

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-34, SUB 46

In the Matter of	)	
Application of Appalachian State	)	TESTIMONY OF
University, d/b/a New River Light and	)	JOHN R. HINTON
Power Company for an Adjustment of	)	PUBLIC STAFF – NORTH
Rates and Charges for Electric Service	)	CAROLINA UTILITIES
in North Carolina	)	COMMISSION

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-34, SUB 46**

**Testimony of John R. Hinton
On Behalf of the Public Staff –
North Carolina Utilities Commission**

December 20, 2017

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **PRESENT POSITION.**

3 A. My name is John R. Hinton. I am the Director of the Economic
4 Research Division of the Public Staff of the North Carolina Utilities
5 Commission, representing the using and consuming public. My
6 business address is 430 North Salisbury Street, Raleigh, North
7 Carolina 27603. My qualifications and experience are provided in
8 Appendix A.

9 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
10 **PROCEEDING?**

11 A. The purpose of my testimony in this proceeding is to present to the
12 Commission my findings and recommendation regarding the cost of
13 capital for rates and charges applicable to electric service in New
14 River Light and Power Company (NRLP or Company).

1 **Q. HOW IS YOUR TESTIMONY STRUCTURED?**

2 A. The remainder of my testimony is structured as follows:

3 I. Introduction and Background;

4 II. Present Financial Market Conditions

5 III. Appropriate Capital Structure for Ratemaking

6 IV. Cost of Long-Term Debt

7 V. Cost of Common Equity

8 VI. Impact of Changing Economic Conditions on
9 Customers

10 VII. Recommended Overall Cost of Capital

11 VIII. Weather Normalization

12 I. **INTRODUCTION AND BACKGROUND**

13 **Q. WHAT IS THE CURRENTLY APPROVED COST OF CAPITAL FOR**
14 **NRLP?**

15 A. On May 1, 1997, the Commission approved 10.65% as the overall
16 cost of capital in Docket No. E-34, Sub 32, the Company's last
17 general rate case. The components of the Company's currently
18 approved cost of capital are shown below, along with the cost of
19 capital components from the preceding case.

1 Docket No. E-34, Sub 32

2				Weighted
3	<u>Item</u>	<u>Ratio%</u>	<u>Cost Rate</u>	<u>Cost Rate</u>
4	Long-Term Debt	6.42%	5.62%	0.36%
5	<u>Common Equity</u>	<u>93.58%</u>	<u>11.00%</u>	<u>10.29%</u>
6	Total	100.00%		10.65%

7 **Q. WHAT IS THE COST OF CAPITAL REQUESTED BY THE**
8 **COMPANY?**

9 A. According to page 14 of Company witness Randall E. Halley's
10 testimony, the Company is proposing an authorized overall return of
11 6.97%. The recommendation is based on a hypothetical 50% debt
12 and 50% common equity capital structure, a 4.23% cost rate of long-
13 term debt, along with a recommended rate of return on common
14 equity of 9.70%, as shown below:

15 Docket No. E-34, Sub 46

16				Weighted
17	<u>Item</u>	<u>Ratio%</u>	<u>Cost Rate</u>	<u>Cost Rate</u>
18	Long-Term Debt	50.00%	4.23%	2.12%
19	<u>Common Equity</u>	<u>50.00%</u>	<u>9.70%</u>	<u>4.85%</u>
20	Total	100.00%		6.97%

21 **Q. WHAT IS YOUR RECOMMENDED COST OF CAPITAL FOR**
22 **NRLP?**

23 A. I determined that 6.45% is an appropriate overall cost of capital. This
24 recommendation is based on a hypothetical capital structure

1 consisting of 50.00% common equity and 50.00% long-term debt. I
2 have incorporated a cost rate of long-term debt of 3.80% and a cost
3 rate of common equity of 9.10%.

4 **Q. ARE THERE ANY LEGAL AND ECONOMIC GUIDELINES TO**
5 **FOLLOW WHEN DETERMINING THE COST OF CAPITAL TO A**
6 **PUBLIC UTILITY?**

7 A. Yes. The appropriate legal and economic guidelines are thoroughly
8 addressed in the Commission's July 23, 2015, Order on Remand in
9 Dominion Energy North Carolina Power's (DNCP's) previous general
10 rate case, Docket No. E-22, Sub 479. Rather than repeat that
11 discussion, I will summarize the two cases that established the basic
12 principles for determining rate of return on equity (ROE).

13 In Federal Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591
14 (1944), the U.S. Supreme Court stated:

15 [T]he return to the equity owner should be
16 commensurate with returns on investments in other
17 enterprises having corresponding risks. That return,
18 moreover, should be sufficient to assure confidence in
19 the financial integrity of the enterprise, so as to
20 maintain its credit and to attract capital.

21 Id. at 603.

22 In Bluefield Water Works & Improvement Co. v. Public Serv. Comm'n
23 of West Virginia, 262 U.S. 679 (1923), the U. S. Supreme Court
24 stated:

1 A public utility is entitled to such rates as will permit it
2 to earn a return on the value of the property which it
3 employs for the convenience of the public equal to that
4 generally being made at the same time and in the same
5 general part of the country on investments in other
6 business undertakings which are attended by
7 corresponding risks and uncertainties; but it has no
8 constitutional right to profits such as are realized or
9 anticipated in highly profitable enterprises or
10 speculative ventures. The return should be reasonably
11 sufficient to assure confidence in the financial
12 soundness of the utility and should be adequate, under
13 efficient and economical management, to maintain and
14 support its credit and enable it to raise the money
15 necessary for the proper discharge of its public duties.
16 A rate of return may be reasonable at one time and
17 become too high or too low by changes affecting
18 opportunities for investment, the money market and
19 business conditions generally.

20 Id. at 692-93.

21 These two decisions recognize that utilities are competing for the
22 capital of investors and provide legal guidelines as to how the
23 allowed rate of return should be set. The decisions specifically speak
24 to the standards or criteria of capital attraction, financial integrity, and
25 comparable earnings. The Hope decision, in particular, recognizes
26 that the cost of common equity is commensurate with risk relative to
27 investments in other enterprises. In competitive capital markets, the
28 required return on common equity will be the expected return
29 foregone by not investing in alternative investments of comparable
30 risk. For the utility to attract capital, possess financial integrity, and
31 exhibit comparable earnings, the return allowed on a utility's
32 common equity should be that return required by investors for stocks

1 with comparable risk.

2 It is widely recognized that a public utility should be allowed a rate of
3 return on capital which, under prudent management, will allow the
4 utility to meet the criteria or standards referenced by the Hope and
5 Bluefield decisions. If the allowed rate of return is set too high,
6 consumers are burdened with excessive costs, current investors
7 receive a windfall, and the utility has an incentive to overinvest. If
8 the return is set too low, and the utility is not able to attract capital on
9 reasonable terms to invest in capital improvements for its service
10 area, then its ability to meet its future service obligations may be
11 impaired. Because a public utility is capital intensive, the cost of
12 capital is a very large part of its overall revenue requirement and is a
13 crucial issue for a company and its ratepayers.

14 **Q. HOW DID YOU DETERMINE THE COST OF CAPITAL THAT YOU**
15 **RECOMMEND IN THIS PROCEEDING?**

16 A. To determine the cost of capital, I performed a study consisting of
17 three steps. First, I determined the appropriate capital structure.
18 Firms normally finance assets with a combination of debt capital and
19 equity capital. Because each form of capital has a different cost,
20 especially after income tax considerations, the relative amounts of
21 each form that are employed to finance the assets can have a
22 significant influence on the overall cost of capital. Second, I

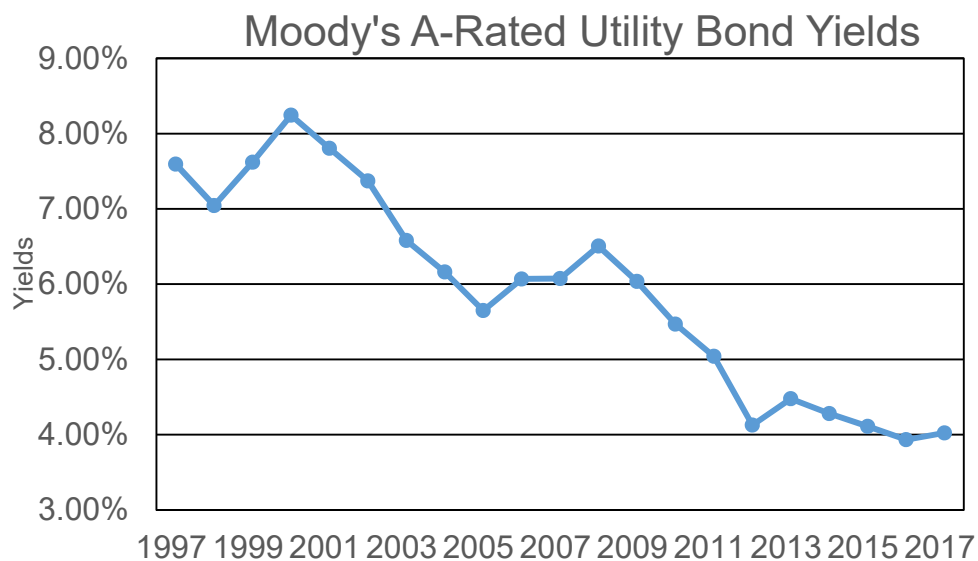
1 determined the cost rates for both forms of financial capital. Third,
2 by combining the capital structure ratios with the associated cost
3 rates, I calculated an overall weighted cost of capital.

4 **II. PRESENT FINANCIAL MARKET CONDITIONS**

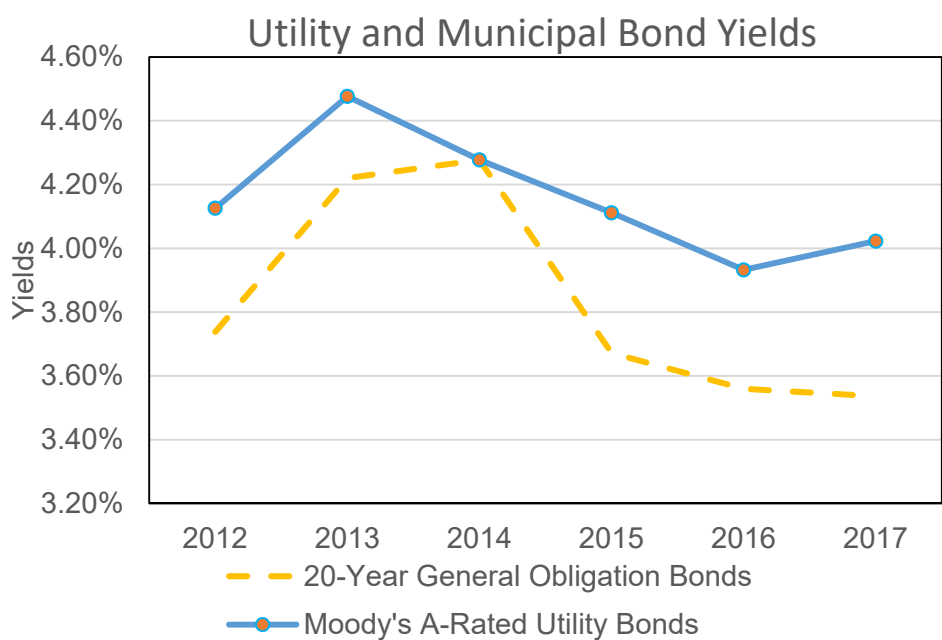
5 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**
6 **CONDITIONS?**

7 A. Yes. The cost of debt capital is lower today relative to more inflationary
8 periods of the past. The continued low rates of inflation, and
9 expectations of future low inflation rates, have contributed to lower
10 interest rates as illustrated in the graph of Moody's A-rated utility bond
11 yields starting in 1997. In addition, the second graph shows lower
12 yields from 2012 for both the Moody's bond yields, which are taxed,
13 as well as the municipal bond yields, which are generally nontaxed,
14 compiled by The Bond Buyer¹.

¹ Bond Buyer Index, Bond Reporter, North Carolina Department of State Treasurer, various issues from December 2012. The yields reflect General Obligation municipal bonds that are rated Aa2 by Moody's Investor Services.



1



2

1 **Q. HOW DO THESE LOWER INTEREST RATES AFFECT THE**
2 **FINANCING COSTS OF A COMPANY?**

3 A. In simple terms, the lower interest rates on borrowed funds combined
4 with a relatively stable inflationary environment of today indicate that
5 the cost have decreased for debt capital. This finding is significant
6 since utility stocks and utility cost of capital are highly interest rate-
7 sensitive relative to most industries within the securities markets.
8 Over the last several years, there have been numerous articles that
9 note how economists' forecasts have been predicting actions by the
10 Federal Reserve of higher interest rates². Given the difficulty in
11 forecasting market conditions and the record of economists of late, I
12 tend to temper my judgment with interest rate predictions by analysts
13 while giving primary weight on current interest rates as reasonable
14 predictors of future rates. In that, I believe the bond prices that
15 investors are willing to pay reflect investor expectations of future
16 economic conditions and future interest rates.

17 **III. APPROPRIATE CAPITAL STRUCTURE FOR RATEMAKING**

18 **Q. PLEASE EXPLAIN THE TERM "CAPITAL STRUCTURE" AND**
19 **HOW THE CAPITAL STRUCTURE APPROVED FOR**
20 **RATEMAKING PURPOSES AFFECTS RATES.**

² Jared Bernstein, "We Keep Flunking Forecasts on Interest Rates, Distorting the Budget Outlook," The New York Times, February 23, 2015.

1 A. The typical electric power utility obtains external capital from investors
2 by borrowing debt and issuing common equity. The capital obtained
3 from investors, in addition to retained earnings, is utilized to finance its
4 assets. The capital structure is simply a representation of how a
5 utility's assets are financed. It is the relative proportions or ratios of
6 debt capital and equity capital to the total of these capital accounts. A
7 goal for ratemaking is to use a reasonable mix of debt and equity
8 capital that allows the opportunity to attract capital and maintain the
9 utilities financial integrity while also maintaining the cost of capital at
10 the lowest reasonable overall rate that is fair to the utility investor and
11 the utility rate payer.

12 **Q. FOR THE DETERMINATION OF THE COST OF CAPITAL COST, IS**
13 **NRLP A TYPICAL ELECTRIC UTILITY?**

14 A. No. First, NRLP is a wholly-owned operation of Appalachian State
15 University (ASU). Second, very little of the Company's assets are
16 financed with debt capital. According to its E-1 filing, the Company's
17 capital structure contains 14% debt and 86% common equity, which
18 in my opinion is unreasonable. While the goal of my investigation is
19 to determine the cost of debt capital and opportunity cost equity capital
20 for an electric utility that competes with other securities in the
21 marketplace, it is incumbent to recognize the unique ownership aspect
22 of this utility as compared to other investor-owned utilities (IOUs).

1 Q. IS THE REQUESTED CAPITAL STRUCTURE IDENTIFIED IN
2 COMPANY WITNESS HALLEY'S TESTIMONY APPROPRIATE
3 FOR RATEMAKING PURPOSES IN THIS PROCEEDING?

4 A. Yes. NRLP has requested the use of a 50% debt ratio and a 50%
5 common equity ratio. The reasonableness of this position is
6 supported by the average³ of twenty-six Commission approved
7 common equity ratios for distribution and vertically integrated electric
8 utilities. The approved equity ratios for 2017 electric distribution cases
9 is 49.52% and the 50.00% median approved equity ratio; while the
10 average vertically integrated equity ratio is 51.88% and the median
11 ratio is 52.00% equity. Given that NRLP has no generation assets,
12 the equity ratios for rate cases involving distribution utilities of 50.00%
13 is supportive of the proposed equity ratio for NRLP, as shown in Exhibit
14 JRH-1.

15 **IV. COST OF LONG-TERM DEBT**

16 Q. IS THE REQUESTED COST OF LONG-TERM DEBT
17 APPROPRIATE FOR RATEMAKING PURPOSES IN THIS
18 PROCEEDING?

³ Due to the inclusion of deferred taxes and other accounting credits, the average common equity ratio excludes public utilities commission decisions in Arkansas, Florida, Indiana, and Michigan jurisdictions. Furthermore, the recommended ratio reflects fully litigated and settled cases from January 1, 2017 through December 7, 2017 for vertically integrated and distribution electric utilities and cases while excluding cases for limited issue riders and transmission services.

1 A. No. NRLP has requested a cost rate of 4.23%, which is based on the
2 approved cost of debt in the 2016 general rate case for Western
3 Carolina University (WCU), Docket No. E-35, Sub 45. The Company
4 maintains it is a reasonable going forward cost of debt. Company
5 witness Halley acknowledges its embedded cost rate of debt is 2.52%,
6 while noting that NRLP's capital structure has very little debt at 14%
7 of its total capitalization.

8 **Q. WHY IS THE RECOMMENDED 4.23% COST OF DEBT NOT**
9 **APPROPRIATE?**

10 A. The cost rate of debt approved in the WCU case was a stipulated
11 issue. Given that I was involved in the previous cited WCU general
12 rate case, I am aware that there were different positions by the parties
13 with regard to the appropriate cost of long-term debt. The cost rate
14 for debt as well as the cost rate for common equity agreed upon by
15 the Public Staff in that case reflected a settlement position that was
16 made in consideration of certain factors and, in my opinion, are not
17 relevant to this proceeding.

18 As such, it is questionable whether one should apply any weight to the
19 Company's reliance on WCU's cost rate for debt. The income from
20 municipal bonds issued by ASU is untaxed. Given that interest
21 income with IOU long-term debt is taxed, a similar question exists how
22 much weight should be afforded to recent cost rates for long-term debt

1 of other electric utilities identified in the Commission's June 2016
2 edition of its "Quarterly Review." Financial textbooks⁴ cite the below
3 formula which enables investors to compare the promised yield on a
4 municipal bond to a yield on a taxable bond:

$$\begin{array}{l} 5 \qquad \text{Equivalent taxable yield} = \frac{(\text{Municipal bond yield})}{(1 - \text{Marginal tax rate})} \\ 6 \end{array}$$

7 **Q. WHAT IS YOUR RECOMMENDED COST OF LONG-TERM DEBT?**

8 A. Given that NRLP is an operating unit of ASU, I believe that a
9 reasonable estimate of the current cost of long-term debt is
10 represented by the 20-year general obligation bond index as
11 published in the Bond Buyer Index. The municipal bonds in this index
12 are rated Aa2 by Moody's Investor Services, which is close to the Aa3
13 rating for ASU, as shown in Exhibit JRH-2. In an effort to determine
14 the current cost of debt along with a hypothetical capital structure, I
15 recommend a 13-week average calculation of September 7, 2017
16 through November 30, 2017 producing a 3.58% cost of debt, as
17 shown in Exhibit JRH-3. I believe this is a reasonable proxy for the
18 cost rate of long-term debt for NRLP and it is appropriate for this
19 proceeding.

⁴ Fabozzi, Frank J. and T. Dossa Fabozzi, The Handbook of Fixed Income Securities, 4th ed., Burr Ridge, Ill: Irwin Publishing, 1995, p. 176.

1 **V. COST OF COMMON EQUITY**

2 **Q. HOW DID YOU DETERMINE THE COST OF COMMON EQUITY?**

3 A. Even though NRLP does not have to compete in the equity market
4 with other comparable risk utility and non-utility companies, I believe
5 it is appropriate to determine the cost rate of common equity as if
6 NRLP had to obtain external capital from the market place. As such,
7 I used the Discounted Cash Flow (DCF) model, the Regression
8 Analysis of Allowed Returns on Equity for electric utilities to determine
9 the appropriate cost of common equity.

10 Because the cost of capital results from the use of a Capital Asset
11 Pricing model (CAPM) continue to be unreasonably low, in part due to
12 the monetary policies of the Federal Reserve, I do not support the use
13 of the model at this time. I also do not support the use of the
14 Comparable Earnings method for this proceeding. The current level
15 of earned returns for many electric utilities is above their regulated
16 returns on equity. It is believed that these above average earnings
17 are partially due to the unregulated operations of many IOUs.
18 Because NRLP has little, if any, unregulated operations, the Company
19 represents a pure-play electric utility. It is common place that IOUs
20 have unregulated operations or own all or portions of subsidiary
21 companies that often carry higher risks and often generate higher
22 earnings. As such, it becomes increasing difficult to find comparable

1 earnings for an electric utility whose revenues are a 100% from
2 regulated operations when the Value Line Investment Survey (Value
3 Line) universe of electric utility companies are involved in diverse and
4 unregulated activities that may be unrelated to the delivery of electric
5 service. In addition, given that the Company is wholly-owned by a
6 state supported university there is an inherent reduction in risk that is
7 difficult to quantify. Thereby, the use of the comparable earning
8 approach to estimate the cost of common equity for NRLP is
9 questionable without making adjustments to the method that could be
10 seen as arbitrary and unsubstantiated.

11 **Q. WOULD YOU PLEASE DESCRIBE THE DCF MODEL?**

12 A. The Discounted Cash Flow model is a method of evaluating the
13 expected cash flows from an investment by giving appropriate
14 consideration to the time value of money. Theory dictates that the
15 price of the investment will equal the discounted cash flows of
16 returns. The return to an equity investor comes in the form of
17 expected future dividends and price appreciation. However, as the
18 new price will again be the sum of the discounted cash flows, price
19 appreciation can be ignored and attention focused on the expected
20 stream of dividends. Mathematically, this relationship may be
21 expressed as follows:

1 Let D_1 = expected dividends per share over the next twelve
2 months;
3 g = expected growth rate of dividends;
4 k = cost of equity capital; and
5 P = price of stock or present value of the future income
6 stream.

7 Then,

$$\begin{array}{l} 8 \\ 9 \\ 10 \end{array} \quad P = \frac{D_1}{1+k} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{t-1}}{(1+k)^t}$$

11 This equation represents the amount an investor would be willing to
12 pay for a share of common equity with a dividend stream over the
13 future periods. Using the formula for a sum of an infinite geometric
14 series, this equation may be reduced to:

$$\begin{array}{l} 15 \\ 16 \\ 17 \\ 18 \end{array} \quad P = \frac{D_1}{k-g}$$

19 Solving for K yields the DCF equation:

$$\begin{array}{l} 20 \\ 21 \\ 22 \\ 23 \end{array} \quad K = \frac{D_1}{P} + g$$

24 Therefore, the rate of return on equity capital required by investors
25 is the sum of the dividend yield (D_1/P) plus the expected long-term
26 growth rate in dividends (g).

1 **Q. HOW DID YOU IDENTIFY A GROUP OF COMPANIES**
2 **COMPARABLE IN RISK TO NRLP?**

3 A. While no two companies are exactly alike, I have identified
4 companies that exhibit investment-related risk measures common
5 with the electric utility industry. I started with over 1,700 companies
6 analyzed in Value Line that are traded in domestic stock exchanges.
7 From this initial group, I selected electric utility companies with Safety
8 Ranks of “2” or less, beta coefficients of 0.75 or less, and Price
9 Stability Ranks of 0.95 or higher. These screens produced a group
10 of 23 utility companies. I then screened the remaining companies
11 that had an S&P Corporate Bond Rating below BBB+ which removed
12 four additional companies and above. Furthermore, I eliminated
13 companies that Value Line had reported to be involved in mergers
14 with other utility companies and companies that had cut their
15 dividends during the last ten years, which removed two additional
16 companies. The risk measures for the comparable group of electric
17 utility companies is shown in Exhibit JRH-4.

18 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD COMPONENT**
19 **OF THE DCF?**

20 A. I calculated the dividend yield by using the Value Line estimate of
21 dividends to be declared over the next 12 months divided by the price
22 of the stock as reported in the Value Line Summary and Index

1 sections for each week of the 13-week period from September 15,
2 2016, through December 8, 2017. The averaging period tends to
3 smooth out short-term variations in the share prices and yields. This
4 process resulted in an average dividend yield of 3.4% for my
5 comparable group.

6 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**
7 **COMPONENT OF THE DCF?**

8 A. It is reasonable to assume that investors develop their expected
9 long-term growth in dividends by examining actual, known past
10 performance and stock analysts' forecasts. I have reviewed
11 historical growth rates and forecasted growth rates to determine an
12 expected growth rate.

13 First, I employed the growth rates of the comparable group in
14 earnings per share (EPS), dividends per share (DPS), and book
15 value per share (BPS) as reported in Value Line over the past five to
16 ten years. Value Line applies a smoothing process in an attempt to
17 avoid the distortion that may be associated with choosing an
18 unrepresentative high or low beginning or ending point.

19 Second, I employed the forecasts of growth rates of the comparable
20 group in EPS, DPS, and BPS as also reported in Value Line. These
21 forecasts are prepared by analysts of an independent advisory
22 service. This service is widely available to investors and should also

1 provide an estimate of investor expectations. Third, I incorporated
2 the consensus of various analysts' five year earnings forecasts of
3 EPS growth rates as published by the Yahoo Finance website.

4 In Exhibit JRH-5, I have presented the dividend yields and various
5 growth rates as described above for the comparable group. That
6 exhibit also shows the estimated cost rates for common equity.

7 **Q. WHAT IS YOUR CONCLUSION OF THE COST OF COMMON**
8 **EQUITY BASED ON THE DCF METHOD?**

9 A. Based upon the DCF method and giving primary weight to the DCF
10 results that rely on the predicted growth rates of EPS and DPS, I
11 determined that the cost of common equity is within the range of
12 8.60% to 9.20%. This range is based on a dividend yield of 3.4%
13 and an expected growth rate of 5.2% to 5.8%.

14 **Q. PLEASE DESCRIBE THE REGRESSION ANALYSIS METHOD**
15 **YOU APPLIED TO ELECTRIC UTILITY RATE CASE DECISIONS.**

16 A. I used a regression analysis to analyze the relationship between
17 allowed returns on equity for electric utilities and Moody's index yields
18 for A-rated utility bonds. This is a form of risk premium analysis. I first
19 presented a similar method (developed by Federal Energy Regulatory
20 Commission staff) to this Commission in DNCP's 1993 rate case,
21 Docket No. E-22, Sub 333. In determining rate of return on equity in

1 the 1993 proceeding, the Commission placed slightly greater weight
2 and emphasis on the risk premium approach than the constant growth
3 DCF results.

4 **Q. PLEASE CONTINUE.**

5 A. This variation of the risk premium model is distinct in that it attempts
6 to quantify the risk premium that equity investors require to invest in a
7 utility's stock instead of its bonds. The regression analysis
8 incorporates the annual average allowed returns on equity⁵ for electric
9 utilities as the dependent variable and the average "A" rated Moody's
10 bond yield as the independent variable. The use of utility bond yields
11 is preferred to the use of US treasury yields so as to focus on the
12 added risk premium associated with an investment in electric utility
13 stocks over a lower risk investment in utility bonds. The R squared
14 value from this analysis shows a strong correlation between the
15 utilities' allowed returns on equity and the bond yields. Page 1 of
16 Exhibit JRH-6 presents the allowed ROEs and public utility yield data,
17 while page 2 presents the results of the regression analysis that
18 provides an estimate of the current cost of common equity.

⁵ Because the Virginia State Corporation Commission's incentive regulation provides a 100 to 200 basis point premium above capital market requirements for certain utility investments, I have excluded those cases.

1 Q. WHAT DID YOU CONCLUDE FROM YOUR REGRESSION
2 ANALYSIS OF ALLOWED EQUITY RETURNS?

3 A. The regression equation quantifies the historical relationship (1988-
4 2017) of allowed returns and yields on Moody's public utility bonds.
5 I applied this historical relationship to a recent six-month average
6 bond yield to generate a predicted estimate for the current cost of
7 equity of 9.48%, as shown on page 2 of Exhibit JRH-6.

8 Q. WILL YOU SUMMARIZE YOUR CONCLUSIONS ON THE COST
9 OF EQUITY FOR NRLP?

10 A. Yes. I employed the DCF method on a comparable risk group of
11 electric utilities and determined that a reasonable range is 8.60% to
12 9.20%. The Regression Analysis of Allowed ROEs method provided
13 a single estimate of 9.48%. In my judgment, a reasonable cost of
14 equity for NRLP is 9.10%, which is the average of the three
15 estimates, as shown in Exhibit JRH-7.

16 VI. IMPACT OF CHANGING ECONOMIC CONDITIONS ON
17 CUSTOMERS

18 Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF
19 RETURN ON EQUITY TAKE INTO CONSIDERATION THE IMPACT
20 OF CHANGING ECONOMIC CONDITIONS ON THE NRLP
21 CUSTOMERS?

1 A. The determination of the rate of return for purposes of compensating
2 investors must be based on the requirements of capital markets.
3 However, as noted by the North Carolina Supreme Court in recent
4 decisions, it is also necessary to consider the impact of changing
5 economic conditions on consumers when determining the ROE.

6 In this case, I have made no quantitative adjustment to my
7 recommended rate of return to reflect the impact of economic
8 conditions on customers. Rather, it is a qualitative consideration in
9 my review. It should further be noted that under North Carolina law
10 the rate of return on common equity should be set as low as possible
11 without impairing the Company's reasonable access to capital, as set
12 forth in the Hope and Bluefield cases discussed previously.

13 I am aware of no clear numerical basis for quantifying the impact of
14 changing economic conditions on customers in determining an
15 appropriate rate of return on equity in setting rates for a public utility.
16 Rather, the impact of changing economic conditions nationwide is
17 inherent in the analytical methods and data I used to determine the
18 cost of equity for utilities that are comparable in risk to NRLP.

19 I have also considered the impact of changing economic conditions
20 on customers from two other perspectives. First, I reviewed the
21 transcript from the public hearing in this proceeding. Second, I
22 reviewed recent economic data applicable to the Town of Boone,

1 North Carolina and Watauga County.

2 No NRLP customers submitted written statements or testified at the

3 October 24, 2017, public hearing regarding questions or concerns

4 with the proposed rate increase. With regard to economic data for

5 North Carolina and the Company's service area, I have had

6 discussions with the Boone Chamber of Commerce. Additionally, I

7 have reviewed county-wide data on total personal income and

8 income per capita for the years 2009 through 2016 as compiled by

9 the Bureau of Economic Analysis (BEA)⁶; data compiled by the North

10 Carolina Department of Commerce; and data compiled by City-

11 Data.com⁷. All of the information gathered indicates that the average

12 level of per-capita income in Boone is significantly lower than the

13 State of North Carolina as a whole. The BEA data indicates that

14 since 2009 the per-capita income for Watauga County observed is

15 18% to 22% lower than the State as a whole. According to the

16 County Profiles⁸ published by the North Carolina Department of

17 Commerce, the June 2017 unemployment rate for Watauga County

18 is 4.5%, which is better than the 5.1% statewide unemployment rate.

19 Given that Boone has a higher percentage of workers in the food and

20 service industry it is not unexpected that the unemployment rate

21 would be relatively low; however, this positive indicator is somewhat

⁶ <https://www.bea.gov/regional/>

⁷ <http://www.city-data.com/city/Boone-North-Carolina.html>

⁸ <https://www.nccommerce.com/lead/>

1 offset with the significantly lower per-capital income for the Watauga
2 County. Unfortunately, there is limited data on the per-capita income
3 for Boone. The City-Data website does not stand behind the
4 accuracy of the data; however, the survey results are supportive of
5 the lower per-income data of the County. Furthermore, it is believed
6 that the distribution of the per-capita incomes is skewed due to high
7 student population in Boone.

8 While the ability of customers to afford the increase in NRLP rates is,
9 arguably, more difficult than normally observed in general rate cases
10 before the Commission, the fact that the existing residential rates for
11 Blue Ridge Electric Membership Corporation (BREMCO), whose
12 service area completely surrounds NRLP, are somewhat higher with
13 a \$24.17 base charge, and high summer energy charges of 10.27
14 cents per kWh and high winter charges of 9.93 cents per kWh,
15 provides an indication that NRLP's customers can afford the
16 proposed rate increases.

17 **VII. RECOMMENDED OVERALL COST OF CAPITAL**

18 **Q. WHAT IS YOUR RECOMMENDED OVERALL RATE OF RETURN?**

19 A. I recommend an overall cost of capital of 6.45% as shown in Exhibit
20 JRH-8. This overall cost of capital is comprised of a hypothetical
21 capital structure comprised of 50% debt capital and 50% equity
22 capital, a 3.80% cost rate for long-term debt, and a 9.10% cost rate

1 of return on common equity cost rate. For reasons previously
2 discussed, I have not adjusted this recommended rate of return on
3 common equity either up or down for the impact on consumers of
4 changing economic conditions. However, because of the lower
5 income levels in Boone, I want to stress that the Commission adopt
6 the lowest reasonable cost of equity that is fair to the Company and
7 the ratepayer.

8 **Q. DID YOU PERFORM ANY TESTS OF REASONABLENESS WITH**
9 **YOUR RECOMMENDED RATE OF RETURN ON EQUITY AND**
10 **OVERALL COST OF CAPITAL?**

11 A. Yes. Based on the recommended capital structure and cost rates,
12 the pre-tax times interest coverage ratio (TIER) is 3.4 times. The
13 ultimate decision on rate of return must result in rates that are as low
14 as constitutionally possible, while still allowing the Company to
15 maintain its financial integrity and meet its service obligations. In my
16 opinion, a pre-tax rating of 3.4 is associated with a financially sound
17 utility, especially for a pure-play utility that is owned by ASU.

18 **VIII. WEATHER NORMALIZATION**

19 **Q. PLEASE EXPLAIN YOUR WEATHER NORMALIZATION**
20 **ADJUSTMENT.**

21 A. Because of the large impact weather on electricity sales, the NCUC

1 typically supports the use of weather normalized test year energy
2 sales as a basis in setting rate increases. Likewise, utilities and
3 financial analysts often find it useful to quantify the excess or loss of
4 energy sales generated by unusual weather. In this investigation, I
5 employed ordinary least squares regression method to analyze the
6 impact of weather on residential electricity sales during the test year.
7 The model normalizes NRLP's electricity sales per customer to
8 weighted⁹ cooling degree days and heating degree days. In that, I
9 defined average weather for Boone, NC over the thirty years from
10 1981 to 2010. Because of the relatively mild temperatures during the
11 winter months of 2016, the impact of my adjustment is to increase
12 test year energy sales by 1,431,331 kWh. The adjustment is shown
13 in Exhibit JRH-9.

14 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

15 **A.** Yes it does.

⁹ The weighted of weather data is performed to better match monthly weather data to the billing cycles for residential customers.

APPENDIX A

QUALIFICATIONS AND EXPERIENCE

JOHN ROBERT HINTON

I received a Bachelor of Science degree in Economics from the University of North Carolina at Wilmington in 1980 and a Master of Economics degree from North Carolina State University in 1983. Since joining the Public Staff in May of 1985, I have filed testimony on the long-range electrical forecast in Docket No. E-100, Sub 50. In 1986, 1989, and 1992, I developed the long range forecasts of peak demand for electricity in North Carolina. I filed testimony on electricity weather normalization in Docket Nos. E-7, Sub 620, E-2, Sub 833, and E-7, Sub 989. I filed testimony on customer growth and the level of funding for nuclear decommissioning costs in Docket No. E-2, Sub 1023. I filed testimony on the level of funding for nuclear decommissioning costs in Docket No. E-7, Sub 1026. I have reviewed numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual Integrated Resource Plans (IRPs). I have filed testimony on the IRPs filed in Docket No. E-100, Subs 114 and 125.

I have been the lead analyst for the Public Staff in numerous avoided cost proceedings. I have filed testimony on the avoided cost of electricity in Docket No. E-100, Subs 106, 136, 140 and 148; and I have filed a Statement of Position in the arbitration case involving EPCOR and Progress Energy Carolinas in Docket No. E-2, Sub 966 and I have filed avoided cost testimony in Docket No. E-7, Sub 1032, Docket E-7, Sub 1130, and Docket No. E-2, Sub 1145.

I have filed testimony on the issuance of certificates of public convenience and necessity (CPCN) in Docket Nos. E-2, Sub 669, SP-132, Sub 0, E-7, Sub 790, Docket Nos. E-7, Sub 790, Sub 791, 832, and 1145.

I have filed testimony on the issue of fair rate of return in Docket Nos. E-22, Sub 333; E-22, Sub 412; P-26, Sub 93; P-12, Sub 89; G-21, Sub 293; P-31, Sub 125; G-5, Sub 327; G-5, Sub 386; G-9, Sub 351; P-100, Sub 133b; ; P-100, Sub 133d (1997 and 2002); G-21, Sub 442; W-778, Sub 31; and W-218, Sub 319. I have filed affidavits in several smaller water utility rate cases.

I have filed testimony on the hedging of natural gas prices in Docket Nos. E-2, Sub 1001 and E-2, Sub 1018. I have filed testimony on the expansion of natural gas in Docket Nos. G-5, Sub 337 and G-5, Sub 372. I performed the financial analysis in the two audit reports on Mid South Water Systems, Inc., Docket No. W-100, Sub 21. I testified in the application to transfer of the CPCN from North Topsail Water and Sewer, Inc. to Utilities, Inc., in Docket No. W-754, Sub 19. I have filed testimony on weather normalization of water sales in Docket No. W-274, Sub 160.

With regard to the 1996 Safe Drinking Water Act, I was a member of the Small Systems Working Group that reported to the National Drinking Water Advisory Council of the U.S. Environmental Protection Agency (EPA). I have published an article in the National Regulatory Research Institute's (NRRI's) Quarterly Bulletin entitled Evaluating Water Utility Financial Capacity.

Commission Approved Common Equity Ratios

Company	Order Date	Case Type	%Common Equity to Total Capital
1 MDU Resources Group Inc.	1/18/2017	Vertically Integrated	50.99%
2 Consolidated Edison Co. of NY	1/24/2017	Distribution	48.00%
3 Delmarva Power & Light Co.	2/15/2017	Distribution	49.10%
4 Rockland Electric Company	2/22/2017	Distribution	49.70%
5 Tucson Electric Power Co.	2/24/2017	Vertically Integrated	50.03%
6 Otter Tail Power Co.	3/2/2017	Vertically Integrated	52.50%
7 Oklahoma Gas and Electric Co.	3/20/2017	Vertically Integrated	53.31%
8 Liberty Utilities Granite St	4/12/2017	Distribution	50.00%
9 Unitil Energy Systems Inc.	4/20/2017	Distribution	50.97%
10 Kansas City Power & Light	5/3/2017	Vertically Integrated	49.20%
11 Northern States Power Co. - MN	5/11/2017	Vertically Integrated	52.50%
12 MDU Resources Group Inc.	6/16/2017	Vertically Integrated	51.40%
13 Potomac Electric Power Co.	7/24/2017	Distribution	49.14%
14 Arizona Public Service Co.	8/15/2017	Vertically Integrated	55.80%
15 Atlantic City Electric Co.	9/22/2017	Distribution	50.47%
16 Oncor Electric Delivery Co.	9/28/2017	Distribution	42.50%
17 Potomac Electric Power Co.	10/20/2017	Distribution	50.15%
18 Pacific Gas and Electric Co.	10/26/2017	Vertically Integrated	52.00%
19 San Diego Gas & Electric Co.	10/26/2017	Vertically Integrated	52.00%
20 Southern California Edison Co.	10/26/2017	Vertically Integrated	48.00%
21 Alaska Electric Light Power	11/15/2017	Vertically Integrated	58.18%
22 NSTAR Electric Co.	11/30/2017	Distribution	53.34%
23 Western Massachusetts Electric	11/30/2017	Distribution	54.51%
24 Puget Sound Energy Inc.	12/5/2017	Vertically Integrated	48.50%
25 Ameren Illinois	12/6/2017	Distribution	50.00%
26 Commonwealth Edison Co.	12/6/2017	Distribution	45.89%
Average of All Distribution Cases			49.52%
Median of all Distribution Cases			50.00%
Average of Vertically Integrated Cases			51.88%
Median of Vertically Integrated Cases			52.00%

Source: SNL Energy download,

<https://platform.mi.spglobal.com/web/client?auth=inherit#industry/pastRateCases?Type=1>

MOODY'S

INVESTORS SERVICE

Rating Action: Moody's assigns Aa3 to Appalachian State University's (NC) 2017A bonds; outlook stable

Global Credit Research - 31 Oct 2017

New York, October 31, 2017 – Issue: General Revenue Refunding Bonds, Series 2017A; Rating: Aa3; Rating Type: Underlying LT; Sale Amount: \$54,650,000; Expected Sale Date: 11/08/2017; Rating Description: Revenue: Public University Broad Pledge;

Summary Rating Rationale

Moody's Investors Service has assigned a Aa3 to Appalachian State University's (ASU) proposed \$55 million of General Revenue Refunding Bonds, series 2017A. The bonds have an expected final maturity in 2036. The outlook is stable.

The Aa3 favorably incorporates ASU's broader membership of the University of North Carolina system, benefitting from strong financial support from the State of North Carolina (Aaa stable). Located in a state with growing numbers of high school graduates, ASU maintains steadily growing enrollment. Recent years of improving operating performance underscore management's prudent budgeting and close financial oversight. These traits are critical to maintaining cash flow above 10%, particularly given the new state imposed requirement that fixes undergraduate tuition for four years, which will likely suppress growth in student charges. Additional credit challenges include the university's relatively thin unrestricted liquidity and elevated financial leverage, which limit the university's ability to assume incremental debt absent commensurate reserve growth.

Rating Outlook

The stable outlook incorporates our expectations of maintenance of double digit cash flow, driving growth in financial reserves at a pace that is, at minimum, consistent with similarly rated peers. It also incorporates our expectations of no material increase in financial leverage, continued state funding growth, and stable liquidity.

Factors that Could Lead to an Upgrade

Substantial growth in flexible financial reserves and improvement of leverage position

Factors that Could Lead to a Downgrade

Deterioration of the State of North Carolina's credit quality or financial support

Any material increase in debt without corresponding reserve growth

Significant softening in operating performance or debt service coverage

Substantial decline in unrestricted liquidity

Legal Security

The general revenue bonds (including the current issuance) and system pool revenue bonds are unsecured obligations of the university, payable from Available Funds, which include unrestricted revenues and unrestricted fund balances, but exclude state appropriations or student tuition payments. At fiscal year end 2017, Available Funds totaled \$205 million (unaudited), which is above the five-year (fiscal 2013-2017) average of \$188 million.

Use of Proceeds

Proceeds from the series 2017A bonds will be used to advance refund certain maturities on the series 2010B-1 and series 2011 revenue bonds. The bonds will produce level annual debt service savings.

Obligor Profile

Founded as a teachers' college in 1899, Appalachian State University joined the University of North Carolina System in 1972. A liberal arts focused university situated in Boone, North Carolina, ASU serves over 18,000 headcount students.

Methodology

The principal methodology used in this rating was Global Higher Education published in November 2015. Please see the Rating Methodologies page on www.moody's.com for a copy of this methodology.

Regulatory Disclosures

For ratings issued on a program, series or category/class of debt, this announcement provides certain regulatory disclosures in relation to each rating of a subsequently issued bond or note of the same series or category/class of debt or pursuant to a program for which the ratings are derived exclusively from existing ratings in accordance with Moody's rating practices. For ratings issued on a support provider, this announcement provides certain regulatory disclosures in relation to the credit rating action on the support provider and in relation to each particular credit rating action for securities that derive their credit ratings from the support provider's credit rating. For provisional ratings, this announcement provides certain regulatory disclosures in relation to the provisional rating assigned, and in relation to a definitive rating that may be assigned subsequent to the final issuance of the debt, in each case where the transaction structure and terms have not changed prior to the assignment of the definitive rating in a manner that would have affected the rating. For further information please see the ratings tab on the issuer/entity page for the respective issuer on www.moody's.com.

Regulatory disclosures contained in this press release apply to the credit rating and, if applicable, the related rating outlook or rating review.

Please see www.moody's.com for any updates on changes to the lead rating analyst and to the Moody's legal entity that has issued the rating.

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MOODY'S
INVESTORS SERVICE

New River Power and Light Co.
Recommended Cost of Long-Term Debt

	Date	20-year General Obligation Bonds
1	30-Nov	3.59%
2	21-Nov	3.51%
3	16-Nov	3.52%
4	8-Nov	3.49%
5	2-Nov	3.67%
6	26-Oct	3.65%
7	19-Oct	3.53%
8	12-Oct	3.61%
9	5-Oct	3.63%
10	28-Sep	3.64%
11	21-Sep	3.60%
12	14-Sep	3.56%
13	7-Sep	3.49%
14	31-Aug	3.51%
15	24-Aug	3.53%
16	17-Aug	3.57%
17	10-Aug	3.52%
18	3-Aug	3.52%
19	27-Jul	3.50%
20	20-Jul	3.52%
21	13-Jul	3.51%
22	6-Jul	3.60%
23	29-Jun	3.58%
24	22-Jun	3.53%
25	15-Jun	3.53%
26	8-Jun	3.53%
13-week Average		3.58%

Source: The Bond Buyer, Bond Buyer Indexes.

Value Line and S&P Investor Related Risk Measures

Company	Safety	Beta	Price Stability	Financial Strength	Earnings Predict.	S&P Bond Rating ²
1 Alliant Energy	2	0.70	95	A	85	A-
2 Amer. Elec. Power	1	0.65	95	A+	90	A-
3 CMS Energy Corp.	2	0.65	100	B++	85	BBB+
4 Consol. Edison	1	0.50	95	A+	95	A-
5 Dominion Energy	2	0.65	100	B++	90	BBB+
6 DTE Energy	2	0.65	100	B++	80	BBB+
7 Duke Energy	2	0.60	100	A	85	A-
8 Edison Int'l	2	0.65	95	A	60	BBB+
9 NextEra Energy	2	0.65	100	A	65	A-
10 PG&E Corp.	2	0.65	95	B++	45	A-
11 Pinnacle West Capital	1	0.70	95	A+	95	A-
12 PPL Corp.	2	0.70	95	B++	65	A-
13 Public Serv. Enterprise	1	0.70	90	A++	65	BBB+
14 Southern Co.	2	0.55	100	A	100	A-
15 WEC Energy Group	1	0.60	95	A+	85	A-
16 Westar Energy	2	0.70	95	A	85	BBB+
17 Xcel Energy Inc.	1	0.60	100	A+	100	A-
Average	1.6	0.64	97		81	

Sources:

¹. Value Line Investment Survey, as of December 5, 2017

². Standard & Poor's Global, Inc., S&P Global Credit Ratings, as of December 5, 2017.

DCF ANALYSIS

	Yield ²	Value Line ¹ Historical						Value Line Forecast			Yahoo ³ EPS
		EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS	
		10-Yr	10-Yr	10-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	
1 Alliant Energy	2.9	5.0	7.5	4.0	6.5	6.5	4.5	6.5	4.5	4.0	7.1
2 Amer. Elec. Power	3.3	3.0	4.0	4.5	5.0	4.5	4.5	4.0	5.0	3.5	2.8
3 CMS Energy Corp.	3.0	8.5	NA	3.0	8.5	11.5	4.5	6.5	6.5	6.5	7.4
4 Consol. Edison	2.9	3.5	1.5	4.0	2.5	2.0	3.5	2.5	3.0	3.5	3.2
5 Dominion Energy	3.3	5.0	7.0	2.5	3.0	7.0	1.5	6.5	9.0	2.5	3.6
6 DTE Energy	4.1	5.5	3.5	4.0	6.0	5.5	4.0	6.0	7.0	4.5	4.9
7 Duke Energy	3.2	3.5	NA	-0.5	0.5	2.5	3.0	4.5	4.5	1.5	3.2
8 Edison Int'l	4.0	5.5	6.0	5.5	5.0	6.5	2.5	4.0	9.0	4.0	5.8
9 NextEra Energy	3.2	8.0	8.5	8.0	5.0	9.0	7.5	7.0	9.5	5.0	8.0
10 PG&E Corp.	2.8	1.0	8.0	5.0	-2.0	1.0	3.5	9.5	7.5	5.0	2.1
11 Pinnacle West Capital	3.6	3.5	2.5	2.0	6.5	3.0	4.0	5.5	5.0	4.0	5.5
12 PPL Corp.	4.3	2.0	4.5	3.0	4.5	1.5	NA	NMF	3.0	NMF	-0.3
13 Public Serv. Enterprise	3.7	6.0	3.5	7.5	-0.5	3.0	6.0	1.0	5.0	3.5	1.5
14 Southern Co.	4.7	3.0	4.0	5.0	3.0	3.5	4.0	3.5	3.5	3.0	2.6
15 WEC Energy Group	3.3	8.5	15.0	8.0	6.5	16.0	9.0	6.0	6.0	5.0	5.3
16 Westar Energy	3.0	4.0	5.0	4.5	7.0	3.0	4.0	6.0	5.0	2.5	2.8
17 Xcel Energy Inc.	3.0	5.0	4.0	4.5	6.0	5.0	4.5	4.5	6.0	4.0	NA
Average ⁴	3.4	4.7	5.6	4.7	5.1	5.4	4.4	5.2	5.8	3.9	4.4
DCF Result		8.2	9.1	8.1	8.5	8.8	7.8	8.6	9.2	7.3	7.8

Sources:

¹ Value Line Investment Survey, Company Reports dated September 15, 2017, October 27, 2017, and November 17, 2017.

² Value Line Summary & Index, as of December 8, 2017.

³ Yahoo Finance, downloaded on December 5, 2017.

⁴ Average excludes negative growth rates.

Data used for the Regression Analysis of Allowed Returns on Equity

		[A] Electric Utilities Approved Returns on Equity ^{1,2}	[B] Moody's A-Rated Bond Yields ³	[C]=[A]-[B] Risk Premium ²
	Year			
1	1988	12.79%	10.49%	2.30%
2	1989	12.97%	9.77%	3.20%
3	1990	12.70%	9.86%	2.84%
4	1991	12.55%	9.36%	3.19%
5	1992	12.09%	8.69%	3.40%
6	1993	11.41%	7.59%	3.82%
7	1994	11.34%	8.31%	3.03%
8	1995	11.55%	7.89%	3.66%
9	1996	11.39%	7.75%	3.64%
10	1997	11.40%	7.60%	3.81%
11	1998	11.66%	7.04%	4.62%
12	1999	10.77%	7.62%	3.15%
13	2000	11.43%	8.24%	3.19%
14	2001	11.09%	7.80%	3.29%
15	2002	11.16%	7.37%	3.79%
16	2003	10.97%	7.80%	3.17%
17	2004	10.75%	7.37%	3.38%
18	2005	10.54%	6.58%	3.96%
19	2006	10.32%	6.16%	4.16%
20	2007	10.30%	6.05%	4.25%
21	2008	10.41%	6.51%	3.90%
22	2009	10.52%	6.04%	4.49%
23	2010	10.37%	5.47%	4.90%
24	2011	10.29%	5.04%	5.25%
25	2012	10.01%	4.13%	5.88%
26	2013	9.80%	4.48%	5.32%
27	2014	9.76%	4.28%	5.48%
28	2015	9.58%	4.11%	5.47%
29	2016	9.60%	3.93%	5.67%
30	2017	9.63%	4.02%	5.61%

¹ Regulatory Research Associates, Regulatory Focus, October 26, 2017.

² Excluding Dominion Virginia jurisdiction cases that are subject to a premium basis point adjustment for certain generation assets (years 2015-2017).

³ Moody's Creditrends with yield data as of November 30, 2017.

Regression Analysis of Allowed Returns on Equity

<i>Regression Statistics of 1988-2017 data</i>	
Multiple R	0.952022
R Square	0.906345
Adjusted R Square	0.903001
Standard Error	0.003042
Observations	30

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.00250739	0.00250739	270.971	6.24828E-16
Residual	28	0.00025909	9.2533E-06		
Total	29	0.00276648			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.0753239	0.0021619	34.842	1.3238E-24
X Variable 1	0.4976460	0.0302315	16.461	6.2483E-16

	Moody's A-Rated Public Utility Bond Yield
Jun-17	3.94%
Jul-17	3.99%
Aug-17	3.86%
Sep-17	3.87%
Oct-17	3.97%
Nov-17	3.83%
Average	3.91%

Predicted Cost of Equity 9.48%

Predicted Cost of Equity of 9.48% = 0.0753 + 0.4976 x Current Bond Yield.

New River Power and Light Co.
Cost of Common Equity

Summary

High DCF Result	9.20%
Low DCF Result	8.60%
Risk Premium Result	9.48%
Average Result	9.09%
Rounded Result	9.10%

New River Power and Light Co.
Cost of Capital

Item	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-term Debt	50.00%	3.80%	1.90%
Common Equity	50.00%	9.10%	4.55%
Total	100.00%		6.45%

Pre-Tax Interest Coverage 3.4 times

New River Light & Power
Weather Adjustment

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]
Month	Residential Customers	Actual WHDD ¹	Normal WHDD	WHDD difference	Actual WCDD ²	Normal WCDD	WCDD difference	HDD Coefficient	CDD Coefficient	Adjustment ³
2016-01	6,130	737.8	980.6	-242.8	0.0	0.0	0.0	0.81845	1.83067	1,218,118
2016-02	6,038	1105.5	1004.8	100.7	0.0	0.0	0.0	0.81845	1.83067	(497,574)
2016-03	6,017	848.7	841.7	7.0	0.0	0.0	0.0	0.81845	1.83067	(34,611)
2016-04	6,020	548.3	683.2	-134.9	0.0	0.2	-0.2	0.81845	1.83067	667,623
2016-05	6,040	432.1	413.4	18.7	0.0	3.2	-3.2	0.81845	1.83067	(56,491)
2016-06	6,165	224.0	192.3	31.7	14.7	22.4	-7.7	0.81845	1.83067	(72,671)
2016-07	6,107	33.5	48.3	-14.8	84.8	75.1	9.7	0.81845	1.83067	(34,073)
2016-08	6,897	1.2	15.5	-14.3	164.7	115.3	49.4	0.81845	1.83067	(542,955)
2016-09	6,245	14.8	52.1	-37.3	112.6	79.4	33.2	0.81845	1.83067	(189,106)
2016-10	6,102	120.6	210.5	-90.0	18.7	17.5	1.2	0.81845	1.83067	436,188
2016-11	6,251	425.7	485.3	-59.6	0.0	0.8	-0.8	0.81845	1.83067	313,717
2016-12	6,245	698.6	742.3	-43.7	0.0	0.0	0.0	0.81845	1.83067	223,165
2016 Test Year Total		5,190.7	5,670.0	(479.3)	395.5	314.0	81.5			1,431,331

Notes:

¹ WHDD=Weighted Heating Degree Days, 65 degree base.² WCDD=Weighted Cooling Degree Days, 65 degree base.³ [J]= -1*([A]*[D]*[H]+[A]*[G]*[I]).