

Direct Testimony and Schedules  
Ann E. Bulkley

Before the Minnesota Public Utilities Commission  
State of Minnesota

In the Matter of the Application of Minnesota Energy Resource Corporation for Authority to  
Increase Rates for Natural Gas Utility Service in Minnesota

Docket No. G011/GR-17-563

Exhibit\_\_\_

**Return on Equity**

October 13, 2017

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**TESTIMONY OF ANN E. BULKLEY**

1     **I.     Introduction and Qualifications**

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

3     A.     My name is Ann E. Bulkley. My business address is 293 Boston Post Road West, Suite  
4           500, Marlborough, Massachusetts 01752.

5

6     **Q.     What is your position with Concentric Energy Advisors, Inc. (“Concentric”)?**

7     A.     I am employed by Concentric as a Senior Vice President.

8

9     **Q.     On whose behalf are you submitting this Direct Testimony?**

10    A.     I am submitting this Direct Testimony before the Minnesota Public Utilities Commission  
11           (“Commission”) on behalf of Minnesota Energy Resources Corporation (“MERC” or the  
12           “Company”).

13

14    **Q.     Please describe your education and experience.**

15    A.     I hold a Bachelor’s degree in Economics and Finance from Simmons College and a  
16           Master’s degree in Economics from Boston University, with more than 20 years of  
17           experience consulting to the energy industry. I have advised numerous energy and utility  
18           clients on a wide range of financial and economic issues with primary concentrations in  
19           valuation and utility rate matters. Many of these assignments have included the  
20           determination of the cost of capital for valuation and ratemaking purposes. I have  
21           included my resume and a summary of testimony that I have filed in other proceedings as  
22           Exhibit \_\_\_ (AEB-1).

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**Q. Please describe Concentric’s activities in energy and utility engagements.**

A. Concentric provides financial and economic advisory services to many and various energy and utility clients across North America. Our regulatory, economic, and market analysis services include utility ratemaking and regulatory advisory services; energy market assessments; market entry and exit analysis; corporate and business unit strategy development; demand forecasting; resource planning; and energy contract negotiations. Our financial advisory activities include buy and sell-side merger, acquisition, and divestiture assignments; due diligence and valuation assignments; project and corporate finance services; and transaction support services. In addition, we provide litigation support services on a wide range of financial and economic issues on behalf of clients throughout North America.

**Q. Are you sponsoring additional schedules?**

A. Yes, I am providing the following additional schedules, which were prepared by me or under my direction, to support my recommendation:

- Exhibit \_\_\_ (AEB-2) – Summary of Results
- Exhibit \_\_\_ (AEB-3) – Proxy Group Selection
- Exhibit \_\_\_ (AEB-4) – Flotation Cost
- Exhibit \_\_\_ (AEB-5) – Constant Growth DCF Model
- Exhibit \_\_\_ (AEB-6) – Two-Stage Growth DCF Model
- Exhibit \_\_\_ (AEB-7) – Projected DCF Model

- 1 • Exhibit \_\_\_ (AEB-8) – BETA Coefficient Calculations
- 2 • Exhibit \_\_\_ (AEB-9) – Capital Asset Pricing Model
- 3 • Exhibit \_\_\_ (AEB-10) – Risk Premium Approach
- 4 • Exhibit \_\_\_ (AEB-11) – Size Premium Analysis
- 5 • Exhibit \_\_\_ (AEB-12) – Capital Expenditures Analysis
- 6 • Exhibit \_\_\_ (AEB-13) – Alternative Rate Mechanisms
- 7 • Exhibit \_\_\_ (AEB-14) – Capital Structure Analysis

8

9 **II. Purpose and Overview of Direct Testimony**

10 **Q. What is the purpose of your Direct Testimony?**

11 A. The purpose of my Direct Testimony is to present evidence and provide a  
12 recommendation regarding the Company’s return on equity (“ROE”)<sup>1</sup> and to provide an  
13 assessment of the capital structure to be used for ratemaking purposes. As referenced  
14 above, my analyses and recommendations are supported by the data presented in  
15 Exhibit\_\_\_(AEB-2-14).

16

17 **Q. Please provide a brief overview of the analyses that led to your ROE**  
18 **recommendation.**

19 A. As discussed in more detail in Section VII, in developing my ROE recommendation, I  
20 applied the Constant Growth, Two-Stage Growth and Projected forms of the Discounted  
21 Cash Flow (“DCF”) model, the Capital Asset Pricing Model (“CAPM”), and the Risk  
22 Premium approach. My recommendation also takes into consideration: (1) Flotation

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<sup>1</sup> Throughout my Direct Testimony, I interchangeably use the terms “ROE” and “cost of equity.”

1 costs; (2) the regulatory environment in which the Company operates; (3) the Company's  
2 small size relative to the proxy group; (4) the Company's capital expenditure  
3 requirements; (5) the Company's high degree of customer concentration as compared to  
4 the proxy group; and (6) the Company's rate design as compared to the proxy group.  
5 Finally, I considered the Company's proposed capital structure as compared to the capital  
6 structures of the proxy companies. While I did not make any specific adjustments to my  
7 ROE estimates for any of these factors, I did take them into consideration in aggregate  
8 when determining where the Company's ROE falls within the range of analytical results.  
9

10 **Q. How is the remainder of your Direct Testimony organized?**

11 A. Section III provides a summary of my analyses and conclusions. Section IV reviews the  
12 regulatory guidelines pertinent to the development of the cost of capital. Section V  
13 discusses current and projected capital market conditions and the effect of those  
14 conditions on the Company's cost of equity. Section VI explains my selection of a proxy  
15 group of natural gas distribution utilities. Section VII describes my analyses and the  
16 analytical basis for the recommendation of the appropriate ROE for MERC. Section VIII  
17 provides a discussion of specific regulatory, business, and financial risks that have a  
18 direct bearing on the ROE to be authorized for the Company in this case. Section IX  
19 discusses the capital structure of the Company as compared with the proxy group.  
20 Section X presents my conclusions and recommendation for the market cost of equity.  
21

1 **III. Summary of Analysis and Conclusions**

2 **Q. Please summarize the key factors considered in your analyses and upon which you**  
3 **base your recommended ROE.**

4 A. My analyses and recommendations considered the following:

- 5 • The *Hope* and *Bluefield* decisions<sup>2</sup> that established the standards for determining a  
6 fair and reasonable allowed ROE, including consistency of the allowed return  
7 with other businesses having similar risk, adequacy of the return to provide access  
8 to capital and support credit quality, and that result must lead to just and  
9 reasonable rates.
- 10 • The effect of current and projected capital market conditions on investors' return  
11 requirements.
- 12 • The Company's regulatory, business, and financial risks relative to the proxy  
13 group of comparable companies and the implications of those risks in arriving at  
14 the appropriate ROE.

15

16 **Q. Please explain how you considered those factors.**

17 A. I have relied on several analytical approaches to estimate MERC's cost of equity based  
18 on a proxy group of publicly traded companies. As shown in Chart 1, those ROE  
19 estimation models produce a wide range of results. My conclusion as to where within  
20 that range of results MERC's ROE falls is based on MERC's business and financial risk  
21 relative to the proxy group.

22

23 **Q. Please summarize the ROE estimation models that you considered to establish the**  
24 **range of ROEs for MERC.**

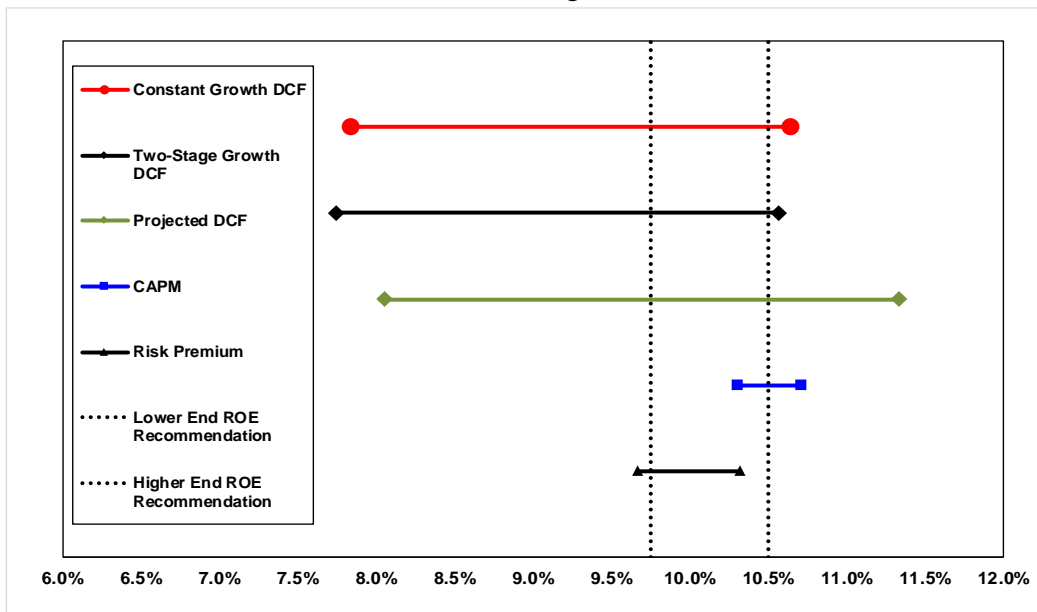
25 A. I considered the results of three DCF models: (1) Constant Growth DCF model using  
26 current dividends and stock prices; (2) Two-Stage Growth DCF model which removes

---

<sup>2</sup> Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944); Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia, 262 U.S. 679 (1923).

1 the effect of earnings growth rates that are considered either too high or too low to be  
 2 sustainable over the long-term; and (3) Constant Growth DCF model developed using  
 3 Value Line projected dividends and stock prices. In addition, I considered two risk  
 4 premium approaches: the CAPM and a Bond Yield Plus Risk Premium methodology.  
 5 Chart 1 summarizes the range of results established using each of these estimation  
 6 methodologies.

7 **CHART 1: SUMMARY OF COST OF EQUITY ANALYTICAL RESULTS<sup>3</sup>**



8  
 9  
 10 As shown in Chart 1 (and in Exhibit \_\_\_ (AEB-2)), the range of the DCF model results is  
 11 wide, particularly in relation to the results of the other methodologies. While it is  
 12 common to consider multiple models to estimate the cost of equity, it is particularly  
 13 important when the range of results is wide.

14  
<sup>3</sup> The analytical results included in Chart 1 reflect the results of the Constant Growth, Two-Stage Growth and Projected DCF analysis excluding the results for individual companies that did not meet the minimum threshold of 7 percent.



1 The requested ROE is for a future rate period; therefore, the analyses supporting my  
2 recommendation rely primarily on forward-looking inputs and assumptions (e.g.,  
3 projected growth rates in the DCF model, forecasted risk-free rate and Market Risk  
4 Premium in the CAPM analysis, etc.) and take into consideration the current high  
5 valuations of utility stocks and the market's expectation for higher interest rates. The  
6 exclusive use of historical inputs and assumptions in the ROE estimation models would  
7 tend to understate the required ROE for MERC when considering current and projected  
8 conditions in capital markets.

9  
10 As discussed in more detail in Section VII, the DCF models are influenced by current  
11 market conditions that are not projected to be sustained in the long-term. Those  
12 conditions result in lower estimates of the ROE using the DCF model. As shown in  
13 Exhibit\_\_\_(AEB-5), the DCF model produces individual company results as low as 5.54  
14 percent, which does not provide a sufficient return increment above the Company's  
15 embedded cost of long-term debt of 3.62 percent.<sup>4</sup> Furthermore, the proxy group's mean  
16 low Constant Growth DCF results<sup>5</sup> are below an acceptable range of returns for a natural  
17 gas distribution utility and are below any authorized ROE for an electric utility or natural  
18 gas utility in the U.S. since at least 1980.<sup>6</sup> Based on prospective market conditions, and  
19 the inverse relationship between the market risk premium and interest rates, I conclude  
20 that the mean low DCF results do not provide a sufficient return increment to compensate

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<sup>4</sup> Exhibit\_\_\_(LJG-1).

<sup>5</sup> My DCF models generated a mean low, mean, and mean high result. The mean low result is the average of the proxy group DCF results calculated using the lowest earnings growth rate for each company from Value Line, Yahoo! Finance or Zacks.

<sup>6</sup> Source: Regulatory Research Associates, Rate Case History January 1, 1980 – July 31, 2017.

1 equity investors for the residual risks of ownership, including the risk that they have the  
2 lowest claim on the Company's assets and income.

3  
4 In my recommendation, I balance concerns about the results produced by the DCF model  
5 with recognition that this Commission has historically given weight to that model. My  
6 ROE recommendation considers the mean and mean-high results of the DCF model, a  
7 forward-looking CAPM analysis, and a Bond Yield plus Risk Premium analysis. I also  
8 consider company-specific risk factors and current and prospective capital market  
9 conditions.

10  
11 **Q. What is your recommended ROE for MERC?**

12 A. In addition to the analytical results presented in Chart 1, I considered the level of  
13 regulatory, business, and financial risk faced by the Company relative to the proxy group  
14 to establish the range of reasonable returns. Considering these factors, and recognizing  
15 the Commission's historical preference for the DCF model, I believe a range from 9.75 to  
16 10.50 percent is reasonable. Within that range, I recommend a return of 10.3 percent  
17 which reflects the range of results for the proxy group companies, the relative risk of  
18 MERC as compared to the proxy group, and current capital market conditions.

19  
20 **Q. Please summarize your analysis of the appropriate ratemaking capital structure for**  
21 **MERC.**

22 A. Based on the analysis presented in Section IX of my testimony, I conclude that the  
23 Company's proposal to establish a common equity ratio of 50.90 percent is reasonable.

1 The proposed common equity ratio is significantly below the actual equity ratios of the  
2 companies in my proxy group. Furthermore, a fundamental aspect of the financial  
3 regulation of utilities is assuring that the subject utility has a reasonable opportunity to  
4 earn a return on capital consistent with the return available on investments of similar risk.  
5 While this principle is most often discussed in terms of the allowed ROE, it is equally  
6 applicable to all aspects of overall Rate of Return (“ROR”). The equity return, the  
7 product of the ROE, and the equity ratio, (i.e., the Weighted Return on Equity  
8 (“WROE”)), ultimately defines the return to shareholders and the product of the cost of  
9 debt and the debt ratio ensures that a company’s debt obligations are met. Therefore, it is  
10 necessary to consider both the rates that are applied to debt and equity and the  
11 composition of the capital structure to determine whether or not the overall ROR is  
12 reasonable. As discussed in greater detail in Section IX, the Company’s proposed  
13 common equity ratio of 50.90 percent is significantly below the average equity ratio for  
14 the proxy companies. The lower equity ratio increases the risk to equity investors  
15 relative to the proxy group, which should be reflected in the ROE. Taken together, the  
16 Company’s proposed common equity ratio of 50.90 percent and my recommended ROE  
17 of 10.30 percent, results in a WROE of 5.24 percent. This reasonably balances the  
18 interests of customers and shareholders by enabling MERC to maintain its financial  
19 integrity and therefore its ability to attract capital at reasonable terms and conditions  
20 under a variety of economic and financial market conditions.

21

1 **IV. Regulatory Guidelines**

2 **Q. Please describe the guiding principles to be used in establishing the cost of capital**  
3 **for a regulated utility.**

4 A. The United States Supreme Court's precedent-setting *Hope* and *Bluefield* cases  
5 established the standards for determining the fairness or reasonableness of a utility's  
6 allowed ROE. Among the standards established by the Court in those cases are: (1)  
7 consistency with other businesses having similar or comparable risks; (2) adequacy of the  
8 return to support credit quality and access to capital; and (3) that the result, as opposed to  
9 the methodology employed, is the controlling factor in arriving at just and reasonable  
10 rates.<sup>7</sup>

11  
12 Based on those recognized standards, the return authorized in this case should provide the  
13 Company with the opportunity to earn an ROE that is:

- 14 • Adequate to attract capital on reasonable terms, thereby enabling the Company to  
15 provide safe, reliable service;
- 16 • Sufficient to ensure the financial soundness of the Company's operations; and
- 17 • Commensurate with returns on investments in comparable risk enterprises.

18 The allowed ROE should enable the Company to finance capital expenditures on  
19 reasonable terms and optimize its financial flexibility over the period during which rates  
20 are expected to remain in effect.

21  
22 **Q. Has the Commission provided similar guidance in establishing the appropriate**  
23 **return on common equity?**

---

<sup>7</sup> Hope, 320 U.S. 591 (1944); Bluefield, 262 U.S. 679 (1923).

1 A. Yes. In its Order in MERC’s previous rate case, the Commission cited Minnesota  
2 Statutes section 216B.16, subdivision 6, which states that:

3 [i]n determining just and reasonable rates, the Commission is required to:

4 Give due consideration to the public need for adequate, efficient, and  
5 reasonable service and to the need of the public utility for revenue  
6 sufficient to enable it to meet the cost of furnishing service, including  
7 adequate provision for depreciation of its utility property used and useful  
8 in rendering service to the public, *and to earn a fair and reasonable return*  
9 *upon the investment in such property.*<sup>8</sup>

10 Additionally, the Commission stated that it “must set rates at a level that permits  
11 stockholders an opportunity to earn a fair and reasonable return on their investment and  
12 permits the utility to continue to attract investment.”<sup>9</sup> This guidance is in accordance  
13 with my view that an allowed rate of return must be sufficient to enable regulated  
14 companies, like MERC, the ability to attract capital on reasonable terms.

15

16 **Q. Why is it important for a utility to be allowed the opportunity to earn an ROE that**  
17 **is adequate to attract capital at reasonable terms?**

18 A. An ROE that is adequate to attract capital at reasonable terms enables the Company to  
19 continue to provide safe, reliable gas distribution service while maintaining its financial  
20 integrity. To the extent that the Company has the opportunity to earn its market-based  
21 cost of capital, neither customers nor shareholders are disadvantaged.

22

23 **Q. Is a utility’s ability to attract capital also affected by the ROEs that are authorized**  
24 **for other utilities?**

---

<sup>8</sup> Minnesota Public Utilities Commission, Docket No. G-011/GR-15-736, issued October 31, 2016, at 19.

<sup>9</sup> *Ibid.*

1 A. Yes. Utilities compete directly for capital with other investments of similar risk, which  
2 include other natural gas and electric utilities. Therefore, the ROE awarded to a utility  
3 sends an important signal to investors regarding whether there is regulatory support for  
4 financial integrity, dividends, growth, and fair compensation for business and financial  
5 risk. The cost of capital represents an opportunity cost to investors. If higher returns are  
6 available for other investments of comparable risk, investors have an incentive to direct  
7 their capital to those investments. Thus, an authorized ROE significantly below  
8 authorized ROEs for other natural gas and electric utilities can inhibit the utility's ability  
9 to attract capital for investment in Minnesota.

10

11 Likewise, because MERC is a subsidiary of WEC Energy Group, Inc. ("WEC"), MERC  
12 competes with the other WEC subsidiaries for investment capital. In determining how to  
13 allocate its finite capital resources, it would be reasonable for WEC to take into account  
14 the authorized ROE of each of its subsidiaries in order to ensure its investors have the  
15 opportunity to receive an appropriate return. As shown in Table 1, MERC currently has  
16 the third lowest authorized ROE of the seven WEC subsidiaries.

1

TABLE 1: AUTHORIZED ROE FOR WEC SUBSIDIARIES

<u>Company</u>	<u>State</u>	<u>Date Authorized</u>	<u>ROE</u>
<u>Peoples Gas Light &amp; Coke Co.</u>	<u>Illinois</u>	<u>1/21/2015</u>	<u>9.05%</u>
<u>Michigan Gas Utilities Corp</u>	<u>Michigan</u>	<u>12/11/2015</u>	<u>9.90%</u>
<u>Minnesota Energy Resources</u>	<u>Minnesota</u>	<u>9/29/2016</u>	<u>9.11%</u>
<u>North Shore Gas Co.</u>	<u>Illinois</u>	<u>1/21/2015</u>	<u>9.05%</u>
<u>Wisconsin Electric Power Co.</u>	<u>Wisconsin</u>	<u>11/14/2014</u>	<u>10.20%</u>
<u>Wisconsin Gas LLC</u>	<u>Wisconsin</u>	<u>11/14/2014</u>	<u>10.30%</u>
<u>Wisconsin Public Service Corp.</u>	<u>Wisconsin</u>	<u>11/19/2015</u>	<u>10.00%</u>

2

3 **Q. What are your conclusions regarding regulatory guidelines and capital market**  
4 **expectations?**

5 A. It is important for the ROE authorized in this proceeding to take into consideration  
6 current and projected capital market conditions, as well as investors' expectations and  
7 requirements for both risks and returns. Further, considering the Company's market and  
8 regulatory risks as noted below, it is important that MERC be afforded the opportunity to  
9 maintain a financial profile that will enable it to access the capital markets at reasonable  
10 rates.

11

12 **V. Capital Market Conditions**

13 **Q. Why is it important to analyze capital market conditions?**

1 A. The ROE estimation models rely on market data that are either specific to the proxy  
2 group, in the case of the DCF model, or to the expectations of market risk, in the case of  
3 the CAPM. The results of the ROE estimation models can be affected by prevailing  
4 market conditions at the time the analysis is performed. While the ROE that is  
5 established in a rate proceeding is intended to be forward-looking, the analyst uses  
6 current and projected market data, specifically stock prices, dividends, growth rates, and  
7 interest rates in the ROE estimation models to estimate the required return for the subject  
8 company. As is discussed in the remainder of this section, analysts and regulatory  
9 commissions have concluded that current market conditions are anomalous and that these  
10 conditions have affected the results of the ROE estimation models. As a result, it is  
11 important to consider the effect of these conditions on the ROE estimation models when  
12 determining the appropriate range and recommended ROE for a future period. If  
13 investors do not expect current market conditions to be sustained in the future, it is  
14 possible that the ROE estimation models will not provide an accurate estimate of  
15 investors' required return during that rate period. Therefore, it is very important to  
16 consider projected market data to estimate the return for that forward-looking period.

17

18 **Q. What factors are affecting the cost of equity for regulated utilities in the current and**  
19 **prospective capital markets?**

20 A. The cost of equity for regulated utility companies is being affected by several factors in  
21 the current and prospective capital markets, including: (1) the current low interest rate  
22 environment and the corresponding effect on valuations and dividend yields of utility  
23 stocks relative to historical levels; and (2) the market's expectation for higher interest



1 rates. In this section, I discuss each of these factors and how it affects the models used to  
2 estimate the cost of equity for regulated utilities.

3  
4 **Q. How has the Federal Reserve’s monetary policy affected capital markets in recent**  
5 **years?**

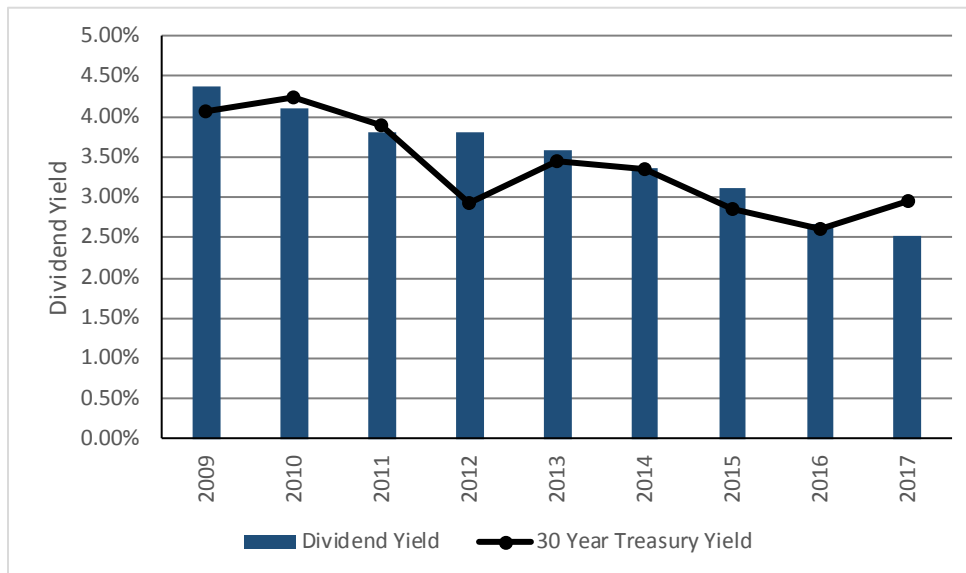
6 A. Extraordinary and persistent federal intervention in capital markets artificially lowered  
7 government bond yields after the Great Recession of 2008-2009, as the Federal Open  
8 Market Committee (“FOMC”) used monetary policy (both reductions in short-term  
9 interest rates and purchases of Treasury bonds and mortgage-backed securities) to  
10 stimulate the U.S. economy. As a result of very low or zero returns on short-term  
11 government bonds, yield-seeking investors have been forced into longer-term  
12 instruments, bidding up prices and reducing yields on those investments. As investors  
13 have moved along the risk spectrum in search of yields that meet their return  
14 requirements, there has been increased demand for dividend-paying equities, such as gas  
15 and electric utility stocks.

16  
17 **Q. How has the period of abnormally low interest rates affected the valuations and**  
18 **dividend yields of utility shares?**

19 A. The Federal Reserve’s accommodating monetary policy has caused investors to seek  
20 alternatives to the historically low interest rates available on Treasury bonds. A result of  
21 this search for higher yield is that the share prices for many common stocks, especially  
22 dividend-paying stocks such as utilities, have been driven higher while the dividend  
23 yields (which are computed by dividing the dividend payment by the stock price) have  
24 decreased to levels well below the historical average. As shown in Chart 2, since the

1 Federal Reserve intervened to stabilize financial markets and support the economic  
2 recovery after the Great Recession of 2008-09, Treasury bond yields and utility dividend  
3 yields have both declined. Specifically, Treasury bond yields have fallen by  
4 approximately 111 basis points since 2009, and natural gas utility dividend yields have  
5 decreased by about 187 basis points over this same period.

6 **CHART 2: DIVIDEND YIELDS FOR NATURAL GAS UTILITY STOCKS**



7  
8 *Source: Bloomberg.*

9  
10 **Q. How have higher stock valuations and lower dividend yields for utility companies**  
11 **affected the results of the DCF model?**

12 **A.** During periods of general economic and capital market stability, the DCF model may  
13 adequately reflect market conditions and investor expectations. However, in the current  
14 market environment, the DCF model results are distorted by the historically low level of  
15 interest rates and the higher valuation of utility stocks. In its recent commentary on the  
16 natural gas distribution utilities, UBS notes that gas utilities are trading at much higher

1 P/E's than expected given the current level of interest rates, and are trading at premiums  
2 to electric utilities.<sup>10</sup> UBS explains:

3 We refreshed our valuation analysis & Gas LDCs continue to trade  
4 at premiums to electric ut(iliti)es, S&P 500 & historical averages.  
5 Accelerated earnings growth supported by pipeline replacement,  
6 relatively low interest rates and the potential for continued industry  
7 consolidation supports premium valuations. That said, we continue  
8 to believe there is downside risk if interest rates continue to move  
9 higher. The Gas LDCs are trading at a P/E multiple of 21.4x vs.  
10 19.8x when the 10-Year was last yielding 2.48%.<sup>11</sup>

11 To assess how low interest rates are affecting the dividend yields for utility stocks, I  
12 compared the Standard & Poor's ("S&P") Utilities index to the yield on the 30-year  
13 Treasury bond since 2007. As shown in Chart 3, the S&P Utilities index has increased  
14 steadily as yields on 30-year Treasury bonds have declined in response to federal  
15 monetary policy:

---

<sup>10</sup> "P/E", or Price/Earnings ratio, is the ratio of a company's stock price to the company's earnings per share. The ratio is used in valuing companies. As the P/E ratio increases, the company's stock is more "expensive."

<sup>11</sup> Jennifer Hills, UBS, Gas Distribution: Valuation Refresh – Still Trading at Premiums (March 14, 2017).

1

**CHART 3: S&P UTILITIES AND U.S. TREASURY BOND YIELDS (2007-2017)**



*Source: SNL Interactive data*

2  
3

4

5 Chart 4 summarizes the average historical and projected P/E ratios for the proxy

6 companies calculated using data from Bloomberg Professional and Value Line. As

7 shown in Chart 4, the average P/E ratio for the proxy companies is higher in 2017 than

8 any other time in the last seventeen years and is significantly higher than the average

9 projected P/E ratio for the group for the period from 2020-2022. All else equal, if P/E

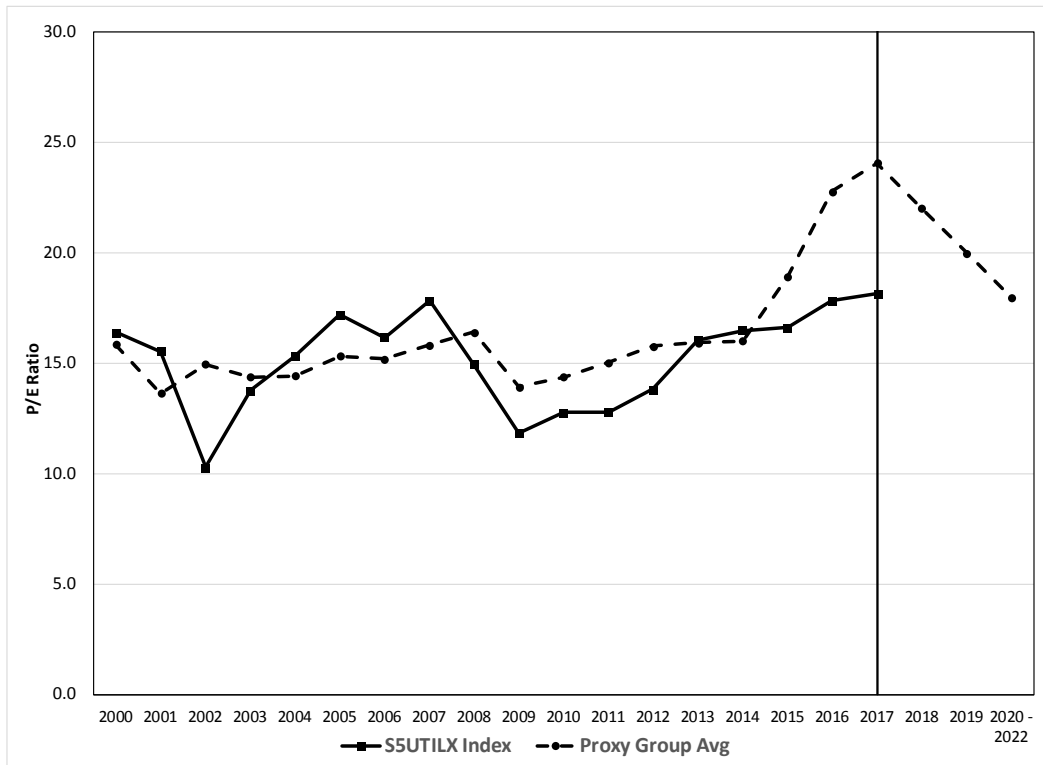
10 ratios for the proxy companies decline, as Value Line's projects, the ROE results from

11 the DCF model would be higher. Therefore, the DCF model is likely understating the

12 forward-looking cost of equity for the proxy group companies.

1

**CHART 4: AVERAGE HISTORICAL PROXY GROUP P/E RATIOS<sup>12</sup>**



2  
3

4 **Q. Is there recognition in the investment community that utility stock valuations are**  
5 **abnormally high and utility dividend yields are abnormally low?**

6 A. Yes, equity analysts have been commenting on both the higher valuation of utility stocks  
7 and the associated impact on utility dividend yields. Value Line recently commented on  
8 the industry’s low dividend yields and high valuations:

9 The high valuation of stocks in the Electric Utility Industry is  
10 evident by a few ways of measuring this. The group’s average  
11 dividend yield, at 3.3%, is comfortably above the median of all  
12 stocks under our coverage. However, this yield is low, by historical  
13 standards. In addition, for many years electric utility equities had a  
14 price-earnings ratio well below that of the market. Thus, the relative  
15 price-earnings ratio shown on our pages was below 1.00. Last year,  
16 this figure was right around 1.00 for many electric utility stocks.

<sup>12</sup> The daily P/E ratios for New Jersey Resources were removed from the proxy group average for 2008Q4 and 2009Q1. NJR was excluded from the period due to non-recurring losses associated with its Energy Services subsidiary that caused a reduction in the Company’s EPS and therefore an increase in the P/E ratio. The resulting daily P/E ratios for 2008Q4 and 2009Q1 were considered outliers and removed.

1 Today, many issues have a price-earnings ratio above 20. We also  
2 note that the majority of electric utility equities are trading within  
3 their 3- to 5-year Target Price Range. A few, such as ALLETE and  
4 CMS Energy, have recent prices above their 2020-2022 Target Price  
5 Range. As a result, the long-term total return potential of this group  
6 is just 3%, despite the likelihood of annual dividend growth from  
7 most of these companies. Income-oriented investors should keep this  
8 in mind.<sup>13</sup>

9 Equity analysts have also noted that gas distributors are experiencing the same high  
10 valuations and low dividend yields as compared to historical levels:

11 Gas LDCs continue to support high multiples even as interest rates  
12 have increased. The 10-yr Treasury is currently yielding 2.48%, the  
13 last time rates were at this level was August 2014 when the multiple  
14 [for gas LDCs] was 19.8X vs. 21.4X today. We believe a higher  
15 multiple is supported by the mid to high single digit earnings growth  
16 expected that is supported by pipeline replacement, but think the  
17 multiple also includes a premium for the potential for additional  
18 M&A in the sector.<sup>14</sup>

19 \*\*\*

20 Gas LDCs continue to trade at a higher average multiple than  
21 Electric Utilities and both are trading higher than their historical  
22 averages. We note that both are off their July 2016 peaks when the  
23 10-yr Treasury hit a near-term trough. Figure 2 shows that on a  
24 NTM P/E basis, Gas LDCs historically trade 12.5% above electric  
25 utilities, but are currently trading at a 20.5% premium.<sup>15</sup>

26  
27 **Q. What evidence is there that the interest rate environment is shifting?**

28 A. Based on stronger conditions in employment markets, a relatively stable inflation rate,  
29 steady economic growth, and increased household spending, the Federal Reserve raised  
30 the short-term borrowing rate by 25 basis points at both the March and June 2017

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<sup>13</sup> Value Line Investment Survey, Electric Utility (Central) Industry, June 16, 2017, at 901.

<sup>14</sup> Jennifer Hills, UBS, Gas Distribution: Valuation Refresh – Still Trading at Premiums (March 14, 2017), at 2.

<sup>15</sup> *Id.*, at 3.

1 meetings. Since December 2015, the Federal Reserve has increased interest rates four  
2 times, bringing the federal funds rate to the range of 1.00 percent to 1.25 percent. As the  
3 economy continues to expand, the Federal Reserve is expected to continue increasing  
4 short-term interest rates to sustain the desired balance between unemployment and  
5 consumer price inflation.<sup>16</sup> The Federal Reserve has indicated that it intends to raise  
6 short-term interest rates gradually in 25 basis point increments to the federal funds rate  
7 over time<sup>17</sup> and in March 2017, projected it would raise interest rates three times in 2017  
8 and three times again in 2018.<sup>18</sup> The prospect of additional short- and long-term interest  
9 rate increases is also supported by Dr. Janet Yellen, Chair of the Federal Reserve, who  
10 noted in the press conference following the June 2017 meeting that:

11 Our outlook is that we anticipate further increases this year and next year  
12 for the federal funds rate and our statement indicates that if the economy  
13 continues to evolve in the manner that we expect that we would feel the  
14 conditions are will be in place to begin this process [balance sheet wind  
15 down] this year.<sup>19</sup>

16  
17 Additionally, the Federal Reserve announced at the September 2017 meeting that the  
18 balance sheet normalization program outlined in the June 2017 Addendum to the Federal  
19 Reserves' Policy Normalization Principles and Plans will commence in October 2017.<sup>20</sup>

20  
21 **Q. What is the financial market's perspective on the future path of interest rates?**

---

<sup>16</sup> FOMC, Federal Reserve press release, September 20, 2017.

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

<sup>18</sup> Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, March 2017. Advance release of table 1 of the Summary of Economic Projections to be released with FOMC minutes. For release at 2:00 p.m., EDT, March 15, 2017.

<sup>19</sup> FOMC, Transcript of Chair Yellen's Press Conference, June 14, 2017.

<sup>20</sup> FOMC, Federal Reserve press release, September 20, 2017.

1 A. According to the September 2017 issue of Blue Chip Financial Forecasts, 86 percent of  
2 those surveyed expect the Federal Reserve will raise short-term interest rates again in  
3 2017 at the December meeting.<sup>21</sup> In response to the question regarding expected  
4 increases in interest rates in 2018 by the Federal Reserve, 30 percent of those surveyed  
5 expect an increase of 50 basis points, 39 percent expect an increase of 75 basis points,  
6 and 21 percent expect an increase of 100 basis points.<sup>22</sup> These responses are aligned with  
7 the FOMC target rate projections noted above.

8

9 **Q. What effect do rising interest rates have on the cost of equity?**

10 A. As interest rates continue to increase, the cost of equity for the proxy companies using the  
11 DCF model is likely to be an overly conservative estimate of investors' required returns  
12 because the proxy group average dividend yield reflects the increase in stock prices that  
13 resulted from substantially lower interest rates. As such, rising interest rates support the  
14 selection of a return toward the upper end of a reasonable range of ROE estimates that are  
15 based on current market data. Alternatively, my CAPM analysis includes estimated  
16 returns based on both current and near-term projected interest rates.

17

18 **Q. What conclusions do you draw from your analysis of capital market conditions?**

19 A. The currently low interest rate environment has driven dividend yields to historically low  
20 levels for utility shares. The effect of actions taken by the Federal Reserve is that the  
21 DCF model, which relies on unsustainably low dividend yields, is artificially understating

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<sup>21</sup> Blue Chip Financial Forecasts, Vol. 36, Issue No. 9, September 1, 2017.

<sup>22</sup> *Ibid.*



1 the forward-looking equity return requirements. As reflected in Chart 2, utility dividend  
2 yields tend to move in the same direction as interest rates, such that as interest rates rise,  
3 we would expect that dividend yields would also rise. Because of recent anomalous  
4 market conditions, it is important to also consider alternative financial models, such as  
5 the CAPM and Risk Premium analyses, together with the DCF results. In addition, the  
6 Federal Reserve increased short-term interest rates again in March and June of this year  
7 and has indicated its intention to continue tightening monetary policy through the  
8 remainder of 2017 and in 2018. In summary, market participants and analysts are  
9 expecting a change from the recent low interest rate environment. As interest rates  
10 increase, it is reasonable to believe that the cost of equity for utilities such as MERC  
11 should also be increasing. Further, because MERC will be setting rates for a future  
12 period, the use of forward-looking interest rates is consistent with the time-period for  
13 which rates will be in effect.

14  
15 **VI. Proxy Group Selection**

16 **Q. Why have you used a group of proxy companies to estimate the cost of equity for**  
17 **MERC?**

18 A. In this case, we are estimating cost of equity for a gas distribution company that is not a  
19 publicly traded entity. Since the cost of equity is a market-based concept, and given that  
20 MERC does not make up the entirety of a publicly traded entity, it is necessary to  
21 establish a group of companies that is both publicly traded and comparable to MERC in  
22 certain fundamental business and financial respects to serve as its “proxy” in the ROE  
23 estimation process.

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Even if MERC were a publicly-traded entity, it is possible that transitory events could bias its market value over a given period. A significant benefit of using a proxy group is that it moderates the effects of unusual events that may be associated with any one company. The proxy companies used in my analyses all possess a set of operating and risk characteristics that are substantially comparable to the Company, and thus provide a reasonable basis to derive and estimate the appropriate ROE for MERC.

**Q. Please provide a brief profile of MERC.**

A. MERC is a natural gas distribution company that is wholly-owned by Integrys Holding, Inc. (“Integrys”), which is ultimately owned by WEC. The Company distributes natural gas to approximately 232,000 customers in 184 communities across Minnesota.<sup>23</sup> As of December 31, 2016, MERC represented approximately 1.1 percent of the total rate base of WEC.<sup>24</sup> MERC’s parent company, Integrys, currently has an investment grade long-term rating of A- (Outlook: Stable) from S&P, and A3 (Outlook: Negative) from Moody’s.<sup>25</sup>

**Q. How did you select the companies included in your proxy group?**

A. I began with the group of 11 domestic U.S. utilities that Value Line classifies as Natural Gas Distribution Utilities, and I simultaneously applied the following screening criteria to select companies that:

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<sup>23</sup> MERC website: <http://www.minnesotaenergyresources.com/company/about.aspx>.  
<sup>24</sup> WEC Energy Group, Inc. Investor Presentation, August 2017, at 36.  
<sup>25</sup> SNL Financial, August 17, 2017.

- 1                   • pay consistent quarterly cash dividends because companies that do not cannot be  
2 analyzed using the Constant Growth DCF model;
- 3                   • have positive long-term earnings growth forecasts from at least two utility  
4 industry equity analysts;
- 5                   • have investment grade long-term issuer ratings from S&P and/or Moody's;
- 6                   • are covered by more than one equity analyst;
- 7                   • derive more than 60 percent of their total operating income from regulated  
8 operations;
- 9                   • derive more than 60 percent of their total regulated operating income from  
10 regulated natural gas operations; and
- 11                  • were not parties to a merger or transformative transaction during the analytical  
12 periods relied on.

13

14 **Q. What is the composition of your proxy group?**

15 A. The screening criteria discussed above is shown in Exhibit \_\_\_\_ (AEB-3), and resulted in  
16 a proxy group consisting of the companies shown in Table 2.

1

TABLE 2: PROXY GROUP

<u>Company</u>	<u>Ticker</u>
<u>Atmos Energy Corporation</u>	<u>ATO</u>
<u>New Jersey Resources Corporation</u>	<u>NJR</u>
<u>NiSource Inc.</u>	<u>NI</u>
<u>Northwest Natural Gas Company</u>	<u>NWN</u>
<u>ONE Gas, Inc.</u>	<u>OGS</u>
<u>South Jersey Industries, Inc.</u>	<u>SJI</u>
<u>Southwest Gas Corporation</u>	<u>SWX</u>
<u>Spire, Inc.</u>	<u>SR</u>

2

3 **VII. Cost of Equity Estimation**

4 **Q. Please briefly discuss the ROE in the context of the regulated rate of return.**

5 A. The overall rate of return for a regulated utility is based on its weighted average cost of  
6 capital, in which the cost rates of the individual sources of capital are weighted by their  
7 respective book values. While the costs of debt and preferred stock can be directly  
8 observed, the cost of equity is market-based and, therefore, must be estimated based on  
9 observable market data.

10

11 **Q. How is the required ROE determined?**

12 A. The required ROE is estimated by using one or more analytical techniques that rely on  
13 market-based data to quantify investor expectations regarding required equity returns,  
14 adjusted for certain incremental costs and risks. Informed judgment is then applied to

1 determine where the Company's cost of equity falls within the range of results. The key  
2 consideration in determining the cost of equity is to ensure that the methodologies  
3 employed reasonably reflect investors' views of the financial markets in general, as well  
4 as the subject company (in the context of the proxy group), in particular.

5  
6 **Q. What methods did you use to determine the Company's ROE?**

7 A. I considered the results of the Constant Growth DCF model, the Two-Stage Growth DCF  
8 model, the Projected Constant Growth DCF model, the CAPM model, and the Bond  
9 Yield Plus Risk Premium methodology. As discussed in more detail below, a reasonable  
10 ROE estimate appropriately considers alternative methodologies and the reasonableness  
11 of their individual and collective results.

12  
13 **A. Importance of Multiple Analytical Approaches**

14 **Q. Why is it important to use more than one analytical approach?**

15 A. Because the cost of equity is not directly observable, it must be estimated based on both  
16 quantitative and qualitative information. When faced with the task of estimating the cost  
17 of equity, analysts and investors are inclined to gather and evaluate as much relevant data  
18 as reasonably can be analyzed. Several models have been developed to estimate the cost  
19 of equity, and I use multiple approaches to estimate the cost of equity. As a practical  
20 matter, however, all of the models available for estimating the cost of equity are subject  
21 to limiting assumptions or other methodological constraints. Consequently, many well-  
22 regarded finance texts recommend using multiple approaches when estimating the cost of

1 equity. For example, Copeland, Koller, and Murrin<sup>26</sup> suggest using the CAPM and  
2 Arbitrage Pricing Theory model, while Brigham and Gapenski<sup>27</sup> recommend the CAPM,  
3 DCF, and Bond Yield Plus Risk Premium approaches.  
4

5 **Q. Is it important given the current market conditions to use more than one analytical**  
6 **approach?**

7 A. Yes. As discussed in Section V above, the U.S. economy is beginning to emerge from an  
8 unprecedented period of low interest rates. Low interest rates, and the effects of the  
9 investor “flight to quality” can be seen in high utility share valuations relative to  
10 historical levels and relative to the broader market. Higher utility stock valuations  
11 produce lower dividend yields and result in lower cost of equity estimates from a DCF  
12 analysis. Low interest rates also impact the CAPM in two ways: (1) the risk-free rate is  
13 lower, and (2) because the market risk premium is a function of interest rates, (i.e., it is  
14 the return on the broad stock market less the risk-free interest rate), the risk premium  
15 should move higher when interest rates are lower. Therefore, it is important to use  
16 multiple analytical approaches to moderate the impact that the current low interest rate  
17 environment is having on the ROE estimates for the proxy group and, where possible,  
18 consider using projected market data in the models to estimate the return for the forward-  
19 looking period. It also highlights the importance of placing equal weight on the results of  
20 the CAPM analysis, which can be estimated using projected market data.  
21

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<sup>26</sup> Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed. (New York: McKinsey & Company, Inc., 2000), at 214.

<sup>27</sup> Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed. (Orlando: Dryden Press, 1994), at 341.

1 **Q. Did you use projected market data in your CAPM analysis?**

2 A. Yes, as will be discussed in more detail below, I have accounted for the likelihood of  
3 interest rates rising during the period when rates will be in effect in my CAPM analyses  
4 by calculating estimated returns using projected interest rates for 2018 through 2023.

5  
6 **Q. Are you aware of any regulatory commissions who have recognized that the current  
7 anomalous conditions in capital markets are causing ROE recommendations based  
8 on DCF models to be unreasonable?**

9 A. Yes, several regulatory commissions have addressed the effect of capital market  
10 conditions on the DCF model, including the Federal Energy Regulatory Commission  
11 (“FERC”), the Illinois Commerce Commission (“ICC”), and the Pennsylvania Public  
12 Utility Commission (“PPUC”).

13  
14 **Q. Please summarize how the FERC has responded to the effect of market conditions  
15 on the DCF.**

16 A. Understanding the important role that dividend yields play in the DCF model, the FERC  
17 determined that anomalous capital market conditions have caused the DCF model to  
18 understate equity costs for regulated utilities. In Opinion No. 531, the FERC noted:

19 There is ‘model risk’ associated with the excessive reliance or  
20 mechanical application of a model when the surrounding conditions  
21 are outside of the normal range. ‘Model risk’ is the risk that a  
22 theoretical model that is used to value real world transactions fails to  
23 predict or represent the real phenomenon that is being modeled.<sup>28</sup>

24 In Opinion No. 531, the FERC noted that the low interest rates and bond yields that  
25 persisted throughout the analytical period that was relied on (study period) resulted in

---

<sup>28</sup> FERC Docket No. EL11-66-001, Opinion No. 531, fn 286. While Opinion No. 531 was recently remanded to the FERC by the D.C. Circuit Court on other grounds, that decision did not question the finding by the FERC that capital market conditions were anomalous.





1 **Q. How have the PPUC and the ICC addressed the effect of market conditions on the**  
2 **DCF?**

3 A. In a 2012 decision for PPL Electric Utilities, while noting that the PPUC has traditionally  
4 relied primarily on the DCF method to estimate the cost of equity for regulated utilities,  
5 the PPUC recognized that market conditions were causing the DCF model to produce  
6 results that were much lower than other models such as the CAPM and Risk Premium.

7 The PPUC's Order explained:

8 Sole reliance on one methodology without checking the validity of  
9 the results of that methodology with other cost of equity analyses  
10 does not always lend itself to responsible ratemaking. We conclude  
11 that methodologies other than the DCF can be used as a check upon  
12 the reasonableness of the DCF derived equity return calculation.<sup>32</sup>

13 The PPUC ultimately concluded:

14 As such, where evidence based on the CAPM and RP methods  
15 suggest that the DCF-only results may understate the utility's current  
16 cost of equity capital, we will give consideration to those other  
17 methods, to some degree, in determining the appropriate range of  
18 reasonableness for our equity return determination.<sup>33</sup>

19 In a recent ICC case, Docket No. 16-0093, Staff relied on a DCF analysis that resulted in  
20 average returns for their proxy groups of 7.24 percent to 7.51 percent. The company  
21 demonstrated that these results were uncharacteristically too low, by comparing the  
22 results of Staff's models to recently authorized ROEs for regulated utilities and the return  
23 on the S&P 500.<sup>34</sup> In Order No. 16-0093, the ICC agreed with the Company that Staff's  
24 proposed ROE of 8.04 percent was anomalous and recognized that a return that is not

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<sup>32</sup> Pennsylvania Public Utility Commission, PPL Electric Utilities, R-2012-2290597, meeting held December 5, 2012, at 80.

<sup>33</sup> *Id.*, at 81.

<sup>34</sup> State of Illinois Commerce Commission, Docket No. 16-0093, Illinois-American Water Company Initial Brief, August 31, 2016, at 10.

1 competitive will deter investment in Illinois.<sup>35</sup> In setting the return in this proceeding,  
2 the ICC recognized that it was necessary to consider other factors beyond the outputs of  
3 the financial models, particularly whether or not the return is sufficient to attract capital,  
4 maintain financial integrity, and is commensurate with returns for companies of  
5 comparable risk, while balancing the interests of customers and shareholders.<sup>36</sup>

6  
7 **Q. Have other regulators considered the effectiveness of the traditional ROE estimation**  
8 **models based on market conditions?**

9 A. Yes. The Surface Transportation Board (“STB”), which regulates the U.S. railroad  
10 industry, began evaluating the effectiveness of the Constant Growth DCF model in  
11 September 2006. The STB instituted a broad rulemaking to obtain public comment on  
12 the most appropriate methodology to use for estimating the ROE for railroads. In  
13 January 2008, the STB replaced the constant growth DCF model with the CAPM, with  
14 the expectation that the CAPM would produce more accurate estimates of the industry’s  
15 cost of capital. In January 2009, as a result of its exploration of the various forms of  
16 ROE estimation models and the review of public comments on the merits and  
17 shortcomings of each of the models, the STB issued a decision modifying its sole reliance  
18 on the CAPM to include an equal weighting of the CAPM and the multi-stage DCF  
19 results. In reaching this decision, the STB concluded that:

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<sup>35</sup> Illinois Staff’s analysis and recommendation in that proceeding were based on its application of the multi-stage DCF model and the CAPM to a proxy group of water utilities.

<sup>36</sup> State of Illinois Commerce Commission Decision, Docket No. 16-0093, Illinois-American Water Company, 2016 WL 7325212 (2016), at 55.

1           Indeed, if our exploration of this issue has revealed nothing else, it  
2           has shown that there is no single simple or correct way to estimate  
3           the cost of equity for the railroad industry, and countless reasonable  
4           options are available. Both the CAPM and the multi-stage DCF  
5           models we propose to use have strengths and weaknesses, and both  
6           take different paths to estimate the same illusory figure. By using an  
7           average of the results produced by both models, we harness the  
8           strengths of both models while minimizing their respective  
9           weaknesses.<sup>37</sup>

10           In this decision, the STB recognizes that it is appropriate to consider the results of various  
11           financial models to estimate the cost of equity within the context of capital market  
12           conditions. Furthermore, the STB recognizes that the appropriate ROE estimation  
13           method(s) can evolve over time as market conditions change.

14  
15   **Q.    Is it relevant that the STB does not regulate the energy industry?**

16    A.    No. The STB decision is an opinion on the appropriate methodologies to consider in  
17           estimating the ROE, and therefore it is relevant regardless of the industry. The STB  
18           decision describes the rigorous analysis and the methodologies that a regulatory body  
19           used to review financial models and to select the most appropriate models in the context  
20           of capital market conditions to estimate the cost of equity. The STB decision reveals the  
21           importance of conducting multiple analyses to estimate ROE, since financial models may  
22           be influenced differently by the same set of market conditions. As the STB noted, by  
23           using an average of the results produced by different models, we benefit from the  
24           strengths of those models while minimizing their respective weaknesses. Accordingly,  
25           mechanical reliance on a single methodology such as the Constant Growth DCF,

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<sup>37</sup> Surface Transportation Board, Use of a multi-stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, Decision STB Ex Parte No. 664 (Sub-No. 1), released January 28, 2009, at 15.

1 regardless of market conditions, may subject the ROE estimation analysis to a greater  
2 degree of bias. In summary, as the STB decision points out, the models used to estimate  
3 the ROE are used by the investment community for all types of investments, and  
4 therefore it is not important that the STB does not regulate energy companies. Rather,  
5 what is important is that the methodologies used reflect what investors consider in  
6 establishing their return requirements.

7  
8 **Q. What are your conclusions about the results of the DCF and CAPM models?**

9 A. Recent market data that is used as the basis for the assumptions for both models have  
10 been affected by market conditions. As a result, relying exclusively on historical  
11 assumptions in these models, without considering whether these assumptions are  
12 consistent with investors' future expectations, will underestimate the cost of equity that  
13 investors would require over the period that the rates in this case are to be in effect. In  
14 this instance, relying on the historical average of abnormally high stock prices results in  
15 low dividend yields that are not expected to continue over the period that the new rates  
16 will be in effect. This, in turn, underestimates the ROE for the rate period.

17  
18 The use of recent historical Treasury bond yields in the CAPM also tends to  
19 underestimate the projected cost of equity. Recent experience indicates that interest rates  
20 are increasing. The expectation that bond yields will not remain at currently low levels  
21 means that the expected cost of equity should be higher than suggested by the CAPM  
22 using historical average yields. The use of projected yields on Treasury bonds results in  
23 CAPM estimates that are more reflective of the market conditions that investors expect

1 during the period that the Company's rates will be in effect.

2  
3 **B. Constant Growth DCF Model**

4 **Q. Please describe the DCF approach.**

5 A. The DCF approach is based on the theory that a stock's current price represents the  
6 present value of all expected future cash flows. In its most general form, the DCF model  
7 is expressed as follows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

8  
9 Where  $P_0$  represents the current stock price,  $D_1 \dots D_\infty$  are all expected future dividends,  
10 and  $k$  is the discount rate, or required ROE. Equation [1] is a standard present value  
11 calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [2]$$

12  
13 Equation [2] is often referred to as the Constant Growth DCF model in which the first  
14 term is the expected dividend yield and the second term is the expected long-term growth  
15 rate.

16  
17 **Q. What assumptions are required for the Constant Growth DCF model?**

18 A. The Constant Growth DCF model requires the following four assumptions: (1) a constant  
19 growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant  
20 price-to-earnings ratio; and (4) a discount rate greater than the expected growth rate. To

1 the extent that any of these assumptions is violated, considered judgment and/or specific  
2 adjustments should be applied to the results.

3  
4 **Q. What market data did you use to calculate the dividend yield in your Constant**  
5 **Growth DCF model?**

6 A. The dividend yield in my Constant Growth DCF model is based on the proxy companies'  
7 current annualized dividend and average closing stock prices over the 30-, 90-, and 180-  
8 trading days ended July 31, 2017.

9  
10 **Q. Why did you use 30-, 90-, and 180-day averaging periods?**

11 A. In my Constant Growth DCF model, I use an average of recent trading days to calculate  
12 the term  $P_0$  in the DCF model to ensure that the ROE is not skewed by anomalous events  
13 that may affect stock prices on any given trading day. The averaging period should also  
14 be reasonably representative of expected capital market conditions over the long-term.  
15 However, the averaging periods that I use rely on historical data which is not consistent  
16 with the forward-looking expectation that interest rates will increase. Therefore, the  
17 results of my Constant Growth DCF model may underestimate the returns of the proxy  
18 group companies. As a result, I place more weight on the mean to mean-high results  
19 produced by my Constant Growth DCF model. In addition, I calculate an additional  
20 Constant Growth DCF analysis which relies on projected market data from Value Line to  
21 more reasonably approximate future market conditions.

22  
23 **Q. Did you make any adjustments to the dividend yield to account for periodic growth**  
24 **in dividends?**

1 A. Yes, I did. Since utility companies tend to increase their quarterly dividends at different  
2 times throughout the year, it is reasonable to assume that dividend increases will be  
3 evenly distributed over calendar quarters. Given that assumption, it is reasonable to  
4 apply one-half of the expected annual dividend growth rate for purposes of calculating  
5 the expected dividend yield component of the DCF model. This adjustment ensures that  
6 the expected first year dividend yield is, on average, representative of the coming twelve-  
7 month period, and does not overstate the aggregated dividends to be paid during that  
8 time.

9

10 **Q. Why is it important to select appropriate measures of long-term growth in applying**  
11 **the DCF model?**

12 A. In its Constant Growth form, the DCF model (i.e., Equation [2]) assumes a single growth  
13 estimate in perpetuity. In order to reduce the long-term growth rate to a single measure,  
14 one must assume a constant payout ratio, and that earnings per share, dividends per share,  
15 and book value per share all grow at the same constant rate. Over the long run, however,  
16 dividend growth can only be sustained by earnings growth. Therefore, it is important to  
17 incorporate a variety of sources of long-term earnings growth rates into the Constant  
18 Growth DCF model.

19

20 **Q. Which sources of long-term earnings growth rates did you use?**

21 A. My Constant Growth DCF model incorporates three sources of long-term earnings  
22 growth rates: (1) Zacks Investment Research; (2) Thomson First Call (provided by  
23 Yahoo! Finance); and (3) Value Line Investment Survey.

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**C. Flotation Costs**

**Q. What are flotation costs?**

A. Flotation costs are the costs associated with the sale of new issues of common stock. These costs include out-of-pocket expenditures for preparation, filing, underwriting, and other issuance costs.

**Q. Why is it important to consider flotation costs in the allowed ROE?**

A. A regulated utility must have the opportunity to earn an ROE that is both competitive and compensatory to attract and retain new investors. To the extent that a company is denied the opportunity to recover prudently incurred flotation costs, actual returns will fall short of expected (or required) returns, thereby diluting equity share value.

**Q. Are flotation costs part of the utility’s invested costs or part of the utility’s expenses?**

A. Flotation costs are part of the invested costs of the utility, which are properly reflected on the balance sheet under “paid in capital.” They are not current expenses, and, therefore, are not reflected on the income statement. Rather, like investments in rate base or the issuance costs of long-term debt, flotation costs are incurred over time. As a result, the great majority of a utility’s flotation cost is incurred prior to the test year, but remains part of the cost structure that exists during the test year and beyond, and as such, should be recognized for ratemaking purposes. Therefore, whether an issuance occurs during the test year, or is planned for the test year, is irrelevant, because failure to allow recovery of



1 past flotation costs may deny MERC the opportunity to earn its required ROR in the  
2 future.

3  
4 **Q. Is the need to consider flotation costs recognized by the academic and financial**  
5 **communities?**

6 A. Yes. The need to reimburse shareholders for the lost returns associated with equity  
7 issuance costs is recognized by the academic and financial communities in the same spirit  
8 that investors are reimbursed for the costs of issuing debt. This treatment is consistent  
9 with the philosophy of a fair ROR. According to Dr. Shannon Pratt:

10 Flotation costs occur when new issues of stock or debt are sold to the  
11 public. The firm usually incurs several kinds of flotation or  
12 transaction costs, which reduce the actual proceeds received by the  
13 firm. Some of these are direct out-of-pocket outlays, such as fees  
14 paid to underwriters, legal expenses, and prospectus preparation  
15 costs. Because of this reduction in proceeds, the firm's required  
16 returns on these proceeds equate to a higher return to compensate for  
17 the additional costs. Flotation costs can be accounted for either by  
18 amortizing the cost, thus reducing the cash flow to discount, or by  
19 incorporating the cost into the cost of capital. Because flotation  
20 costs are not typically applied to operating cash flow, one must  
21 incorporate them into the cost of capital.<sup>38</sup>

22  
23 **Q. Has the Commission previously recognized the need to include flotation costs?**

24 A. Yes. The need to reimburse investors for equity issuance costs has been recognized by  
25 the Commission in many, although not all, previous decisions.<sup>39</sup> My examination  
26 concludes that flotation costs are properly included in MERC's ROE determination.

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<sup>38</sup> Shannon P. Pratt, *Cost of Capital Estimation and Applications*, Second Edition, at 220-221.

<sup>39</sup> Docket No. E-001/GR-10-276, Findings of Fact, Conclusions, and Order, at 9; Docket No. E002/GR-10-971, Findings of Fact, Conclusions, and Order, at 8; Docket No. E002/GR-08-1065, Findings of Fact, Conclusions of Law, and Order, at 10-11; Docket No. E017/GR-07-1178, Findings of Fact, Conclusions of Law, and Order, at 57-58; Docket No. G004/GR-04-1487, Findings of Fact, Conclusions of Law and Order, at 11.

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**Q. How did you calculate the flotation costs for MERC?**

A. My flotation cost calculation is based on the costs of issuing equity that were incurred by Integrys in its two most recent common equity issuances. Those issuance costs were applied to my proxy group. Based on the issuance costs provided in Exhibit\_\_\_(AEB-4), flotation costs for MERC are approximately 0.11 percent (i.e., 11 basis points).

**Q. Do your final results include an adjustment for flotation cost recovery?**

A. No. I did not make an explicit adjustment for flotation costs to any of my quantitative analyses. Rather, I provide the above result for consideration in my recommended ROE, which reflects the range of results from my Constant Growth DCF, Two-Stage Growth DCF, Projected DCF, CAPM, and Risk Premium analyses.

**D. Discounted Cash Flow Model Results**

**Q. Please summarize the results of your DCF analyses.**

A. Table 3 (*see* also Exhibit\_\_\_AEB-2 and AEB-5, columns 12, 13 and 14) presents the results of the eight proxy companies developed from my proxy group screen. As shown in Table 3, the Constant Growth DCF analysis produces a range of returns from 7.76 percent to 10.71 percent.

**Q. How did you calculate the range of results for the Constant Growth DCF Model?**

A. I calculated the low result for my DCF models using the minimum growth rate (i.e., the lowest of the First Call, Zacks, and Value Line earnings growth rates) for each of the

1 proxy group companies. Thus, the low result reflects the minimum DCF result for the  
2 proxy group. I used a similar approach to calculate the high results, using the highest  
3 growth rate for each proxy group company. The mean results were calculated using the  
4 average growth rates from all three sources.

5  
6 **Q. Have you excluded any of the Constant Growth DCF results for individual**  
7 **companies in your proxy group?**

8 A. Yes, I have. It is appropriate to exclude Constant Growth DCF results below a specified  
9 threshold at which equity investors would consider such returns to provide an insufficient  
10 return increment above long-term debt costs. The average credit rating for the companies  
11 in the proxy group is A-/A3. The average yield on Moody's A-rated utility bonds for the  
12 30 trading days ending July 31, 2017 was 3.96 percent. As shown on Exhibit \_\_\_\_ (AEB-  
13 5), I have eliminated Constant Growth DCF results lower than 7.0 percent because such  
14 returns would provide equity investors a risk premium only 304 basis points above A-  
15 rated utility bonds. This resulted in the elimination of low-end results for New Jersey  
16 Resources Corporation, South Jersey Industries, Southwest Gas Corporation, and Spire,  
17 Inc.<sup>40</sup> from the proxy company results.

18  
19 **Q. Has the Department of Commerce recognized the importance of excluding the ROE**  
20 **results for individual companies that are unreasonably low?**

21 A. Yes. In Docket No. E017/GR-15-1033 for Otter Tail Power Company, Mr. Kundert of  
22 the Department of Commerce ("Department") reasoned that:

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<sup>40</sup> The low-end result for Spire, Inc. was only excluded from the Constant Growth model using the 30-day average of the stock prices. Spire, Inc.'s low-end result was included in the 90- and 180-day average price scenarios.

1 Any method of estimating the required rate of return, including DCF  
2 analysis, must survive the test of reasonableness based on well-established  
3 financial principles. In a DCF analysis, the results should not be  
4 mechanically accepted if they violate well-accepted financial principles.  
5 For example, it is important for companies in the DOC proxy group to be  
6 financially viable because it is in the public interest, including the interest  
7 of ratepayers, for the utility to have a reasonable opportunity to recover its  
8 costs; setting the return on equity (ROE) too low would not give the utility  
9 a reasonable opportunity to finance the necessary capital improvements to  
10 its system.<sup>41</sup>

11 In that case, the Department determined the proxy group using a screening criterion that  
12 eliminated companies that had a constant growth DCF result below a certain threshold.  
13 The ROE threshold they used was based on current market conditions using the results of  
14 the CAPM model which supported a ROE threshold of 7 percent.<sup>42</sup> In addition, I am  
15 aware that the Department also recognized the importance of excluding the low ROE  
16 results of individual companies in Northern States Power Company-Minnesota's Docket  
17 Nos. E002/GR-13-868 and E002/GR-15-826. In those proceedings, the ROE Threshold  
18 used was 8 percent and 7 percent, respectively.<sup>43</sup>

19  
20 **Q. Is your approach for excluding the Constant Growth DCF results for individual**  
21 **companies in your proxy group consistent with the approach applied by the**  
22 **Department?**

23 A. Yes. The Department eliminates a company from the proxy group if the company's ROE  
24 does not exceed a certain threshold. While, I do not exclude the company from the proxy  
25 group, I remove the specific constant growth DCF result for the company that is below  
26 the ROE threshold which as discussed above is 7 percent. For example, in Exhibit \_\_\_\_

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<sup>41</sup> Docket No. E017/GR-15-1033, In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota (August 16, 2016) at 11.

<sup>42</sup> *Id.*, at 13.

<sup>43</sup> *Ibid.*

1 (AEB-5, column 9), the low-end result for New Jersey Resources was 5.54 percent which  
2 was below the 7 percent ROE threshold; therefore, the result was excluded from column  
3 12 which displays the final constant growth DCF results for each proxy group company.  
4 While the low-end result for New Jersey Resources was excluded, the mean and high-end  
5 results for the company exceed the 7 percent threshold and were included in the proxy  
6 group average. Thus, both approaches achieve the goal of excluding the results of  
7 companies who have a constant growth DCF result that is below the threshold that equity  
8 investors would consider to provide a sufficient risk premium above long-term debt costs.  
9

10 **Q. Have you considered the results of any other DCF analyses?**

11 A. Yes, I have considered the results of two additional DCF models: (1) a Two-Stage  
12 Growth DCF model which removes the effect of earnings growth rates that are  
13 considered either too high or too low to be sustainable over the long-term; and (2) a  
14 Projected Constant Growth DCF model developed using Value Line projected dividends  
15 and stock prices.  
16

17 **Q. Please generally describe your Two-Stage Growth DCF model.**

18 A. As discussed in the Section above, the Constant Growth DCF model assumes a single  
19 growth estimate in perpetuity which for my Constant Growth DCF model was the long-  
20 term earnings growth rates from First Call, Zacks, and Value Line. The earnings growth  
21 rates used in my Constant Growth DCF model are developed by analysts for a five-year  
22 period and therefore, may not be reflective of the long-term growth rate of a company.  
23 As a result, I developed a Two-Stage Growth DCF model to reduce the impact of low or

1 high earnings growth rates on the calculated ROE of a company by utilizing one growth  
2 rate to reflect short-term growth and a separate growth rate for long-term growth.

3  
4 **Q. How did you apply the Two-Stage Growth DCF to the companies in your proxy**  
5 **group?**

6 A. I applied the Two-Stage Growth DCF approach to companies that had an earnings growth  
7 rate that was considered to be unsustainable for the long-term as compared to the proxy  
8 group. An earnings growth rate was considered to be abnormally high or low if the  
9 earnings growth rate was outside of the range determined by the average growth rate of  
10 the proxy group plus or minus one standard deviation. For the companies with a high or  
11 low growth rate, I estimated the companies ROE by applying the earnings growth rate  
12 used in the Constant Growth DCF model for the first five years (i.e., short-term) and then  
13 for the long-term, I used the proxy group average growth rate minus one standard  
14 deviation in the case of companies with a low growth rate and the proxy group average  
15 growth rate plus one standard deviation in the case of companies with a high growth rate.  
16 This approach is consistent with the approach applied by the Department and adopted by  
17 the Commission in the Company's last rate case as well as several additional  
18 proceedings. Table 3 (*see* also Exhibit \_\_\_ (AEB-6), presents the results of my Two-  
19 Stage Growth DCF model. As shown in Table 3, the Two-Stage Growth DCF analysis  
20 produces a range of returns from 7.67 percent to 10.63 percent.

21  
22 **Q. How did you develop a Project Constant Growth DCF model?**

1 A. I developed a projected Constant Growth DCF model using Value Line’s projected  
 2 average prices and projected dividends for the period from 2020-2022 and the five-year  
 3 projected EPS growth rates that cover this time-period. As shown in Exhibit \_\_\_ (AEB-  
 4 7), the use of Value Line projected assumptions in the DCF model results increases the  
 5 ROE by 68 basis points (i.e., 9.43 percent vs. 8.75 percent); from the average DCF mean  
 6 result for all three dividend measurement periods shown in Exhibit \_\_\_ (AEB-5).

7  
 8 **Q. What were the results of your DCF analyses?**

9 A. Table 3 summarizes the results of my DCF analyses. As shown in Table 3, the mean  
 10 DCF results range from 8.72 percent to 9.43 percent and the mean high results are in the  
 11 range of 10.53 percent to 11.33 percent. While I also summarize the mean low DCF  
 12 results, I do not believe that the low DCF results provide a reasonable spread over the  
 13 expected yields on Treasury bonds to compensate investors for the incremental risk  
 14 related to an equity investment.

15 **TABLE 3: DISCOUNTED CASH FLOW RESULTS**

	Mean Low	Mean	Mean High
<b>Constant Growth DCF<sup>44</sup></b>			
30-Day Average	7.89%	8.72%	10.61%
90-Day Average	7.76%	8.72%	10.61%
180-Day Average	7.87%	8.82%	10.71%
<b>Two-Stage Growth DCF<sup>45</sup></b>			
30-Day Average	7.78%	8.73%	10.53%
90-Day Average	7.67%	8.73%	10.53%
180-Day Average	7.78%	8.83%	10.63%
<b>Constant Growth DCF – Projected Price and Dividends<sup>46</sup></b>			
2020-2022 Projection	8.05%	9.43%	11.33%

16

<sup>44</sup> See Exhibit \_\_\_ (AEB-5).

<sup>45</sup> See Exhibit \_\_\_ (AEB-6).

<sup>46</sup> See Exhibit \_\_\_ (AEB-7).

1 **Q. What are your conclusions about the results of the DCF models?**

2 A. As discussed previously, one primary assumption of the DCF models is a constant P/E  
3 ratio. That assumption is heavily influenced by the market price of utility stocks. To the  
4 extent that utility valuations are high and may not be sustainable, it is important to  
5 consider the results of the DCF models with caution. As shown in Chart 2 above, the  
6 dividend yield for natural gas utilities over the past nine years has declined from a high in  
7 2009 of 4.38 percent to a low in 2017 of 2.51 percent as a result of recent market  
8 conditions. The recent decline in dividend yields is further supported by the mean  
9 dividend yields on the DCF analysis for MERC which ranged from 2.69 percent to 2.79  
10 percent over the analytical periods considered. As I indicated previously, this is due to  
11 the high utility equity valuations as investors have sought higher returns, but such levels  
12 are not expected to be sustained in the upcoming year.

13  
14 Since the low dividend yields may result in the DCF model understating investors'  
15 expected return, I have given primary weight to the mean and high-end DCF results. My  
16 overall recommendation also relies on the results of other ROE estimation models.

17

18 **E. CAPM Analysis**

19 **Q. Please briefly describe the Capital Asset Pricing Model.**

20 A. The CAPM is a risk premium approach that estimates the cost of equity for a given  
21 security as a function of a risk-free return plus a risk premium to compensate investors  
22 for the non-diversifiable or “systematic” risk of that security. This second component is



1 the product of the market risk premium and the Beta coefficient, which measures the  
2 relative riskiness of the security being evaluated.

3  
4 The CAPM is defined by four components, each of which must theoretically be a  
5 forward-looking estimate:

$$K_e = r_f + \beta(r_m - r_f) \quad [3]$$

6  
7 Where:

8  $K_e$  = the required market ROE;

9  $\beta$  = Beta coefficient of an individual security;

10  $r_f$  = the risk-free rate of return; and

11  $r_m$  = the required return on the market.

12 In this specification, the term  $(r_m - r_f)$  represents the market risk premium. According to  
13 the theory underlying the CAPM, since unsystematic risk can be diversified away,  
14 investors should only be concerned with systematic or non-diversifiable risk. Non-  
15 diversifiable risk is measured by Beta, which is defined as:

$$\beta = \frac{\text{Covariance}(r_e, r_m)}{\text{Variance}(r_m)} \quad [4]$$

16 The variance of the market return (i.e., Variance  $(r_m)$ ) is a measure of the uncertainty of  
17 the general market, and the covariance between the return on a specific security and the  
18 general market (i.e., Covariance  $(r_e, r_m)$ ) reflects the extent to which the return on that  
19 security will respond to a given change in the general market return. Thus, Beta  
20 represents the risk of the security relative to the general market.

21  
22 **Q. What risk-free rate did you use in your CAPM analysis?**

1 A. I relied on three sources for my estimate of the risk-free rate: (1) the current 30-day  
2 average yield on 30-year U.S. Treasury bonds (i.e., 2.84 percent);<sup>47</sup> (2) the average  
3 projected 30-year U.S. Treasury bond yield for Q4 2017 through Q4 2018 of 3.42  
4 percent;<sup>48</sup> and (3) the average projected 30-year U.S. Treasury bond yield for 2019  
5 through 2023 of 4.30 percent.<sup>49</sup>

6

7 **Q. Why did you use the 30-year Treasury bond yield as the risk-free rate in the CAPM**  
8 **analysis?**

9 A. In determining the security most relevant to the application of the CAPM, it is important  
10 to select the term (or maturity) that best matches the life of the underlying investment.

11 As noted by Morningstar:

12 The traditional thinking regarding the time horizon of the chosen Treasury  
13 security is that it should match the time horizon of whatever is being  
14 valued... Note that the horizon is a function of the investment, not the  
15 investor. If an investor plans to hold stock in a company for only five  
16 years, the yield on a five-year Treasury note would not be appropriate  
17 since the company will continue to exist beyond those five years.<sup>50</sup>

18 Because utility companies represent long-duration investments, it is appropriate to use  
19 yields on long-term Treasury bonds as the risk-free rate component of the CAPM. In my  
20 view, the 30-year Treasury bond is the appropriate security for that purpose. Because the  
21 cost of capital is intended to be forward-looking, it is appropriate to consider projected  
22 measures of interest rates and the market risk premium.

23

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<sup>47</sup> Bloomberg Professional, as of July 31, 2017.

<sup>48</sup> Blue Chip Financial Forecasts, Vol. 36, No. 8, August 1, 2017, at 2.

<sup>49</sup> Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14.

<sup>50</sup> Morningstar Inc., Ibbotson SBBI 2013 Valuation Yearbook, at 44.

1 **Q. Why did you consider the current average yield on 30-year Treasury bonds as well**  
2 **as the projected Treasury bond yields?**

3 A. As discussed previously, the estimation of the cost of equity in this case should be  
4 forward looking since it is the return that investors would receive over the future rate  
5 period. Therefore, the inputs and assumptions used in the CAPM analysis should reflect  
6 the expectations of the market at that time. As discussed in Section V of my Direct  
7 Testimony, leading economists surveyed by Blue Chip are expecting an increase in long-  
8 term interest rates over the next five years. This is an important consideration for equity  
9 investors as they assess their return requirements. A CAPM analysis based entirely on  
10 the current average risk-free rate of 2.84 percent fails to take into consideration the effect  
11 of the market's expectations for interest rate increases on the cost of equity. For that  
12 reason, I have used the projected yields on 30-year Treasury bonds over the near-term  
13 horizon of 2019 – 2023, the period that rates will be in effect, as the risk-free rate.

14  
15 **Q. What Beta coefficients did you use in your CAPM analysis?**

16 A. As shown on Exhibit \_\_\_ (AEB-8), I used the average Beta coefficients for the proxy  
17 group companies as reported by Value Line. Value Line's calculation is based on five  
18 years of weekly returns relative to the New York Stock Exchange Composite Index. My  
19 average Beta coefficient for the proxy group was 0.719.

20  
21 **Q. How did you estimate the market risk premium in the CAPM?**

22 A. I estimated the market risk premium based on the expected return on the S&P 500 Index  
23 less the yield on the 30-year Treasury bond. I calculated the expected return on the S&P

1 500 Index companies for which dividend yields and long-term earnings projections are  
 2 available using the Constant Growth DCF model discussed earlier in my Direct  
 3 Testimony. Based on an estimated market capitalization-weighted dividend yield of 1.99  
 4 percent and a weighted long-term growth rate of 11.11 percent, the estimated required  
 5 market return for the S&P 500 Index is 13.21 percent. As shown in Exhibit \_\_\_ (AEB-  
 6 9), the implied market risk premium over the current 30-day average of the 30-year U.S.  
 7 Treasury bond yield, and projected yields on the 30-year U.S. Treasury bond, range from  
 8 8.91 percent to 10.37 percent.

9  
 10 **Q. What are the results of your CAPM analyses?**

11 A. As shown in Table 4 (*see* also Exhibit \_\_\_ (AEB-9), my CAPM analyses produces a  
 12 range of returns from 10.30 percent to 10.71 percent.

13 **TABLE 4: CAPM RESULTS**

	<b>Current Risk-Free Rate (2.84%)</b>	<b>Q4 2017-Q4 2018 Projected Risk-Free Rate (3.42%)</b>	<b>2019-2023 Projected Risk-Free Rate (4.30%)</b>	<b>Mean Result</b>
<b>Value Line Beta</b>	10.30%	10.46%	10.71%	<b>10.49%</b>

14  
 15 **F. Bond Yield Risk Premium Analysis**

16 **Q. Please describe the Bond Yield Plus Risk Premium approach.**

17 A. In general terms, this approach is based on the fundamental principle that equity investors  
 18 bear the residual risk associated with equity ownership and therefore require a premium  
 19 over the return they would have earned as a bondholder. That is, since returns to equity

1 holders have greater risk than returns to bondholders, equity investors must be  
2 compensated to bear that risk. Risk premium approaches, therefore, estimate the cost of  
3 equity as the sum of the equity risk premium and the yield on a particular class of bonds.  
4 In my analysis, I used actual authorized returns for gas utilities as the historical measure  
5 of the cost of equity to determine the risk premium.

6  
7 **Q. Are there other considerations that should be addressed in conducting this analysis?**

8 A. Yes. It is important to recognize both academic literature and market evidence indicating  
9 that the equity risk premium (as used in this approach) is inversely related to the level of  
10 interest rates. That is, as interest rates increase (decrease), the equity risk premium  
11 decreases (increases). Consequently, it is important to develop an analysis that:  
12 (1) reflects the inverse relationship between interest rates and the equity risk premium;  
13 and (2) relies on recent and expected market conditions. Such an analysis can be  
14 developed based on a regression of the risk premium as a function of U.S. Treasury bond  
15 yields. If we let authorized ROEs for gas utilities serve as the measure of required equity  
16 returns and define the yield on the long-term U.S. Treasury bond as the relevant measure  
17 of interest rates, the risk premium simply would be the difference between those two  
18 points.<sup>51</sup>

19  
20 **Q. Is the Bond Yield Plus Risk Premium analysis relevant to investors?**

---

<sup>51</sup> See e.g., S. Keith Berry, *Interest Rate Risk and Utility Risk Premia during 1982-93*, Managerial and Decision Economics, Vol. 19, No. 2 (March, 1998), in which the author used a methodology similar to the regression described below, including using allowed ROEs as the relevant data source, and came to similar conclusions regarding the inverse relationship between risk premia and interest rates. See also Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholders Required Rates of Return*, Financial Management, Spring 1986, at 66.

1 A. Yes. Investors are aware of ROE awards in other jurisdictions, and they consider those  
2 awards as a benchmark for a reasonable level of equity returns for utilities of comparable  
3 risk operating in other jurisdictions. Since my Bond Yield Plus Risk Premium analysis is  
4 based on authorized ROEs for gas utilities relative to corresponding Treasury yields, it  
5 provides relevant information to assess the return expectations of investors.

6

7 **Q. What did your Bond Yield Plus Risk Premium analysis reveal?**

8 A. As shown on Chart 5 below, from 1992 through July 2017, there was a strong negative  
9 relationship between risk premia and interest rates. To estimate that relationship, I  
10 conducted a regression analysis using the following equation:

11 
$$RP = a + b(T) \quad [5]$$

12 Where:

13 RP = Risk Premium (difference between allowed ROEs and the yield on 30-year  
14 U.S. Treasury bonds)

15 a = intercept term

16 b = slope term

17 T = 30-year U.S. Treasury bond yield

18

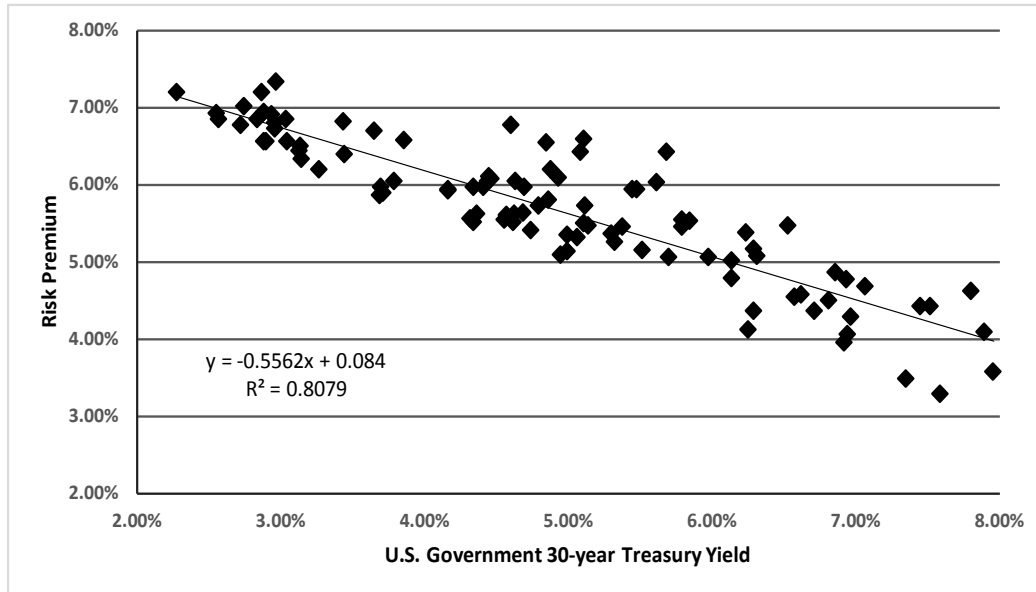
19 Data regarding allowed ROEs were derived from 559 rate cases from 1992 through July  
20 2017 as reported by Regulatory Research Associates.<sup>52</sup> This equation's coefficients were  
21 statistically significant at the 99.0 percent level.

---

<sup>52</sup> This analysis began with a total of 848 cases and was screened to eliminate limited issue rider cases, transmission-only cases, and cases that were silent with respect to the authorized ROE. After applying those screening criteria, the analysis was based on data for 559 cases.

1

**CHART 5: RISK PREMIUM RESULTS**



2

3 As shown on Exhibit \_\_\_\_ (AEB-10), based on the current 30-day average of the 30-year  
4 U.S. Treasury bond yield (i.e., 2.84 percent), the risk premium would be 6.82 percent,  
5 resulting in an estimated ROE of 9.67 percent. Based on the near-term (2017-2018)  
6 projections of the 30-year U.S. Treasury bond yield (i.e., 3.42 percent), the risk premium  
7 would be 6.50 percent, resulting in an estimated ROE of 9.92 percent. Based on longer-  
8 term (2019-2023) projections of the 30-year U.S. Treasury bond yield (i.e., 4.30 percent),  
9 the risk premium would be 6.01 percent, resulting in an estimated ROE of 10.31 percent.

10

11 **Q. How did the results of the Bond Yield Risk Premium inform your recommended**  
12 **ROE for the Company?**

13 A. I have considered the results of the Bond Yield Risk Premium analysis in setting my  
14 recommended ROE for the Company. The results of both my CAPM and Bond Yield  
15 Risk Premium analysis provide support for my view that the DCF model is understating  
16 investors' return requirements under current market conditions. Also, as noted above,

1 investors will consider the ROE award of a company when assessing the risk of that  
2 company as compared to utilities of comparable risk operating in other jurisdictions. The  
3 risk premium analysis takes into account this comparison by estimating the return  
4 expectations of investors based on the current and past ROE awards of gas utilities across  
5 the U.S. As a result, I have weighted the results of my Bond Yield Risk Premium  
6 analysis equally with the results of the DCF and CAPM models.

7  
8 **VIII. Regulatory and Business Risks**

9 **Q. Is it reasonable to rely exclusively on the mean DCF, CAPM, and Risk Premium**  
10 **results for the proxy group to provide an appropriate estimate of the cost of equity**  
11 **for MERC?**

12 A. No. These results provide only a range of the appropriate estimate of the Company's cost  
13 of equity. There are several additional factors that must be taken into consideration when  
14 determining where the Company's cost of equity falls within the range of results. These  
15 factors, which are discussed below, should be considered with respect to their overall  
16 effect on the Company's risk profile.

17  
18 **A. Minnesota Allowed ROEs**

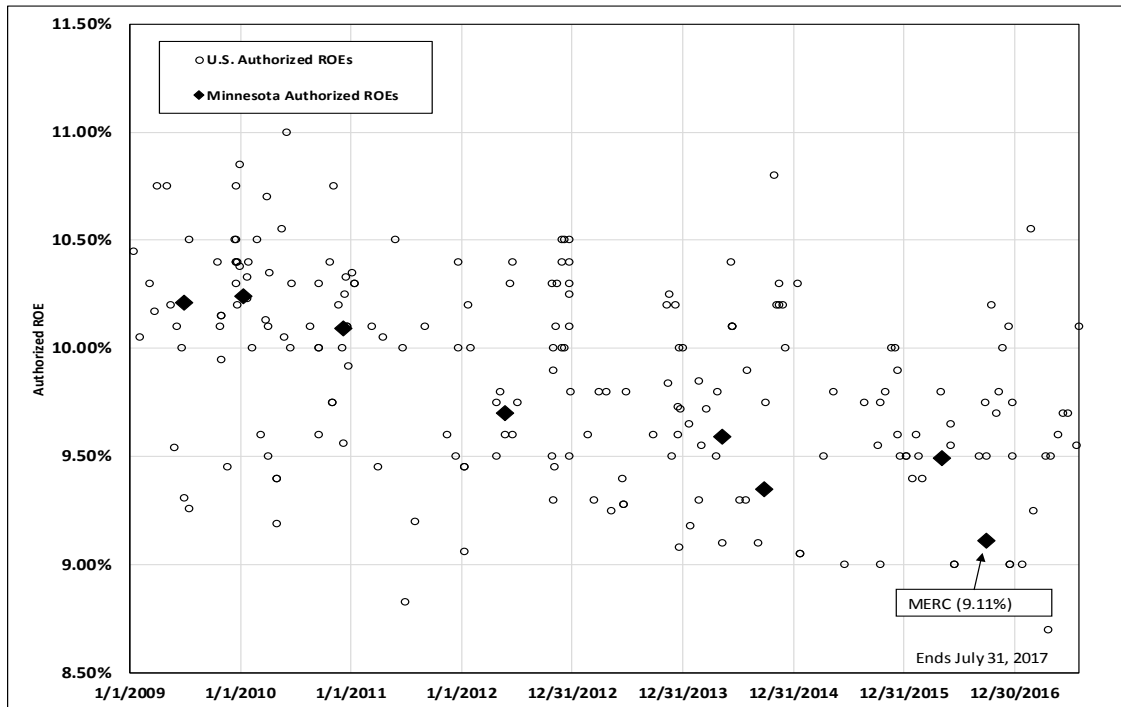
19 **Q. How do recent returns in Minnesota compare to the authorized returns in other**  
20 **jurisdictions?**

21 A. Over time, the Commission's preference for the DCF model has significantly reduced the  
22 overall authorized ROE for natural gas utility operations in Minnesota. Chart 6 below  
23 shows the authorized returns for natural gas utilities in other jurisdictions since January  
24 2009, and the returns authorized in Minnesota for natural gas companies. As shown in



1 Chart 6, the authorized returns for natural gas companies in Minnesota have steadily  
2 declined from 2009 to 2016 and are currently at the bottom of the range produced by the  
3 authorized ROEs from other state jurisdictions.

4 **CHART 6: COMPARISON OF MINNESOTA AND U.S. AUTHORIZED RETURNS**



5  
6  
7 **Q. What does this information indicate regarding the level of allowed ROEs for natural**  
8 **gas companies in Minnesota versus the returns authorized in other jurisdictions?**

9 A. Over the past several years, the Commission's authorized ROEs have been below the  
10 average authorized return on equity for the U.S. This is the result of the Commission's  
11 primary reliance on the results of the DCF analysis to determine a company's authorized  
12 ROE.

1 **Q. Is there any reason that the Commission should be concerned about authorizing**  
2 **equity returns that are at the low end of the range established by other state**  
3 **regulatory jurisdictions?**

4 A. Yes, for several reasons. First, as noted previously, Minnesota utility subsidiaries must  
5 compete for capital within their own corporate structure, which must in turn compete for  
6 capital with other utilities and businesses. Placing MERC at the low end of authorized  
7 ROEs over the longer term can negatively impact MERC's access to capital.

8  
9 Second, as noted in Sections V and VII, the historically low interest rates on Treasury  
10 bonds have resulted in high valuations of utility stocks which has reduced dividend yields  
11 and therefore the ROE results produced by the DCF model. However, given that interest  
12 rates are expected to increase over the period in which MERC's rate will be in effect, the  
13 results of the DCF model will underestimate an investor's expected ROE. As a result, it  
14 is important that the Commission consider the results of alternative methods such as the  
15 forward looking CAPM and Bond Yield Plus Risk Premium analyses.

16

17 **B. Small Size Risk**

18 **Q. Please explain the risk associated with small size.**

19 A. Both the financial and academic communities have long accepted the proposition that the  
20 cost of equity for small firms is subject to a "size effect." While empirical evidence of  
21 the size effect often is based on studies of industries other than regulated utilities, utility  
22 analysts also have noted the risk associated with small market capitalizations.  
23 Specifically, an analyst for Ibbotson Associates noted:

1 For small utilities, investors face additional obstacles, such as a smaller  
2 customer base, limited financial resources, and a lack of diversification  
3 across customers, energy sources, and geography. These obstacles imply  
4 a higher investor return.<sup>53</sup>

5  
6 **Q. How does the smaller size of a utility affect its business risk?**

7 A. In general, smaller companies are less able to withstand adverse events that affect their  
8 revenues and expenses. The impact of weather variability, the loss of large customers to  
9 bypass opportunities, or the destruction of demand as a result of general macroeconomic  
10 conditions or fuel price volatility will have a proportionately greater impact on the  
11 earnings and cash flow volatility of smaller utilities. Similarly, capital expenditures for  
12 non-revenue producing investments, such as system maintenance and replacements, will  
13 put proportionately greater pressure on customer costs, potentially leading to customer  
14 attrition or demand reduction. Taken together, these risks affect the return required by  
15 investors for smaller companies.

16  
17 **Q. How does MERC's natural gas distribution operations compare in size to the proxy  
18 group companies?**

19 A. MERC's natural gas distribution operations are substantially smaller than the median for  
20 the proxy group companies in terms of market capitalization. Exhibit \_\_\_ (AEB-11)  
21 provides the actual market capitalization for the proxy group companies and estimates the  
22 implied market capitalization for MERC (i.e., the implied market capitalization if  
23 MERC's natural gas distribution operations were a stand-alone publicly-traded entity).  
24 To estimate the size of the Company's market capitalization relative to the proxy group, I

---

<sup>53</sup> Michael Annin, Equity and the Small-Stock Effect, Public Utilities Fortnightly, October 15, 1995.

1 used the Company's proposed capital structure equity component of \$152.3 million. I  
2 then applied the median market-to-book ratio for the proxy group of 2.06 to MERC's  
3 implied common equity balance and arrived at an implied market capitalization of  
4 approximately \$314.2 million, or 8.76 percent of the median market capitalization for the  
5 proxy group.

6  
7 **Q. How did you estimate the size premium for MERC?**

8 A. Given this relative size information, it is possible to estimate the impact of size on the  
9 ROE for MERC using Duff and Phelps data that estimates the stock risk premia based on  
10 the size of a company's market capitalization. As shown in Exhibit \_\_\_ (AEB-11), the  
11 median market capitalization of the proxy group of approximately \$3.59 billion  
12 corresponds to the fourth decile of the Duff and Phelps market capitalization data. Based  
13 on Duff and Phelps' analysis, that decile corresponds to a size premium of 0.98 percent  
14 (i.e., 98 basis points). MERC's implied market capitalization of approximately \$314.2  
15 million falls within the ninth decile, which comprises market capitalization levels up to  
16 \$567.8 million and corresponds to a size premium of 2.68 percent (i.e., 268 basis points).  
17 The difference between those size premia is 170 basis points (i.e., 2.68 percent minus  
18 0.98 percent).

19  
20 **Q. Have regulators in other jurisdictions made a specific risk adjustment to the ROE**  
21 **results based on a company's small size?**

22 A. Yes, other regulators have accepted the importance of small size in setting the risk  
23 premium for regulated utilities. For example, the British Columbia Utilities

1 Commission's ("BCUC") Generic Cost of Capital decision for Stage 2 stated that small  
2 size relative to the benchmark utility was a business risk factor considered when  
3 awarding an equity risk premium to the following utilities:

- 4 • FortisBC Electric - awarded a total equity risk premium of 40 basis points,<sup>54</sup>
- 5 • FortisBC Whistler - awarded an additional 25 basis points (for a total of 75 basis  
6 points above the benchmark) "in recognition of risks related to its small size,"<sup>55</sup>  
7 and
- 8 • PNG-Tumbler Ridge- awarded an additional 25 basis points above the 50 basis  
9 point risk premium given to PNG-West due to "greater weight on factors related  
10 to size" among other things.<sup>56</sup>

11  
12 In addition, the Yukon Utilities Board, in Board Order 2017-01, concluded "that small  
13 size is the most significant factor to be considered in determining a risk premium for  
14 ATCO Electric Yukon ("AEY")."<sup>57</sup> The Board noted the 25 basis point premium  
15 awarded for small size in the BCUC decision which the Board deemed an acceptable  
16 premium for the additional risk associated with AEY's small size. Therefore, the Board  
17 awarded AEY an ROE that was equal to the ROE determined for the BCUC benchmark  
18 utility plus a 25 basis point premium for size.<sup>58</sup>

---

<sup>54</sup> BCUC Generic Cost of Capital Proceeding (Stage 2) Decision, March 25, 2014, at iv.

<sup>55</sup> *Id.*, at iii.

<sup>56</sup> *Id.*, at iv.

<sup>57</sup> YUB Appendix A to Board Order 2017-01: Reasons for Decision, April 27, 2017, at 44

<sup>58</sup> *Ibid.*

1 In Order No. 15, the Regulatory Commission of Alaska concluded that Alaska Electric  
2 Light and Power Company (“AEL&P”) was riskier than the proxy group companies due  
3 to small size as well as other business risks. The Commission did “not believe that  
4 adopting the upper end of the range of ROE analyses in this case, without an explicit  
5 adjustment, would adequately compensate AEL&P for its greater risk.”<sup>59</sup> Thus, the  
6 Commission awarded AEL&P an ROE of 12.875 percent which was 108 basis points  
7 above the highest return on equity estimate from any model presented in the case.<sup>60</sup>  
8

9 **Q. How have you considered the smaller size of MERC in your recommendation?**

10 A. While I have estimated the effect of MERC’s small size on the ROE, I am not proposing  
11 a specific adjustment for this risk factor. Rather, I believe it is important to consider the  
12 small size of MERC’s natural gas distribution operations in the determination of where,  
13 within the range of analytical results, the Company’s required ROE falls. Therefore, the  
14 additional risk associated with small size indicates that the Company’s ROE should be  
15 established above the mean results for the proxy group companies.  
16

17 **C. MERC’s Capital Expenditure Plan**

18 **Q. Please summarize the Company’s capital expenditure requirements.**

19 A. The Company’s current projections for 2018 through 2021 include at least \$266.4 million  
20 in capital investments for the period.<sup>61</sup> Based on the Company’s net utility plant of

---

<sup>59</sup> Docket No. U-10-29, In the Matter of the Revenue Requirement and Cost of Service Study Designated as TA381-1 Filed by Alaska Electric Light and Power Company, Order entered September 2, 2011 (Order No. 15) at 37.

<sup>60</sup> *Id.*, at 32 and 37.

<sup>61</sup> Docket No. G011/GR17-563, Direct Testimony of Mary L. Wolter, at 9.

1 approximately \$291 million as of December 31, 2016,<sup>62</sup> the \$266.4 million anticipated  
2 capital expenditures is approximately 91.56 percent of MERC's net utility plant as of  
3 December 31, 2016.

4  
5 **Q. How is the Company's risk profile affected by its substantial capital expenditure**  
6 **requirements?**

7 A. As with any utility faced with substantial capital expenditure requirements, the  
8 Company's risk profile may be adversely affected in two significant and related ways:  
9 (1) the heightened level of investment increases the risk of under recovery or delayed  
10 recovery of the invested capital; and (2) an inadequate return would put downward  
11 pressure on key credit metrics.

12  
13 **Q. Do credit rating agencies recognize the risks associated with elevated levels of**  
14 **capital expenditures?**

15 A. Yes, they do. From a credit perspective, the additional pressure on cash flows associated  
16 with high levels of capital expenditures exerts corresponding pressure on credit metrics  
17 and, therefore, credit ratings. To that point, S&P explains the importance of regulatory  
18 support for large capital projects:

19 When applicable, a jurisdiction's willingness to support large capital  
20 projects with cash during construction is an important aspect of our  
21 analysis. This is especially true when the project represents a major  
22 addition to rate base and entails long lead times and technological  
23 risks that make it susceptible to construction delays. Broad support  
24 for all capital spending is the most credit-sustaining. Support for  
25 only specific types of capital spending, such as specific  
26 environmental projects or system integrity plans, is less so, but still  
27 favorable for creditors. Allowance of a cash return on construction

---

<sup>62</sup> Gas Jurisdictional Annual Report, Minnesota Energy Resources, 2016.

1 work-in-progress or similar ratemaking methods historically were  
2 extraordinary measures for use in unusual circumstances, but when  
3 construction costs are rising, cash flow support could be crucial to  
4 maintain credit quality through the spending program. Even more  
5 favorable are those jurisdictions that present an opportunity for a  
6 higher return on capital projects as an incentive to investors.<sup>63</sup>

7 Therefore, to the extent that MERC's rates do not permit the opportunity to recover its  
8 full cost of doing business, the Company will face increased recovery risk and thus  
9 increased pressure on its credit metrics.

10  
11 **Q. What initiatives require the greatest need for capital over the next several years?**

12 A. Company witness Ms. Mary Wolter provides supporting information for MERC's capital  
13 expenditure plan in her testimony.

14  
15 **Q. How do MERC's capital expenditure requirements compare to those of the proxy  
16 group companies?**

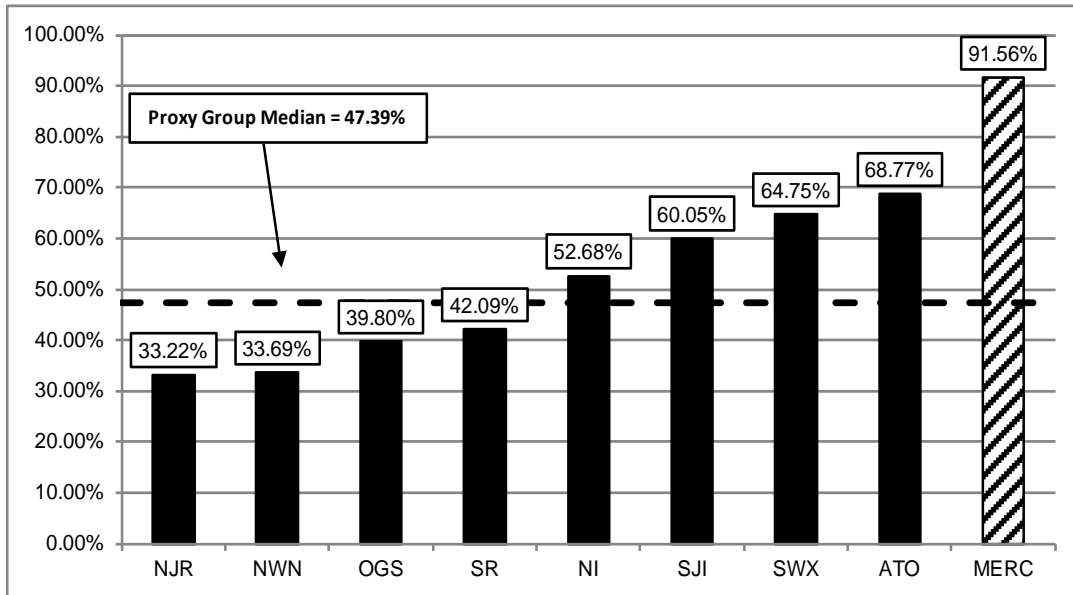
17 A. As shown in Exhibit \_\_\_ (AEB-12), I calculated the ratio of expected capital  
18 expenditures to net utility plant for MERC and each of the companies in the proxy group  
19 by dividing each company's projected capital expenditures for the period from 2018-  
20 2021 by its total net utility plant as of December 31, 2016. As shown in  
21 Exhibit \_\_\_ (AEB-12) (*see* also Chart 7 below), MERC's ratio of capital expenditures as  
22 a percentage of net utility plant of 91.56 percent is approximately 1.93 times the median  
23 for the proxy group companies of 47.4 percent.

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<sup>63</sup> S&P Global Ratings, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 7.



1 **CHART 7: COMPARISON OF CAPITAL EXPENDITURES – PROXY GROUP**  
 2 **COMPANIES**



3  
 4  
 5 **Q. Are capital tracking mechanisms available to the electric and natural gas utilities in**  
 6 **Minnesota?**

7 **A.** Yes. In Minnesota, capital tracking mechanisms are available that allow electric and  
 8 natural gas utilities to recover investment in certain capital investment projects between  
 9 rate cases. Specifically, there is the Gas Utility Infrastructure Cost (“GUIC”) Rider,  
 10 which allows a utility to recover their investment in certain gas infrastructure investments  
 11 that improve safety and reliability, and the Natural Gas Expansion Project Rider  
 12 (“NGEP”), which grant the utility the ability to recover certain investment in natural gas  
 13 expansion projects.

14  
 15 **Q. To what extent does MERC have a capital tracking mechanism to recover the costs**  
 16 **associated with its capital expenditures plan between rate cases?**

1 A. It is important to note that MERC is not presently utilizing a capital recovery  
2 rider. While MERC intends to utilize the NGEF according to the testimony of Ms.  
3 Amber Lee, the opportunity to recover costs through a capital tracking mechanism is  
4 limited. As a result, MERC would still depend on rate case filings for capital cost  
5 recovery.

6  
7 Additionally, as shown in Exhibit \_\_\_\_ (AEB-13), 87 percent of the proxy group utilities  
8 recover costs through capital tracking mechanisms. As such, MERC has equal or greater  
9 risk relative to the proxy group in this area.

10

11 **Q. What are your conclusions regarding the effect of the Company's capital spending**  
12 **requirements on its risk profile and cost of capital?**

13 A. The Company's capital expenditure requirements as a percentage of net utility plant is  
14 significant and will continue over the next few years. Additionally, unlike most of the  
15 operating subsidiaries of the proxy group, MERC does not have a comprehensive capital  
16 tracking mechanism to recover the Company's projected capital expenditures. Therefore,  
17 MERC's significant capital expenditures plan and limited ability to recover the capital  
18 investment costs in a timely manner results in a risk profile that is greater than that of the  
19 proxy group and supports an ROE toward the higher end of the reasonable range of  
20 ROEs.

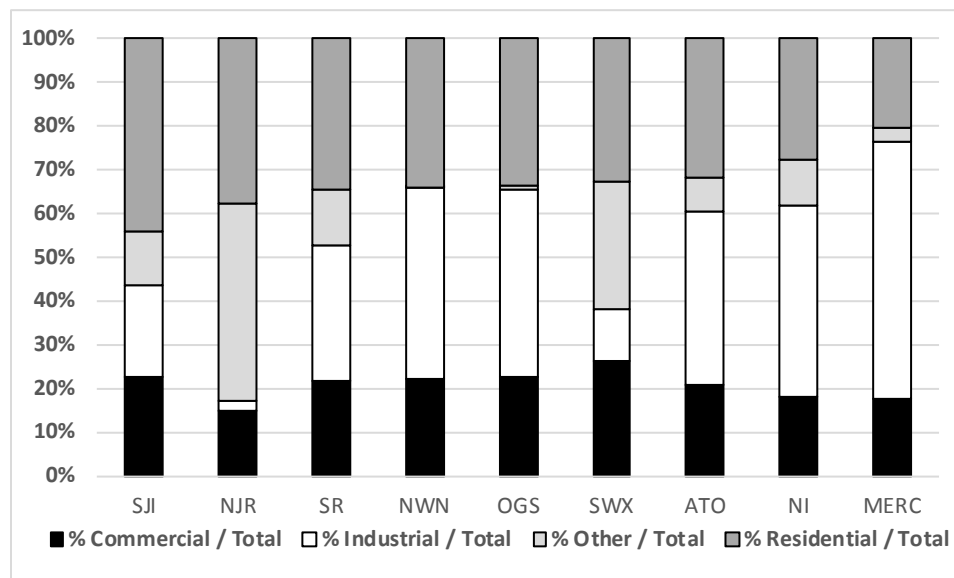
21

1 **D. Customer Concentration**

2 **Q. Please summarize MERC's customer concentration risk.**

3 A. Approximately 59 percent of MERC's total company utility gas sales in 2015 were  
4 derived from industrial customers. As shown in Chart 8, MERC's commercial and  
5 industrial sales volume as a percentage of total utility gas sales was 77 percent, higher  
6 than each of the proxy group companies.<sup>64</sup> Furthermore, MERC has only 3 percent of its  
7 total volume that is associated with either electric power or vehicle fuel (i.e., Other  
8 Volume) which is lower than all but two of the proxy group companies. As a result,  
9 MERC is only marginally benefiting from two rapidly growing segments of natural gas  
10 consumption.

11 **CHART 8: CUSTOMER CONCENTRATION<sup>65</sup>**



12  
<sup>64</sup> Does not include "other" or residential customers.

<sup>65</sup> EIA FORM 176 - Other sales includes Electric Power and Vehicle Fuel Volume.

1 **Q. How does customer concentration affect business risk?**

2 A. A relatively high concentration of commercial and industrial customers results in higher  
3 business risk. Since the customers are large, they can represent a significant portion of a  
4 company's sales which could be lost if a customer goes out of business or switches  
5 suppliers. As noted by Dhaliwal, Judd, Serfling and Shaikh in their article, *Customer*  
6 *Concentration Risk and the Cost of Equity Capital*:

7        Depending on a major customer for a large portion of sales can be risky  
8        for a supplier for two primary reasons. First, a supplier faces the risk of  
9        losing substantial future sales if a major customer becomes financially  
10       distressed or declares bankruptcy, switches to a different supplier, or  
11       decides to develop products internally. Consistent with this notion,  
12       Hertz et al. (2008) and Kolay et al. (2015) document negative supplier  
13       abnormal stock returns to the announcement that a major customer  
14       declares bankruptcy. Further, a customer's weak financial condition or  
15       actions could signal inherent problems about the supplier's viability to its  
16       remaining customers and lead to compounding losses in sales. Second, a  
17       supplier faces the risk of losing anticipated cash flows from being unable  
18       to collect outstanding receivables if the customer goes bankrupt. This  
19       assertion is consistent with the finding that suppliers offering customers  
20       more trade credit experience larger negative abnormal stock returns  
21       around the announcement of a customer filing for Chapter 11 bankruptcy  
22       (Jorion and Zhang, 2009; Kolay et al., 2015).<sup>66</sup>

23       Therefore, a company that has a high degree of customer concentration will be inherently  
24       riskier than a company that derived income from a larger customer base. Furthermore, as  
25       Dhaliwal, Judd, Serfling and Shaik detail in the article, the increased risk associated with  
26       a more concentrated customer base will have the effect of increasing a company's cost of  
27       equity.<sup>67</sup>

28

---

<sup>66</sup> Dhaliwal, Dan S., J. Scott Judd, Matthew A. Serfling, and Sarah Shaikh. "Customer Concentration Risk and the Cost of Equity Capital." SSRN Electronic Journal (2016): 1-2. Web.

<sup>67</sup> *Id.*, at 4.

1 **Q. Please describe how changes in economic conditions and MERC's high degree of**  
2 **customer concentration can affect its business risk?**

3 A. While MERC doesn't depend on any one major customer, MERC has a high  
4 concentration of commercial and industrial customers. MERC's major industrial  
5 customers are engaged in industries such as taconite mining and processing and paper  
6 manufacturing. Taconite processing is highly dependent on economic conditions and the  
7 business cycle as taconite is an input into steel which is used in durable consumer goods.  
8 Paper manufacturing companies (i.e., paper mills) are also facing decreased demand as  
9 companies are moving away from printed materials and instead providing information  
10 electronically.

11

12 **Q. How has mining and logging employment fared in recent economic conditions?**

13 A. As shown in

14 Chart 9, total mining and logging employment in Minnesota has been volatile, decreasing from a  
15 high of 6,300 in 2008 to a low of 4,300 in 2009 before rebounding to pre-recession levels  
16 in the beginning of 2011.

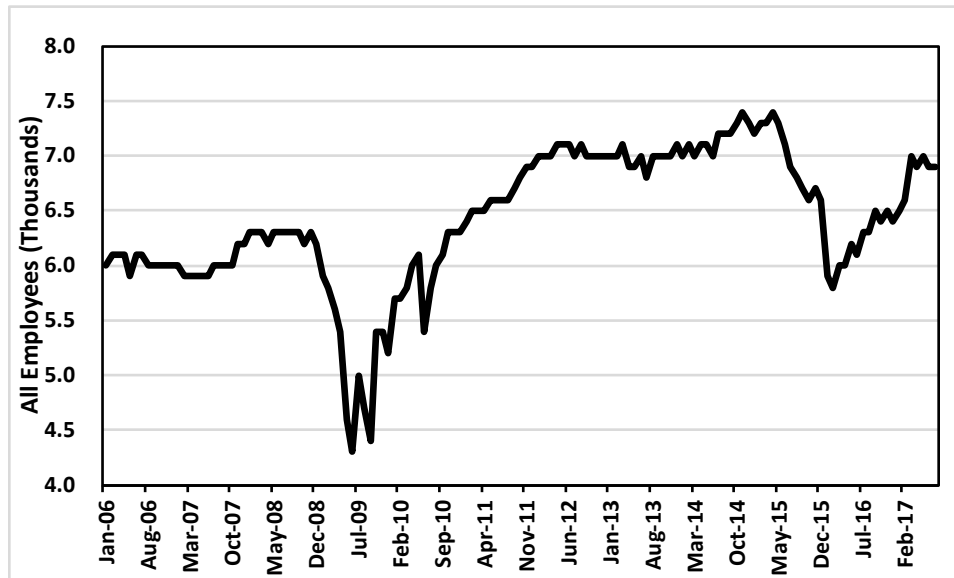
17

18 **Q. Is MERC's natural gas delivery volume dependent on the taconite processing and**  
19 **paper manufacturing industries?**

20 A. Yes. MERC has 8 large customers in taconite processing and paper manufacturing,  
21 representing 28 percent of the Company's distribution load. Fluctuations in the business  
22 cycle could have a large impact on MERC's natural gas sales. Furthermore, if taconite  
23 processing firms and paper mills reduce output due to weak economic conditions, the

1 effect could be compounded if local employment declined, reducing the sales volume for  
2 MERC.

3  
4 **CHART 9: MINNESOTA MINING AND LOGGING EMPLOYMENT (THOUS.)**



5  
6  
7 **Q. Are you aware of other risk factors that could affect MERC's business operations?**

8 **A.** Yes. MERC is also in direct competition with other sources of energy such as electricity,  
9 diesel, solar, and wind among others. Furthermore, as discussed in the testimony of  
10 Company witness Ms. Mary Wolter, in Minnesota, natural gas utilities do not have  
11 exclusive service territories; therefore, MERC is expected to compete with other natural  
12 gas utilities who serve the surrounding areas such as Northern States Power Company or  
13 CenterPoint Energy Minnesota Gas.<sup>68</sup> This creates an additional risk that customers in  
14 the commercial and industrial classes could be served by a competing natural gas utility.  
15 Thus, MERC's reliance on a large percentage of commercial and industrial load results in

<sup>68</sup> Minnesota Public Utilities Commission, Docket No. G-011,002/C-17-305, issued July 12, 2017, at 5.

1 an increased risk of volatility with respect to sales, earnings, and cash flow.

2  
3 **Q. What is your conclusion regarding the Company's customer concentration and its**  
4 **effect on the cost of equity for MERC?**

5 A. MERC is heavily reliant on sales to commercial and industrial customers. As noted  
6 above, 77 percent of MERC's total utility gas sales were to commercial and industrial  
7 customers. This concentration is higher than all of the proxy group companies. A high  
8 degree of customer concentration increases MERC's risk related to customer migration,  
9 economic conditions, or competition. Increased customer diversity decreases the effect  
10 that any one customer can have on a company's sales. Thus, MERC's heavy customer  
11 concentration in a small number of customers within the commercial and industrial rate  
12 classes implies that MERC has an above average risk profile when compared to the  
13 companies in the proxy group.

14  
15 **E. MERC's Revenue-Decoupling Pilot Program**

16 **Q. What is your understanding of the Company's Revenue-Decoupling Pilot Program?**

17 A. As discussed in its Order in MERC's previous rate case, the Commission approved  
18 MERC's request to continue its revenue-decoupling pilot program which applies to the  
19 Company's residential and small commercial and industrial rate classes for an additional  
20 three years.<sup>69</sup> The Company's revenue-decoupling mechanism was designed by first  
21 determining the rate class revenue requirements excluding the cost of gas for each of  
22 MERC's rate classes included in the pilot program. The revenue requirement for each

---

<sup>69</sup> Minnesota Public Utilities Commission, Docket No. G-011/GR-15-736, issued October 31, 2016, at 45.

1 rate class was set by the Commission in the Company's last rate case. MERC then  
2 calculates, at the end of each year during the pilot program, the revenue excluding gas  
3 costs that is collected from each of the rate classes included in the pilot program and  
4 compares the revenue collected with the approved rate classes revenue requirements. If  
5 the revenue collected does not equal the revenue requirement, MERC adjusts distribution  
6 rates to recover or refund any differences to those rates classes where there was an over  
7 or under collection of revenue. In order to mitigate any potential large bill increases  
8 associated with the distribution rate adjustment, the Company has implemented a  
9 10 percent symmetrical cap on the size of the revenue-decoupling adjustment. The goal  
10 of the Company's decoupling mechanism is to separate the recovery of fixed costs from  
11 gas volumes sold, mitigating the risks associated with weather, energy efficiency, and  
12 changes in economic conditions for MERC in Minnesota.

13  
14 **Q. Have you evaluated the effect of the Revenue-Decoupling Pilot Program on the**  
15 **Company's Authorized ROE?**

16 A. Yes, I have. Since the ROE recommendation is established for a company based on its  
17 risk relative to the proxy group, it is necessary to consider how the revenue-decoupling  
18 pilot program affects the Company's risk profile relative to the proxy companies. As  
19 shown on Exhibit \_\_\_ (AEB-13), approximately 67 percent of the jurisdictions where the  
20 proxy companies operate have approved some form of mechanism (i.e., formula rate  
21 plan, revenue decoupling mechanism, straight fixed-variable rate design) that provides  
22 for the recovery of prudently incurred costs between rate cases. In addition, as discussed



1 above, nearly all of the proxy companies have implemented some form of capital tracking  
2 mechanism to address ongoing capital replacement programs.

3  
4 **Q. What is your conclusion regarding the effect of the Company's Revenue-Decoupling**  
5 **Pilot Program on the cost of equity for MERC?**

6 A. Based on the analysis discussed above, the implementation of the revenue-decoupling  
7 pilot program makes MERC's risk profile more comparable to the proxy group  
8 companies with respect to the availability of cost recovery mechanisms, since many of  
9 the proxy companies have approved some form of an alternative rate mechanism, such as  
10 non-volumetric rate design. However, the implementation of the revenue-decoupling  
11 pilot program does not sufficiently offset the additional business risk factors that affect  
12 the Company such as customer concentration and the relatively small size of the  
13 Company.

14  
15 **Q. Has the Commission considered the business risk of a company when determining**  
16 **the appropriate cost of equity among a range of results?**

17 A. Yes. In Docket No. E017/GR-15-1033, the Commission noted that:

1 [t]he record in this case establishes a compelling basis for selecting an  
2 ROE above the mean average within the DCF range, given Otter Tail's  
3 unique characteristics and circumstances relative to other utilities in the  
4 proxy group. These factors include the company's relatively smaller size,  
5 geographically diffuse customer base, and the scope of the Company's  
6 planned infrastructure investments. The Commission has also considered  
7 Otter Tail's recognized the Company's performance in completing major  
8 infrastructure projects substantially under budget, its history of providing  
9 reliable service with stable rates, and its record of effectively serving the  
10 needs of its customers, as measured by multiple customer-satisfaction  
11 metrics.<sup>70</sup>

12 As a result, the Commission authorized Otter Tail Power Company a return on equity of  
13 9.41 percent which was calculated as the midpoint of the average and mean-high results  
14 of the Department's Two-Stage Growth DCF analysis. The Commission believed that an  
15 ROE of 9.41 percent appropriately accounted for the company-specific adjustments that  
16 were appropriate to make in the case of Otter Tail Power Company.

17  
18 **Q. How have you accounted for the additional business risk of MERC relative to the**  
19 **proxy group?**

20 A. As discussed above, in the areas that I have evaluated, MERC has greater risk than the  
21 proxy group, due primarily to its small size, capital expenditure program, and high degree  
22 of customer concentration. Furthermore, as discussed in Section VII, the Company has  
23 incurred flotation costs associated with the sale of new issues of common stock which  
24 must also be accounted for in the determination of the Company's ROE. As a result, I  
25 consider MERC's additional business risk and flotation costs when developing my  
26 recommended ROE among the range of results.

27  

---

<sup>70</sup> Docket No. E017/GR-15-1033, In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota (May 1, 2017) at 55.

1 **IX. Capital Structure**

2 **Q. Is the capital structure of the Company an important consideration in the**  
3 **determination of the appropriate ROE?**

4 A. Yes, it is. Assuming other factors equal, a higher debt ratio increases the risk to  
5 investors. For debt holders, higher debt ratios result in a greater portion of the available  
6 cash flow being required to meet debt service, thereby increasing the risk associated with  
7 the payments on debt. The result of increased risk is a higher interest rate. The  
8 incremental risk of a higher debt ratio is more significant for common equity  
9 shareholders. Common shareholders are the residual claimants on the cash flow of the  
10 Company. Therefore, the greater the debt service requirement, the less cash flow  
11 available for common equity holders.

12

13 **Q. What is MERC's proposed capital structure?**

14 A. The Company's proposal is to establish a capital structure composed of 50.90 percent  
15 common equity, 39.24 percent long-term debt, and 9.86 percent short-term debt.<sup>71</sup>

16

17 **Q. Did you conduct any analysis to determine if this requested equity ratio was**  
18 **reasonable?**

19 A. Yes, I did. I reviewed the capital structures for each of the proxy group companies at the  
20 operating company level. Since the ROE is set based on the return that is derived from  
21 the risk-comparable proxy group, it is reasonable to look to the proxy group average  
22 capital structure to benchmark the equity ratio for the Company.

23

---

<sup>71</sup> Exhibit\_\_(LJG-1).

1 **Q. Please discuss your analysis of the capital structures of the proxy group companies.**

2 A. My analysis of the proxy group companies' actual capital structures is provided in  
3 Exhibit \_\_\_ (AEB-14). As shown in that schedule, I calculated the most recent annual  
4 actual equity ratio for each of the proxy group companies at the operating subsidiary level  
5 which produced equity ratios for the proxy group ranging from 51.69 percent to 62.08  
6 percent, with an average of 55.27 percent.<sup>72</sup>

7  
8 **Q. Do you have any additional comments regarding the relationship between the**  
9 **authorized equity ratio and the authorized ROE?**

10 A. Yes. There is a direct relationship between the authorized equity ratio and the authorized  
11 ROE. In particular, the authorized equity ratio is a primary indicator of financial risk for  
12 a regulated utility such as MERC. To the extent the authorized equity ratio is reduced, a  
13 corresponding increase is necessary in the authorized ROE to compensate investors for  
14 the greater financial risk associated with a lower equity ratio.

15  
16 **Q. Have you conducted an analysis to examine how the Commission's recent**  
17 **authorized equity ratios and authorized ROEs compare to those authorized in other**  
18 **jurisdictions?**

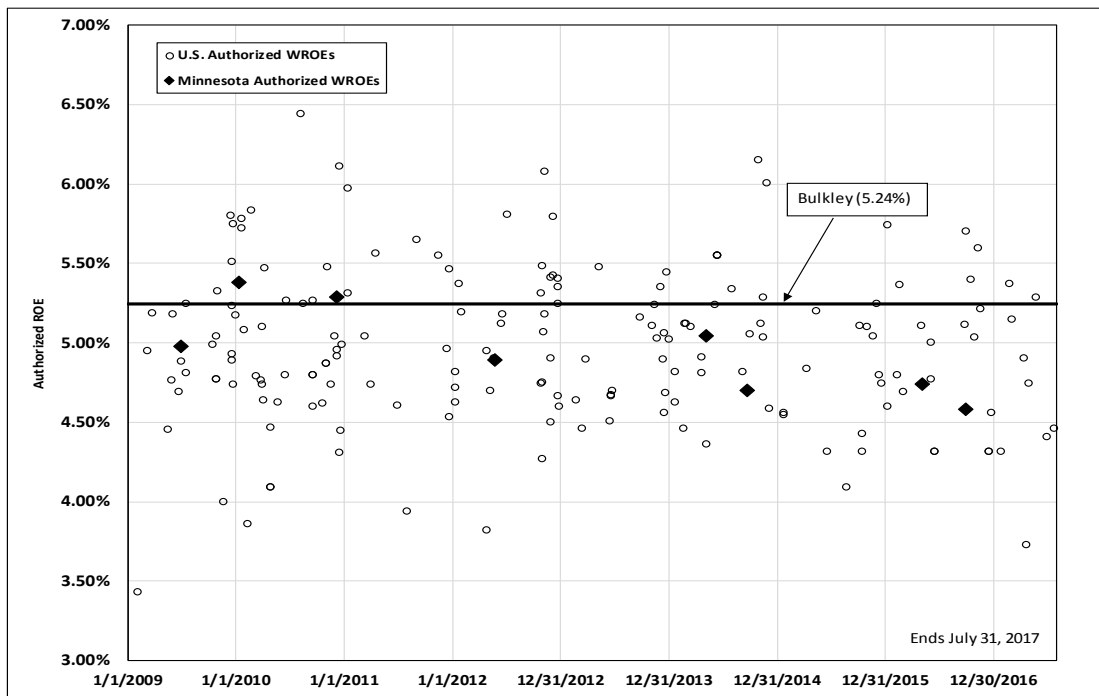
19 A. Yes, I did. I compared the authorized WROEs (i.e., authorized ROE times the authorized  
20 equity ratio) for natural gas utilities in Minnesota to the authorized WROEs in other  
21 jurisdictions. Chart 10 below shows the authorized WROEs for natural gas utilities in  
22 other jurisdictions since January 2009, and the authorized WROEs for natural gas  
23 companies in Minnesota. As shown in Chart 10, the authorized WROEs for natural gas

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<sup>72</sup> Source: SNL Financial and FERC Form 2 annual reports.

1 companies in Minnesota have declined since 2009 and are currently towards the bottom  
 2 of the range of WROEs authorized by state jurisdictions. This may be the result of the  
 3 Commission's preference for the DCF model, which has produced significantly lower  
 4 results than other ROE estimation models, at the same time, the equity ratios approved by  
 5 the Commission have remained relatively constant. The result is overall lower WROEs  
 6 in Minnesota compared to other jurisdictions.

8 **CHART 10: COMPARISON OF MINNESOTA AND U.S. AUTHORIZED WEIGHTED**  
 9 **EQUITY RETURNS<sup>73</sup>**



10  
 11  
 12 **Q. Is the level of the WROE allowed in other jurisdictions relevant when considering**  
 13 **the appropriate equity ratio for MERC?**

<sup>73</sup> Rate cases in Arkansas, Florida, Indiana, and Michigan have been excluded from Chart 10 since the authorized capital structure approved in the cases includes deferred taxes and other credits at zero or low cost. The additional items have the effect of reducing both the equity and debt ratios used to establish the rate of return which, in turn, produces results that are not comparable to allowed equity ratios in other states.

1 A. Yes. One of the most important principles in determining the ROE is to ensure a  
2 company has the opportunity to earn a reasonable return on capital that is consistent with  
3 the returns available on investments of comparable risk. While it is referenced most  
4 often in the discussion of the appropriate ROE, it is equally important to consider the  
5 equity ratio. It is the combination of the equity ratio and the authorized ROE that define  
6 the return to investors. Therefore, as discussed above, the Commission must consider the  
7 equity ratio as well as the authorized ROE to establish a risk-comparable return.

8

9 **Q. What is your conclusion regarding an appropriate capital structure for MERC?**

10 A. MERC's proposed common equity ratio of 50.90 percent is approximately 400 basis  
11 points lower than the mean equity ratio of the utility operating subsidiaries of the proxy  
12 companies. This difference in capitalization is significant and should be considered in  
13 setting the appropriate ROE at the higher end of the range of reasonable equity returns.  
14 Based on this analysis, the proposed equity ratio in combination with my recommended  
15 ROE are reasonable and would be adequate to support capital attraction on reasonable  
16 terms.

17

18 **X. Conclusions and Recommendation**

19 **Q. What is your conclusion regarding a fair ROE for MERC?**

20 A. Based on the quantitative and qualitative analyses presented in my Direct Testimony, and  
21 in light of the business and financial risks of MERC compared to the proxy group, it is  
22 my view that an ROE of 10.3 percent on an equity ratio of 50.90 percent would fairly  
23 balance the interests of customers and shareholders. This ROE would enable the

1 Company to maintain its financial integrity and therefore its ability to attract capital at  
 2 reasonable rates under a variety of economic and financial market conditions, while  
 3 continuing to provide safe, reliable, and affordable gas utility service to customers in  
 4 Minnesota.

5 **TABLE 5: SUMMARY OF ANALYTICAL RESULTS<sup>74</sup>**

<b>Constant Growth DCF</b>			
	Mean Low	Mean	Mean High
30-Day Average Price	7.89%	8.72%	10.61%
90-Day Average Price	7.76%	8.72%	10.61%
180-Day Average Price	7.87%	8.82%	10.71%
<b>Two-Stage Growth DCF</b>			
30-Day Average Price	7.78%	8.73%	10.53%
90-Day Average Price	7.67%	8.73%	10.53%
180-Day Average Price	7.78%	8.83%	10.63%
<b>Projected Constant Growth DCF</b>			
Value Line Div. Yld. Projections	8.05%	9.43%	11.33%
<b>Capital Asset Pricing Model</b>			
	Current Risk-Free Rate (2.84%)	Q4 2017 – Q4 2018 Projected Risk-Free Rate (3.42%)	2019-2023 Projected Risk-Free Rate (4.30%)
Value Line Beta	10.30%	10.46%	10.71%
<b>Bond Yield Plus Risk Premium</b>			
Bond Yield Plus Risk Premium	9.67%	9.92%	10.31%
<b>Additional Considerations</b>			
Small Size Premium		1.70%	
Flotation Costs		0.11%	

6  
 7 **Q. Does this conclude your Direct Testimony?**

8 **A.** Yes, it does.

<sup>74</sup> The analytical results included in Table 5 reflect the results of the Constant Growth, Two-Stage Growth and Projected DCF analysis excluding the results for individual companies that did not meet the minimum threshold of 7 percent.



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**Ann E. Bulkley**  
**Senior Vice President**

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Ms. Bulkley more than two decades of management and economic consulting experience in the energy industry. Ms. Bulkley has extensive state and federal regulatory experience on both electric and natural gas issues including rate of return, cost of equity and capital structure issues. Ms. Bulkley has advised clients seeking to acquire utility assets, providing valuation services including an understanding of regulation, market expected returns, and the assessment of utility risk factors. Ms. Bulkley has assisted clients with valuations of public utility and industrial properties for ratemaking, purchase and sale considerations, ad valorem tax assessments, and accounting and financial purposes. In addition, Ms. Bulkley has experience in the areas of contract and business unit valuation, strategic alliances, market restructuring and regulatory and litigation support.

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## **REPRESENTATIVE PROJECT EXPERIENCE**

### **Regulatory Analysis and Ratemaking**

Ms. Bulkley has provided a range of advisory services relating to regulatory policy analysis and many aspects of utility ratemaking. Specific services have included: cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies; development of merchant function exit strategies; analysis and program development to address residual energy supply and/or provider of last resort obligations; stranded costs assessment and recovery; performance-based ratemaking analysis and design; and many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation).

### ***Cost of Capital***

Ms. Bulkley has provided expert testimony on the cost of capital testimony before several state regulatory commissions. In addition, Ms. Bulkley has prepared and provided supporting analysis for at least forty Federal and State regulatory proceedings over the past seven years. Ms. Bulkley's expert testimony experience includes:

- Northern States Power Company: Before the North Dakota Public Service Commission, provided expert testimony on the cost of capital for the company's North Dakota electric utility operations.
- WE Energies: Before the Michigan Public Service Commission, provided expert testimony in support of the company's cost of capital for its electric utility operations.
- Atmos Energy: Provided expert testimony in support of the company's return on equity and capital structure before the Public Utilities Commission for the State of Colorado.
- UNS Electric: Provided expert testimony in support of the company's return on equity and capital structure before the Arizona Corporation Commission.
- Portland Natural Gas Transmission: Provided testimony strategy as well as analytical support for cost of capital testimony before the Federal Energy Regulatory Commission.





- In addition to the specific cases listed above, Ms. Bulkley has provided testimony strategy as well as analytical support on cost of capital in several cases in the following states: Arizona, Colorado, Connecticut, Massachusetts, Minnesota, New Mexico, New York, North Carolina, South Carolina, South Dakota, Virginia, and Utah.

### ***Valuation***

Ms. Bulkley has provided valuation services to utility clients, unregulated generators and private equity clients for a variety of purposes including ratemaking, fair value, ad valorem tax, litigation and damages, and acquisition. Ms. Bulkley's appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice. In addition, Ms. Bulkley has relied on other simulation based valuation methodologies.

Representative projects/clients have included:

- Northern Indiana Fuel and Light: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Kokomo Gas: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Prepared fair value rate base analyses for Northern Indiana Public Service Company for several electric rate proceedings. Valuation approaches used in this project included income, cost and comparable sales approaches.
- Confidential Utility Client: Prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.
- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support for and prepared appraisal reports of generation assets to be used in ad valorem tax disputes.
- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.



- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

### ***Rate-making***

Ms. Bulkley has assisted several clients with analysis to support investor-owned and municipal utility clients in the preparation of rate cases. Sample engagements include:

- Assisted several investor-owned and municipal clients on cost allocation and rate design issues including the development of expert testimony supporting recommended rate alternatives.
- Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Analyzed and evaluated rate application. Attended hearings and conducted investigation of rate application for regulatory staff. Prepared, supported and defended recommendations for revenue requirements and rates for the company. Developed rates for gas utility for transportation program and ancillary services.

### **Strategic and Financial Advisory Services**

Ms. Bulkley has assisted several clients across North America with analytically based strategic planning, due diligence and financial advisory services.

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed, and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.
- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

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## **PROFESSIONAL HISTORY**

### **Concentric Energy Advisors, Inc. (2002 – Present)**

Senior Vice President

Vice President

Assistant Vice President

Project Manager



**Navigant Consulting, Inc. (1995 – 2002)**

Project Manager

**Cahners Publishing Company (1995)**

Economist

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**EDUCATION**

M.A., Economics, Boston University, 1995

B.A., Economics and Finance, Simmons College, 1991

Certified General Appraiser licensed in the Commonwealth of Massachusetts and the State of Michigan



SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
<b>Arizona Corporation Commission</b>				
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
<b>Arkansas Public Service Commission</b>				
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
<b>Colorado Public Utilities Commission</b>				
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity
<b>Connecticut Public Utilities Regulatory Authority</b>				
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
<b>Federal Energy Regulatory Commission</b>				
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity



SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
<b>Indiana Utility Regulatory Commission</b>				
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value
<b>Kansas Corporation Commission</b>				
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
<b>Massachusetts Department of Public Utilities</b>				
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
<b>Michigan Public Service Commission</b>				
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity
<b>Michigan Tax Tribunal</b>				
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets



SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
<b>New Mexico Public Regulation Commission</b>				
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. -15-001398-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. -15-00296-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. – 16-00269-UT	Return on Equity
<b>New York State Department of Public Service</b>				
New York State Electric and Gas Company	05/15	New York State Electric and Gas Company	Case No. 15-G-0284	Return on Equity
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0059	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity
Niagara Mohawk Power Corporation	04/17	National Grid USA	Case No. C-17-E-0238	Return on Equity
Central Hudson Gas and Electric Corporation	07/17	Central Hudson Gas and Electric Corporation	Gas 17-G-0460 Electric 17-E-0459	Return on Equity
<b>North Dakota Public Service Commission</b>				
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity



SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
<b>Oklahoma Corporation Commission</b>				
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
<b>Public Utility Commission of Pennsylvania</b>				
American Water Works Company Inc.	04/17	Pennsylvania-American Water Company	Docket No. R-2017-2595853	Return on Equity
<b>Public Utility Commission of Texas</b>				
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
<b>South Dakota Public Utilities Commission</b>				
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity

SUMMARY OF ROE ANALYSES RESULTS<sup>1</sup>

<b>Constant Growth DCF</b>			
	Mean Low	Mean	Mean High
30-Day Average	7.89%	8.72%	10.61%
90-Day Average	7.76%	8.72%	10.61%
180-Day Average	7.87%	8.82%	10.71%
Constant Growth Average	7.84%	8.75%	10.64%
Average of All Constant Growth DCF-- with Exclusion			9.08%
<b>Two-Stage Growth DCF</b>			
	Mean Low	Mean	Mean High
30-Day Average	7.78%	8.73%	10.53%
90-Day Average	7.67%	8.73%	10.53%
180-Day Average	7.78%	8.83%	10.63%
Two-Stage Average	7.74%	8.77%	10.56%
Average of All Two-Stage DCF-- with Exclusion			9.02%
<b>Projected DCF</b>			
	Mean Low	Mean	Mean High
2020-2022 Projection	8.05%	9.43%	11.33%
<b>Overall DCF</b>			
Overall DCF Average	7.88%	8.98%	10.85%
<b>CAPM</b>			
	Low	Median	High
CAPM	10.30%	10.46%	10.71%
CAPM Mean Result	10.49%		
<b>Treasury Yield Plus Risk Premium</b>			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium	9.67%	9.92%	10.31%
Risk Premium Mean Result	9.97%		
<b>Average of Results</b>			
	Average Low Results	Average Mean Results	Average High Results
<b>All Methods</b>	<b>9.28%</b>	<b>9.79%</b>	<b>10.62%</b>
<b>CAPM and Risk Premium</b>	<b>9.98%</b>	<b>10.19%</b>	<b>10.51%</b>

**Notes:**

[1] The analytical results included in the table reflect the results of the Constant Growth, Two-Stage Growth and Projected DCF analysis excluding the results for individual companies that did not meet the minimum threshold of 7 percent.



## PROXY GROUP SCREENING DATA AND RESULTS - FINAL PROXY GROUP

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	
Company	Ticker	Dividends	S&P Credit Rating Between BBB- and AAA	Covered by More Than One Analyst	Positive Growth Rates from at least two sources (Value Line, Yahoo! First Call, and Zacks)	% Regulated Operating Income > 60%	% Regulated Natural Gas Operating Income > 60%	Announced Merger within 180 days from 7/31/2017
Atmos Energy Corporation	ATO	Yes	A	Yes	Yes	94.03%	69.22%	No
New Jersey Resources Corporation	NJR	Yes	A	Yes	Yes	65.21%	100.42%	No
NiSource Inc.	NI	Yes	BBB+	Yes	Yes	102.42%	66.53%	No
Northwest Natural Gas Company	NWN	Yes	A+	Yes	Yes	100.04%	95.54%	No
ONE Gas Inc.	OGS	Yes	A-	Yes	Yes	100.00%	100.00%	No
South Jersey Industries, Inc.	SJI	Yes	BBB+	Yes	Yes	76.67%	100.00%	No
Southwest Gas Corporation	SWX	Yes	BBB+	Yes	Yes	82.14%	100.00%	No
Spire, Inc.	SR	Yes	A-	Yes	Yes	99.08%	100.00%	No

## Notes:

[1] Source: Bloomberg Professional

[2] Source: SNL Financial

[3] Source: Yahoo! Finance and Zacks

[4] Source: Yahoo! Finance, Value Line Investment Survey, and Zacks

[5] Source: Form 10-K's for 2016, 2015, and 2014

[6] Source: Form 10-K's for 2016, 2015, and 2014

[7] Source: SNL Financial News Releases

## FLOTATION COST ADJUSTMENT

Company	Date [i]	Shares Issued (000)	Offering Price	Under-writing Discount [ii]	Offering Expense (\$000) [iii]	Net Proceeds Per Share	Total Flotation Costs (\$000)	Equity Issue Before Costs (\$000)	Net Proceeds (\$000)	Flotation Cost Percentage
Integrus Holding, Inc.	11/12/2003	4,025	\$ 43.00	1.51	\$ 217	\$ 41.44	\$ 6,295	\$ 173,075	\$ 166,780	3.64%
Integrus Holding, Inc.	11/9/2005	1,900	\$ 53.70	1.75	\$ 415	\$ 51.73	\$ 3,740	\$ 102,030	\$ 98,291	3.67%
							\$ 10,035	\$ 275,105	\$ 265,070	3.65%

## Notes:

[i] Offering Completion Date

[ii] Underwriting discount was calculated as the market price minus the offering price when not explicitly given in the prospectus.

[iii] 2005 SEC Form 10-K, at 60 and 2003 SEC Form 10-K, at 73 (Net Proceeds).

The flotation cost adjustment is derived by dividing the dividend yield by 1 - F (where F = flotation costs expressed in percentage terms), or by 0.9635, and adding that result to the constant growth rate to determine the cost of equity. Using the formulas shown previously in my testimony, the Constant Growth DCF calculation is modified as follows to accommodate an adjustment for flotation costs:

$$k = \frac{D \times (1 + 0.5g)}{P \times (1 - F)} + g$$

Company	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	
Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Expected Dividend Yield Adjusted for Flotation Costs	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Earnings Growth	ROE	ROE Adjusted for Flotation Costs	
Atmos Energy Corporation	ATO	\$1.80	\$84.34	2.13%	2.21%	2.29%	6.00%	7.00%	7.00%	6.67%	8.87%	8.96%
New Jersey Resources Corporation	NJR	\$1.02	\$40.81	2.50%	2.56%	2.66%	3.00%	6.00%	6.00%	5.00%	7.56%	7.66%
NiSource Inc.	NI	\$0.70	\$25.75	2.72%	2.81%	2.91%	5.50%	7.49%	6.50%	6.50%	9.30%	9.41%
Northwest Natural Gas Company	NWN	\$1.88	\$61.22	3.07%	3.15%	3.27%	7.00%	4.00%	4.30%	5.10%	8.25%	8.37%
ONE Gas Inc.	OGS	\$1.68	\$70.73	2.38%	2.46%	2.55%	9.50%	5.50%	5.50%	6.83%	9.29%	9.38%
South Jersey Industries, Inc.	SJI	\$1.09	\$34.06	3.20%	3.30%	3.43%	3.50%	6.00%	10.00%	6.50%	9.80%	9.93%
Southwest Gas Corporation	SWX	\$1.98	\$76.66	2.58%	2.65%	2.75%	7.50%	4.00%	5.00%	5.50%	8.15%	8.25%
Spire, Inc.	SR	\$2.10	\$70.57	2.98%	3.06%	3.17%	8.00%	3.95%	4.40%	5.45%	8.51%	8.62%
Mean											8.72%	8.82%
Flotation Cost Adjustment											[12]	0.11%

## Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals 30-day average as of July 31, 2017

[3] Equals [1] / [2]

[4] Equals [3] x (1 + [9])

[5] Equals [4] / (1 - Flotation Cost)

[6] Source: Value Line

[7] Source: Yahoo! Finance

[8] Source: Zacks

[9] Equals Average ([6], [7], [8])

[10] Equals [4] + [9]

[11] Equals [5] + [9]

[12] Equals Average ([11]) - Average ([10])

30-DAY CONSTANT GROWTH DCF -- MERC PROXY GROUP

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group			With Exclusions		
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.80	\$84.34	2.13%	2.21%	6.00%	7.00%	7.00%	6.67%	8.20%	8.87%	9.21%	8.20%	8.87%	9.21%
New Jersey Resources Corporation	NJR	\$1.02	\$40.81	2.50%	2.56%	3.00%	6.00%	6.00%	5.00%	5.54%	7.56%	8.57%		7.56%	8.57%
NiSource Inc.	NI	\$0.70	\$25.75	2.72%	2.81%	5.50%	7.49%	6.50%	6.50%	8.29%	9.30%	10.31%		9.30%	10.31%
Northwest Natural Gas Company	NWN	\$1.88	\$61.22	3.07%	3.15%	7.00%	4.00%	4.30%	5.10%	7.13%	8.25%	10.18%	8.29%	8.25%	10.18%
ONE Gas Inc.	OGS	\$1.68	\$70.73	2.38%	2.46%	9.50%	5.50%	5.50%	6.83%	7.94%	9.29%	11.99%	7.94%	9.29%	11.99%
South Jersey Industries, Inc.	SJI	\$1.09	\$34.06	3.20%	3.30%	3.50%	6.00%	10.00%	6.50%	6.76%	9.80%	13.36%		9.80%	13.36%
Southwest Gas Corporation	SWX	\$1.98	\$76.66	2.58%	2.65%	7.50%	4.00%	5.00%	5.50%	6.63%	8.15%	10.18%		8.15%	10.18%
Spire, Inc.	SR	\$2.10	\$70.57	2.98%	3.06%	8.00%	3.95%	4.40%	5.45%	6.98%	8.51%	11.09%		8.51%	11.09%
Mean				2.69%	2.77%	6.25%	5.49%	6.09%	5.94%	7.18%	8.72%	10.61%	7.89%	8.72%	10.61%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 30-day average as of July 31, 2017
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7]))
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7]))
- [12] - [14] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

90-DAY CONSTANT GROWTH DCF -- MERC PROXY GROUP

Company		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group			With Exclusions		
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.80	\$82.44	2.18%	2.26%	6.00%	7.00%	7.00%	6.67%	8.25%	8.92%	9.26%	8.25%	8.92%	9.26%
New Jersey Resources Corporation	NJR	\$1.02	\$40.80	2.50%	2.56%	3.00%	6.00%	6.00%	5.00%	5.54%	7.56%	8.57%		7.56%	8.57%
NiSource Inc.	NI	\$0.70	\$25.01	2.80%	2.89%	5.50%	7.49%	6.50%	6.50%	8.38%	9.39%	10.39%	8.38%	9.39%	10.39%
Northwest Natural Gas Company	NWN	\$1.88	\$60.55	3.10%	3.18%	7.00%	4.00%	4.30%	5.10%	7.17%	8.28%	10.21%	7.17%	8.28%	10.21%
ONE Gas Inc.	OGS	\$1.68	\$69.82	2.41%	2.49%	9.50%	5.50%	5.50%	6.83%	7.97%	9.32%	12.02%	7.97%	9.32%	12.02%
South Jersey Industries, Inc.	SJI	\$1.09	\$35.66	3.06%	3.16%	3.50%	6.00%	10.00%	6.50%	6.61%	9.66%	13.21%		9.66%	13.21%
Southwest Gas Corporation	SWX	\$1.98	\$79.81	2.48%	2.55%	7.50%	4.00%	5.00%	5.50%	6.53%	8.05%	10.07%		8.05%	10.07%
Spire, Inc.	SR	\$2.10	\$69.83	3.01%	3.09%	8.00%	3.95%	4.40%	5.45%	7.02%	8.54%	11.13%	7.02%	8.54%	11.13%
Mean				2.69%	2.77%	6.25%	5.49%	6.09%	5.94%	7.18%	8.72%	10.61%	7.76%	8.72%	10.61%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 90-day average as of July 31, 2017
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7]))
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7]))
- [12] - [14] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

180-DAY CONSTANT GROWTH DCF -- MERC PROXY GROUP

Company		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group			With Exclusions		
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.80	\$78.69	2.29%	2.36%	6.00%	7.00%	7.00%	6.67%	8.36%	9.03%	9.37%	8.36%	9.03%	9.37%
New Jersey Resources Corporation	NJR	\$1.02	\$38.68	2.64%	2.70%	3.00%	6.00%	6.00%	5.00%	5.68%	7.70%	8.72%		7.70%	8.72%
NiSource Inc.	NI	\$0.70	\$23.72	2.95%	3.05%	5.50%	7.49%	6.50%	6.50%	8.53%	9.54%	10.55%	8.53%	9.54%	10.55%
Northwest Natural Gas Company	NWN	\$1.88	\$59.69	3.15%	3.23%	7.00%	4.00%	4.30%	5.10%	7.21%	8.33%	10.26%	7.21%	8.33%	10.26%
ONE Gas Inc.	OGS	\$1.68	\$66.61	2.52%	2.61%	9.50%	5.50%	5.50%	6.83%	8.09%	9.44%	12.14%	8.09%	9.44%	12.14%
South Jersey Industries, Inc.	SJI	\$1.09	\$34.46	3.16%	3.27%	3.50%	6.00%	10.00%	6.50%	6.72%	9.77%	13.32%		9.77%	13.32%
Southwest Gas Corporation	SWX	\$1.98	\$79.28	2.50%	2.57%	7.50%	4.00%	5.00%	5.50%	6.55%	8.07%	10.09%		8.07%	10.09%
Spire, Inc.	SR	\$2.10	\$67.19	3.13%	3.21%	8.00%	3.95%	4.40%	5.45%	7.14%	8.66%	11.25%	7.14%	8.66%	11.25%
Mean				2.79%	2.87%	6.25%	5.49%	6.09%	5.94%	7.28%	8.82%	10.71%	7.87%	8.82%	10.71%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals 180-day average as of July 31, 2017
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [8])
- [5] Source: Value Line
- [6] Source: Yahoo! Finance
- [7] Source: Zacks
- [8] Equals Average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7]))
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7]))
- [12] - [14] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

30-DAY TWO-STAGE GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Average Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$84.34	2.13%	2.21%	6.67%	6.67%	8.87%	\$1.86	1.09	1.71	\$1.98	1.19	1.67	\$2.12	1.29	1.64	\$2.26	1.40	1.61	\$2.41	1.53	1.57	\$2.57	\$116.46	\$76.14	\$84.34
New Jersey Resources Corporation	NJR	\$1.02	\$40.81	2.50%	2.56%	5.00%	5.19%	7.73%	\$1.05	1.08	0.97	\$1.10	1.16	0.95	\$1.15	1.25	0.92	\$1.21	1.35	0.90	\$1.27	1.45	0.88	\$1.34	\$52.53	\$36.19	\$40.81
NiSource Inc.	NI	\$0.70	\$25.75	2.72%	2.81%	6.50%	6.50%	9.30%	\$0.72	1.09	0.66	\$0.77	1.19	0.64	\$0.82	1.31	0.63	\$0.87	1.43	0.61	\$0.93	1.56	0.60	\$0.99	\$35.28	\$22.61	\$25.75
Northwest Natural Gas Company	NWN	\$1.88	\$61.22	3.07%	3.15%	5.10%	5.19%	8.33%	\$1.93	1.08	1.78	\$2.03	1.17	1.73	\$2.13	1.27	1.68	\$2.24	1.38	1.63	\$2.35	1.49	1.58	\$2.47	\$78.83	\$52.84	\$61.22
ONE Gas Inc.	OGS	\$1.68	\$70.73	2.38%	2.46%	6.83%	6.70%	9.17%	\$1.74	1.09	1.59	\$1.86	1.19	1.56	\$1.98	1.30	1.52	\$2.12	1.42	1.49	\$2.26	1.55	1.46	\$2.41	\$97.83	\$63.10	\$70.73
South Jersey Industries, Inc.	SJI	\$1.09	\$34.06	3.20%	3.30%	6.50%	6.50%	9.80%	\$1.13	1.10	1.02	\$1.20	1.21	0.99	\$1.28	1.32	0.96	\$1.36	1.45	0.94	\$1.45	1.60	0.91	\$1.54	\$46.67	\$29.24	\$34.06
Southwest Gas Corporation	SWX	\$1.98	\$76.66	2.58%	2.65%	5.50%	5.50%	8.15%	\$2.03	1.08	1.88	\$2.15	1.17	1.83	\$2.26	1.27	1.79	\$2.39	1.37	1.75	\$2.52	1.48	1.70	\$2.66	\$100.20	\$67.71	\$76.66
Spire, Inc.	SR	\$2.10	\$70.57	2.98%	3.06%	5.45%	5.45%	8.51%	\$2.16	1.09	1.99	\$2.27	1.18	1.93	\$2.40	1.28	1.88	\$2.53	1.39	1.82	\$2.67	1.50	1.77	\$2.81	\$92.01	\$61.17	\$70.57
Mean				2.69%	2.77%	5.94%	5.96%	8.73%																			
Mean (excluding ROE < 7%) [30]								8.73%																			

Standard Deviation [6] 0.75%  
 Avg. less Standard Dev [7] 5.19%  
 Avg. plus Standard Dev [8] 6.70%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

90-DAY TWO-STAGE GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Average Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$82.44	2.18%	2.26%	6.67%	6.67%	8.92%	\$1.86	1.09	1.71	\$1.98	1.19	1.67	\$2.12	1.29	1.64	\$2.26	1.41	1.60	\$2.41	1.53	1.57	\$2.57	\$113.84	\$74.25	\$82.44
New Jersey Resources Corporation	NJR	\$1.02	\$40.80	2.50%	2.56%	5.00%	5.19%	7.73%	\$1.05	1.08	0.97	\$1.10	1.16	0.95	\$1.15	1.25	0.92	\$1.21	1.35	0.90	\$1.27	1.45	0.88	\$1.34	\$52.53	\$36.19	\$40.80
NiSource Inc.	NI	\$0.70	\$25.01	2.80%	2.89%	6.50%	6.50%	9.39%	\$0.72	1.09	0.66	\$0.77	1.20	0.64	\$0.82	1.31	0.63	\$0.87	1.43	0.61	\$0.93	1.57	0.59	\$0.99	\$34.25	\$21.87	\$25.01
Northwest Natural Gas Company	NWN	\$1.88	\$60.55	3.10%	3.18%	5.10%	5.19%	8.36%	\$1.93	1.08	1.78	\$2.03	1.17	1.73	\$2.13	1.27	1.67	\$2.24	1.38	1.62	\$2.35	1.49	1.57	\$2.47	\$77.96	\$52.18	\$60.55
ONE Gas Inc.	OGS	\$1.68	\$69.82	2.41%	2.49%	6.83%	6.70%	9.20%	\$1.74	1.09	1.59	\$1.86	1.19	1.56	\$1.98	1.30	1.52	\$2.12	1.42	1.49	\$2.26	1.55	1.46	\$2.41	\$96.57	\$62.20	\$69.82
South Jersey Industries, Inc.	SJI	\$1.09	\$35.66	3.06%	3.16%	6.50%	6.50%	9.66%	\$1.13	1.10	1.03	\$1.20	1.20	1.00	\$1.28	1.32	0.97	\$1.36	1.45	0.94	\$1.45	1.59	0.91	\$1.54	\$48.86	\$30.82	\$35.66
Southwest Gas Corporation	SWX	\$1.98	\$79.81	2.48%	2.55%	5.50%	5.50%	8.05%	\$2.03	1.08	1.88	\$2.15	1.17	1.84	\$2.26	1.26	1.80	\$2.39	1.36	1.75	\$2.52	1.47	1.71	\$2.66	\$104.31	\$70.83	\$79.81
Spire, Inc.	SR	\$2.10	\$69.83	3.01%	3.09%	5.45%	5.45%	8.54%	\$2.16	1.09	1.99	\$2.27	1.18	1.93	\$2.40	1.28	1.88	\$2.53	1.39	1.82	\$2.67	1.51	1.77	\$2.81	\$91.05	\$60.44	\$69.83
Mean				2.69%	2.77%	5.94%	5.96%	8.73%																			
Mean (excluding ROE < 7%) [30]								8.73%																			

Standard Deviation [6] 0.75%  
 Avg. less Standard Dev [7] 5.19%  
 Avg. plus Standard Dev [8] 6.70%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

180-DAY TWO-STAGE GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Average Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$78.69	2.29%	2.36%	6.67%	6.67%	9.03%	\$1.86	1.09	1.71	\$1.98	1.19	1.67	\$2.12	1.30	1.63	\$2.26	1.41	1.60	\$2.41	1.54	1.56	\$2.57	\$108.65	\$70.52	\$78.69
New Jersey Resources Corporation	NJR	\$1.02	\$38.68	2.64%	2.70%	5.00%	5.19%	7.87%	\$1.05	1.08	0.97	\$1.10	1.16	0.94	\$1.15	1.26	0.92	\$1.21	1.35	0.89	\$1.27	1.46	0.87	\$1.34	\$49.79	\$34.08	\$38.68
NiSource Inc.	NI	\$0.70	\$23.72	2.95%	3.05%	6.50%	6.50%	9.54%	\$0.72	1.10	0.66	\$0.77	1.20	0.64	\$0.82	1.31	0.62	\$0.87	1.44	0.61	\$0.93	1.58	0.59	\$0.99	\$32.49	\$20.60	\$23.72
Northwest Natural Gas Company	NWN	\$1.88	\$59.69	3.15%	3.23%	5.10%	5.19%	8.41%	\$1.93	1.08	1.78	\$2.03	1.18	1.72	\$2.13	1.27	1.67	\$2.24	1.38	1.62	\$2.35	1.50	1.57	\$2.47	\$76.86	\$51.33	\$59.69
ONE Gas Inc.	OGS	\$1.68	\$66.61	2.52%	2.61%	6.83%	6.70%	9.32%	\$1.74	1.09	1.59	\$1.86	1.20	1.55	\$1.98	1.31	1.52	\$2.12	1.43	1.48	\$2.26	1.56	1.45	\$2.41	\$92.13	\$59.01	\$66.61
South Jersey Industries, Inc.	SJI	\$1.09	\$34.46	3.16%	3.27%	6.50%	6.50%	9.77%	\$1.13	1.10	1.03	\$1.20	1.20	0.99	\$1.28	1.32	0.97	\$1.36	1.45	0.94	\$1.45	1.59	0.91	\$1.54	\$47.21	\$29.63	\$34.46
Southwest Gas Corporation	SWX	\$1.98	\$79.28	2.50%	2.57%	5.50%	5.50%	8.07%	\$2.03	1.08	1.88	\$2.15	1.17	1.84	\$2.26	1.26	1.79	\$2.39	1.36	1.75	\$2.52	1.47	1.71	\$2.66	\$103.62	\$70.30	\$79.28
Spire, Inc.	SR	\$2.10	\$67.19	3.13%	3.21%	5.45%	5.45%	8.66%	\$2.16	1.09	1.99	\$2.27	1.18	1.93	\$2.40	1.28	1.87	\$2.53	1.39	1.81	\$2.67	1.51	1.76	\$2.81	\$87.61	\$57.84	\$67.19
Mean				2.79%	2.87%	5.94%	5.96%	8.83%																			
Mean (excluding ROE < 7%) [30]								8.83%																			

Standard Deviation [6] 0.75%  
 Avg. less Standard Dev [7] 5.19%  
 Avg. plus Standard Dev [8] 6.70%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826



30-DAY TWO-STAGE GROWTH DCF -- LOW GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Low Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$84.34	2.13%	2.20%	6.00%	5.52%	7.75%	\$1.85	1.08	1.72	\$1.97	1.16	1.69	\$2.08	1.25	1.67	\$2.21	1.35	1.64	\$2.34	1.45	1.61	\$2.47	\$110.43	\$76.01	\$84.34
New Jersey Resources Corporation	NJR	\$1.02	\$40.81	2.50%	2.54%	3.00%	3.34%	5.85%	\$1.04	1.06	0.98	\$1.07	1.12	0.95	\$1.10	1.19	0.93	\$1.13	1.26	0.90	\$1.17	1.33	0.88	\$1.20	\$48.07	\$36.17	\$40.81
NiSource Inc.	NI	\$0.70	\$25.75	2.72%	2.79%	5.50%	5.50%	8.29%	\$0.72	1.08	0.66	\$0.76	1.17	0.65	\$0.80	1.27	0.63	\$0.84	1.38	0.61	\$0.89	1.49	0.60	\$0.94	\$33.66	\$22.60	\$25.75
Northwest Natural Gas Company	NWN	\$1.88	\$61.22	3.07%	3.13%	4.00%	4.00%	7.13%	\$1.92	1.07	1.79	\$1.99	1.15	1.74	\$2.07	1.23	1.69	\$2.16	1.32	1.64	\$2.24	1.41	1.59	\$2.33	\$74.49	\$52.78	\$61.22
ONE Gas Inc.	OGS	\$1.68	\$70.73	2.38%	2.44%	5.50%	5.50%	7.94%	\$1.73	1.08	1.60	\$1.82	1.17	1.56	\$1.92	1.26	1.53	\$2.03	1.36	1.49	\$2.14	1.47	1.46	\$2.26	\$92.44	\$63.08	\$70.73
South Jersey Industries, Inc.	SJI	\$1.09	\$34.06	3.20%	3.26%	3.50%	3.50%	6.76%	\$1.11	1.07	1.04	\$1.15	1.14	1.01	\$1.19	1.22	0.98	\$1.23	1.30	0.95	\$1.27	1.39	0.92	\$1.32	\$40.45	\$29.17	\$34.06
Southwest Gas Corporation	SWX	\$1.98	\$76.66	2.58%	2.63%	4.00%	4.00%	6.63%	\$2.02	1.07	1.89	\$2.10	1.14	1.85	\$2.18	1.21	1.80	\$2.27	1.29	1.76	\$2.36	1.38	1.71	\$2.46	\$93.27	\$67.65	\$76.66
Spire, Inc.	SR	\$2.10	\$70.57	2.98%	3.03%	3.95%	3.95%	6.98%	\$2.14	1.07	2.00	\$2.23	1.14	1.94	\$2.31	1.22	1.89	\$2.41	1.31	1.84	\$2.50	1.40	1.78	\$2.60	\$85.65	\$61.11	\$70.57
Mean				2.69%	2.75%	4.43%	4.41%	7.17%																			
Mean (excluding ROE < 7%) [30]								7.78%																			

Standard Deviation [6] 1.09%  
 Avg. less Standard Dev [7] 3.34%  
 Avg. plus Standard Dev [8] 5.52%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

90-DAY TWO-STAGE GROWTH DCF -- LOW GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Low Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k) <sup>1</sup>	PV of Year 1 Div.	Year 2 Div.	(1+k) <sup>2</sup>	PV of Year 2 Div.	Year 3 Div.	(1+k) <sup>3</sup>	PV of Year 3 Div.	Year 4 Div.	(1+k) <sup>4</sup>	PV of Year 4 Div.	Year 5 Div.	(1+k) <sup>5</sup>	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$82.44	2.18%	2.25%	6.00%	5.52%	7.81%	\$1.85	1.08	1.72	\$1.97	1.16	1.69	\$2.08	1.25	1.66	\$2.21	1.35	1.63	\$2.34	1.46	1.61	\$2.47	\$107.94	\$74.13	\$82.44
New Jersey Resources Corporation	NJR	\$1.02	\$40.80	2.50%	2.54%	3.00%	3.34%	5.85%	\$1.04	1.06	0.98	\$1.07	1.12	0.95	\$1.10	1.19	0.93	\$1.13	1.26	0.90	\$1.17	1.33	0.88	\$1.20	\$48.06	\$36.17	\$40.80
NiSource Inc.	NI	\$0.70	\$25.01	2.80%	2.88%	5.50%	5.50%	8.38%	\$0.72	1.08	0.66	\$0.76	1.17	0.65	\$0.80	1.27	0.63	\$0.84	1.38	0.61	\$0.89	1.50	0.60	\$0.94	\$32.68	\$21.86	\$25.01
Northwest Natural Gas Company	NWN	\$1.88	\$60.55	3.10%	3.17%	4.00%	4.00%	7.17%	\$1.92	1.07	1.79	\$1.99	1.15	1.74	\$2.07	1.23	1.69	\$2.16	1.32	1.64	\$2.24	1.41	1.59	\$2.33	\$73.67	\$52.12	\$60.55
ONE Gas Inc.	OGS	\$1.68	\$69.82	2.41%	2.47%	5.50%	5.50%	7.97%	\$1.73	1.08	1.60	\$1.82	1.17	1.56	\$1.92	1.26	1.53	\$2.03	1.36	1.49	\$2.14	1.47	1.46	\$2.26	\$91.25	\$62.18	\$69.82
South Jersey Industries, Inc.	SJI	\$1.09	\$35.66	3.06%	3.11%	3.50%	3.50%	6.61%	\$1.11	1.07	1.04	\$1.15	1.14	1.01	\$1.19	1.21	0.98	\$1.23	1.29	0.95	\$1.27	1.38	0.92	\$1.32	\$42.35	\$30.75	\$35.66
Southwest Gas Corporation	SWX	\$1.98	\$79.81	2.48%	2.53%	4.00%	4.00%	6.53%	\$2.02	1.07	1.90	\$2.10	1.13	1.85	\$2.18	1.21	1.81	\$2.27	1.29	1.76	\$2.36	1.37	1.72	\$2.46	\$97.10	\$70.77	\$79.81
Spire, Inc.	SR	\$2.10	\$69.83	3.01%	3.07%	3.95%	3.95%	7.02%	\$2.14	1.07	2.00	\$2.23	1.15	1.94	\$2.31	1.23	1.89	\$2.41	1.31	1.83	\$2.50	1.40	1.78	\$2.60	\$84.75	\$60.38	\$69.83
Mean				2.69%	2.75%	4.43%	4.41%	7.17%																			
Mean (excluding ROE < 7%) [30]								7.67%																			

Standard Deviation [6] 1.09%  
 Avg. less Standard Dev [7] 3.34%  
 Avg. plus Standard Dev [8] 5.52%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

180-DAY TWO-STAGE GROWTH DCF -- LOW GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Low Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$78.69	2.29%	2.36%	6.00%	5.52%	7.92%	\$1.85	1.08	1.72	\$1.97	1.16	1.69	\$2.08	1.26	1.66	\$2.21	1.36	1.63	\$2.34	1.46	1.60	\$2.47	\$103.03	\$70.39	\$78.68
New Jersey Resources Corporation	NJR	\$1.02	\$38.68	2.64%	2.68%	3.00%	3.34%	5.99%	\$1.04	1.06	0.98	\$1.07	1.12	0.95	\$1.10	1.19	0.92	\$1.13	1.26	0.90	\$1.17	1.34	0.87	\$1.20	\$45.56	\$34.06	\$38.68
NiSource Inc.	NI	\$0.70	\$23.72	2.95%	3.03%	5.50%	5.50%	8.53%	\$0.72	1.09	0.66	\$0.76	1.18	0.64	\$0.80	1.28	0.63	\$0.84	1.39	0.61	\$0.89	1.51	0.59	\$0.94	\$31.00	\$20.59	\$23.72
Northwest Natural Gas Company	NWN	\$1.88	\$59.69	3.15%	3.21%	4.00%	4.00%	7.21%	\$1.92	1.07	1.79	\$1.99	1.15	1.74	\$2.07	1.23	1.68	\$2.16	1.32	1.63	\$2.24	1.42	1.58	\$2.33	\$72.63	\$51.27	\$59.69
ONE Gas Inc.	OGS	\$1.68	\$66.61	2.52%	2.59%	5.50%	5.50%	8.09%	\$1.73	1.08	1.60	\$1.82	1.17	1.56	\$1.92	1.26	1.52	\$2.03	1.37	1.48	\$2.14	1.48	1.45	\$2.26	\$87.05	\$58.99	\$66.61
South Jersey Industries, Inc.	SJI	\$1.09	\$34.46	3.16%	3.22%	3.50%	3.50%	6.72%	\$1.11	1.07	1.04	\$1.15	1.14	1.01	\$1.19	1.22	0.98	\$1.23	1.30	0.95	\$1.27	1.38	0.92	\$1.32	\$40.93	\$29.57	\$34.46
Southwest Gas Corporation	SWX	\$1.98	\$79.28	2.50%	2.55%	4.00%	4.00%	6.55%	\$2.02	1.07	1.90	\$2.10	1.14	1.85	\$2.18	1.21	1.81	\$2.27	1.29	1.76	\$2.36	1.37	1.72	\$2.46	\$96.46	\$70.25	\$79.28
Spire, Inc.	SR	\$2.10	\$67.19	3.13%	3.19%	3.95%	3.95%	7.14%	\$2.14	1.07	2.00	\$2.23	1.15	1.94	\$2.31	1.23	1.88	\$2.41	1.32	1.83	\$2.50	1.41	1.77	\$2.60	\$81.56	\$57.78	\$67.19
Mean				2.79%	2.85%	4.43%	4.41%	7.27%																			
Mean (excluding ROE < 7%) [30]								7.78%																			

Standard Deviation [6] 1.09%  
 Avg. less Standard Dev [7] 3.34%  
 Avg. plus Standard Dev [8] 5.52%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

30-DAY TWO-STAGE GROWTH DCF -- HIGH GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	High Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$84.34	2.13%	2.21%	7.00%	7.00%	9.21%	\$1.86	1.09	1.71	\$1.99	1.19	1.67	\$2.13	1.30	1.64	\$2.28	1.42	1.60	\$2.44	1.55	1.57	\$2.61	\$118.29	\$76.15	\$84.34
New Jersey Resources Corporation	NJR	\$1.02	\$40.81	2.50%	2.57%	6.00%	6.48%	9.01%	\$1.05	1.09	0.96	\$1.11	1.19	0.94	\$1.18	1.30	0.91	\$1.25	1.41	0.89	\$1.33	1.54	0.86	\$1.41	\$55.79	\$36.25	\$40.81
NiSource Inc.	NI	\$0.70	\$25.75	2.72%	2.82%	7.49%	7.49%	10.31%	\$0.73	1.10	0.66	\$0.78	1.22	0.64	\$0.84	1.34	0.63	\$0.90	1.48	0.61	\$0.97	1.63	0.59	\$1.04	\$36.95	\$22.63	\$25.75
Northwest Natural Gas Company	NWN	\$1.88	\$61.22	3.07%	3.18%	7.00%	7.00%	10.18%	\$1.95	1.10	1.77	\$2.08	1.21	1.72	\$2.23	1.34	1.67	\$2.38	1.47	1.62	\$2.55	1.62	1.57	\$2.73	\$85.87	\$52.89	\$61.22
ONE Gas Inc.	OGS	\$1.68	\$70.73	2.38%	2.49%	9.50%	9.15%	11.66%	\$1.76	1.12	1.58	\$1.93	1.25	1.55	\$2.11	1.39	1.52	\$2.31	1.55	1.49	\$2.53	1.74	1.46	\$2.76	\$109.63	\$63.15	\$70.73
South Jersey Industries, Inc.	SJI	\$1.09	\$34.06	3.20%	3.36%	10.00%	9.15%	12.60%	\$1.14	1.13	1.02	\$1.26	1.27	0.99	\$1.38	1.43	0.97	\$1.52	1.61	0.95	\$1.68	1.81	0.93	\$1.83	\$52.88	\$29.21	\$34.06
Southwest Gas Corporation	SWX	\$1.98	\$76.66	2.58%	2.68%	7.50%	7.50%	10.18%	\$2.05	1.10	1.86	\$2.21	1.21	1.82	\$2.37	1.34	1.77	\$2.55	1.47	1.73	\$2.74	1.62	1.69	\$2.95	\$110.06	\$67.78	\$76.66
Spire, Inc.	SR	\$2.10	\$70.57	2.98%	3.09%	8.00%	8.00%	11.09%	\$2.18	1.11	1.97	\$2.36	1.23	1.91	\$2.55	1.37	1.86	\$2.75	1.52	1.81	\$2.97	1.69	1.76	\$3.21	\$103.69	\$61.27	\$70.57
Mean				2.69%	2.80%	7.81%	7.72%	10.53%																			
Mean (excluding ROE < 7%) [30]								10.53%																			

Standard Deviation [6] 1.33%  
 Avg. less Standard Dev [7] 6.48%  
 Avg. plus Standard Dev [8] 9.15%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

90-DAY TWO-STAGE GROWTH DCF -- HIGH GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	High Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	PV of Year 1 Div. (1+k)^1	Year 2 Div.	PV of Year 2 Div. (1+k)^2	Year 3 Div.	PV of Year 3 Div. (1+k)^3	Year 4 Div.	PV of Year 4 Div. (1+k)^4	Year 5 Div.	PV of Year 5 Div. (1+k)^5	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price	Year 5 Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$82.44	2.18%	2.26%	7.00%	7.00%	9.26%	\$1.86	1.09	1.71	\$1.99	1.19	1.67	\$2.13	1.30	1.64	\$2.28	1.43	1.60	\$2.44	1.56	1.57	\$2.61	\$115.63	\$74.26	\$82.44
New Jersey Resources Corporation	NJR	\$1.02	\$40.80	2.50%	2.57%	6.00%	6.48%	9.01%	\$1.05	1.09	0.96	\$1.11	1.19	0.94	\$1.18	1.30	0.91	\$1.25	1.41	0.89	\$1.33	1.54	0.86	\$1.41	\$55.78	\$36.24	\$40.80
NiSource Inc.	NI	\$0.70	\$25.01	2.80%	2.90%	7.49%	7.49%	10.39%	\$0.73	1.10	0.66	\$0.78	1.22	0.64	\$0.84	1.35	0.62	\$0.90	1.49	0.61	\$0.97	1.64	0.59	\$1.04	\$35.88	\$21.88	\$25.01
Northwest Natural Gas Company	NWN	\$1.88	\$60.55	3.10%	3.21%	7.00%	7.00%	10.21%	\$1.95	1.10	1.77	\$2.08	1.21	1.71	\$2.23	1.34	1.66	\$2.38	1.48	1.62	\$2.55	1.63	1.57	\$2.73	\$84.93	\$52.22	\$60.55
ONE Gas Inc.	OGS	\$1.68	\$69.82	2.41%	2.52%	9.50%	9.15%	11.70%	\$1.76	1.12	1.58	\$1.93	1.25	1.54	\$2.11	1.39	1.51	\$2.31	1.56	1.48	\$2.53	1.74	1.46	\$2.76	\$108.23	\$62.25	\$69.82
South Jersey Industries, Inc.	SJI	\$1.09	\$35.66	3.06%	3.21%	10.00%	9.15%	12.45%	\$1.14	1.12	1.02	\$1.26	1.26	1.00	\$1.38	1.42	0.97	\$1.52	1.60	0.95	\$1.68	1.80	0.93	\$1.83	\$55.36	\$30.79	\$35.66
Southwest Gas Corporation	SWX	\$1.98	\$79.81	2.48%	2.57%	7.50%	7.50%	10.07%	\$2.05	1.10	1.87	\$2.21	1.21	1.82	\$2.37	1.33	1.78	\$2.55	1.47	1.74	\$2.74	1.62	1.70	\$2.95	\$114.58	\$70.91	\$79.81
Spire, Inc.	SR	\$2.10	\$69.83	3.01%	3.13%	8.00%	8.00%	11.13%	\$2.18	1.11	1.97	\$2.36	1.23	1.91	\$2.55	1.37	1.86	\$2.75	1.53	1.80	\$2.97	1.69	1.75	\$3.21	\$102.60	\$60.54	\$69.83
Mean				2.69%	2.80%	7.81%	7.72%	10.53%																			
Mean (excluding ROE < 7%) [30]								10.53%																			

Standard Deviation [6] 1.33%  
 Avg. less Standard Dev [7] 6.48%  
 Avg. plus Standard Dev [8] 9.15%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

180-DAY TWO-STAGE GROWTH DCF -- HIGH GROWTH RATE

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	High Growth Rate	Second Growth Rate	Mean ROE	Year 1 Div.	(1+k)^1	PV of Year 1 Div.	Year 2 Div.	(1+k)^2	PV of Year 2 Div.	Year 3 Div.	(1+k)^3	PV of Year 3 Div.	Year 4 Div.	(1+k)^4	PV of Year 4 Div.	Year 5 Div.	(1+k)^5	PV of Year 5 Div.	Year 6 Div.	Year 5 Stock Price	Year 5 Stock Price	Current Stock Price
Atmos Energy Corporation	ATO	\$1.80	\$78.69	2.29%	2.37%	7.00%	7.00%	9.37%	\$1.86	1.09	1.70	\$1.99	1.20	1.67	\$2.13	1.31	1.63	\$2.28	1.43	1.60	\$2.44	1.56	1.56	\$2.61	\$110.36	\$70.53	\$78.69
New Jersey Resources Corporation	NJR	\$1.02	\$38.68	2.64%	2.72%	6.00%	6.48%	9.15%	\$1.05	1.09	0.96	\$1.11	1.19	0.93	\$1.18	1.30	0.91	\$1.25	1.42	0.88	\$1.33	1.55	0.86	\$1.41	\$52.88	\$34.14	\$38.68
NiSource Inc.	NI	\$0.70	\$23.72	2.95%	3.06%	7.49%	7.49%	10.55%	\$0.73	1.11	0.66	\$0.78	1.22	0.64	\$0.84	1.35	0.62	\$0.90	1.49	0.60	\$0.97	1.65	0.59	\$1.04	\$34.04	\$20.61	\$23.72
Northwest Natural Gas Company	NWN	\$1.88	\$59.69	3.15%	3.26%	7.00%	7.00%	10.26%	\$1.95	1.10	1.76	\$2.08	1.22	1.71	\$2.23	1.34	1.66	\$2.38	1.48	1.61	\$2.55	1.63	1.57	\$2.73	\$83.72	\$51.38	\$59.69
ONE Gas Inc.	OGS	\$1.68	\$66.61	2.52%	2.64%	9.50%	9.15%	11.82%	\$1.76	1.12	1.57	\$1.93	1.25	1.54	\$2.11	1.40	1.51	\$2.31	1.56	1.48	\$2.53	1.75	1.45	\$2.76	\$103.25	\$59.06	\$66.60
South Jersey Industries, Inc.	SJI	\$1.09	\$34.46	3.16%	3.32%	10.00%	9.15%	12.57%	\$1.14	1.13	1.02	\$1.26	1.27	0.99	\$1.38	1.43	0.97	\$1.52	1.61	0.95	\$1.68	1.81	0.93	\$1.83	\$53.50	\$29.60	\$34.46
Southwest Gas Corporation	SWX	\$1.98	\$79.28	2.50%	2.59%	7.50%	7.50%	10.09%	\$2.05	1.10	1.87	\$2.21	1.21	1.82	\$2.37	1.33	1.78	\$2.55	1.47	1.74	\$2.74	1.62	1.70	\$2.95	\$113.82	\$70.38	\$79.28
Spire, Inc.	SR	\$2.10	\$67.19	3.13%	3.25%	8.00%	8.00%	11.25%	\$2.18	1.11	1.96	\$2.36	1.24	1.91	\$2.55	1.38	1.85	\$2.75	1.53	1.80	\$2.97	1.70	1.74	\$3.21	\$98.73	\$57.94	\$67.19
Mean				2.79%	2.90%	7.81%	7.72%	10.63%																			
Mean (excluding ROE < 7%) [30]								10.63%																			

Standard Deviation [6] 1.33%  
 Avg. less Standard Dev [7] 6.48%  
 Avg. plus Standard Dev [8] 9.15%

Notes:

- [1] Source: Schedule-5
- [2] Source: Schedule-5
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.50 x [5])
- [5] Source: Schedule-5
- [6] Standard Deviation of Column [5]
- [7] Mean of Column [5], minus [6]
- [8] Mean of Column [5], plus [6]
- [9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
- [10] ROE that sets [2] equal to [29] using Excel's goal seek function
- [11] [2] x [4]
- [12] = (1 + [10]) ^ 1
- [13] = [11] / [12]
- [14] = [11] \* (1 + [5])
- [15] = (1 + [10]) ^ 2
- [16] = [14] / [15]
- [17] = [14] \* (1 + [5])
- [18] = (1 + [10]) ^ 3
- [19] = [17] / [18]
- [20] = [17] \* (1 + [5])
- [21] = (1 + [10]) ^ 4
- [22] = [20] / [21]
- [23] = [20] \* (1 + [5])
- [24] = (1 + [10]) ^ 5
- [25] = [23] / [24]
- [26] = [23] \* (1 + [9])
- [27] = [26] / ([10] - [9])
- [28] = [27] / [24]
- [29] = [13] + [16] + [19] + [22] + [25] + [28]
- [30] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

PROJECTED CONSTANT GROWTH DCF -- MERC PROXY GROUP

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	All Proxy Group			With Exclusions		
		Annualized Dividend (2020 - 2022)	Stock Price (2020 - 2022)			Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$2.30	\$115.00	\$95.00	\$105.00	2.19%	2.26%	6.00%	7.00%	7.00%	6.67%	8.26%	8.93%	9.27%	8.26%	8.93%	9.27%
New Jersey Resources Corporation	NJR	\$1.12	\$35.00	\$25.00	\$30.00	3.73%	3.83%	3.00%	6.00%	6.00%	5.00%	6.79%	8.83%	9.85%		8.83%	9.85%
NiSource Inc.	NI	\$1.00	\$30.00	\$19.00	\$24.50	4.08%	4.21%	5.50%	7.49%	6.50%	6.50%	9.69%	10.71%	11.72%	9.69%	10.71%	11.72%
Northwest Natural Gas Company	NWN	\$2.00	\$60.00	\$50.00	\$55.00	3.64%	3.73%	7.00%	4.00%	4.30%	5.10%	7.71%	8.83%	10.76%	7.71%	8.83%	10.76%
ONE Gas Inc.	OGS	\$2.45	\$115.00	\$85.00	\$100.00	2.45%	2.53%	9.50%	5.50%	5.50%	6.83%	8.02%	9.37%	12.07%	8.02%	9.37%	12.07%
South Jersey Industries, Inc.	SJI	\$1.30	\$35.00	\$25.00	\$30.00	4.33%	4.47%	3.50%	6.00%	10.00%	6.50%	7.91%	10.97%	14.55%	7.91%	10.97%	14.55%
Southwest Gas Corporation	SWX	\$2.50	\$90.00	\$60.00	\$75.00	3.33%	3.43%	7.50%	4.00%	5.00%	5.50%	7.40%	8.93%	10.96%	7.40%	8.93%	10.96%
Spire, Inc.	SR	\$2.50	\$85.00	\$65.00	\$75.00	3.33%	3.42%	8.00%	3.95%	4.40%	5.45%	7.35%	8.87%	11.47%	7.35%	8.87%	11.47%
Mean						3.39%	3.49%	6.25%	5.49%	6.09%	5.94%	7.89%	9.43%	11.33%	8.05%	9.43%	11.33%

Notes:

- [1] Source: Value Line dated June 2, 2017, 2020-2022 projection
- [2] Source: Value Line, dated June 2, 2017, 2020-2022 target price
- [3] Source: Value Line, dated June 2, 2017, 2020-2022 target price
- [4] Equals Average ([2], [3])
- [5] Equals [1] / [4]
- [6] Equals [5] x (1 + 0.50 x [10])
- [7] Source: Value Line
- [8] Source: Yahoo! Finance
- [9] Source: Zacks
- [10] Equals Average ([7], [8], [9])
- [11] Equals [5] x (1 + 0.50 x Minimum ([7], [8], [9]) + Minimum ([7], [8], [9])
- [12] Equals [6] + [10]
- [13] Equals [5] x (1 + 0.50 x Maximum ([7], [8], [9]) + Maximum ([7], [8], [9])
- [14] - [16] Excludes companies with ROEs less than the a 7.00% return, consistent with the Department position in Docket No. E-002/GR-15-826

BETA  
AS OF July 31, 2017

<u>Proxy Group</u>		<u>[1]</u> <u>Value Line</u>
Atmos Energy Corporation	ATO	0.70
New Jersey Resources Corporation	NJR	0.80
NiSource Inc.	NI	0.65
Northwest Natural Gas Company	NWN	0.65
ONE Gas Inc.	OGS	0.70
South Jersey Industries, Inc.	SJI	0.80
Southwest Gas Corporation	SWX	0.75
Spire, Inc.	SR	0.70
Mean		0.719

Notes:[1] Source: Value Line; dated June 2, 2017



## CAPITAL ASSET PRICING MODEL

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate ( <i>R<sub>f</sub></i> )	Beta ( <i>β</i> )	Market Return ( <i>R<sub>m</sub></i> )	Market Risk Premium ( <i>R<sub>m</sub> - R<sub>f</sub></i> )	ROE ( <i>K</i> )
<u>Proxy Group Average Value Line Beta</u>					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	2.84%	0.719	13.21%	10.37%	10.30%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2017 - Q4 2018) [2]	3.42%	0.719	13.21%	9.79%	10.46%
Projected 30-year U.S. Treasury bond yield (2019 - 2023) [3]	4.30%	0.719	13.21%	8.91%	10.71%
				MEAN	10.49%

Notes:

[1] Source: Bloomberg Professional, 30-day average as of July 31, 2017

[2] Source: Blue Chip Financial Forecasts, Vol. 36, No. 8, August 1, 2017, at 2

[3] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14

[4] See Notes [1], [2], and [3]

[5] Source: Schedule-8

[6] Source: Schedule-9, at 2

[7] Equals [6] - [4]

[8] Equals [4] + ([5] x [7])

## MARKET RISK PREMIUM DERIVED FROM ANALYSTS LONG-TERM GROWTH ESTIMATES

[9] Estimated Weighted Average Dividend Yield	1.99%
[10] Estimated Weighted Average Long-Term Growth Rate	11.11%
[11] S&P 500 Estimated Required Market Return	13.21%

## STANDARD AND POOR'S 500 INDEX

Name	Ticker	[12] Weight in Index	[13] Estimated Dividend Yield	[14] Cap-Weighted Dividend Yield	[15] Long-Term Growth Est.	[16] Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	0.16%	4.00%	0.65%	6.50%	1.06%
American Express Co	AXP	0.34%	1.50%	0.52%	8.87%	3.04%
Verizon Communications Inc	VZ	0.90%	4.77%	4.29%	1.92%	1.73%
Broadcom Ltd	AVGO	0.46%	1.65%	0.76%	15.42%	7.04%
Boeing Co/The	BA	0.65%	2.34%	1.53%	16.08%	10.49%
Caterpillar Inc	CAT	0.31%	2.74%	0.84%	8.05%	2.46%
JPMorgan Chase & Co	JPM	1.48%	2.18%	3.23%	10.53%	15.64%
Chevron Corp	CVX	0.94%	3.96%	3.73%	42.57%	40.09%
Coca-Cola Co/The	KO	0.89%	3.23%	2.87%	5.14%	4.57%
AbbVie Inc	ABBV	0.51%	3.66%	1.85%	7.45%	3.77%
Walt Disney Co/The	DIS	0.78%	1.42%	1.11%	7.88%	6.17%
Extra Space Storage Inc	EXR	0.05%	3.92%	0.18%	6.25%	0.28%
El du Pont de Nemours & Co	DD	0.32%	1.85%	0.60%	6.85%	2.22%
Exxon Mobil Corp	XOM	1.54%	3.85%	5.94%	4.74%	7.32%
Phillips 66	PSX	0.20%	3.34%	0.65%	16.53%	3.23%
General Electric Co	GE	1.01%	3.75%	3.78%	11.00%	11.10%
HP Inc	HPQ	0.15%	2.78%	0.41%	3.30%	0.48%
Home Depot Inc/The	HD	0.81%	2.38%	1.94%	13.00%	10.59%
International Business Machines Corp	IBM	0.61%	4.15%	2.55%	3.54%	2.17%
Concho Resources Inc	CXO	0.09%	n/a	n/a	-19.97%	-1.76%
Johnson & Johnson	JNJ	1.63%	2.53%	4.12%	6.23%	10.15%
McDonald's Corp	MCD	0.58%	2.42%	1.40%	10.05%	5.79%
Merck & Co Inc	MRK	0.80%	2.94%	2.34%	6.00%	4.77%
3M Co	MMM	0.55%	2.34%	1.28%	7.87%	4.30%
American Water Works Co Inc	AWK	0.07%	2.05%	0.13%	7.00%	0.46%
Bank of America Corp	BAC	1.08%	1.99%	2.15%	17.07%	18.46%
CSRA Inc	CSRA	0.02%	1.23%	0.03%	7.50%	0.18%
Baker Hughes a GE Co	BHGE	0.07%	1.84%	0.13%	n/a	n/a
Pfizer Inc	PFE	0.90%	3.86%	3.48%	5.33%	4.80%
Procter & Gamble Co/The	PG	1.06%	3.04%	3.21%	7.54%	7.98%
AT&T Inc	T	1.09%	5.03%	5.48%	5.25%	5.72%
Travelers Cos Inc/The	TRV	0.16%	2.25%	0.36%	7.21%	1.16%
United Technologies Corp	UTX	0.43%	2.36%	1.02%	8.56%	3.69%
Analog Devices Inc	ADI	0.13%	2.28%	0.30%	11.76%	1.55%
Wal-Mart Stores Inc	WMT	1.10%	2.55%	2.80%	5.14%	5.64%
Cisco Systems Inc	CSCO	0.72%	3.69%	2.64%	7.10%	5.09%
Intel Corp	INTC	0.76%	3.07%	2.33%	8.20%	6.22%
General Motors Co	GM	0.24%	4.22%	1.01%	9.04%	2.16%
Microsoft Corp	MSFT	2.55%	2.15%	5.47%	9.57%	24.42%
Dollar General Corp	DG	0.09%	1.38%	0.13%	9.08%	0.85%
Kinder Morgan Inc/DE	KMI	0.21%	2.45%	0.51%	14.85%	3.08%
Citigroup Inc	C	0.85%	1.87%	1.59%	10.18%	8.64%
American International Group Inc	AIG	0.27%	1.96%	0.54%	11.00%	3.02%
Honeywell International Inc	HON	0.47%	1.95%	0.92%	9.95%	4.69%
Altria Group Inc	MO	0.57%	3.76%	2.13%	1.51%	0.86%
HCA Healthcare Inc	HCA	0.13%	n/a	n/a	11.44%	1.54%
Under Armour Inc	UA	0.02%	n/a	n/a	10.81%	0.18%
International Paper Co	IP	0.10%	3.36%	0.35%	6.73%	0.70%
Hewlett Packard Enterprise Co	HPE	0.13%	1.48%	0.19%	-1.16%	-0.15%
Abbott Laboratories	ABT	0.39%	2.16%	0.84%	11.33%	4.40%
Aflac Inc	AFL	0.14%	2.16%	0.31%	5.00%	0.72%
Air Products & Chemicals Inc	APD	0.14%	2.67%	0.38%	8.78%	1.24%
Royal Caribbean Cruises Ltd	RCL	0.11%	1.70%	0.19%	19.46%	2.15%
American Electric Power Co Inc	AEP	0.16%	3.35%	0.53%	2.50%	0.39%
Hess Corp	HES	0.06%	2.25%	0.14%	-14.74%	-0.95%
Anadarko Petroleum Corp	APC	0.12%	0.44%	0.05%	9.00%	1.05%
Aon PLC	AON	0.16%	1.04%	0.17%	10.52%	1.73%
Apache Corp	APA	0.09%	2.02%	0.17%	-20.62%	-1.77%
Archer-Daniels-Midland Co	ADM	0.11%	3.03%	0.33%	10.00%	1.09%
Automatic Data Processing Inc	ADP	0.24%	1.92%	0.46%	11.60%	2.81%
Verisk Analytics Inc	VRSK	0.07%	n/a	n/a	8.18%	0.54%
AutoZone Inc	AZO	0.07%	n/a	n/a	11.69%	0.81%
Avery Dennison Corp	AVY	0.04%	1.94%	0.07%	7.65%	0.29%
Ball Corp	BLL	0.07%	0.95%	0.06%	8.00%	0.54%
Bank of New York Mellon Corp/The	BK	0.25%	1.81%	0.45%	12.08%	3.01%
CR Bard Inc	BCR	0.11%	0.32%	0.03%	8.73%	0.93%
Baxter International Inc	BAX	0.15%	1.06%	0.16%	13.56%	2.03%
Becton Dickinson and Co	BDX	0.21%	1.45%	0.30%	9.87%	2.06%
Berkshire Hathaway Inc	BRK/B	1.05%	n/a	n/a	2.00%	2.09%
Best Buy Co Inc	BBY	0.08%	2.33%	0.19%	13.28%	1.08%
H&R Block Inc	HRB	0.03%	3.15%	0.09%	11.00%	0.32%
Boston Scientific Corp	BSX	0.17%	n/a	n/a	10.69%	1.77%
Bristol-Myers Squibb Co	BMJ	0.42%	2.74%	1.16%	9.10%	3.87%
Fortune Brands Home & Security Inc	FBHS	0.05%	1.10%	0.05%	11.98%	0.55%
Brown-Forman Corp	BF/B	0.05%	1.48%	0.07%	8.47%	0.41%
Cabot Oil & Gas Corp	COG	0.05%	0.80%	0.04%	31.95%	1.67%
Campbell Soup Co	CPB	0.07%	2.65%	0.19%	5.37%	0.39%
Kansas City Southern	KSU	0.05%	1.28%	0.06%	12.70%	0.63%
Advanced Micro Devices Inc	AMD	0.06%	n/a	n/a	5.00%	0.29%
Hilton Worldwide Holdings Inc	HLT	0.09%	0.96%	0.09%	15.54%	1.43%

## STANDARD AND POOR'S 500 INDEX

Name	Ticker	[12]	[13]	[14]	[15]	[16]
		Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
Carnival Corp	CCL	0.16%	2.40%	0.39%	13.11%	2.14%
Qorvo Inc	QRVO	0.04%	n/a	n/a	13.24%	0.53%
CenturyLink Inc	CTL	0.06%	9.28%	0.54%	-1.72%	-0.10%
Cigna Corp	CI	0.20%	0.02%	0.00%	13.05%	2.64%
UDR Inc	UDR	0.05%	3.17%	0.15%	5.97%	0.28%
Clorox Co/The	CLX	0.08%	2.52%	0.20%	7.16%	0.56%
CMS Energy Corp	CMS	0.06%	2.88%	0.17%	7.43%	0.44%
Colgate-Palmolive Co	CL	0.29%	2.22%	0.64%	8.99%	2.60%
Comerica Inc	CMA	0.06%	1.66%	0.10%	12.10%	0.70%
CA Inc	CA	0.06%	3.29%	0.20%	2.93%	0.17%
Conagra Brands Inc	CAG	0.06%	2.48%	0.16%	8.65%	0.56%
Consolidated Edison Inc	ED	0.12%	3.33%	0.38%	4.50%	0.52%
SL Green Realty Corp	SLG	0.05%	3.00%	0.14%	0.80%	0.04%
Corning Inc	GLW	0.12%	2.13%	0.25%	9.05%	1.08%
Cummins Inc	CMI	0.13%	2.57%	0.33%	10.20%	1.31%
Danaher Corp	DHR	0.26%	0.69%	0.18%	8.78%	2.26%
Target Corp	TGT	0.14%	4.38%	0.62%	-1.03%	-0.15%
Deere & Co	DE	0.19%	1.87%	0.35%	8.20%	1.53%
Dominion Energy Inc	D	0.22%	3.91%	0.86%	5.45%	1.20%
Dover Corp	DOV	0.06%	2.10%	0.12%	13.80%	0.82%
CBOE Holdings Inc	CBOE	0.05%	1.14%	0.06%	20.00%	0.96%
Dow Chemical Co/The	DOW	0.36%	2.86%	1.02%	5.70%	2.04%
Duke Energy Corp	DUK	0.27%	4.18%	1.13%	5.70%	1.55%
Eaton Corp PLC	ETN	0.16%	3.07%	0.49%	11.25%	1.79%
Ecolab Inc	ECL	0.17%	1.12%	0.20%	12.96%	2.25%
PerkinElmer Inc	PKI	0.03%	0.43%	0.01%	10.40%	0.34%
Emerson Electric Co	EMR	0.17%	3.22%	0.56%	7.07%	1.24%
EOG Resources Inc	EOG	0.25%	0.70%	0.18%	-39.09%	-9.77%
Entergy Corp	ETR	0.06%	4.54%	0.28%	-3.83%	-0.24%
Equifax Inc	EFX	0.08%	1.07%	0.09%	11.17%	0.89%
EQT Corp	EQT	0.05%	0.19%	0.01%	17.50%	0.88%
XL Group Ltd	XL	0.05%	1.98%	0.10%	9.00%	0.47%
Gartner Inc	IT	0.05%	n/a	n/a	17.50%	0.92%
FedEx Corp	FDX	0.25%	0.96%	0.24%	13.67%	3.47%
Macy's Inc	M	0.03%	6.36%	0.21%	-1.10%	-0.04%
FMC Corp	FMC	0.05%	0.86%	0.04%	12.00%	0.56%
Ford Motor Co	F	0.20%	5.35%	1.07%	-2.07%	-0.41%
NextEra Energy Inc	NEE	0.31%	2.69%	0.84%	6.88%	2.15%
Franklin Resources Inc	BEN	0.11%	1.79%	0.20%	10.00%	1.14%
Freepoint-McMoRan Inc	FCX	0.10%	n/a	n/a	23.96%	2.31%
Gap Inc/The	GPS	0.04%	3.86%	0.17%	6.67%	0.29%
General Dynamics Corp	GD	0.27%	1.71%	0.46%	9.59%	2.57%
General Mills Inc	GIS	0.15%	3.52%	0.51%	7.57%	1.11%
Genuine Parts Co	GPC	0.06%	3.18%	0.18%	7.81%	0.44%
WW Grainger Inc	GWV	0.04%	3.07%	0.13%	9.55%	0.42%
Halliburton Co	HAL	0.17%	1.70%	0.29%	n/a	n/a
Harley-Davidson Inc	HOG	0.04%	3.00%	0.12%	8.68%	0.34%
Harris Corp	HRS	0.06%	1.85%	0.12%	n/a	n/a
HCP Inc	HCP	0.07%	4.68%	0.32%	3.40%	0.23%
Helmerich & Payne Inc	HP	0.03%	5.53%	0.14%	n/a	n/a
Fortive Corp	FTV	0.10%	0.43%	0.04%	8.74%	0.89%
Hershey Co/The	HSY	0.07%	2.49%	0.18%	9.63%	0.70%
Synchrony Financial	SYF	0.11%	1.98%	0.22%	8.07%	0.89%
Hormel Foods Corp	HRL	0.08%	1.99%	0.16%	6.40%	0.53%
Arthur J Gallagher & Co	AJG	0.05%	2.65%	0.13%	9.95%	0.48%
Mondelez International Inc	MDLZ	0.30%	1.73%	0.52%	10.52%	3.20%
CenterPoint Energy Inc	CNP	0.06%	3.80%	0.21%	6.53%	0.36%
Humana Inc	HUM	0.15%	0.69%	0.11%	15.49%	2.35%
Willis Towers Watson PLC	WLTW	0.09%	1.42%	0.13%	10.00%	0.92%
Illinois Tool Works Inc	ITW	0.22%	1.85%	0.41%	7.60%	1.68%
Ingersoll-Rand PLC	IR	0.10%	1.82%	0.18%	10.53%	1.07%
Foot Locker Inc	FL	0.03%	2.63%	0.07%	7.56%	0.21%
Interpublic Group of Cos Inc/The	IPG	0.04%	3.33%	0.13%	8.64%	0.33%
International Flavors & Fragrances Inc	IFF	0.05%	1.92%	0.09%	7.90%	0.38%
Jacobs Engineering Group Inc	JEC	0.03%	1.14%	0.03%	10.54%	0.30%
Hanesbrands Inc	HBI	0.04%	2.62%	0.10%	13.80%	0.52%
Kellogg Co	K	0.11%	3.18%	0.34%	6.46%	0.70%
Perrigo Co PLC	PRGO	0.05%	0.85%	0.04%	1.58%	0.08%
Kimberly-Clark Corp	KMB	0.20%	3.15%	0.62%	6.22%	1.23%
Kimco Realty Corp	KIM	0.04%	5.35%	0.21%	20.29%	0.79%
Kohl's Corp	KSS	0.03%	5.32%	0.17%	3.73%	0.12%
Oracle Corp	ORCL	0.94%	1.52%	1.43%	8.35%	7.85%
Kroger Co/The	KR	0.10%	2.04%	0.20%	7.03%	0.70%
Leggett & Platt Inc	LEG	0.03%	2.99%	0.09%	14.50%	0.42%
Lennar Corp	LEN	0.05%	0.31%	0.01%	11.29%	0.55%
Leucadia National Corp	LUK	0.04%	1.54%	0.07%	18.00%	0.77%
Eli Lilly & Co	LLY	0.41%	2.52%	1.04%	9.35%	3.87%
L Brands Inc	LB	0.06%	5.17%	0.31%	7.11%	0.43%
Charter Communications Inc	CHTR	0.46%	n/a	n/a	23.96%	11.02%
Lincoln National Corp	LNC	0.07%	1.59%	0.12%	9.60%	0.72%
Loews Corp	L	0.07%	0.51%	0.04%	n/a	n/a
Lowe's Cos Inc	LOW	0.30%	2.12%	0.63%	15.67%	4.66%
Host Hotels & Resorts Inc	HST	0.06%	4.29%	0.27%	2.97%	0.19%
Marsh & McLennan Cos Inc	MMC	0.18%	1.92%	0.35%	12.29%	2.24%
Masco Corp	MAS	0.06%	1.05%	0.06%	14.33%	0.79%
Mattel Inc	MAT	0.03%	3.00%	0.09%	11.30%	0.35%
S&P Global Inc	SPGI	0.18%	1.07%	0.19%	10.00%	1.80%
Medtronic PLC	MDT	0.52%	2.19%	1.14%	6.06%	3.15%
CVS Health Corp	CVS	0.37%	2.50%	0.93%	12.07%	4.47%
Micron Technology Inc	MU	0.14%	n/a	n/a	10.00%	1.43%
Motorola Solutions Inc	MSI	0.07%	2.07%	0.14%	3.85%	0.26%

## STANDARD AND POOR'S 500 INDEX

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Mylan NV	MYL	0.10%	n/a	n/a	12.00%	1.14%
Laboratory Corp of America Holdings	LH	0.07%	n/a	n/a	10.75%	0.80%
Newell Brands Inc	NWL	0.12%	1.75%	0.20%	12.05%	1.40%
Newmont Mining Corp	NEM	0.09%	0.81%	0.07%	8.65%	0.78%
Twenty-First Century Fox Inc	FOXA	0.14%	1.24%	0.17%	9.39%	1.31%
NIKE Inc	NKE	0.35%	1.22%	0.43%	11.00%	3.88%
NiSource Inc	NI	0.04%	2.69%	0.10%	6.98%	0.27%
Noble Energy Inc	NBL	0.06%	1.38%	0.09%	3.73%	0.24%
Norfolk Southern Corp	NSC	0.15%	2.17%	0.32%	12.68%	1.87%
Eversource Energy	ES	0.09%	3.13%	0.27%	6.07%	0.53%
Northrop Grumman Corp	NOC	0.21%	1.52%	0.32%	7.57%	1.58%
Wells Fargo & Co	WFC	1.22%	2.89%	3.53%	11.46%	13.97%
Nucor Corp	NUE	0.08%	2.62%	0.22%	12.00%	1.01%
PVH Corp	PVH	0.04%	0.13%	0.01%	9.09%	0.38%
Occidental Petroleum Corp	OXY	0.22%	4.97%	1.07%	-3.49%	-0.75%
Omnicom Group Inc	OMC	0.08%	2.79%	0.23%	6.97%	0.58%
ONEOK Inc	OKE	0.10%	5.27%	0.52%	10.50%	1.03%
Raymond James Financial Inc	RJF	0.05%	1.06%	0.06%	17.00%	0.93%
PG&E Corp	PCG	0.16%	3.13%	0.49%	3.70%	0.58%
Parker-Hannifin Corp	PH	0.10%	1.59%	0.16%	10.27%	1.03%
PPL Corp	PPL	0.12%	4.12%	0.49%	1.20%	0.14%
PepsiCo Inc	PEP	0.76%	2.76%	2.09%	6.39%	4.84%
Exelon Corp	EXC	0.16%	3.42%	0.55%	3.33%	0.54%
ConocoPhillips	COP	0.26%	2.34%	0.60%	7.00%	1.79%
PulteGroup Inc	PHM	0.03%	1.47%	0.05%	18.40%	0.62%
Pinnacle West Capital Corp	PNW	0.04%	3.02%	0.13%	5.80%	0.26%
PNC Financial Services Group Inc/The	PNC	0.28%	2.33%	0.66%	10.15%	2.88%
PPG Industries Inc	PPG	0.12%	1.71%	0.21%	8.09%	0.99%
Praxair Inc	PX	0.17%	2.42%	0.41%	11.73%	1.99%
Progressive Corp/The	PGR	0.12%	1.44%	0.18%	11.67%	1.45%
Public Service Enterprise Group Inc	PEG	0.10%	3.82%	0.40%	3.20%	0.33%
Raytheon Co	RTN	0.23%	1.86%	0.42%	8.31%	1.89%
Robert Half International Inc	RHI	0.03%	2.12%	0.06%	8.30%	0.22%
SCANA Corp	SCG	0.04%	3.81%	0.16%	4.07%	0.17%
Edison International	EIX	0.12%	2.76%	0.32%	6.23%	0.73%
Schlumberger Ltd	SLB	0.43%	2.92%	1.26%	41.04%	17.75%
Charles Schwab Corp/The	SCHW	0.26%	0.75%	0.19%	19.46%	5.08%
Sherwin-Williams Co/The	SHW	0.14%	1.01%	0.14%	10.74%	1.54%
JM Smucker Co/The	SJM	0.06%	2.56%	0.16%	4.93%	0.31%
Snap-on Inc	SNA	0.04%	1.84%	0.07%	10.85%	0.44%
AMETEK Inc	AME	0.06%	0.58%	0.04%	11.14%	0.72%
Southern Co/The	SO	0.22%	4.84%	1.05%	4.83%	1.05%
BB&T Corp	BBT	0.17%	2.79%	0.49%	9.75%	1.70%
Southwest Airlines Co	LUV	0.15%	0.90%	0.14%	8.20%	1.25%
Stanley Black & Decker Inc	SWK	0.10%	1.79%	0.18%	11.00%	1.08%
Public Storage	PSA	0.16%	3.89%	0.63%	5.47%	0.89%
SunTrust Banks Inc	STI	0.13%	1.82%	0.23%	8.56%	1.07%
Sysco Corp	SY	0.13%	2.51%	0.32%	11.22%	1.44%
Andeavor	ANDV	0.07%	2.21%	0.16%	16.80%	1.22%
Texas Instruments Inc	TXN	0.37%	2.46%	0.91%	10.53%	3.89%
Textron Inc	TXT	0.06%	0.16%	0.01%	8.78%	0.52%
Thermo Fisher Scientific Inc	TMO	0.31%	0.34%	0.11%	12.40%	3.88%
Tiffany & Co	TIF	0.05%	2.09%	0.11%	10.10%	0.55%
TJX Cos Inc/The	TJX	0.21%	1.78%	0.37%	12.44%	2.56%
Torchmark Corp	TMK	0.04%	0.76%	0.03%	7.17%	0.30%
Total System Services Inc	TSS	0.05%	0.82%	0.04%	11.00%	0.58%
Johnson Controls International plc	JCI	0.17%	2.57%	0.43%	12.50%	2.08%
Ulta Beauty Inc	ULTA	0.07%	n/a	n/a	21.83%	1.55%
Union Pacific Corp	UNP	0.38%	2.35%	0.88%	11.85%	4.45%
UnitedHealth Group Inc	UNH	0.84%	1.56%	1.32%	12.49%	10.51%
Unum Group	UNM	0.05%	1.84%	0.09%	7.00%	0.36%
Marathon Oil Corp	MRO	0.05%	1.64%	0.08%	n/a	n/a
Varian Medical Systems Inc	VAR	0.04%	n/a	n/a	7.20%	0.29%
Ventas Inc	VTR	0.11%	4.60%	0.50%	4.10%	0.45%
VF Corp	VFC	0.11%	2.70%	0.31%	7.78%	0.88%
Vornado Realty Trust	VNO	0.07%	3.02%	0.21%	-3.01%	-0.21%
Vulcan Materials Co	VMC	0.07%	0.81%	0.06%	25.27%	1.87%
Weyerhaeuser Co	WY	0.11%	3.76%	0.43%	7.40%	0.84%
Whirlpool Corp	WHR	0.06%	2.47%	0.15%	14.19%	0.84%
Williams Cos Inc/The	WMB	0.12%	3.78%	0.45%	15.50%	1.85%
WEC Energy Group Inc	WEC	0.09%	3.30%	0.30%	5.55%	0.50%
Xerox Corp	XR	0.04%	3.26%	0.12%	2.90%	0.10%
Adobe Systems Inc	ADBE	0.33%	n/a	n/a	19.56%	6.44%
AES Corp/VA	AES	0.03%	4.29%	0.14%	8.33%	0.28%
Amgen Inc	AMGN	0.58%	2.64%	1.53%	4.67%	2.70%
Apple Inc	AAPL	3.53%	1.69%	5.98%	10.49%	37.02%
Autodesk Inc	ADSK	0.11%	n/a	n/a	26.00%	2.89%
Cintas Corp	CTAS	0.06%	0.99%	0.06%	10.48%	0.68%
Comcast Corp	CMCSA	0.87%	1.56%	1.35%	11.57%	10.03%
Molson Coors Brewing Co	TAP	0.08%	1.84%	0.15%	7.09%	0.56%
KLA-Tencor Corp	KLAC	0.07%	2.33%	0.15%	2.30%	0.15%
Marriott International Inc/MD	MAR	0.18%	1.27%	0.23%	15.10%	2.71%
McCormick & Co Inc/MD	MKC	0.05%	1.97%	0.10%	9.60%	0.47%
Nordstrom Inc	JWN	0.04%	3.05%	0.11%	7.63%	0.28%
PACCAR Inc	PCAR	0.11%	1.46%	0.16%	6.73%	0.74%
Costco Wholesale Corp	COST	0.32%	1.26%	0.40%	10.28%	3.25%
Stryker Corp	SYK	0.25%	1.16%	0.29%	8.40%	2.10%
Tyson Foods Inc	TSN	0.08%	1.42%	0.12%	7.40%	0.62%
Applied Materials Inc	AMAT	0.22%	0.90%	0.20%	18.97%	4.11%
Time Warner Inc	TWX	0.36%	1.57%	0.57%	7.00%	2.53%
American Airlines Group Inc	AAL	0.11%	0.79%	0.09%	-1.26%	-0.14%

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Cardinal Health Inc	CAH	0.11%	2.39%	0.27%	8.27%	0.92%
Celgene Corp	CELG	0.48%	n/a	n/a	20.09%	9.69%
Cerner Corp	CERN	0.10%	n/a	n/a	12.70%	1.23%
Cincinnati Financial Corp	CINF	0.06%	2.63%	0.15%	n/a	n/a
DR Horton Inc	DHI	0.06%	1.12%	0.07%	12.66%	0.77%
Flowserve Corp	FLS	0.02%	1.85%	0.05%	12.68%	0.31%
Electronic Arts Inc	EA	0.16%	n/a	n/a	13.75%	2.26%
Express Scripts Holding Co	ESRX	0.16%	n/a	n/a	11.15%	1.84%
Expeditors International of Washington Inc	EXPD	0.05%	1.43%	0.07%	8.80%	0.42%
Fastenal Co	FAST	0.06%	2.98%	0.17%	15.40%	0.87%
M&T Bank Corp	MTB	0.11%	1.84%	0.21%	10.19%	1.15%
Fiserv Inc	FISV	0.12%	n/a	n/a	12.00%	1.49%
Fifth Third Bancorp	FITB	0.09%	2.10%	0.19%	4.20%	0.38%
Gilead Sciences Inc	GILD	0.45%	2.73%	1.24%	-7.44%	-3.37%
Hasbro Inc	HAS	0.06%	2.15%	0.13%	9.70%	0.58%
Huntington Bancshares Inc/OH	HBAN	0.07%	2.42%	0.16%	10.47%	0.69%
Welltower Inc	HCN	0.12%	4.74%	0.58%	4.43%	0.55%
Biogen Inc	BIIB	0.28%	n/a	n/a	6.28%	1.75%
Range Resources Corp	RRC	0.02%	0.38%	0.01%	1.85%	0.04%
Northern Trust Corp	NTRS	0.09%	1.92%	0.17%	12.36%	1.13%
Packaging Corp of America	PKG	0.05%	2.30%	0.11%	8.25%	0.39%
Paychex Inc	PAYX	0.09%	3.46%	0.33%	8.28%	0.78%
People's United Financial Inc	PBCT	0.03%	3.96%	0.11%	2.00%	0.05%
Patterson Cos Inc	PDCO	0.02%	2.49%	0.05%	5.77%	0.11%
QUALCOMM Inc	QCOM	0.36%	4.29%	1.53%	8.75%	3.13%
Roper Technologies Inc	ROP	0.11%	0.60%	0.07%	12.87%	1.39%
Ross Stores Inc	ROST	0.10%	1.16%	0.11%	13.60%	1.33%
IDEXX Laboratories Inc	IDXX	0.07%	n/a	n/a	10.85%	0.72%
AutoNation Inc	AN	0.02%	n/a	n/a	3.92%	0.08%
Starbucks Corp	SBUX	0.36%	1.85%	0.66%	17.47%	6.22%
KeyCorp	KEY	0.09%	2.11%	0.19%	10.90%	0.98%
Staples Inc	SPLS	0.03%	4.73%	0.14%	-1.00%	-0.03%
State Street Corp	STT	0.16%	1.80%	0.29%	9.05%	1.44%
US Bancorp	USB	0.40%	2.12%	0.86%	12.13%	4.89%
AO Smith Corp	AOS	0.04%	1.05%	0.04%	15.00%	0.54%
Symantec Corp	SYMC	0.09%	0.97%	0.08%	11.38%	0.98%
T Rowe Price Group Inc	TROW	0.09%	2.76%	0.25%	12.85%	1.16%
Waste Management Inc	WM	0.15%	2.26%	0.34%	10.22%	1.54%
CBS Corp	CBS	0.11%	1.09%	0.12%	12.89%	1.42%
Allergan PLC	AGN	0.39%	1.11%	0.43%	13.95%	5.38%
Whole Foods Market Inc	WFM	0.06%	1.72%	0.10%	6.53%	0.40%
Constellation Brands Inc	STZ	0.15%	1.08%	0.16%	16.36%	2.48%
Xilinx Inc	XLNX	0.07%	2.21%	0.16%	8.37%	0.60%
DENTSPLY SIRONA Inc	XRAY	0.06%	0.56%	0.04%	9.63%	0.62%
Zions Bancorporation	ZION	0.04%	1.06%	0.04%	9.00%	0.38%
Alaska Air Group Inc	ALK	0.05%	1.41%	0.07%	11.80%	0.57%
Invesco Ltd	IVZ	0.06%	3.34%	0.21%	12.29%	0.79%
Intuit Inc	INTU	0.16%	0.99%	0.16%	15.60%	2.50%
Morgan Stanley	MS	0.39%	2.13%	0.84%	16.72%	6.60%
Microchip Technology Inc	MCHP	0.08%	1.81%	0.15%	15.08%	1.28%
Chubb Ltd	CB	0.31%	1.94%	0.60%	10.00%	3.10%
Hologic Inc	HOLX	0.06%	n/a	n/a	11.52%	0.65%
Chesapeake Energy Corp	CHK	0.02%	n/a	n/a	-13.51%	-0.28%
Citizens Financial Group Inc	CFG	0.08%	2.05%	0.17%	21.44%	1.73%
O'Reilly Automotive Inc	ORLY	0.08%	n/a	n/a	15.27%	1.25%
Allstate Corp/The	ALL	0.15%	1.63%	0.25%	9.00%	1.36%
FLIR Systems Inc	FLIR	0.02%	1.61%	0.04%	n/a	n/a
Equity Residential	EQR	0.11%	2.96%	0.34%	9.55%	1.09%
BorgWarner Inc	BWA	0.04%	1.20%	0.05%	5.48%	0.25%
Newfield Exploration Co	NFX	0.03%	n/a	n/a	12.19%	0.32%
Incyte Corp	INCY	0.12%	n/a	n/a	47.75%	5.93%
Simon Property Group Inc	SPG	0.23%	4.42%	0.99%	6.22%	1.40%
Eastman Chemical Co	EMN	0.06%	2.45%	0.14%	7.43%	0.41%
AvalonBay Communities Inc	AVB	0.12%	2.95%	0.36%	6.91%	0.83%
Prudential Financial Inc	PRU	0.22%	2.65%	0.59%	10.93%	2.42%
United Parcel Service Inc	UPS	0.35%	3.01%	1.04%	9.13%	3.15%
Apartment Investment & Management Co	AIV	0.03%	3.16%	0.10%	19.33%	0.63%
Walgreens Boots Alliance Inc	WBA	0.39%	1.98%	0.78%	9.35%	3.67%
McKesson Corp	MCK	0.15%	0.84%	0.13%	5.38%	0.83%
Lockheed Martin Corp	LMT	0.38%	2.49%	0.95%	9.37%	3.59%
AmerisourceBergen Corp	ABC	0.09%	1.56%	0.15%	9.58%	0.89%
Capital One Financial Corp	COF	0.19%	1.86%	0.35%	6.89%	1.31%
Waters Corp	WAT	0.06%	n/a	n/a	8.28%	0.52%
Dollar Tree Inc	DLTR	0.08%	n/a	n/a	17.10%	1.33%
Darden Restaurants Inc	DRI	0.05%	3.00%	0.14%	10.05%	0.48%
NetApp Inc	NTAP	0.05%	1.84%	0.10%	8.49%	0.46%
Citrix Systems Inc	CTXS	0.05%	n/a	n/a	14.48%	0.79%
Goodyear Tire & Rubber Co/The	GT	0.04%	1.27%	0.05%	n/a	n/a
DXC Technology Co	DXC	0.10%	0.92%	0.09%	n/a	n/a
DaVita Inc	DVA	0.06%	n/a	n/a	8.73%	0.50%
Hartford Financial Services Group Inc/The	HIG	0.09%	1.67%	0.15%	9.50%	0.87%
Iron Mountain Inc	IRM	0.04%	6.04%	0.26%	14.60%	0.64%
Estee Lauder Cos Inc/The	EL	0.10%	1.37%	0.14%	10.54%	1.06%
Principal Financial Group Inc	PFG	0.09%	2.82%	0.25%	9.37%	0.82%
Stericycle Inc	SRCL	0.03%	n/a	n/a	8.14%	0.24%
Universal Health Services Inc	UHS	0.05%	0.36%	0.02%	9.13%	0.41%
E*TRADE Financial Corp	ETFC	0.05%	n/a	n/a	15.37%	0.79%
Skyworks Solutions Inc	SWKS	0.09%	1.22%	0.11%	13.59%	1.19%
National Oilwell Varco Inc	NOV	0.06%	0.61%	0.03%	n/a	n/a
Quest Diagnostics Inc	DGX	0.07%	1.66%	0.11%	9.13%	0.61%
Activision Blizzard Inc	ATVI	0.21%	0.49%	0.10%	10.69%	2.27%

## STANDARD AND POOR'S 500 INDEX

Name	Ticker	[12]	[13]	[14]	[15]	[16]
		Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
Rockwell Automation Inc	ROK	0.10%	1.84%	0.18%	11.37%	1.10%
Kraft Heinz Co/The	KHC	0.48%	2.74%	1.33%	8.39%	4.07%
American Tower Corp	AMT	0.27%	1.88%	0.50%	20.11%	5.36%
Regeneron Pharmaceuticals Inc	REGN	0.23%	n/a	n/a	18.96%	4.43%
Amazon.com Inc	AMZN	2.16%	n/a	n/a	26.27%	56.76%
Ralph Lauren Corp	RL	0.02%	2.64%	0.05%	0.59%	0.01%
Boston Properties Inc	BXP	0.08%	2.48%	0.21%	5.21%	0.44%
Amphenol Corp	APH	0.11%	0.99%	0.11%	10.00%	1.07%
Arconic Inc	ARNC	0.05%	0.97%	0.05%	16.90%	0.84%
Pioneer Natural Resources Co	PXD	0.13%	0.05%	0.01%	15.00%	1.89%
Valero Energy Corp	VLO	0.14%	4.06%	0.57%	10.30%	1.45%
Synopsys Inc	SNPS	0.05%	n/a	n/a	9.03%	0.47%
L3 Technologies Inc	LLL	0.06%	1.71%	0.11%	6.57%	0.41%
Western Union Co/The	WU	0.04%	3.54%	0.15%	7.50%	0.32%
CH Robinson Worldwide Inc	CHRW	0.04%	2.74%	0.12%	9.20%	0.39%
Accenture PLC	ACN	0.36%	1.88%	0.68%	9.75%	3.53%
TransDigm Group Inc	TDG	0.07%	n/a	n/a	8.32%	0.56%
Yum! Brands Inc	YUM	0.12%	1.59%	0.19%	12.62%	1.51%
Prologis Inc	PLD	0.15%	2.89%	0.42%	5.84%	0.86%
FirstEnergy Corp	FE	0.06%	4.51%	0.29%	-2.00%	-0.13%
VeriSign Inc	VRSN	0.05%	n/a	n/a	10.20%	0.47%
Quanta Services Inc	PWR	0.02%	n/a	n/a	16.80%	0.38%
Henry Schein Inc	HSIC	0.07%	n/a	n/a	10.61%	0.70%
Ameren Corp	AEE	0.06%	3.14%	0.19%	5.60%	0.35%
ANSYS Inc	ANSS	0.05%	n/a	n/a	12.20%	0.62%
Scripps Networks Interactive Inc	SNI	0.04%	1.37%	0.05%	7.45%	0.28%
NVIDIA Corp	NVDA	0.44%	0.34%	0.15%	9.56%	4.21%
Sealed Air Corp	SEE	0.04%	1.47%	0.06%	10.57%	0.41%
Cognizant Technology Solutions Corp	CTSH	0.19%	0.87%	0.16%	14.43%	2.68%
Intuitive Surgical Inc	ISRG	0.16%	n/a	n/a	10.05%	1.59%
Affiliated Managers Group Inc	AMG	0.05%	0.43%	0.02%	15.79%	0.76%
Aetna Inc	AET	0.23%	1.30%	0.30%	11.70%	2.73%
Republic Services Inc	RSG	0.10%	2.15%	0.21%	11.46%	1.13%
eBay Inc	EBAY	0.17%	n/a	n/a	8.05%	1.40%
Goldman Sachs Group Inc/The	GS	0.40%	1.33%	0.54%	7.96%	3.22%
Sempra Energy	SRE	0.13%	2.91%	0.38%	10.67%	1.38%
Moody's Corp	MCO	0.11%	1.15%	0.13%	8.00%	0.92%
Priceline Group Inc/The	PCLN	0.45%	n/a	n/a	16.75%	7.60%
F5 Networks Inc	FFIV	0.03%	n/a	n/a	12.48%	0.44%
Akamai Technologies Inc	AKAM	0.04%	n/a	n/a	13.72%	0.51%
Devon Energy Corp	DVN	0.08%	0.72%	0.06%	31.37%	2.50%
Alphabet Inc	GOOGL	1.28%	n/a	n/a	16.64%	21.34%
Red Hat Inc	RHT	0.08%	n/a	n/a	16.93%	1.35%
Allegion PLC	ALLE	0.04%	0.79%	0.03%	12.58%	0.44%
Netflix Inc	NFLX	0.36%	n/a	n/a	40.60%	14.50%
Agilent Technologies Inc	A	0.09%	0.88%	0.08%	9.00%	0.79%
Anthem Inc	ANTM	0.22%	1.50%	0.33%	9.81%	2.18%
CME Group Inc	CME	0.19%	2.15%	0.41%	10.47%	1.99%
Juniper Networks Inc	JNPR	0.05%	1.43%	0.07%	9.46%	0.46%
BlackRock Inc	BLK	0.31%	2.34%	0.74%	13.60%	4.27%
DTE Energy Co	DTE	0.09%	3.08%	0.27%	5.35%	0.47%
Nasdaq Inc	NDAQ	0.06%	2.04%	0.11%	9.82%	0.55%
Philip Morris International Inc	PM	0.83%	3.56%	2.94%	9.67%	7.98%
salesforce.com Inc	CRM	0.29%	n/a	n/a	27.90%	8.21%
MetLife Inc	MET	0.27%	2.91%	0.78%	10.51%	2.83%
Under Armour Inc	UA	0.02%	n/a	n/a	11.28%	0.21%
Monsanto Co	MON	0.23%	1.85%	0.43%	10.20%	2.38%
Coach Inc	COH	0.06%	2.86%	0.17%	12.23%	0.74%
Fluor Corp	FLR	0.03%	1.93%	0.05%	13.29%	0.37%
CSX Corp	CSX	0.21%	1.62%	0.33%	11.06%	2.27%
Edwards Lifesciences Corp	EW	0.11%	n/a	n/a	16.68%	1.85%
Ameriprise Financial Inc	AMP	0.10%	2.29%	0.23%	6.40%	0.63%
Xcel Energy Inc	XEL	0.11%	3.04%	0.33%	5.90%	0.65%
Rockwell Collins Inc	COL	0.08%	1.24%	0.10%	10.91%	0.86%
TechnipFMC PLC	FTI	0.06%	n/a	n/a	10.23%	0.62%
Zimmer Biomet Holdings Inc	ZBH	0.11%	0.79%	0.09%	8.26%	0.92%
CBRE Group Inc	CBG	0.06%	n/a	n/a	9.35%	0.55%
Mastercard Inc	MA	0.61%	0.69%	0.42%	15.38%	9.39%
Signet Jewelers Ltd	SIG	0.02%	2.03%	0.04%	2.90%	0.06%
CarMax Inc	KMX	0.06%	n/a	n/a	13.89%	0.77%
Intercontinental Exchange Inc	ICE	0.18%	1.20%	0.22%	12.74%	2.29%
Fidelity National Information Services Inc	FIS	0.14%	1.27%	0.17%	12.00%	1.65%
Chipotle Mexican Grill Inc	CMG	0.04%	n/a	n/a	50.88%	2.27%
Wynn Resorts Ltd	WYNN	0.06%	1.55%	0.09%	19.95%	1.20%
Assurant Inc	AIZ	0.03%	2.01%	0.05%	21.41%	0.56%
NRG Energy Inc	NRG	0.04%	0.49%	0.02%	-9.00%	-0.32%
Monster Beverage Corp	MNST	0.14%	n/a	n/a	20.30%	2.77%
Regions Financial Corp	RF	0.08%	2.47%	0.20%	13.86%	1.11%
Mosaic Co/The	MOS	0.04%	2.49%	0.10%	16.35%	0.63%
Expedia Inc	EXPE	0.10%	0.77%	0.08%	17.98%	1.78%
Discovery Communications Inc	DISCA	0.02%	n/a	n/a	10.45%	0.18%
CF Industries Holdings Inc	CF	0.03%	4.09%	0.13%	6.00%	0.19%
Viacom Inc	VIAB	0.06%	2.29%	0.13%	2.13%	0.12%
Wyndham Worldwide Corp	WYN	0.05%	2.22%	0.11%	13.90%	0.69%
Alphabet Inc	GOOG	1.47%	n/a	n/a	16.64%	24.51%
TE Connectivity Ltd	TEL	0.13%	1.99%	0.26%	6.87%	0.89%
Cooper Cos Inc/The	COO	0.05%	0.02%	0.00%	11.20%	0.61%
Discover Financial Services	DFS	0.10%	2.30%	0.24%	6.19%	0.64%
TripAdvisor Inc	TRIP	0.02%	n/a	n/a	15.14%	0.35%
Dr Pepper Snapple Group Inc	DPS	0.08%	2.55%	0.19%	8.58%	0.65%
Visa Inc	V	0.83%	0.66%	0.55%	17.50%	14.51%

## STANDARD AND POOR'S 500 INDEX

Name	Ticker	[12]	[13]	[14]	[15]	[16]
		Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
Mid-America Apartment Communities Inc	MAA	0.05%	3.36%	0.18%	n/a	n/a
Xylem Inc/NY	XYL	0.05%	1.27%	0.06%	12.10%	0.56%
Marathon Petroleum Corp	MPC	0.13%	2.86%	0.38%	11.96%	1.58%
Level 3 Communications Inc	LVT	0.10%	n/a	n/a	5.00%	0.48%
Tractor Supply Co	TSCO	0.03%	1.92%	0.06%	14.90%	0.49%
ResMed Inc	RMD	0.05%	1.71%	0.09%	10.44%	0.52%
Mettler-Toledo International Inc	MTD	0.07%	n/a	n/a	12.08%	0.81%
Albemarle Corp	ALB	0.06%	1.11%	0.06%	11.70%	0.68%
Essex Property Trust Inc	ESS	0.08%	2.67%	0.21%	7.48%	0.59%
GGP Inc	GGP	0.09%	3.89%	0.35%	5.84%	0.53%
Realty Income Corp	O	0.07%	4.45%	0.32%	4.90%	0.35%
Seagate Technology PLC	STX	0.04%	7.65%	0.34%	8.73%	0.39%
WestRock Co	WRK	0.07%	2.79%	0.18%	8.50%	0.56%
IHS Markit Ltd	INFO	0.08%	n/a	n/a	14.21%	1.20%
Western Digital Corp	WDC	0.11%	2.35%	0.27%	15.74%	1.78%
Church & Dwight Co Inc	CHD	0.06%	1.42%	0.09%	8.77%	0.53%
Duke Realty Corp	DRE	0.05%	2.66%	0.12%	4.52%	0.21%
Federal Realty Investment Trust	FRT	0.04%	3.02%	0.13%	7.83%	0.34%
MGM Resorts International	MGM	0.09%	1.34%	0.12%	14.79%	1.27%
Twenty-First Century Fox Inc	FOX	0.10%	1.25%	0.13%	9.39%	0.98%
Alliant Energy Corp	LNT	0.04%	3.11%	0.13%	5.65%	0.24%
JB Hunt Transport Services Inc	JBHT	0.05%	1.01%	0.05%	13.35%	0.60%
Lam Research Corp	LRCX	0.12%	1.13%	0.13%	12.46%	1.46%
Mohawk Industries Inc	MHK	0.08%	n/a	n/a	8.18%	0.69%
Pentair PLC	PNR	0.05%	2.19%	0.11%	5.78%	0.30%
Vertex Pharmaceuticals Inc	VRTX	0.17%	n/a	n/a	72.93%	12.71%
Facebook Inc	FB	1.83%	n/a	n/a	26.79%	48.92%
United Rentals Inc	URI	0.05%	n/a	n/a	14.17%	0.65%
Alexandria Real Estate Equities Inc	ARE	0.05%	2.84%	0.14%	7.10%	0.36%
United Continental Holdings Inc	UAL	0.09%	n/a	n/a	4.37%	0.41%
Navient Corp	NAVI	0.02%	4.34%	0.08%	8.00%	0.15%
Delta Air Lines Inc	DAL	0.16%	1.64%	0.27%	6.93%	1.13%
News Corp	NWS	0.01%	1.36%	0.02%	9.90%	0.13%
Centene Corp	CNC	0.06%	n/a	n/a	12.90%	0.80%
Regency Centers Corp	REG	0.05%	3.20%	0.16%	9.14%	0.47%
Macerich Co/The	MAC	0.04%	4.95%	0.18%	4.12%	0.15%
Martin Marietta Materials Inc	MLM	0.06%	0.74%	0.05%	21.71%	1.41%
Envision Healthcare Corp	EVHC	0.03%	n/a	n/a	8.06%	0.24%
PayPal Holdings Inc	PYPL	0.32%	n/a	n/a	19.44%	6.23%
Coty Inc	COTY	0.07%	2.44%	0.17%	2.01%	0.14%
DISH Network Corp	DISH	0.07%	n/a	n/a	-3.60%	-0.24%
Alexion Pharmaceuticals Inc	ALXN	0.14%	n/a	n/a	20.04%	2.80%
Everest Re Group Ltd	RE	0.05%	1.91%	0.09%	10.00%	0.49%
News Corp	NWSA	0.02%	1.40%	0.03%	9.90%	0.25%
Global Payments Inc	GPN	0.07%	0.06%	0.00%	13.50%	0.88%
Crown Castle International Corp	CCI	0.19%	3.78%	0.70%	21.20%	3.94%
Delphi Automotive PLC	DLPH	0.11%	1.28%	0.14%	11.88%	1.31%
Advance Auto Parts Inc	AAP	0.04%	0.21%	0.01%	12.75%	0.48%
Michael Kors Holdings Ltd	KORS	0.03%	n/a	n/a	4.25%	0.11%
Align Technology Inc	ALGN	0.06%	n/a	n/a	29.87%	1.83%
Illumina Inc	ILMN	0.12%	n/a	n/a	14.57%	1.68%
Acuity Brands Inc	AYI	0.04%	0.26%	0.01%	17.67%	0.69%
Alliance Data Systems Corp	ADS	0.06%	0.86%	0.05%	10.00%	0.61%
LKQ Corp	LKQ	0.05%	n/a	n/a	12.50%	0.61%
Nielsen Holdings PLC	NLSN	0.07%	3.16%	0.22%	10.00%	0.70%
Garmin Ltd	GRMN	0.04%	4.06%	0.17%	5.70%	0.25%
Cimarex Energy Co	XEC	0.04%	0.32%	0.01%	15.00%	0.64%
Zoetis Inc	ZTS	0.14%	0.67%	0.09%	13.43%	1.88%
Digital Realty Trust Inc	DLR	0.09%	3.23%	0.27%	5.49%	0.47%
Equinix Inc	EQIX	0.16%	1.77%	0.28%	40.67%	6.50%
Discovery Communications Inc	DISCK	0.02%	n/a	n/a	10.45%	0.25%

## Notes:

[9] Equals sum of Col. [14]

[10] Equals sum of Col. [16]

[11] Equals ([9] x (1 + (0.5 x [10]))) + [10]

[12] Equals weight in S&amp;P 500 based on market capitalization

[13] Source: Bloomberg Professional, as of July 31, 2017

[14] Equals [12] x [13]

[15] Source: Bloomberg Professional, as of July 31, 2017

[16] Equals [12] x [15]

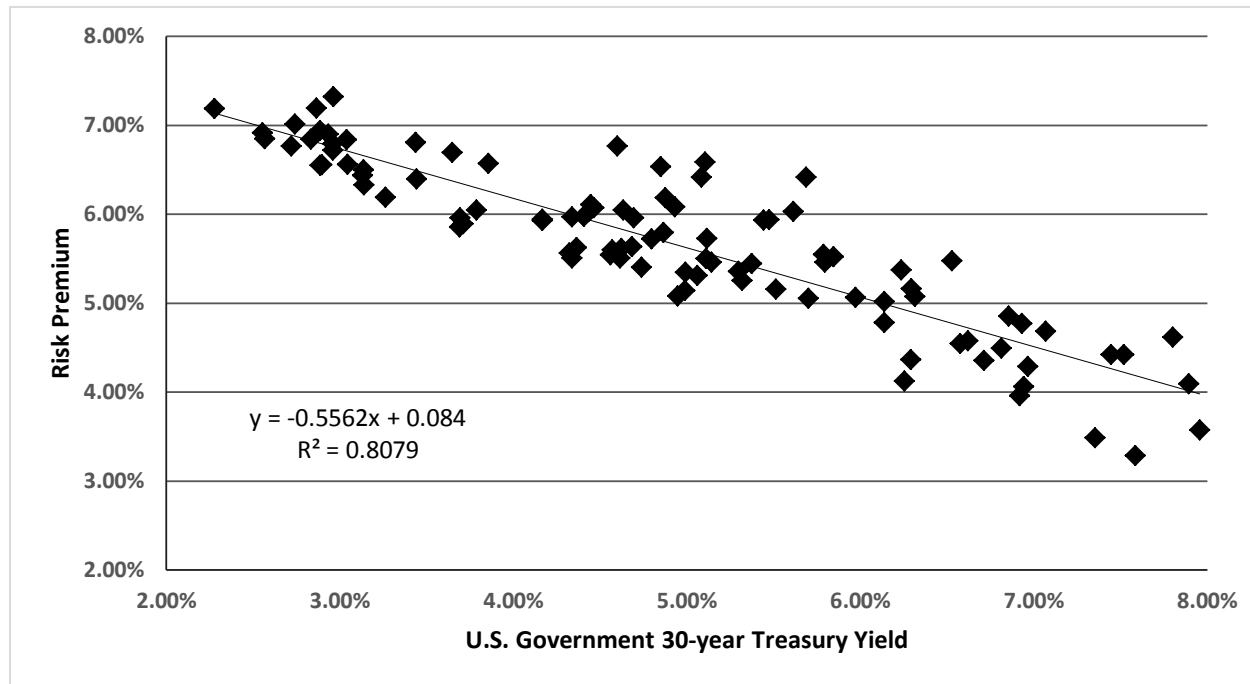
## BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
	Average Authorized Gas ROE	U.S. Govt. 30- Year Treasury	Risk Premium
1992.1	12.42%	7.80%	4.62%
1992.2	11.98%	7.89%	4.09%
1992.3	11.87%	7.45%	4.42%
1992.4	11.94%	7.52%	4.42%
1993.1	11.75%	7.07%	4.68%
1993.2	11.71%	6.86%	4.85%
1993.3	11.39%	6.31%	5.07%
1993.4	11.16%	6.14%	5.02%
1994.1	11.12%	6.57%	4.55%
1994.2	10.84%	7.35%	3.48%
1994.3	10.87%	7.58%	3.28%
1994.4	11.53%	7.96%	3.57%
1995.2	11.00%	6.94%	4.06%
1995.3	11.07%	6.71%	4.35%
1995.4	11.61%	6.23%	5.37%
1996.1	11.45%	6.29%	5.16%
1996.2	10.88%	6.92%	3.96%
1996.3	11.25%	6.96%	4.29%
1996.4	11.19%	6.62%	4.58%
1997.1	11.31%	6.81%	4.49%
1997.2	11.70%	6.93%	4.77%
1997.3	12.00%	6.53%	5.47%
1997.4	10.92%	6.14%	4.78%
1998.2	11.37%	5.85%	5.52%
1998.3	11.41%	5.47%	5.94%
1998.4	11.69%	5.10%	6.59%
1999.1	10.82%	5.37%	5.44%
1999.2	11.25%	5.79%	5.46%
1999.4	10.38%	6.25%	4.12%
2000.1	10.66%	6.29%	4.36%
2000.2	11.03%	5.97%	5.06%
2000.3	11.33%	5.79%	5.55%
2000.4	12.10%	5.69%	6.41%
2001.1	11.38%	5.44%	5.93%
2001.2	10.75%	5.70%	5.05%
2001.4	10.65%	5.30%	5.35%
2002.1	10.67%	5.51%	5.15%
2002.2	11.64%	5.61%	6.03%
2002.3	11.50%	5.08%	6.42%
2002.4	11.01%	4.93%	6.08%
2003.1	11.38%	4.85%	6.53%
2003.2	11.36%	4.60%	6.76%
2003.3	10.61%	5.11%	5.50%
2003.4	10.84%	5.11%	5.73%
2004.1	11.06%	4.88%	6.18%
2004.2	10.57%	5.32%	5.25%
2004.3	10.37%	5.06%	5.31%
2004.4	10.66%	4.86%	5.79%
2005.1	10.65%	4.69%	5.96%
2005.2	10.54%	4.47%	6.07%
2005.3	10.47%	4.44%	6.03%
2005.4	10.32%	4.68%	5.63%
2006.1	10.68%	4.63%	6.05%
2006.2	10.60%	5.14%	5.46%
2006.3	10.34%	4.99%	5.34%
2006.4	10.14%	4.74%	5.40%
2007.1	10.52%	4.80%	5.72%
2007.2	10.13%	4.99%	5.14%
2007.3	10.03%	4.95%	5.08%
2007.4	10.12%	4.61%	5.50%
2008.1	10.38%	4.41%	5.97%
2008.2	10.17%	4.57%	5.60%
2008.3	10.55%	4.44%	6.11%
2008.4	10.34%	3.65%	6.69%
2009.1	10.24%	3.44%	6.81%
2009.2	10.11%	4.17%	5.94%
2009.3	9.88%	4.32%	5.56%
2009.4	10.31%	4.34%	5.97%



## BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
	Average Authorized Gas ROE	U.S. Govt. 30- Year Treasury	Risk Premium
2010.1	10.24%	4.62%	5.61%
2010.2	9.99%	4.36%	5.62%
2010.3	10.43%	3.86%	6.57%
2010.4	10.09%	4.17%	5.93%
2011.1	10.10%	4.56%	5.54%
2011.2	9.85%	4.34%	5.51%
2011.3	9.65%	3.69%	5.96%
2011.4	9.88%	3.04%	6.84%
2012.1	9.63%	3.14%	6.50%
2012.2	9.83%	2.93%	6.90%
2012.3	9.75%	2.74%	7.01%
2012.4	10.06%	2.86%	7.19%
2013.1	9.57%	3.13%	6.44%
2013.2	9.47%	3.14%	6.33%
2013.3	9.60%	3.71%	5.89%
2013.4	9.83%	3.79%	6.04%
2014.1	9.54%	3.69%	5.85%
2014.2	9.84%	3.44%	6.39%
2014.3	9.45%	3.26%	6.19%
2014.4	10.28%	2.96%	7.32%
2015.1	9.47%	2.55%	6.91%
2015.2	9.43%	2.88%	6.55%
2015.3	9.75%	2.96%	6.79%
2015.4	9.68%	2.96%	6.72%
2016.1	9.48%	2.72%	6.76%
2016.2	9.42%	2.57%	6.85%
2016.3	9.47%	2.28%	7.19%
2016.4	9.67%	2.83%	6.84%
2017.1	9.60%	3.04%	6.56%
2017.2	9.45%	2.90%	6.55%
2017.3	9.83%	2.88%	6.94%
AVERAGE	10.59%	4.92%	5.67%
MEDIAN	10.55%	4.86%	5.72%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.898828
R Square	0.807892
Adjusted R Square	0.805912
Standard Error	0.004008
Observations	99

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.006552	0.006552	407.92	0.000000
Residual	97	0.001558	0.000016		
Total	98	0.008110			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.0840	0.001413	59.46	0.00000000	0.081241	0.086851	0.081241	0.086851
U.S. Govt. 30-Year Treasury	(0.5562)	0.027539	(20.20)	0.00000000	(0.610877)	(0.501560)	(0.610877)	(0.501560)

	[7]	[8]	[9]
	U.S. Govt. 30-year Treasury	Risk Premium	ROE
Current 30-Day Average [4]	2.84%	6.82%	9.67%
Blue Chip Consensus Forecast (Q4 2017 - Q4 2018) [5]	3.42%	6.50%	9.92%
Blue Chip Consensus Forecast (2019 - 2023) [6]	4.30%	6.01%	10.31%
AVERAGE		6.45%	9.97%

Notes:

- [1] Source: Regulatory Research Associates, accessed August 9, 2017
- [2] Source: Bloomberg Professional, quarterly bond yields are the average of each trading day in the quarter
- [3] Equals Column [1] - Column [2]
- [4] Source: Bloomberg Professional, 30-day average as of July 31, 2017
- [5] Source: Blue Chip Financial Forecasts, Vol. 36, No. 8, August 1, 2017, at 2
- [6] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14
- [7] See notes [4], [5] & [6]
- [8] Equals  $0.0840 + (-0.5562 \times \text{Column [7]})$
- [9] Equals Column [7] + Column [8]

## SIZE PREMIUM CALCULATION

## Proxy Group Market Capitalization and Market-to-Book Ratio

Company	Ticker	[1]	[2]
		Market Capitalization (\$ billions)	Market-to-Book Ratio
Atmos Energy Corporation	ATO	8.88	2.30
New Jersey Resources Corporation	NJR	3.53	2.74
NiSource Inc.	NI	8.36	2.02
Northwest Natural Gas Company	NWN	1.75	2.02
ONE Gas Inc.	OGS	3.71	1.91
South Jersey Industries, Inc.	SJI	2.71	2.10
Southwest Gas Corporation	SWX	3.65	2.13
Spire, Inc.	SR	3.41	1.69
Average		4.50	2.11
Median		3.59	2.06

Minnesota Energy Resources Corporation	
Common Equity (\$ millions) [3]	152.3
Implied Market Capitalization [4]	314.2
As a percent of Proxy Group Median Market Capitalization	8.76%

## Duff &amp; Phelps 2017 Valuation Hand Book -- Size Premium

Breakdown of Deciles 1-10	[5]	[6]
	Market Capitalization of Largest Company (\$ millions)	Size Premium
1-Largest	609,163.5	-0.35%
2	24,233.7	0.61%
3	10,711.2	0.89%
4	5,676.7	0.98%
5	3,512.9	1.51%
6	2,390.9	1.66%
7	1,570.0	1.72%
8	1,030.4	2.08%
9	567.8	2.68%
10-Smallest	262.9	5.59%
Minnesota Energy Resources Corporation - Implied Market Capitalization	314.2	2.68%
Proxy Group Median Market Capitalization	3,586.3	0.98%
Size Premium [7]		1.70%

## Notes:

[1] Source: Bloomberg Professional; equals 30-day average as of July 31, 2017

[2] Source: Bloomberg Professional; equals 30-day average as of July 31, 2017

[3] Docket No. G011/GR17-563, Direct Testimony of Lisa J. Gast, at 13 (Table 2).

[4] Equals [3] x proxy group median market-to-book ratio

[5] Duff & Phelps 2017 Valuation Hand Book – U.S. Guide to Cost of Capital Exhibit 7.2.

[6] Duff & Phelps 2017 Valuation Hand Book – U.S. Guide to Cost of Capital Exhibit 4.7.

[7] Equals 2.68% – 0.98%

2018-2021 CAPITAL EXPENDITURES AS A PERCENT OF 2016 NET PLANT  
(\$ Millions)

		[1]	[2]	[3]	[4]	[5]	[6]
		2016	2018	2019	2020	2021	2018-21 Cap. Ex. / 2016 Net Plant
Atmos Energy Corporation	ATO						
Capital Spending per Share			\$11.35	\$12.05	\$12.75	\$12.75	
Common Shares Outstanding			110.00	115.00	120.00	120.00	
Capital Expenditures			\$1,248.5	\$1,385.8	\$1,530.0	\$1,530.0	68.77%
Net Plant		\$8,280.5					
New Jersey Resources Corporation	NJR						
Capital Spending per Share			\$2.20	\$2.30	\$2.40	\$2.40	
Common Shares Outstanding			86.00	86.00	86.00	86.00	
Capital Expenditures			\$189.2	\$197.8	\$206.4	\$206.4	33.22%
Net Plant		\$2,407.7					
NiSource Inc.	NI						
Capital Spending per Share			\$4.90	\$5.18	\$5.45	\$5.45	
Common Shares Outstanding			325.00	327.50	330.00	330.00	
Capital Expenditures			\$1,592.5	\$1,694.8	\$1,798.5	\$1,798.5	52.68%
Net Plant		\$13,068.0					
Northwest Natural Gas Company	NWN						
Capital Spending per Share			\$6.45	\$6.40	\$6.35	\$6.35	
Common Shares Outstanding			29.50	29.75	30.00	30.00	
Capital Expenditures			\$190.3	\$190.4	\$190.5	\$190.5	33.69%
Net Plant		\$2,260.9					
ONE Gas Inc.	OGS						
Capital Spending per Share			\$6.90	\$6.88	\$6.85	\$6.85	
Common Shares Outstanding			52.50	53.75	55.00	55.00	
Capital Expenditures			\$362.3	\$369.5	\$376.8	\$376.8	39.80%
Net Plant		\$3,731.6					
South Jersey Industries, Inc.	SJI						
Capital Spending per Share			\$3.60	\$4.43	\$5.25	\$5.25	
Common Shares Outstanding			83.00	84.50	86.00	86.00	
Capital Expenditures			\$298.8	\$373.9	\$451.5	\$451.5	60.05%
Net Plant		\$2,623.8					
Southwest Gas Corporation	SWX						
Capital Spending per Share			\$11.75	\$12.85	\$13.95	\$13.95	
Common Shares Outstanding			49.00	50.50	52.00	52.00	
Capital Expenditures			\$575.8	\$648.9	\$725.4	\$725.4	64.75%
Net Plant		\$4,132.0					
Spire, Inc.	SR						
Capital Spending per Share			\$6.90	\$7.00	\$7.10	\$7.10	
Common Shares Outstanding			48.50	49.25	50.00	50.00	
Capital Expenditures			\$334.7	\$344.8	\$355.0	\$355.0	42.09%
Net Plant		\$3,300.9					
Minnesota Energy Resources Company	MERC						
Capital Expenditures [7]			\$66.6	\$66.6	\$66.6	\$66.6	91.56%
Net Plant [8]		\$291.0					
							MERC CapEx Total (2018 - 2021)
							\$266.4
							MERC CapEx Annual Average
							\$66.6
							Proxy Group Median
							47.4%
							MERC as % Proxy Group Median
							1.93

## Notes:

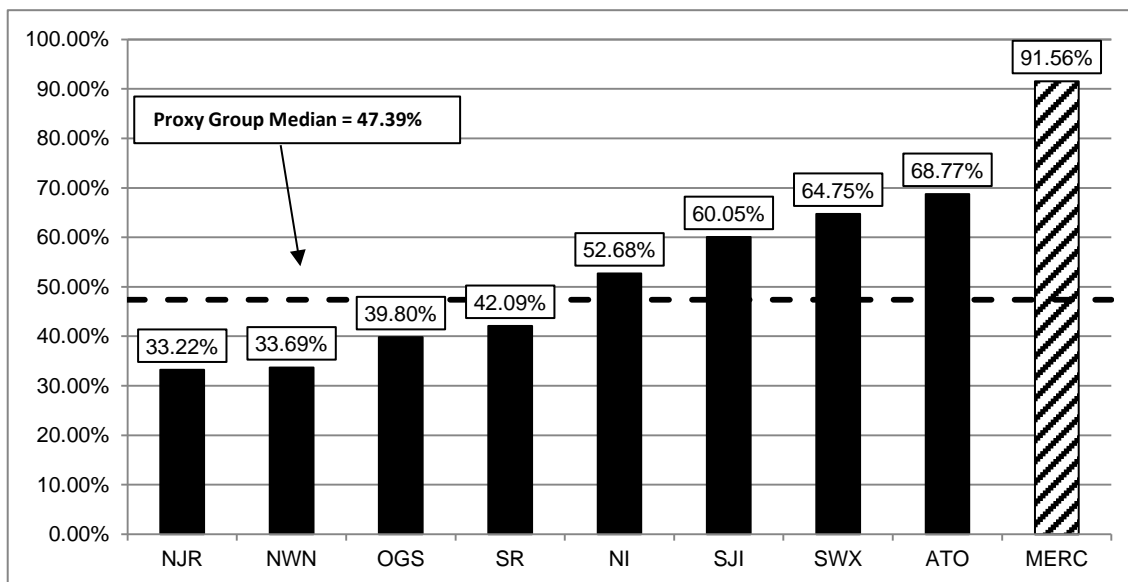
[1] - [5] Source: Value Line, dated June 2, 2017

[6] Equals (Column [2] + [3] + [4] + [5]) / Column [1]

[7] Docket No. G011/GR17-563, Direct Testimony of Mary L. Wolter, at 9.

[8] From MERC 2016 Gas Jurisdictional Annual Report

2018-2021 CAPITAL EXPENDITURES AS A PERCENT OF 2016 NET PLANT



Projected CAPEX / 2016 Net Plant

Company	2018-2021
New Jersey Resources Corporation	NJR 33.22%
Northwest Natural Gas Company	NWN 33.69%
ONE Gas Inc.	OGS 39.80%
Spire, Inc.	SR 42.09%
NiSource Inc.	NI 52.68%
South Jersey Industries, Inc.	SJI 60.05%
Southwest Gas Corporation	SWX 64.75%
Atmos Energy Corporation	ATO 68.77%
Minnesota Energy Resources Company	MERC 91.56%
Proxy Group Median	47.39%
MERC/Proxy Group	1.93

Notes:

Source: Schedule-12 page 1 col. [6]

NON-VOLUMETRIC RATE DESIGN & CAPITAL TRACKING MECHANISMS

Proxy Group Company	Ticker	Utility	State	[1]	[2]	[3]	[4]	[5]
				Non-Volumetric Rate Design				
				Rate Stabilization Tariff	Revenue Decoupling Mechanism	Straight Fixed-Variable Rate Design	Non-Volumetric Rate Design	Capital Tracking Mechanism
Atmos Energy Corporation	ATO	Atmos Energy Corporation	CO	N	N	N	N	Y
		Atmos Energy Corporation	KS	N	N	N	N	Y
		Atmos Energy Corporation	KY	N	N	N	N	Y
		Atmos Energy Corporation	LA	Y	N	N	Y	N
		Atmos Energy Corporation	MS	Y	N	N	Y	Y
		Atmos Energy Corporation	TN	Y	N	N	Y	Y
		Atmos Energy Corporation	TX	Y	N	N	Y	Y
		Atmos Energy Corporation	VA	N	N	N	N	Y
New Jersey Resources Corporation	NJR	New Jersey Natural Gas Company	NJ	N	Y	N	Y	Y
NiSource Inc.	NI	Northern Indiana Public Service Company	IN	N	N	N	N	Y
		Columbia Gas of Kentucky	KY	N	N	N	N	Y
		Columbia Gas of Maryland	MD	N	Y	N	Y	Y
		Bay State Gas Company d/b/a Columbia Gas of Massachusetts	MA	N	Y	N	Y	Y
		Columbia Gas of Ohio	OH	N	N	Y	Y	Y
		Columbia Gas of Pennsylvania	PA	N	N	N	N	Y
		Columbia Gas of Virginia	VA	N	Y	N	Y	Y
		Northwest Natural Gas Company	NWN	Northwest Natural Gas Company	OR	N	Y	N
Northwest Natural Gas Company	WA	N		N	N	N	Y	
One Gas, Inc.	OGS	Oklahoma Natural Gas Company	OK	Y	N	Y	Y	N
		Kansas Gas Service Company	KS	N	N	N	N	Y
		Texas Gas Service Company	TX	N	N	Y	Y	Y
South Jersey Industries, Inc.	SJI	South Jersey Gas Company	NJ	N	Y	N	Y	Y
Southwest Gas Corporation	SWX	Southwest Gas Corporation	AZ	N	Y	N	Y	Limited
		Southwest Gas Corporation	CA	N	Y	N	Y	Y
		Southwest Gas Corporation	NV	N	Y	N	Y	Y
Spire, Inc.	SR	Alabama Gas Corporation	AL	Y	N	N	Y	Y
		Missouri Gas Energy	MO	N	N	Y	Y	Y
		Laclede Gas [6]	MO	N	N	Y	Y	Y
		Mobile Gas	AL	Y	N	N	Y	Y
		Wilmot Gas	MS	N	N	N	N	N
Total Number of Jurisdictions (Y)							20	26
Total Number of Jurisdictions							30	30
Percent of Jurisdictions							66.7%	86.7%

Notes:

- [1] Source: American Gas Association, Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms: Current List, December 2016.
- [2] Source: American Gas Association, Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms: Current List, December 2016.
- [3] Source: American Gas Association, Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms: Current List, December 2016.
- [4] Identifies companies with either a formula rate plan, revenue decoupling mechanism or straight fixed-variable rate design.
- [5] Source: American Gas Association, Innovative Rates, Non-Volumetric Rates, and Tracking Mechanisms: Current List, December 2016.
- [6] Laclede Gas has a rate structure that is similar to straight fixed-variable rate design.

## CAPITAL STRUCTURE ANALYSIS

COMMON EQUITY RATIO - Weighted Operating Subsidiaries

Proxy Group	Ticker	2016
Atmos Energy Corporation	ATO	51.69%
New Jersey Resources Corporation	NJR	55.51%
NiSource Inc.	NI	55.30%
Northwest Natural Gas Company	NWN	52.22%
One Gas, Inc.	OGS	62.08%
South Jersey Industries, Inc.	SJI	53.05%
Southwest Gas Corporation	SWX	54.25%
Spire, Inc.	SR	58.04%
MEAN		55.27%
LOW		51.69%
HIGH		62.08%

LONG-TERM DEBT RATIO - Weighted Operating Subsidiaries

Proxy Group	Ticker	2016
Atmos Energy Corporation	ATO	32.35%
New Jersey Resources Corporation	NJR	42.24%
NiSource Inc.	NI	44.65%
Northwest Natural Gas Company	NWN	42.07%
One Gas, Inc.	OGS	37.92%
South Jersey Industries, Inc.	SJI	26.73%
Southwest Gas Corporation	SWX	44.94%
Spire, Inc.	SR	32.36%
MEAN		37.91%
LOW		26.73%
HIGH		44.94%

SHORT-TERM DEBT RATIO - Weighted Operating Subsidiaries

Proxy Group	Ticker	2016
Atmos Energy Corporation	ATO	15.96%
New Jersey Resources Corporation	NJR	2.25%
NiSource Inc.	NI	0.05%
Northwest Natural Gas Company	NWN	5.72%
One Gas, Inc.	OGS	0.00%
South Jersey Industries, Inc.	SJI	20.22%
Southwest Gas Corporation	SWX	0.81%
Spire, Inc.	SR	9.60%
MEAN		6.83%
LOW		0.00%
HIGH		20.22%

COMMON EQUITY RATIO - Natural Gas Utility Operating Companies

Company Name	Ticker	2016
Atmos Energy Corporation	ATO	51.69%
New Jersey Natural Gas Company	NJR	55.51%
Bay State Gas Company	NI	60.74%
Columbia Gas of Kentucky, Incorporated	NI	50.36%
Columbia Gas of Maryland, Incorporated	NI	54.23%
Columbia Gas of Ohio, Incorporated	NI	50.07%
Columbia Gas of Pennsylvania, Inc.	NI	55.34%
Columbia Gas of Virginia, Incorporated	NI	45.11%
Northern Indiana Public Service Company	NI	58.54%
Northwest Natural Gas Company	NWN	52.22%
Kansas Gas Service Company	OGS	62.01%
Oklahoma Natural Gas Company	OGS	62.13%
Texas Gas Service Company	OGS	62.09%
South Jersey Gas Company	SJI	53.05%
Southwest Gas Corporation	SWX	54.25%
Alabama Gas Corporation	SR	72.32%
Laclede Gas Company	SR	50.39%
Mobile Gas Service Corporation	SR	52.83%
Willmut Gas & Oil Company	SR	53.08%

LONG-TERM DEBT RATIO - Natural Gas Utility Operating Companies

Company Name	Ticker	2016
Atmos Energy Corporation	ATO	32.35%
New Jersey Natural Gas Company	NJR	42.24%
Bay State Gas Company	NI	39.26%
Columbia Gas of Kentucky, Incorporated	NI	47.88%
Columbia Gas of Maryland, Incorporated	NI	45.77%
Columbia Gas of Ohio, Incorporated	NI	49.93%
Columbia Gas of Pennsylvania, Inc.	NI	44.66%
Columbia Gas of Virginia, Incorporated	NI	54.89%
Northern Indiana Public Service Company	NI	41.46%
Northwest Natural Gas Company	NWN	42.07%
Kansas Gas Service Company	OGS	37.99%
Oklahoma Natural Gas Company	OGS	37.87%
Texas Gas Service Company	OGS	37.91%
South Jersey Gas Company	SJI	26.73%
Southwest Gas Corporation	SWX	44.94%
Alabama Gas Corporation	SR	20.85%
Laclede Gas Company	SR	38.12%
Mobile Gas Service Corporation	SR	41.00%
Willmut Gas & Oil Company	SR	46.57%

SHORT-TERM DEBT RATIO - Natural Gas Utility Operating Companies

Company Name	Ticker	2016
Atmos Energy Corporation	ATO	15.96%
New Jersey Natural Gas Company	NJR	2.25%
Bay State Gas Company	NI	0.00%
Columbia Gas of Kentucky, Incorporated	NI	1.76%
Columbia Gas of Maryland, Incorporated	NI	0.00%
Columbia Gas of Ohio, Incorporated	NI	0.00%
Columbia Gas of Pennsylvania, Inc.	NI	0.00%
Columbia Gas of Virginia, Incorporated	NI	0.00%
Northern Indiana Public Service Company	NI	0.00%
Northwest Natural Gas Company	NWN	5.72%
Kansas Gas Service Company	OGS	0.00%
Oklahoma Natural Gas Company	OGS	0.00%
Texas Gas Service Company	OGS	0.00%
South Jersey Gas Company	SJI	20.22%
Southwest Gas Corporation	SWX	0.81%
Alabama Gas Corporation	SR	6.84%
Laclede Gas Company	SR	11.49%
Mobile Gas Service Corporation	SR	6.16%
Willmut Gas & Oil Company	SR	0.35%

Notes:

[1] Ratios are weighted by actual common capital, long-term debt and short-term debt of Operating Subsidiaries.

[2] Natural Gas and Electric Operating Subsidiaries with data listed as N/A from SNL Financial have been excluded from the analysis.