Roger Morin notes:

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<sup>200</sup> See Schedule PKC-5 and Schedule PKC-6.

<sup>201</sup> See Direct Testimony of Pradip K. Chattopadhyay, at Bates 171.

1 Casual inspection of the Zacks Investment Research, First Call  
2 Thompson, and Multex Web sites reveals that earnings per share  
3 forecasts dominate the information provided. There are few, if any,  
4 dividend growth forecasts. Only Value Line provides comprehensive  
5 long-term dividend growth forecasts. The wide availability of earnings  
6 forecast is not surprising. There is an abundance of evidence attesting  
7 to the importance of earnings in assessing investors' expectations. The  
8 sheer volume of earnings forecasts available from the investment  
9 community relative to the scarcity of dividend forecasts attests to their  
10 importance. The fact that these investment information providers focus  
11 on growth in earnings rather than growth in dividend indicates that the  
12 investment community regards earnings growth as a superior indicator  
13 of future long-term growth.<sup>202</sup>

14 I also note that services such as Zacks and First Call are freely available consensus  
15 estimates that reflect the assessments of multiple analysts. Value Line estimates, in  
16 contrast, are available via a subscription service and are attributable to a single analyst.  
17 Consequently, consensus projections are less likely to be biased in one direction or  
18 another as a result of an individual analyst; that is why one of my screening criteria  
19 requires that subject company to be followed by two or more firms.

20 **Q. Did Dr. Chattopadhyay comment on the research that you provided in discovery**  
21 **regarding investors' views about the relevance of dividend and earnings growth?**

22 A. Yes, he did. In summary, Dr. Chattopadhyay argues those articles do not support my  
23 position that earnings growth is the appropriate measure for the purpose of the DCF  
24 model.<sup>203</sup> Dr. Chattopadhyay suggests that the proper frame of reference is expected  
25 dividend and earnings growth, whereas the articles focused on historical growth, or

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<sup>202</sup> Roger A. Morin, PhD, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 302 – 303.

<sup>203</sup> See Direct Testimony of Pradip K. Chattopadhyay, at Bates 173.

1 forecasts of cash flow measures aside from dividends.<sup>204</sup> Although I disagree with his  
2 conclusions, I understand that Dr. Chattopadhyay's analyses place considerable weight  
3 on Value Line which, as noted above, is the only service that provides DPS and BVPS  
4 growth rates.

5 **Q. What is your conclusion regarding the appropriateness of DPS and BVPS growth**  
6 **rates?**

7 A. My analyses demonstrate that even if we were to rely solely on data from Value Line,  
8 projected EPS growth is the only expected growth metric with a statistically significant  
9 ability to explain utility price valuations. Those results confirm Dr. Chattopadhyay's  
10 observation that earnings growth is positively related to price changes.<sup>205</sup>

11 **C. Application of the Multi-Stage DCF Model**

12 **Q. Please briefly describe the structure and intent of the Multi-Stage DCF model**  
13 **included in your Direct Testimony.**

14 A. As discussed in my response to Dr. Woolridge, the Multi-Stage DCF model enables the  
15 analyst to model growth in three stages, rather than a single growth rate in perpetuity (as  
16 the Constant Growth DCF model assumes).<sup>206</sup> The terminal growth rate, which begins in  
17 the eleventh year and assumes that in the long-run, growth will converge to the rate of

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<sup>204</sup> See Direct Testimony of Pradip K. Chattopadhyay, at Bates 174-176.

<sup>205</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 155-156. See Attachment RBH-Rebuttal-13.

<sup>206</sup> See Direct Testimony of Robert B. Hevert, at Bates 509.

1 growth in the overall economy, specifically relies on market-based data (via the TIPS  
2 spread) to arrive at the market-expected rate of growth.

3 The use of expected long-term GDP growth in the terminal period is consistent with  
4 practice and financial literature. For example, Dr. Roger Morin writes “[i]t is useful to  
5 remember that eventually all company growth rates, especially utility services growth  
6 rates, converge to a level consistent with the growth rate of the aggregate economy.”<sup>207</sup>

7 In a similar vein, Morningstar describes a three-stage DCF approach (generally consistent  
8 with the model included in my Direct Testimony) in which the final stage assumes that  
9 long-run growth moves toward that of the overall economy. Morningstar describes an  
10 approach to calculating the long-term growth estimate that is similar to that which is  
11 included in my model in that Morningstar’s method also combines historical average real  
12 GDP growth rate with a measure of inflation calculated using the TIPS spread.<sup>208</sup>

13 **Q. Does Dr. Chattopadhyay agree with your application of the Multi-Stage DCF**  
14 **model?**

15 A. No, Dr. Chattopadhyay suggests there is an element of judgment that goes along with the  
16 model, and that gas utilities operate in a sufficiently stable environment that no such  
17 model is needed.<sup>209</sup>

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<sup>207</sup> Roger A. Morin, New Regulatory Finance, Public Utilities Report, Inc., 2006, at 308.

<sup>208</sup> Morningstar, Ibbotson SBBI 2013 Valuation Yearbook, at 52. I note that the long-term growth rate in my Multi-Stage DCF model equals 5.30 percent. Implied Expected Nominal GDP = ((1 + Historical Real GDP Growth) x (1 + Implied Forward Inflation)) – 1, or 5.50 percent = ((1 + 3.22 percent) x (1 + 2.21 percent)) – 1.

<sup>209</sup> See Direct Testimony of Pradip K. Chattopadhyay, at Bates 181.

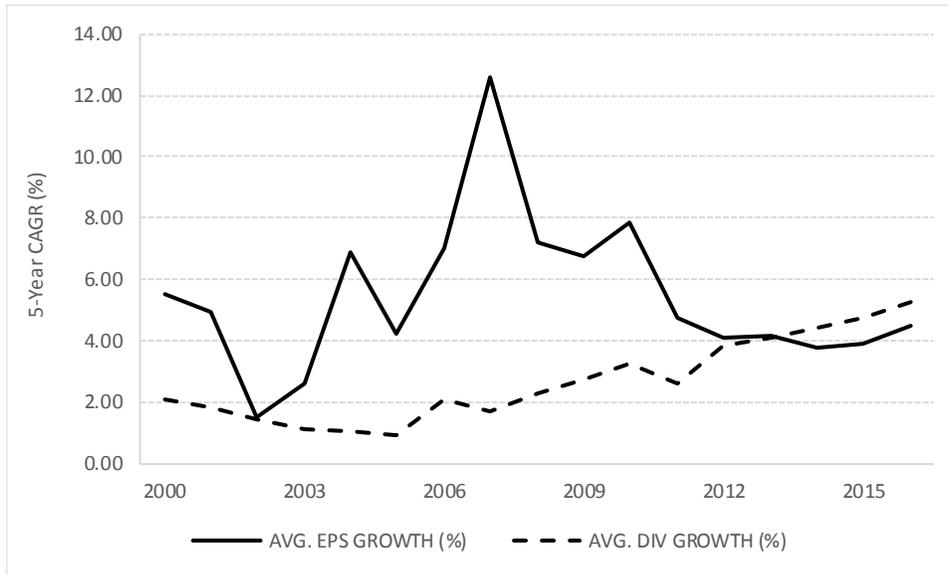
1 **Q. Do you agree with Dr. Chattopadhyay's assessment?**

2 A. No, I do not. In large measure, Dr. Chattopadhyay's recognition that dividends and  
3 earnings are not expected to grow at the same rate over the coming three to five years  
4 supports the use of the Multi-Stage approach.<sup>210</sup> If, as Dr. Chattopadhyay suggests, the  
5 industry is sufficiently stable that the Multi-Stage model does not add information to the  
6 Cost of Equity estimation process, the fundamental assumptions underlying the Constant  
7 Growth form of the DCF model would hold. That is, earnings, dividends, and book value  
8 all would grow at the same, constant rate, in perpetuity. As Dr. Chattopadhyay  
9 acknowledges, however, that is not the case. Earnings and Dividend average growth  
10 rates for the companies within Dr. Chattopadhyay's proxy group typically have not been  
11 consistent, often diverging (see Chart 13, below).

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<sup>210</sup> *Ibid.*, at Bates 177-178.

**Chart 13: Five-Year EPS and Dividend Growth Rates**  
**(OCA Proxy Group)<sup>211</sup>**



It is quite clear that the fundamental assumptions underlying the Constant Growth DCF model do not hold and have not held for some time. As such, I disagree with Dr. Chattopadhyay’s conclusion, and continue to believe the Multi-Stage DCF model provides relevant information and produces meaningful estimates of the Company’s Cost of Equity.

<sup>211</sup> Source: S&P Global Market Intelligence. Five-year Compound Annual Growth Rate of EPS after extraordinary items and dividends declared.

1       **D. Application of the Capital Asset Pricing Model**

2       **Q. As a preliminary matter, please provide a brief summary of the CAPM and its**  
3       **components.**

4       A. As discussed in my Direct Testimony, the CAPM is a risk premium-based model defined  
5       by four components:  $k = r_f + \beta(r_m - r_f)$  [3]

6       where:

7                $r_f$  is the risk-free rate of return;

8                $\beta$  is the Beta coefficient, which reflects the subject security's risk relative to the  
9               overall market<sup>212</sup>;

10               $r_m$  is the expected return on the market, taken as a whole; and

11               $(r_m - r_f)$  is the "Market Risk Premium," or the incremental return required to  
12              invest in the equity market over the risk-free rate of return (*i.e.*, the premium  
13              required to take on "market risk").

14       In essence, the model estimates the Cost of Equity as the sum of the risk-free rate of  
15       return, and the risk-adjusted Market Risk Premium ("MRP").

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<sup>212</sup> As noted in my Direct Testimony at Bates 517 (Equation [7]), risk is defined as the volatility of returns.

1 **Q. With that background in mind, what are the principal areas in which you disagree**  
2 **with Dr. Chattopadhyay’s application of the CAPM?**

3 A. Our disagreements lie in three areas: (1) the calculation of the expected MRP; (2) the  
4 tenor of the risk-free rate; and (3) the use of projected interest rates. In addition to those  
5 methodological differences, Dr. Chattopadhyay and I disagree regarding the extent to  
6 which CAPM results should figure in determining the Company’s ROE.

7 **Q. What is the nature of Dr. Chattopadhyay’s concern with the methods by which you**  
8 **estimated the MRP?**

9 A. Dr. Chattopadhyay primarily is concerned that my market return estimates rely on  
10 “biased” earnings growth estimates, and it is inappropriate to “mix” sources of data (that  
11 is, applying a Value Line Beta coefficient to Bloomberg market return estimates, and vice  
12 versa). Although Dr. Chattopadhyay adopts one of the two approaches included in my  
13 Direct Testimony (that is, the use of Bloomberg-derived expected returns), his Value  
14 Line approach is calculated in an entirely different manner.

15 **Q. Please describe how Dr. Chattopadhyay calculates his Value Line MRP.**

16 A. First, although Dr. Chattopadhyay finds my Bloomberg MRP approach reasonable,<sup>213</sup> he  
17 believes it is necessary to also use Value Line’s projected DPS and BVPS growth rates to  
18 calculate a Value Line-based MRP. Dr. Chattopadhyay then eliminates companies for  
19 which projected growth rates are not fully available, leaving 408 of the 500 companies.

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<sup>213</sup> Dr. Chattopadhyay uses my Bloomberg-based MRP in Attachment RBH-5. Direct Testimony of Pradip K. Chattopadhyay at Bates 189-190.

1 Lastly, he adjusts his MRP estimate by the market capitalization weighted mean Beta  
2 coefficient from Value Line for the remaining 408 companies in his market sample.<sup>214</sup>

3 **Q. What is your response to Dr. Chattopadhyay's Value Line MRP approach?**

4 A. First, if relying solely on earnings growth projections is reasonable in my Bloomberg  
5 approach, it is unclear why it is unreasonable for my Value Line approach. For the  
6 reasons discussed earlier, earnings growth projections are more appropriate than dividend  
7 or book value growth rates. Therefore, I disagree with Dr. Chattopadhyay's use of those  
8 growth rates in his expected market return calculation.

9 Second, Dr. Chattopadhyay uses data from different time periods for his MRP  
10 calculation. For his Bloomberg-based approach, he used my Attachment RBH-5, which  
11 included data as of March 31, 2017. For his Value Line approach, he used Value Line  
12 data downloaded on October 25, 2017, for the companies provided in OCA 4-15 (that is,  
13 the S&P 500 companies as of September 30, 2017). That inconsistency is important  
14 because the companies included in the S&P 500 can and do change from one period to  
15 another, and potentially could affect the calculation of the market-capitalization  
16 weights.<sup>215</sup>

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<sup>214</sup> Dr. Chattopadhyay derives the conclusion that the MRP equals  $(k_e - r_f)/B$  on Bates 191 of his testimony; I will not repeat that derivation here.

<sup>215</sup> In fact, there are 21 companies in Attachment OCA 4-15 that are not in the S&P 500 Index presented in Attachment RBH-5.

1 **Q. Do you agree with Dr. Chattopadhyay that it is inappropriate to “mix” the data**  
2 **sources of the Market Risk Premium and Beta coefficients applied in the calculation**  
3 **of your CAPM estimates?**

4 A. No, I do not. Dr. Chattopadhyay has not provided any evidence to conclude that the  
5 differences in how Bloomberg and Value Line calculate their respective Beta coefficients  
6 meaningfully affect the CAPM estimates.

7 **Q. Turning now to the risk-free rate component, what is the basis of your disagreement**  
8 **with Dr. Chattopadhyay?**

9 A. Whereas I rely on the 30-year Treasury yield, Dr. Chattopadhyay believes the ten-year  
10 Treasury yield is the better measure. Dr. Chattopadhyay suggests that because interest  
11 rate risk increases as maturities lengthen, short-term Treasury Bills best capture the risk-  
12 free rate. Nonetheless, Dr. Chattopadhyay prefers the 10-year Treasury yield because, in  
13 his view, it balances the incremental interest rate risk associated with longer-term  
14 maturities with the “...consideration that investors have relatively long investment  
15 horizons and that regulated utility rates are usually set for longer terms than just a few  
16 months.”<sup>216</sup>

17 **Q. Do you agree that either Treasury Bills or the frequency of rate filings should be**  
18 **used as a frame of reference for tenor of the appropriate risk-free rate?**

19 A. No, I do not. The term of the Treasury security used to establish the risk-free rate should  
20 match the duration of the underlying investment, not the frequency of rate filings. To

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<sup>216</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 186-187.

1 that point, Morningstar has observed that: “The time horizon of the chosen Treasury  
2 security[...] should match the time horizon of whatever is being valued.”<sup>217</sup> Because  
3 utility companies represent long-duration investments, it is appropriate to use yields on  
4 long-term Treasury Bonds as the risk-free rate component of the CAPM.

5 **Q. Please briefly explain the term “duration” and explain why it is important in this**  
6 **context.**

7 A. In finance, “duration” (whether for bonds or equity) typically refers to the present value  
8 weighted time to receive the security’s cash flows. In terms of its practical application,  
9 duration is a measure of the percentage change in the market price of a given stock in  
10 response to a change in the implied long-term return of that stock. A common portfolio  
11 strategy is to match the duration of investments with the term of the underlying asset in  
12 which the funds are being invested, or the term of a liability being funded. Since the term  
13 of the risk-free rate should match the horizon of the underlying investment, it is  
14 appropriate to consider the duration of equity investments (often referred to as “Equity  
15 Duration”) of the subject company when selecting the Treasury yield used as the risk-free  
16 rate in the CAPM. If the average Equity Duration of the proxy group is closer to 30 years  
17 than to the frequency of rate requests, it would be appropriate to use the longer-term  
18 security as the measure of the risk-free rate.

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<sup>217</sup> Morningstar, Inc., 2013 Ibbotson Stocks, Bonds, Bills and Inflation Valuation Yearbook, at 44.

1 **Q. Have you calculated the Equity Duration for Dr. Chattopadhyay's proxy group?**

2 A. Yes, I have. Using the stock price, dividend, and growth rate data contained in Schedules  
3 PKC 4 and PKC-5, I calculated the average Equity Duration for each of Dr.  
4 Chattopadhyay's proxy companies. Those results, which are provided in Attachment  
5 RBH-Rebuttal-17, indicate that the average Equity Duration is approximately 42.00  
6 years. Consequently, the 30-year Treasury yield is the appropriate measure of the risk-  
7 free rate.

8 **Q. Putting aside the issue of Equity Duration, does Dr. Chattopadhyay's DCF model**  
9 **recognize the perpetual nature of equity?**

10 A. Yes, it does. The Gordon model, described in Equation [2] above, assumes that  
11 dividends are received in perpetuity. If the model's underlying assumptions hold, there is  
12 no difference between holding the stock and collecting dividends in perpetuity, or selling  
13 the stock at the end of a given holding period. In the latter instance, the price at which  
14 the stock is sold (that is, the terminal value) also is defined by Equation [2].

15 The important point is that the terminal value represents the perpetual claim on cash  
16 flows at that time. If the holding period is five years, the only way the DCF result can  
17 remain constant (or reasonable) is if the stock is sold at the prevailing market price, as  
18 defined by the Gordon Model. In other words, even if an investor were to hold a share of  
19 stock for 20 years, they only would earn their required return if the stock is sold to an  
20 investor that values the shares assuming cash flows in perpetuity. The same is true if the  
21 initial holding period is 7 years, 10 years, 32 years, 87 years, or any other horizon. If

1 equity were not perpetual, the shares would hold no value at the end of the holding period  
2 and the ROE estimates would be implausibly low. It is, therefore, the perpetual nature of  
3 equity, not the frequency of rate filings that defines the duration of the equity investment  
4 and, therefore, the appropriate tenor of the risk-free rate.

5 **Q. Do you agree Dr. Chattopadhyay's concern regarding projected yields?**

6 A. No, I do not. As discussed in my Direct Testimony, the Cost of Equity is forward-  
7 looking.<sup>218</sup> As to the CAPM specifically, each of the components theoretically should be  
8 forward-looking,<sup>219</sup> to which Dr. Chattopadhyay agrees.<sup>220</sup> His objection to applying  
9 projected Treasury yields in the CAPM, therefore, contradicts arguments elsewhere in his  
10 testimony.

11 **E. Size Premium**

12 **Q. Please briefly summarize Dr. Chattopadhyay's position regarding the size effect.**

13 A. Dr. Chattopadhyay recognizes that I do not make a specific adjustment for the  
14 Company's relatively small size, but points to certain factors which, he believes, suggests  
15 that the effect does not apply in this instance. In that regard, Dr. Chattopadhyay suggests  
16 that the size effect is dependent on the time period chosen for review, and that it may not  
17 apply to utilities.<sup>221</sup>

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<sup>218</sup> See Direct Testimony of Robert B. Hevert, at Bates 514-515.

<sup>219</sup> See Direct Testimony of Robert B. Hevert, at Bates 516. Dr. Chattopadhyay notes that the Beta coefficient is historical looking; to my knowledge, there is no data source that forecasts the Beta coefficient.

<sup>220</sup> See Direct Testimony of Pradip K. Chattopadhyay, at Bates 154.

<sup>221</sup> *Ibid.*, at 184.

1 **Q. As a preliminary matter, is there support in the financial community for the use of a**  
2 **small size premium?**

3 A. Yes, there have been several studies conducted that demonstrate the size premium. One  
4 of the earliest works in this area found that over a period of 40 years "the common stock  
5 of small firms had, on average, higher risk-adjusted returns than the common stock of  
6 large firms."<sup>222</sup> The author, who referred to that finding as the "size effect" suggested  
7 that the CAPM was mis-specified in that on average, smaller firms had significantly  
8 larger risk-adjusted returns than larger firms. The author also concluded that the size  
9 effect was "most pronounced for the smallest firms in the sample."<sup>223</sup> Since then,  
10 additional empirical research has focused on explaining the size effect as a function of  
11 lower trading volume and other factors, but the proposition that Beta fails to reflect the  
12 risks of smaller firms persists.<sup>224</sup>

13 In 1994, Fama and French also focused on the issue of whether the CAPM adequately  
14 explained security returns and proposed a "three factor" model for expected security  
15 returns. Those factors include: (1) the covariance with the market; (2) size; and (3)  
16 financial risk as determined by the book-to-market ratio. As explained by Morningstar,  
17 Fama and French "found that the returns on stocks are better explained as a function of  
18 size and book-to-market value in addition to the single market factor of the CAPM, with

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<sup>222</sup> R. W. Banz, *The Relationship Between Return and Market Value of Common Stocks*, Journal of Financial Economics, 9, 1981.

<sup>223</sup> *Ibid.*

<sup>224</sup> See, for example, Mario Levis, *The record on small companies: A review of the evidence*, *Journal of Asset Management*, March, 2002.

1 the company's size capturing the size effect and its book-to-market ratio capturing the  
2 financial distress of a firm."<sup>225</sup>

3 In any event, while the research discussed above support my position that the size effect  
4 is a reasonable consideration in determining the Company's Cost of Equity, Dr.  
5 Chattopadhyay is correct in observing that I have not made a specific adjustment to my  
6 recommended ROE due its relatively small size.

7 **Q. Are there other observable factors that support the consideration of a small size**  
8 **premium?**

9 A. Yes, there are. First, EnergyNorth's market capitalization is far below the smallest of  
10 both my proxy group, and Dr. Chattopadhyay's comparison group. It therefore is not  
11 surprising that (as discussed below) Algonquin Power & Utilities Corp.'s ("Algonquin,"  
12 the Company's ultimate parent company) trading volume also is well below its peers.  
13 Algonquin's comparatively low trading volume (of its common stock), along with its  
14 somewhat low degree of institutional ownership indicate that investors require a  
15 "liquidity premium." Those issues, and their implications for the Company's Cost of  
16 Equity, are discussed in more detail below.

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<sup>225</sup> Morningstar, Ibbotson SBBI 2013 Valuation Yearbook, at 109.

1 **Q. How does relatively low trading volume affect the returns required by equity**  
2 **investors?**

3 A. Smaller companies (such as Algonquin) typically have fewer shares outstanding, and  
4 fewer shares traded than their larger counterparts. Both factors are important to  
5 institutional investors, who typically hold larger numbers of shares in each of their  
6 investments as a matter of management efficiency. That is, institutional investors tend to  
7 have minimum dollar amounts for individual investments, which lead to positions  
8 involving larger numbers of shares. If an institutional investor holds a relatively large  
9 portion of the shares of a company, its ability to sell its position (without adversely  
10 affecting the market price of shares) may be limited by the volume of shares traded each  
11 day. That uncertainty, which often is referred to as “liquidity risk,” requires a higher  
12 expected return (that is, the “liquidity premium” noted earlier). As noted by Amihud and  
13 Mendelson:

14 ...investors prefer to commit capital to liquid investments, which can be  
15 traded quickly and at low cost whenever the need arises. Investments  
16 with less liquidity must offer higher expected returns to attract  
17 investors.<sup>226</sup>

18 **Q. How does Algonquin’s trading volume compare to your proxy group, and to Dr.**  
19 **Chattopadhyay’s comparison group?**

20 A. It is below both. As Table 9 (below) indicates, Algonquin’s average daily volume has  
21 been only about 72.34 percent of the average daily volume of the Value Line electric and

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<sup>226</sup> Yakov Amihud, Haim Mendelson, *Liquidity, Asset Prices and Financial Policy*, Financial Analysts Journal, Vol. 47, No. 6 (Nov-Dec 1991), at 56.

1 natural gas companies, roughly the 52<sup>nd</sup> percentile. However, when we look at the  
2 average daily float (the percentage of outstanding shares traded on an average day),  
3 Algonquin’s average daily float is the lowest of the Value Line utility companies. That  
4 lower trading volume and float is a direct measure of relatively low liquidity, which is a  
5 factor underlying the size premium.

6 **Table 9: Market Capitalization and Trading Volume**

	Market Capitalization (\$millions)		Average Daily Volume		Average Daily Float	
Algonquin Power & Utilities	\$5,861		989,135		0.23%	
Value Line electric and gas utility companies (Average)	\$14,299	40.99%	1,367,258	72.34%	0.55%	42.24%

7

8 **Q. Turning now to “institutional ownership,” please explain that term how it is related**  
9 **to the Cost of Equity.**

10 A. Institutional ownership refers to the extent to which a given company’s common stock is  
11 owned by large financial institutions, mutual funds, insurance companies, and  
12 endowments.<sup>227</sup> Because they tend to have more resources than retail investors,  
13 institutional investors are able to perform more in-depth research, and tend to take larger  
14 positions in a given company’s stock. A significant benefit of institutional investors to  
15 capital-intensive companies such as Algonquin is that they tend to be an efficient source  
16 of equity capital. In addition, because they buy and sell large stock positions based on  
17 their individual research and portfolio objectives, institutional investors provide a

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<sup>227</sup> As opposed to institutional ownership, “retail” ownership refers to ownership by individual investors.

1 significant source of liquidity. As discussed below, a more liquid market means that an  
2 investor can sell stocks without the risk of losing value.

3 There is little question that institutional ownership is important to equity investors. Value  
4 Line, for example provides institutional buy and sell decisions (by quarter) as well as  
5 total institutional ownership. Similarly, Yahoo! Finance (a source on which Dr.  
6 Chattopadhyay relies) reports institutional ownership as a percentage of float and shares  
7 held. Because their access to this efficient source of equity capital and market liquidity is  
8 diminished, companies with lower levels of institutional ownership are at a competitive  
9 disadvantage, and their investors face greater liquidity risk. Those companies therefore  
10 must provide higher returns to compensate investors for that disadvantaged position and  
11 incremental risk.

12 **Q. How does Algonquin's degree of institutional ownership compare to your proxy**  
13 **group, and to Dr. Chattopadhyay's comparison group**

14 A. Algonquin's institutional ownership is below 96.00 percent of the Value Line electric and  
15 natural gas utility companies. Whereas the average percentage of institutional ownership  
16 across the Value Line utility universe is 73.57 percent, 40.94 percent of Algonquin's  
17 shares are owned by institutional investors. As with its comparatively low trading  
18 volumes and float, Algonquin's relatively low degree of institutional ownership also  
19 suggests that a liquidity premium (again, owing to its small size) is appropriate.

1 **Q. What do you conclude from that data?**

2 A. There is little question that Algonquin has a lower percentage of institutional ownership,  
3 and low daily trading volumes relative to other utility companies. As a consequence,  
4 equity investors face greater liquidity risk for which they would require a liquidity  
5 premium. Because Dr. Chattopadhyay and I both estimated Cost of Equity based on  
6 proxy groups of companies with greater degrees of institutional ownership and higher  
7 daily trading volumes, the liquidity premium required to invest in Algonquin's shares is  
8 not reflected in our analytical results. Although it is difficult to estimate the required  
9 liquidity premium, Algonquin's relatively illiquid shares provide further support for my  
10 recommended ROE.

11 **F. Flotation Costs**

12 **Q. Please summarize Dr. Chattopadhyay's view regarding the recovery of flotation**  
13 **costs.**

14 A. Dr. Chattopadhyay suggests that because M/B ratios are greater than 1.00, his DCF  
15 estimates already reflect flotation costs. If, however, a given company's M/B ratio is  
16 "...actually close to one" and there is a risk of dilution associated with the issuance of  
17 new shares, a premium to the ROE may be in order, although that premium may be  
18 needed to account for more "fundamental" issues.<sup>228</sup>

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<sup>228</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 182.

1 **Q. What is your response to Dr. Chattopadhyay in that regard?**

2 A. Dr. Chattopadhyay does not appear to disagree that flotation costs are legitimately  
3 incurred, necessary costs. Rather, he suggests that the recovery of those costs, if at all,  
4 should be conditioned on the M/B ratio. That position, however, is misplaced. As Dr.  
5 Morin notes, “[t]he flotation cost adjustment does not depend on any market-to-book  
6 input assumption and is still relevant even when utility companies have stock prices in  
7 excess of book value, as they have for over two decades.”<sup>229</sup> Dr. Morin goes on to note  
8 that “[t]he derivation of the conventional flotation cost formula does not depend on the  
9 assumption of a market-to-book ratio equal to 1.00.”<sup>230</sup> Consequently, I disagree with  
10 Dr. Chattopadhyay’s conclusions regarding the flotation cost adjustment.

11 **G. Revenue Decoupling Mechanisms**

12 **Q. Please summarize Dr. Chattopadhyay’s observation on the Company’s proposed**  
13 **decoupling mechanism.**

14 A. Dr. Chattopadhyay argues that my analysis regarding the rate mechanisms in place at the  
15 proxy group companies is not “comprehensive enough to conclude definitively that the  
16 Company’s proposed mechanism does not reduce risk” relative to our proxy groups.<sup>231</sup>  
17 He concludes that it is “premature” to conclude that the Company’s Cost of Equity  
18 should not be adjusted downward.<sup>232</sup>

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<sup>229</sup> Roger A. Morin, PhD, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 336.

<sup>230</sup> *Ibid.*

<sup>231</sup> Direct Testimony of Pradip K. Chattopadhyay, at Bates 192.

<sup>232</sup> *Ibid.* at Bates 193.

1 **Q. Should the ROE in this proceeding be adjusted due to the Company's proposed**  
2 **decoupling mechanisms?**

3 A. No, it should not. The relevant analytical issue is whether the Company is so less risky  
4 than its peers as a direct result of the revenue decoupling mechanism that investors would  
5 specifically and measurably reduce their return requirement.<sup>233</sup> Attachment RBH-11 to  
6 my Direct Testimony summarized the types of revenue stabilization mechanisms in effect  
7 within my proxy group.<sup>234</sup> From the perspective of an equity investor, the question is one  
8 of incremental risk based on the suite of revenue stabilization and cost recovery  
9 mechanisms, not the presence, or not, of an individual structure. Because revenue  
10 stabilization and cost recovery mechanisms are common among the proxy companies,  
11 there is no reason to assume the Company would be materially less risky, and its Cost of  
12 Equity would be lower than its peers' as a result of the proposed rate design change. That  
13 said, given the increasing prevalence of decoupling structure, a reasonable question  
14 becomes whether the Company would be comparatively riskier without a decoupling  
15 mechanism in place, not whether it would be comparatively less risky with one.

16 **Q. Has the financial community recognized the prevalence of revenue stabilization**  
17 **mechanisms?**

18 A. Yes. In 2012, for example, Value Line, noted several mechanisms that were put in place  
19 to reduce regulatory lag. In its review, Value Line specifically noted recovery

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<sup>233</sup> See, generally, *Bluefield and Hope*.

<sup>234</sup> As noted earlier, Attachment RBH-Rebuttal-9 updates Attachment RBH-11 to include OGS and EnergyNorth.

1 mechanisms for capital expenditures, tracking mechanisms for certain kinds of expenses,  
2 and decoupling mechanisms as methods to reduce regulatory lag and provide utilities the  
3 opportunity to earn their authorized returns.<sup>235</sup> Even then, Value Line believed the use of  
4 such mechanisms was “likely to increase as utilities request similar mechanisms in  
5 additional states.”<sup>236</sup> Similarly, S&P noted it has “seen many state commissions approve  
6 alternative ratemaking techniques to traditional base rate case applications, which help  
7 utilities sustain cash flow measures, earning power, and ultimately, credit quality.”<sup>237</sup>  
8 The point simply is that because the use of such structures has been well known among  
9 investors, there is no reason to believe their adoption would now affect required returns.

10 **Q. Did Dr. Chattopadhyay provide any empirical basis to support the position that cost**  
11 **recovery mechanisms have affected, or will affect utilities’ valuations, or their Costs**  
12 **of Equity?**

13 A. No, he did not.

14 **Q. Are you aware of any other studies that have addressed the relationship between**  
15 **decoupling mechanisms generally, and the cost of capital?**

16 A. Yes. In March 2014, The Brattle Group (“Brattle”) published a study addressing the  
17 effect of revenue decoupling structures on the cost of capital for electric utilities.<sup>238</sup> In its

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<sup>235</sup> Paul E. Debbas, CFA, *What Electric Utilities Are Doing About Regulatory Lag*, Value Line, May 23, 2012.  
<sup>236</sup> *Ibid.*  
<sup>237</sup> S&P RatingsDirect, *Industry Economic and Ratings Outlook: U.S. Regulated Utilities Expected to Continue on Stable Trajectory In 2013*, dated January 25, 2013.  
<sup>238</sup> The Brattle Group, *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation*, Prepared for the Energy Foundation, March 20, 2014.

1 report, which extended a prior analysis focused on natural gas distribution utilities,  
2 Brattle pointed out that although decoupling structures may affect revenue, net income  
3 still can vary.<sup>239</sup> Brattle further noted that the distinction between diversifiable and non-  
4 diversifiable risk is important to equity investors and as such, the relationship between  
5 decoupling and the Cost of Equity should be examined in that context. Further to that  
6 point, Brattle noted that although reductions in total risk may be important to  
7 bondholders, only reductions in non-diversifiable business risk would justify a reduction  
8 to the ROE.<sup>240</sup>

9 Brattle's empirical analysis examined the relationship between decoupling and the After-  
10 Tax Weighted Average Cost of Capital ("ATWACC") for a group of electric utilities that  
11 had implemented decoupling structures in various jurisdictions throughout the United  
12 States. The ATWACC reflected the capital structure, market costs of debt and equity,  
13 and corporate income tax rate for each of the companies in the sample.<sup>241</sup> Based on the  
14 study's results, Brattle concluded that ". . . there is no statistically significant evidence of  
15 a decrease in the cost of capital following adoption of decoupling."<sup>242</sup>

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<sup>239</sup> *Ibid.*, page 7.

<sup>240</sup> *Ibid.*, page 8.

<sup>241</sup> *Ibid.*, page 15. The market Cost of Equity was estimated using the Constant Growth DCF model.

<sup>242</sup> *Ibid.*, page 18.

1 **Q. Have other jurisdictions been inclined to reduce the authorized ROE to account for**  
2 **decoupling or other revenue stabilization mechanisms?**

3 A. No. In the early years of decoupling implementation, a few jurisdictions made defined  
4 adjustments to the authorized ROE to account for decoupling. Since 2014, however, no  
5 jurisdiction that I am aware of has made a specific basis-point adjustment because of a  
6 utility's decoupling mechanism. In fact, the two primary jurisdictions that previously  
7 made defined adjustments – Maryland and the District of Columbia (DC) – no longer do  
8 so. In Potomac Electric Power Company's most recent rate case in the DC, the Public  
9 Service Commission noted that:

10 In examining decoupling mechanism in other jurisdictions, the  
11 Commission found adjustments to the ROE as a result of having a  
12 decoupling mechanism were highly discretionary and with no common  
13 accord on how to weigh the impact of a decoupling mechanism on a  
14 utility's operation. Moreover, in the vast majority of cases, utility  
15 commissions made no explicit adjustment to the ROE for a decoupling  
16 mechanism... Since the majority of the companies in the Company's  
17 proxy group have some form of decoupling mechanism, the  
18 Commission agrees that some of the effects of decoupling mechanisms  
19 are reflected in the market data... Accordingly, we find that no further  
20 adjustment to the ROE is warranted.<sup>243</sup>

21 **VI. SUMMARY AND CONCLUSION**

22 **Q. Please summarize the analytical updates contained in your Rebuttal Testimony.**

23 A. Table 10 (below) summarizes my updated analytical results (*see* also Attachment RBH-  
24 Rebuttal-1 through Attachment RBH-Rebuttal-7). As discussed in my Direct Testimony,

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<sup>243</sup> DC PSC Order No. 18846, July 25, 2017, at 94.

1 all of the models used to estimate the Cost of Equity are subject to limiting assumptions  
2 or other methodological constraints.<sup>244</sup> As also noted in my Direct Testimony, adherence  
3 to any single approach, or the results of any one approach, can result in misleading  
4 conclusions; a reasonable ROE estimate therefore weighs the individual and collective  
5 results of multiple methodologies.<sup>245</sup> Because the capital markets have become  
6 increasingly unsettled, with several measures indicating capital costs have increased, it is  
7 especially important to consider the breadth of quantitative and qualitative information  
8 contained in my Rebuttal Testimony.

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<sup>244</sup> See Direct Testimony of Robert B. Hevert, at Bates 493-494.

<sup>245</sup> *Ibid.*

1

**Table 10: Summary of Results<sup>246</sup>**

<b>Discounted Cash Flow</b>	<b>Mean Low</b>	<b>Mean</b>	<b>Mean High</b>
30-Day Constant Growth DCF	7.21%	9.14%	12.01%
90-Day Constant Growth DCF	7.15%	9.07%	11.94%
180-Day Constant Growth DCF	7.18%	9.10%	11.97%
30-Day Multi-Stage DCF	8.04%	8.44%	9.16%
90-Day Multi-Stage DCF	7.99%	8.38%	9.08%
180-Day Multi-Stage DCF	7.99%	8.42%	9.13%
30-Day MSDCF – Terminal P/E	8.36%	9.61%	11.49%
90-Day MSDCF – Terminal P/E	8.17%	9.43%	11.30%
180-Day MSDCF – Terminal P/E	8.29%	9.54%	11.42%
		<b>Bloomberg Derived Market Risk Premium</b>	<b>Value Line Derived Market Risk Premium</b>
<b>CAPM Results</b>			
<i>Average Bloomberg Beta Coefficient</i>			
Current 30-Year Treasury (2.79%)		10.37%	10.72%
Near-Term Projected 30-Year Treasury (3.32%)		10.89%	11.25%
<i>Average Value Line Beta Coefficient</i>			
Current 30-Year Treasury (2.79%)		11.27%	11.67%
Near-Term Projected 30-Year Treasury (3.32%)		11.80%	12.19%
	<b>Low</b>	<b>Mid</b>	<b>High</b>
<b>Bond Yield Risk Premium</b>	9.92%	9.96%	10.19%

2

<sup>246</sup> See also Attachment RBH-Rebuttal-1 through Attachment RBH-Rebuttal-7.

1 Developing and establishing a Cost of Equity recommendation requires an element of  
2 judgment. That judgment, however, should consider the reasonableness of model results,  
3 and the economic environment in which the analyses were undertaken. As discussed in  
4 my Direct Testimony, no model should be applied without considerable judgment in the  
5 interpretation of results.<sup>247</sup> The recent trends in the Constant Growth DCF results are  
6 difficult to reconcile with observable, prevailing market conditions.

7 My recommendations therefore take into consideration the results of my Cost of Equity  
8 analyses in the context of current and expected capital market conditions, and the need  
9 for utilities such as EnergyNorth to maintain a level of financial integrity that enables  
10 access to capital, at reasonable costs, under a variety of economic and financial market  
11 conditions. With such considerations in mind, the analyses and data discussed  
12 throughout my Rebuttal Testimony continue to support my recommended Cost of Equity  
13 of 10.30 percent, within a range of 10.00 percent to 10.60 percent.

14 **Q. Does this conclude your Rebuttal Testimony?**

15 **A.** Yes, it does.

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<sup>247</sup> See Direct Testimony of Robert B. Hevert, at Bates 495.

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