

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. W-354, SUB 364

In the Matter of:

Application by Carolina Water Service,
Inc., of North Carolina, 4944 Parkway
Plaza Boulevard, Suite 375, Charlotte,
North Carolina 28217, for Authority to
Adjust and Increase Rates for Water
and Sewer Utility Service in All Service
Areas in North Carolina

) TESTIMONY OF
) JOHN R. HINTON
) PUBLIC STAFF – NORTH
) CAROLINA UTILITIES
) COMMISSION

**CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA
DOCKET NO. W-354, SUB 364**

**TESTIMONY OF JOHN R. HINTON
ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION**

NOVEMBER 4, 2019

1 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS**
2 **ADDRESS FOR THE RECORD.**

3 A. My name is John R. Hinton and my business address is 430 North
4 Salisbury Street, Raleigh, North Carolina. I am the Director of the
5 Economic Research Division of the Public Staff. My qualifications
6 and experience are provided in Appendix A.

7 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
8 **PROCEEDING?**

9 A. The purpose of my testimony is to present to the North Carolina
10 Utilities Commission (Commission) the results of my analysis and
11 my recommendations as to the fair rate of return to be used in
12 establishing rates for water and sewer utility service provided by
13 Carolina Water Service, Inc. of North Carolina (CWSNC or
14 Company).

Q. WHAT IS THE CURRENTLY APPROVED COST OF CAPITAL FOR CWSNC?

1 A. In the last CWSNC general rate case, Docket No. W-354, Sub 360,
2 the Commission approved a capital structure of 49.09% long-term
3 debt, 50.910% common equity, a cost rate of long-term debt of
4 5.68%, and a cost rate of common equity of 9.75% for an overall
5 weighted cost of capital of 7.75%.

Q. WHAT IS THE COST OF CAPITAL REQUESTED BY CWSNC IN THIS PROCEEDING?

6 A. CWSNC has requested an overall weighted cost of capital of
7 8.07%. This applied for rate of return is based on a capital structure
8 as of March 31, 2019, that is comprised of 52.04% long-term debt,
9 47.96% common equity. The Company has requested a cost rate
10 of long-term debt of 5.59%, and a cost rate for common equity of
11 10.75%.

Q. HOW DOES CWSNC WITNESS D'ASCENDIS DEVELOP HIS RECOMMENDATION?

12 A. CWSNC witness D'Ascendis utilizes three cost of equity methods: (1)
13 Discounted Cash Flow (DCF); (2) the Risk Premium Model which
14 relies on the Predictive Risk Premium method (PRPM) and the Total
15 Market Approach RPM; and (3) Capital Asset Pricing Model (CAPM).

1 He applies these methodologies to a proxy group of six publically
2 traded water companies. D'Ascendis' first method relies on the DCF
3 model which produces an 8.70% estimated cost of equity.

4 Mr. D'Ascendis' second method yielded a 10.62% estimated cost of
5 equity, which is an average of his 11.20% PRPM result and the
6 10.03% risk premium result using An Adjusted Market Approach.

7 His third method incorporates the mean and medium results of his
8 traditional and empirical capital asset pricing model (CAPM)
9 applications that result in a 10.21% cost rate for common equity. The
10 model incorporates a risk-free rate of return, beta coefficient, and the
11 expected return on the market. To derive the expected return on the
12 market, the witness relies on a historical arithmetic return on the S&P
13 500 of 11.89% and two forecasted based returns on the S&P 500 of
14 13.82.% and 16.03%. With these and other inputs, he estimated the
15 cost of equity by averaging the traditional CAPM results of 9.85% and
16 9.75% with the empirical CAPM results of 10.65% and 10.58% that
17 ultimately produced his 10.21% estimated cost of equity.

18 His fourth approach applies the above three methods to a group of
19 non-price regulated companies that he selected with the use of Value
20 Line's beta coefficients along with the residual standard errors that
21 resulted with a 11.78% estimated cost of equity.

1 His conclusion for the cost of equity using his three methods as
2 applied to his utility and non-utility groups of companies is 10.35%.
3 Given that the witness believes that CWSNC small size relative to his
4 proxy groups is more risky, he increases the baseline cost of equity by
5 0.40%, which raises his recommended cost rate of common equity to
6 10.75%, as compared to 11.90%, which represents a 15 basis point
7 reduction in his recommended ROE filed approximately 9 months prior
8 in Docket No. W-354, Sub 360.

9 **Q. WHAT IS THE OVERALL RATE OF RETURN RECOMMENDED**
10 **BY THE PUBLIC STAFF?**

11 A. The Public Staff recommends an overall rate of return of 7.15%,
12 based on the updated capital structure consisting of 50.90% long-
13 term debt and 49.10% common equity. The recommended overall
14 cost of capital incorporates the above capital structure along with a
15 recommended debt cost rate of 5.36% and a 9.00% cost rate for
16 common equity. Relative to the Company's last rate case, the
17 reduction in the Public Staff's recommended ROE represents a 20
18 basis point reduction from 9.20% cost rate for common equity.
19 Based on the Public Staff's proposed rate base, capital structure,
20 and cost of debt, the differences in the Company's 10.75% return
21 on common equity (ROE) and the Public Staff's 9.0% ROE lead to

1 an approximate \$ 1.5 million increase in CWSNC's revenue
2 requirements.

3 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY**
4 **STRUCTURED?**

5 A. The remainder of my testimony is presented in the following six
6 sections:

7 I. Legal and Economic Guidelines for Fair Rate of Return

8 II. Present Financial Market Conditions

9 III. Appropriate Capital Structure and Cost of Long-Term Debt

10 IV. The Cost of Common Equity Capital

11 V. Concerns with Company Witness D'Ascendis' Testimony

12 VI. Summary and Recommendations

13 **I. LEGAL AND ECONOMIC GUIDELINES FOR**
14 **FAIR RATE OF RETURN**

15 **Q. PLEASE BRIEFLY DESCRIBE THE ECONOMIC AND LEGAL**
16 **FRAMEWORK OF YOUR ANALYSIS.**

17 A. Public utilities possess certain characteristics of natural
18 monopolies. For instance, it is more efficient for a single firm to
19 provide a service such as water production and distribution or
20 wastewater collection and treatment than for two or more firms

1 offering the same service in the same area to do so. Therefore,
2 regulatory bodies have assigned franchised territories to public
3 utilities to provide services more efficiently and at a lower cost to
4 consumers.

5 **Q. WHAT IS THE ECONOMIC RELATIONSHIP BETWEEN RISK**
6 **AND THE COST OF CAPITAL?**

7 A. The cost of equity capital to a firm is equal to the rate of return
8 investors expect to earn on the firm's securities given the securities'
9 level of risk. An investment with a greater risk will require a higher
10 expected return by investors. In Federal Power Comm'n v. Hope
11 Natural Gas Co., 320 U.S. 591, 603 (1944) (Hope), the United
12 States Supreme Court stated:

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

19 In Bluefield Waterworks & Impr. Co. v. Public Service Comm'n, 262
20 U.S. 679, 692-93 (1923) (Bluefield) the United States Supreme
21 Court stated: A public utility is entitled to such rates as will permit it
22 to earn a return on the value of the property which it employs for
23 the convenience of the public equal to that generally being made at

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

13 These two decisions recognize that utilities are competing for the
14 capital of investors and provide legal guidelines as to how the
15 allowed rate of return should be set. The decisions specifically
16 speak to the standards or criteria of capital attraction, financial
17 integrity, and comparable earnings. The Hope decision, in
18 particular, recognizes that the cost of common equity is
19 commensurate with risk relative to investments in other enterprises.
20 In competitive capital markets, the required return on common
21 equity will be the expected return foregone by not investing in

1 alternative stocks of comparable risk. Thus, in order for the utility to
2 attract capital, possess financial integrity, and exhibit comparable
3 earnings, the return allowed on a utility's common equity should be
4 that return required by investors for stocks with comparable risk. As
5 such, the return requirements of debt and equity investors, which is
6 shaped by expected risk and return, is paramount in attracting
7 capital.

8 It is widely recognized that a public utility should be allowed a rate
9 of return on capital, which will allow the utility, under prudent
10 management, to attract capital under the criteria or standards
11 referenced by the Hope and Bluefield decisions. If the allowed rate
12 of return is set too high, consumers are burdened with excessive
13 costs, current investors receive a windfall, and the utility has an
14 incentive to overinvest. Likewise, customers will be charged prices
15 that are greater than the true economic costs of providing these
16 services. Consumers will consume too few of these services from
17 a point of view of efficient resource allocation. If the return is set
18 too low, then the utility stockholders would suffer because a
19 declining value of the underlying property will be reflected in a
20 declining value of the utility's equity shares. This could happen
21 because the utility would not be earning enough to maintain and

1 expand its facilities to meet customer demand for service, cover its
2 operating costs, and attract capital on reasonable terms. Lenders
3 will shy away from the company because of the increased risk that
4 the utility will default on its debt obligations. Because a public utility
5 is capital intensive, the cost of capital is a very large part of its
6 overall revenue requirement and is a crucial issue for a company
7 and its ratepayers.

8 The Hope and Bluefield standards are embodied in N.C. Gen. Stat.
9 § 62-133(b)(4), which requires that the allowed rate of return be
10 sufficient to enable a utility by sound management:

11 “...to produce a fair return for its shareholders,
12 considering changing economic conditions and other
13 factors, . . . to maintain its facilities and services in
14 accordance with the reasonable requirements of its
15 customers in the territory covered by its franchise, and
16 to compete in the market for capital funds on terms
17 that are reasonable and are fair to its customers and
18 to its existing investors.”

19 N.C. Gen. Stat. § 62-133(b)(4) (2017).

20 On April 12, 2013, the North Carolina Supreme Court decided State
21 ex rel. Utils. Comm’n v. Cooper, 366 N.C. 484, 739 S.E. 2d 541
22 (2013) (Cooper). In that decision, the Supreme Court reversed and
23 remanded the Commission’s January 27, 2012, Order in Docket
24 No. E-7, Sub 989, approving a stipulated return on equity of

1 10.50% for Duke Energy Carolinas, LLC. In its decision, the
2 Supreme Court held (1) that the 10.50% return on equity was not
3 supported by the Commission's own independent findings and
4 analysis as required by State ex rel. Utils. Comm'n v. Carolina Util.
5 Customers Ass'n, 348 N.C. 452, 500 S.E.2d 693 (1998) (CUCA I),
6 in cases involving nonunanimous stipulations, and (2) that the
7 Commission must make findings of fact regarding the impact of
8 changing economic conditions on consumers when determining the
9 proper return on equity for a public utility. In Cooper, the Court's
10 holding introduced a new factor to be considered by the
11 Commission regardless of whether there is a stipulation.

12 In considering this new element, the Commission is guided by
13 ratemaking principles laid down by statute and interpreted by a
14 body of North Carolina case law developed over many years.
15 According to these principles, the test of a fair rate of return is a
16 return on equity that will provide a utility, by sound management,
17 the opportunity to (1) produce a fair profit for its shareholders in
18 view of current economic conditions, (2) maintain its facilities and
19 service, and (3) compete in the marketplace for capital. State ex
20 rel. Utils. Comm'n v. General Tel. Co., 281 N.C. 318, 370, 189
21 S.E.2d 705, 738 (1972). Rates should be set as low as reasonably

1 possible consistent with constitutional constraints. State ex rel.
2 Utils. Comm'n v. Pub. Staff-N. Carolina Utils. Comm'n, 323 N.C.
3 481, 490, 374 S.E.2d 361, 366 (1988). The exercise of subjective
4 judgment is a necessary part of setting an appropriate return on
5 equity. Id. Thus, in a particular case, the Commission must strike
6 a balance that (1) avoids setting a return so low that it impairs the
7 utility's ability to attract capital, (2) avoids setting a return any
8 higher than needed to raise capital on reasonable terms, and (3)
9 considers the impact of changing economic conditions on
10 consumers.

11 **Q. WHAT IS A FAIR RATE OF RETURN?**

12 A. The fair rate of return is simply a percentage, which, when
13 multiplied by a utility's rate base investment will yield the dollars of
14 net operating income, a utility should reasonably have the
15 opportunity to earn. This dollar amount of net operating income is
16 available to pay the interest cost on a utility's debt capital and a
17 return to the common equity investor. The fair rate of return
18 multiplied by the utility's rate base yields the dollars a utility needs
19 to recover in order to earn the investors' required return on capital.

20 **Q. HOW DID YOU DETERMINE THE FAIR RATE OF RETURN THAT**

1 **YOU RECOMMEND IN THIS PROCEEDING?**

2 A. To determine the fair rate of return, I performed a cost of capital
3 study consisting of three steps. First, I determined the appropriate
4 capital structure for ratemaking purposes, i.e., the proper
5 proportions of each form of capital. Utilities normally finance assets
6 with debt and common equity. Because each of these forms of
7 capital have different costs, especially after income tax
8 considerations, the relative amounts of each form employed to
9 finance the assets can have a significant influence on the overall
10 cost of capital, revenue requirements, and rates. Thus, the
11 determination of the appropriate capital structure for ratemaking
12 purposes is important to the utility and to ratepayers. Second, I
13 determined the cost rate of each form of capital. The individual
14 debt issues have contractual agreements explicitly stating the cost
15 of each issue. The embedded annual cost rate of debt is generally
16 calculated with the annual interest cost divided by the debt
17 outstanding. The cost of common equity is more difficult to
18 determine because it is based on the investor's opportunity cost of
19 capital. Third, by combining the appropriate capital structure ratios
20 for ratemaking purposes with the associated cost rates, I calculate
21 an overall weighted cost of capital or fair rate of return.

1 **II. PRESENT FINANCIAL MARKET CONDITIONS**

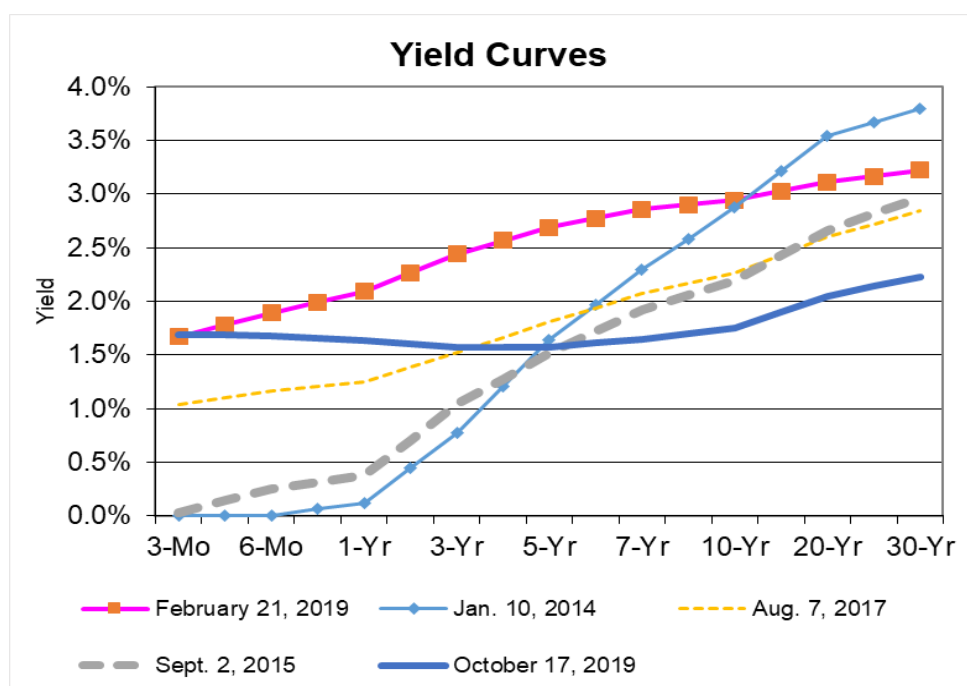
2 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**
3 **CONDITIONS?**

4 A. Yes. The cost of financing is much lower today than in the more
5 inflationary period of the 1990s. More recently, the continued low
6 rates of inflation and expectations of future low inflation rates have
7 contributed to even lower interest rates. According to Moody's Bond
8 Survey, yields on long-term "A" rated public utility bonds have fallen
9 88 basis points from 4.25% at the time, February 21, 2019, as of the
10 Order in Docket No. W-354, Sub 360, as compared to 3.37% for
11 September 2019. By the close of this proceeding, the Company will
12 have received five rate increases over the last six years (Docket
13 Nos. W-354, Sub 360, Sub 356, Sub 344, and Sub 336). Relative to
14 the filing of the cost of capital settlement in January 2014 rate case
15 in Docket No. W-354, Sub 336, yields on Moody's A-rated utility
16 bonds are 126 basis points lower than the average 4.63% yield
17 observed during January 2014, as illustrated my by Exhibit 1.

18

1 **Q. HOW HAVE INTEREST RATES CHANGED SINCE THE**
 2 **COMPANY'S LAST RATE CASE?**

3 A. Interest rates on various loans have fallen as the yields on treasury
 4 securities have fallen since the Commission issued its Order on
 5 February 21, 2019. The below graph shows the lower yields that on
 6 average, are over 100 basis points lower for all durations except for
 7 a minor increase in 90-day treasury bills. The average decrease in
 8 treasury bonds of 5-,7-,10-,20-, and 30-years bonds is 111 basis
 9 points. While Utilities, Inc., Corix Utilities, and its ultimate parent, the
 10 British Columbia Investment Management Corporation (BCIMC)
 11 generally cannot obtain capital at these interest rates, the falling
 12 yields are indicators of the declining cost of debt capital.



13

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

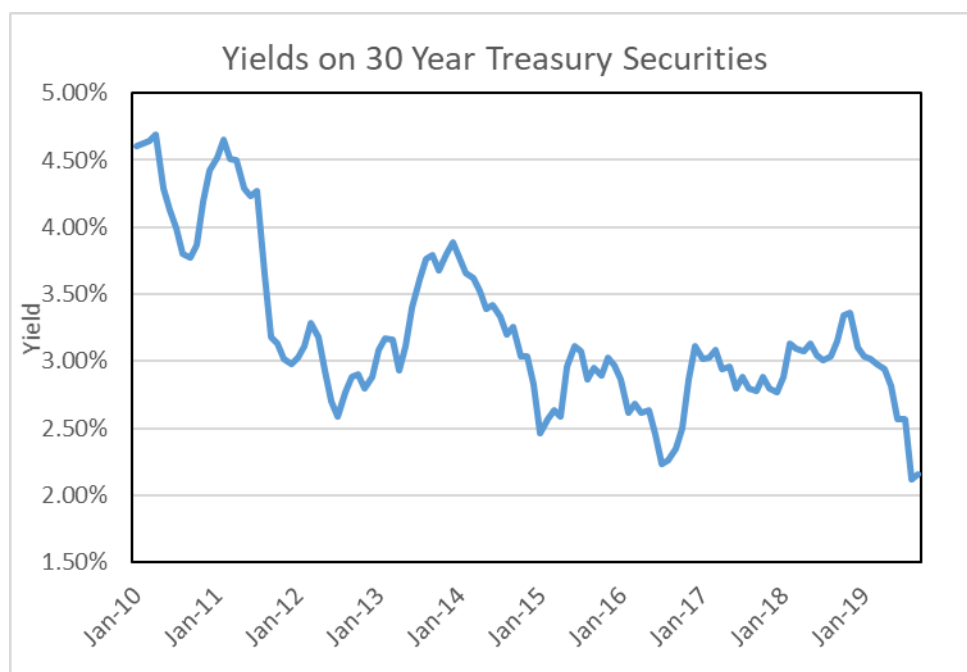
3 A. The lower interest rates, especially for longer-term securities, and
4 the stable inflationary environment of today indicate that borrowers
5 are paying less for the time value of money. This is significant since
6 utility stocks and utility capital costs are highly interest rate-sensitive
7 relative to most industries within the securities markets.
8 Furthermore, given that investors often view purchases of the
9 common stocks of utilities as substitutes for fixed income
10 investments, the reductions in interest rates observed over the past
11 ten or more years has generally followed the decreases in investor
12 required rates of return on common equity.

13 **Q. WITH THE DECREASES IN INTEREST RATES, DO YOU RELY**
14 **ON INTEREST RATE PREDICTIONS IN YOUR INVESTIGATION?**

15 A. No. I do not rely on interest rate forecasts to determine the cost of
16 equity. Rather, I believe that relying on current interest rates,
17 especially in relation to yields on long-term bonds, is more
18 appropriate for ratemaking. In that, it is reasonable to expect that as
19 investors are pricing bonds in the marketplace that are based on
20 expectations on the domestic and international demand and supply
21 of capital, future interest rates, future inflation rates, etc. While I

1 have a healthy respect for forecasting, I am aware of the risk of
2 relying on predictions of rising interest rates to determine utility rates.
3 A case can be observed in the testimony of Company witness Ahern
4 in the 2013 Aqua rate case, Docket W-218, Sub 363. In that
5 proceeding, she identified several interest rate forecasts by Blue
6 Chip Financial Forecasts of 30-year Treasury Bonds yields that were
7 predicted to rise to 4.3% in 2015, 4.7% in 2016, 5.2% in 2017, and
8 5.5% for 2020 – 2024¹. As illustrated in the graph below, these
9 forecasts significantly over-estimated actual interest rates for 30-year
10 Treasury Bonds. Similar over-estimated forecasts can be identified
11 in witness D'Ascendis' Exhibit DWD-4 in the Company's 2018 rate
12 case where the Blue Chip Consensus Forecasts predicted the 30-
13 year Treasury Bonds would rise to 3.8% by the third quarter of 2019.
14 According to the Federal Reserve, the highest observed yield on 30-
15 year Treasury Bonds for the third quarter of 2019 is 2.65%, and the
16 average for the quarter was 2.29%, a forecast error between 115 to
17 151 basis points. In my opinion, these types of errors that make
18 these forecasts inappropriate for ratemaking. As such, I tend to
19 place more weight with current market determined interest rates.

¹ Docket W-218 Sub 363, T. Vol. 2, page 171, lines 8-9.



1

III. APPROPRIATE CAPITAL STRUCTURE AND COST OF LONG-TERM DEBT

2 **Q. WHY IS THE APPROPRIATE CAPITAL STRUCTURE**
3 **IMPORTANT FOR RATEMAKING PURPOSES?**

4 A. For companies that do not have monopoly power, the price that an
5 individual company charges for its products or services is set in a
6 competitive market, and that price is generally not influenced by the
7 company's capital structure. However, the capital structure that is
8 determined to be appropriate for a regulated public utility has a
9 direct bearing on the fair rate of return, revenue requirement, and,

1 therefore, the prices charged to captive ratepayers.

2 **Q. PLEASE EXPLAIN THE TERM CAPITAL STRUCTURE AND**
3 **HOW THE CAPITAL STRUCTURE APPROVED FOR**
4 **RATEMAKING PURPOSES AFFECTS RATES.**

5 A. The capital structure is simply a representation of how a utility's
6 assets are financed. It is the relative proportions or ratios of debt
7 and common equity to the total of these forms of capital, which
8 have different costs. Common equity is far more expensive than
9 debt for ratemaking purposes for two reasons. First, as mentioned
10 earlier, there are income tax considerations. Interest on debt is
11 deductible for purposes of calculating income taxes. The cost of
12 common equity, on the other hand, must be "grossed up" to allow
13 the utility sufficient revenue to pay income taxes and to earn its cost
14 of common equity on a net or after-tax basis. Therefore, the
15 amount of revenue the utility must collect from ratepayers to meet
16 income tax obligations is directly related to both the common equity
17 ratio in the capital structure and the cost of common equity. A
18 second reason for this cost difference is that the cost of common
19 equity must be set at a marginal or current cost rate. Conversely,
20 the cost of debt is set at an embedded rate because the utility is
21 incurring costs that are previously established in contracts with

1 security holders.

2 Because the Commission has the duty to promote economic utility
3 service, it must decide whether or not a utility's requested capital
4 structure is appropriate for ratemaking purposes. An example of
5 the cost difference can be seen in the Company's filing. Based
6 upon the Company's requested capital cost rates, each dollar of its
7 common equity, and long-term debt that supports the retail rate
8 base has the following approximate annual costs (including income
9 tax, regulatory fee, and gross receipts tax expense) to ratepayers:

- 10 (1) Each \$1 of common equity costs a ratepayer -
11 approximately 12 cents per year.
12 (2) Each \$1 of long-term debt costs a ratepayer less than 6
13 cents - per year.

14 **Q. WHAT CAPITAL STRUCTURE HAS THE COMPANY**
15 **REQUESTED IN THIS CASE?**

16 A. The Company's application requests to use a capital structure of
17 52.04% long-term debt and 47.96% common equity as of March 31,
18 2019.

19 **Q. DO YOU SUPPORT THE CAPITAL STRUCTURE PROPOSED BY**
20 **THE COMPANY IN THIS CASE?**

21 A. No. I recommend that the Company update its proposed capital
22 structure as of September 30, 2019, which includes the balance of

1 the Company's Revolving Credit Facility of \$45.5 million that was
2 entered into on October 23, 2015. I believe that the updated capital
3 structure that includes the credit facility of 50.90% debt and 49.10%
4 common equity is both representative and reasonable for
5 ratemaking. The support for the recommended balances of long-
6 term debt and common equity in the capital structure that underlie
7 the proposed ratios is shown in my Exhibit 2.

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

10 A. I recommend the use of the Company's proposed cost of debt that
11 has been updated as of September 30, 2019, to 5.36%. The
12 Company maintains that the make whole provisions contained in
13 their existing Notes make it uneconomical for refinancing.
14 CWSNC's and Utilities, Inc. has a history of making private
15 placements of debt at relatively higher interest rates relative to
16 public offerings by other utilities, such as seen with Aqua North
17 Carolina. Unlike Aqua North Carolina, CWSNC does not have any
18 loans that are associated with the rehabilitation of water
19 infrastructure that was enabled through the State Revolving Fund
20 Program authorized by the Safe Drinking Water Act. The Public
21 Staff urges the Company to continue to investigate this source of

1 funding, which are at cost rates that are typically lower than
2 available in the market, as well as other sources of capital that
3 minimize the cost rate for long-term debt. My recommended capital
4 structure and cost of debt is as follows:

5 CWSNC

6 as of September 30, 2019

7	Item	Ratio	Cost Rate
8	Long-Term Debt	\$ 286,738,052	50.90% 5.36%
9	Common Equity	297,299,961	49.10%
10	Total	\$ 584,038,013	100.00%

11 **IV. THE COST OF COMMON EQUITY CAPITAL**

12 **Q. HOW DID YOU DEFINE THE COST OF COMMON EQUITY?**

13 A. The cost of equity capital for a firm is the expected rate of return on
14 common equity that investors require in order to induce them to
15 purchase shares of the firm's common stock. The return is
16 expected given that when the investor buys a share of the firm's
17 common stock, he does not know with certainty what his returns will
18 be in the future.

19 **A: DCF METHOD**

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

1 CAPITAL FOR THE COMPANY?

2 A. I used the discounted cash flow (DCF) model and the Risk
3 Premium model to determine the cost of equity for the Company.

4 Q. PLEASE DESCRIBE YOUR DCF ANALYSIS.

A. The discounted cash flow model is a method of evaluating the expected cash flows from an investment by giving appropriate consideration to the time value of money. The DCF model is based on the theory that the price of the investment will equal the discounted cash flows of returns. The return to an equity investor comes in the form of expected future dividends and price appreciation. However, as the new price will again be the sum of the discounted cash flows, price appreciation is ignored, and attention focused on the expected stream of dividends. Mathematically, this relationship may be expressed as follows:

15 Let D_1 = expected dividends per share over the next twelve months;

16 g = expected growth rate of dividends;

17 k = cost of equity capital; and

18 P = price of stock or present value of the future income
19 stream.

20 Then,

$$21 \quad D_1 + D_1(1+g) + D_1(1+g)^2 + \dots + D_1(1+g)^{t-1}$$

$$P = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \frac{D_t}{(1+k)^t}$$

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

$$P = \frac{D_1}{k-g}$$

Solving for k yields the DCF equation:

$$k = \frac{D_1 + g}{P}$$

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

Q. DID YOU APPLY THE DCF METHOD DIRECTLY TO CWSNC?

A. No, BCIMC's common stock is not publicly traded; rather, it is a private equity fund. Thus to estimate the investor required rate of return, I applied the DCF method to a risk-comparable investment that is comprised of a group of seven water utilities and nine natural gas local distribution utility companies (LDCs) followed by Value Line Investment Survey (Value Line). I included the group of LDCs

1 because they exhibit risk measures similar to the group of water
2 companies. The standard edition of Value Line covers eight water
3 companies and ten LDCs. From there, I excluded Consolidated
4 Water Co. because of its significant overseas operations. I
5 considered removing The SJW Group (SJW) from the group
6 because the dividend pricing period included pre-merger and post-
7 merger periods. However, I observed relatively little price changes
8 attributed to the merger, as Value Line's expected dividend yields
9 for SJW ranged from 1.7% to 1.9% over the 13-week period. As
10 such, I believed that any bias in the pricing of the stock was
11 minimal; thus, I decided to keep the Company in the group. A
12 similar situation exists with Aqua America, Inc., who is currently
13 involved in a merger with Peoples Natural Gas; however, like SJW,
14 I believe any bias reflected in Value Line's pricing data appears
15 minimal. In addition, I excluded NiSource, Inc. from the
16 comparable group of gas utilities because of cuts in their dividends
17 paid to shareholders.

18 **Q. WHAT MEASURES OF RISK DID YOU REVIEW TO**
19 **DETERMINE THE COMPARABILITY OF INVESTING IN**
20 **WATER UTILITIES AND THE LDCS?**

21 A. I reviewed standard risk measures that are widely available to

1 investors that are considered by most investors when making
2 investment decisions. The beta coefficient is a measure of the
3 sensitivity of a stock's price to overall fluctuations in the market.
4 The Value Line Investment Survey beta coefficient describes
5 the relationship of a company's stock price with the New York
6 Stock Exchange Composite. A beta value of less than 1.0
7 means that the stock's price is less volatile than the movement
8 in the market; conversely, a beta value greater than 1.0
9 indicates that the stock price is more volatile than the market.

10 I reviewed the Value Line Safety Rank, which is defined as a
11 measure of the total risk of a stock. The Safety Rank is
12 calculated by averaging two variables (1) the stock's index of
13 price stability, and (2) the Financial Strength rating of the
14 company. In addition, I reviewed the S&P Common Stock
15 Rating. The stock rating system takes into consideration two
16 important factors in the determination of a stock's rating: the
17 stability and growth of earnings and dividends. However, the
18 stock rating does not consider a company's balance sheet or
19 other factors. The stock rating system has seven grades, with
20 A+ being the highest rating possible.

1 I also reviewed Moody's and S&P's Bond Rating, which are
2 assessments of the creditworthiness of a company. Credit
3 rating agencies focus on the creditworthiness of the particular
4 bond issuer, which includes a detailed and thorough review of
5 the potentials areas of business risk and financial risk of the
6 company. These and other risk measures for the comparable
7 groups are shown in my Exhibit 3 and are further explained in
8 Appendix B.

9 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD**
10 **COMPONENT OF THE DCF?**

11 A. I calculated the dividend yield by using the Value Line estimate of
12 dividends to be declared over the next 12 months divided by the
13 price of the stock as reported in the Value Line Summary and Index
14 sections for each week of the 13-week period of July 26, 2019,
15 through October 18, 2019. A 13-week averaging period tends to
16 smooth out short-term variations in the stock prices. This process
17 resulted in an average dividend yield of 1.7% for the comparable
18 group of water utilities and 2.6% for the LDC group utilities.

19 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**
20 **COMPONENT OF THE DCF?**

1 A. I employed the growth rates of the comparable group in earnings
2 per share (EPS), dividend per share (DPS), and book value per
3 share (BPS) as reported in Value Line over the past ten and five
4 years. I also employed the forecasts of the growth rates of the
5 comparable groups in EPS, DPS, and BPS, as reported in Value
6 Line. The historical and forecast growth rates are prepared by
7 analysts of an independent advisory service that is widely available
8 to investors, and should also provide an estimate of investor
9 expectations. I include both historical known growth rates and
10 forecast growth rates because it is reasonable to expect that
11 investors consider both sets of data in deriving their expectations.

12 Finally, I incorporated the consensus of various analysts' forecasts
13 of five-year EPS growth rate projections, as reported in Yahoo
14 Finance. The dividend yields and growth rates for each of the
15 companies and for the average for the comparable group, as shown
16 in my Exhibit 4.

17 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COST OF**
18 **COMMON**

19 **EQUITY TO THE COMPANY BASED ON THE DCF METHOD?**

20 A. Based upon the DCF analysis for the comparable group of water

1 utilities, I determined that a reasonable expected dividend yield is
2 1.7% with an expected growth rate of 6.0% to 7.0%, which yields a
3 7.7% to 8.7% cost of equity result.

4 Based upon the DCF analysis for the comparable group of LDCs, I
5 determined that a reasonable expected dividend yield is 2.6%, with
6 an expected growth rate of 5.7% to 6.7%, which yields a range of
7 results of 8.3% to 9.3% for the cost of equity.

8 However, my ultimate DCF based cost of equity is based on the
9 average estimates for the two groups of companies, which I will
10 later summarize in my Exhibit 8 that quantifies an approximate
11 range of DCF based cost of equity estimates of 8.48% to 8.80% for
12 DCF based cost of equity of 8.64%.

13 **B: REGRESSION ANALYSIS METHOD**

14 **Q. PLEASE DESCRIBE YOUR RISK PREMIUM ANALYSIS.**

15 A. The equity risk premium method can be defined as the difference
16 between the expected return on a common stock and the expected
17 return on a debt security. The differential between the two rates of
18 return is indicative of the return investors require in order to
19 compensate them for the additional risk involved with an investment
20 in the Company's common stock over an investment in the

1 Company's bonds that involves less risk.

2 In order to quantify the risk premium, I need estimates of the cost of
3 equity and the cost of debt at contemporaneous points in time.

4 This method relies on approved returns on common equity for
5 water utility companies from various public utility commissions that
6 are published by the Regulatory Research Associates, Inc. (RRA),
7 within SNL Global Market Intelligence. In order to estimate the
8 relationship with a representative cost of debt capital, I have
9 regressed the average annual allowed equity returns with the
10 average Moody's A-rated yields for Public Utility bonds from 2006
11 through 2019. The regression analysis, which incorporates years of
12 historical data, is combined with recent monthly yields to provide an
13 estimate of the current cost of common equity.

14 **Q. WHAT ARE THE STRENGTHS OF USING ALLOWED RETURNS?**

15 A. The use of allowed returns as the basis for the expected equity
16 return has strengths over other approaches that involve models that
17 subtract a cost rate of debt from the estimated equity return. One
18 strength of my approach is that authorized returns on equity are
19 generally arrived at through lengthy investigations by various parties
20 with opposing views on the rate of return required by investors.

1 Thus, it is reasonable to conclude that the approved allowed returns
2 are good estimates for the cost of equity.

3 **Q. WHAT WERE THE RESULTS OF YOUR RISK PREMIUM**
4 **ANALYSIS?**

5 A. The summary data of risk premiums shown on my Exhibit 5, page 1
6 of 2 indicates that the average risk premium is 5.00%, with a
7 maximum premium of 5.78% and minimum premium of 3.73%,
8 which when combined with the average of the last six months of A-
9 rated bond yields produces yields with an average cost of equity of
10 8.70%, a maximum cost of equity of 9.48%, and a minimum cost of
11 equity of 7.44%. However, to better estimate the current cost of
12 equity, I employ a statistical regression in order to quantify the
13 relationship of allowed equity returns and bond costs. My Exhibit 5,
14 page 2 of 2, displays a regression analysis of the data that indicates
15 a significant statistical relationship of the allowed equity returns and
16 bond costs, such that a one percent decrease in the bond cost
17 corresponds to an increase of approximately 26 basis points in the
18 equity risk premium.² While various studies on the cost of equity
19 capital have differed on the level of the negative relationship of

² The regression indicated a significant statistical relationship of $ROE = 0.08599 + 0.26148$, with an adjusted $R^2 = 0.7732$.

1 interest rates and risk premiums, there has been agreement that as
2 interest rates fall, there is an increase in the premium.³ Applying this
3 relationship to the current utility bond cost of 3.71%⁴ resulted in a
4 current estimate of the cost of equity of 9.57%.

5 **C. COMPARABLE EARNINGS METHOD**

6 **Q. PLEASE DESCRIBE YOUR COMPARABLE EARNINGS**
7 **ANALYSIS.**

8 A. I included the comparable earnings method, which incorporates
9 reviewing earned returns on common equity for my comparable
10 group of water and natural gas utilities. This approach is based
11 upon the Hope case cited earlier in my testimony that maintains that
12 an investor should be able to earn a return comparable to the returns
13 available on alternative investments with similar risks.

14 **Q. WHAT ARE SOME OF THE STRENGTHS AND WEAKNESSES**
15 **INHERENT IN THE COMPARABLE EARNINGS METHOD?**

16 A. A strength of this method is that information on earned returns on
17 common equity is widely available to investors, and it is believed that
18 investors use actual earned returns as a guide in determining their

³ Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity." Financial Management, Spring 1985, pp. 33-45.

⁴ The 3.71% current bond yield was determined using the most recent ten-month average yield-to-maturity rate of Moody's A-rated Utility Bond Yields.

1 expected return on an investment. A weakness is that actual earned
2 rates of return can be impacted by factors outside the company's
3 control, such as weather, inflation, and tax changes, including
4 accelerated deferred income taxes. These unforeseen developments
5 can cause a company's earned rate of return to exceed or fall short of
6 its cost of capital during any certain period making this method
7 somewhat less reliable than other cost of capital methods, and it
8 suffers from circular reasoning. In addition, earned rates of return on
9 equity may often include non-regulated income. Thus, I consider the
10 results of this method only as a check on the results from my DCF
11 analysis and Regression Method.

12 **Q. HOW DID YOU APPLY THE COMPARABLE EARNING METHOD?**

13 A. I examined the five years of historical earned returns of my
14 comparable group of LDCs as reported in Value Line, as shown in my
15 Exhibit 6.

16 **Q. WHAT DID YOU CONCLUDE FROM YOUR COMPARABLE**
17 **EARNINGS ANALYSIS OF THE GROUP OF COMPARABLE**
18 **WATER UTILITIES?**

19 A. Based on the earned rates of return, I conclude that the cost of
20 equity using the comparable earnings analysis provides a

1 reasonable check on my results using the DCF model and the
2 Regression Analysis of Approved ROEs. In that, some of the results
3 for the water and gas utility groups are reasonably within or close to
4 the results identified in the Summary analysis shown in my Exhibit 8.

5 **D: CAPM**

6 **Q. PLEASE DESCRIBE HOW YOU USED THE CAPM.**

7 A. The CAPM is another version of the risk premium method. As with
8 the Comparable Earnings method, I consider the results as a check
9 on the results of my DCF and Regression Analysis methods. The
10 CAPM incorporates the relationship between a security's
11 investment risk and its market rate of return. The Beta is an
12 indicator of the relative volatility of the stock in question to the
13 volatility of the market. The equation used to estimate the cost of
14 equity is:

15
$$K = R_f + \beta(R_m - R_f)$$

16 Where, K = the cost of equity

17 R_f = the risk free rate

18 β = the beta coefficient

19 R_m = the expected return on the market.

20 **Q. WHAT ASSUMPTIONS DID YOU USE IN YOUR CAPM**

1 **ANALYSIS?**

2 A. The CAPM estimate was derived with the following inputs: the most
3 recent six-month average 30-year treasury yield of 2.53% and the
4 Value Line Betas for the comparable groups of seven water
5 companies and nine LDCs. For the expected return on the market,
6 I relied on historical returns on the S&P500 published by Duff and
7 Phelps, LLC., which have continued with the original data series by
8 Ibbottson and Associates. The annual data of large company stock
9 returns from 1926 through 2018 generated a 10.0% return using
10 the geometric average and 11.9% using the arithmetic return
11 producing the following cost of equity results of 7.65%, 7.68%,
12 8.93%, and 8.96% as shown in my Exhibit 7.

13 **Q. WHAT DID YOU CONCLUDE FROM YOUR CAPM?**

14 A. I conclude that the cost of equity using the CAPM provides a
15 reasonable check on my results using the DCF model and the
16 Regression Analysis of Approved ROEs. However, I believe the use
17 of the geometric return, which measures the annualized rate of
18 return compounded over time, is the more appropriate measure of
19 investor expectations. This position is in step with the Security and
20 Exchange Commission's requirements for publishing earned rates of

1 return for mutual funds. However, I believe the 7.65% and 7.68
2 estimates are at the low end of CWSNC's cost of equity. As such,
3 these results provide a limited check on my recommended cost of
4 equity.

5 **Q. GIVEN YOUR STUDY ON THE COST OF EQUITY, WHAT IS YOUR**
6 **RECOMMENDED COST OF EQUITY?**

7 A. Based on all of the results of my DCF model that indicate a cost of
8 equity from 8.48% to 8.80% with a central estimate of 8.64% and
9 Risk Premium model that indicates a cost of equity of 9.57%, I
10 determined that the investor required rate of return for CWSNC is
11 9.11%, which I have rounded to 9.10%, as shown in my Exhibit 8.

12 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
13 **RETURN ON COMMON EQUITY TAKE INTO CONSIDERATION**
14 **THE IMPACT OF A WATER/SEWER SYSTEM IMPROVEMENT**
15 **MECHANISM PURSUANT TO N.C. GEN. STAT. § 62-133.12 ON**
16 **THE COMPANY'S FINANCIAL RISK?**

17 A. In my opinion, the water and sewer improvement charge
18 mechanism (WSIC and SSIC) provides the ability for enhanced
19 cost recovery of the eligible capital improvements reducing
20 regulatory lag through incremental and timely rate increases. I

1 believe this mechanism is seen by debt and equity investors as
2 supportive regulation that mitigates business and regulatory risk.
3 As such, I believe that this mechanism is noteworthy and is
4 supportive of my recommendation.

5 **Q. DO YOU BELIEVE THAT THE COMMISSION SHOULD**
6 **RECOGNIZE THE REDUCTION IN INVESTMENT RISK FROM**
7 **THE CONSUMPTION ADJUSTMENT MECHANISM (CAM)?**

8 **A.** Yes. I believe that the enhanced protection from decreasing
9 customer revenue will stabilize earnings, which should contribute to
10 a reduction in perceived business risk and investment risk.
11 Consumption adjustment mechanisms are relatively new to the
12 water utility industry; however, similar mechanisms have been
13 employed in the natural gas industry. In North Carolina, Piedmont
14 Natural Gas, Inc.'s Consumption Utilization Tracker program was
15 first approved in Docket No. G-9, Sub 499, and later renamed
16 Margin Decoupling Tracker (MDT), and Public Service of North
17 Carolina has a similar program which has worked to help stabilize
18 the Company's earnings.

19 However, in those rate case proceedings where the trackers were
20 approved, there was no explicit recognition of the decrease in the

1 Company's business risk in those proceedings and subsequent
2 proceedings, indicating that any direct benefit to customers was
3 lost. This was, in part, due to the fact that similar trackers were in
4 operation with various other LDCs, and an argument could be
5 made the risk reduction was somewhat captured in the market
6 prices of the Company's common stock. However, according to a
7 data response from Mr. D'Ascendis, only two companies in his
8 group of water utilities, California Water Service Company and
9 American Water Works, and of those two corporate holding
10 companies, there are only four operating water utility subsidiaries
11 companies with a CAM.

12 I believe that some recognition of the reduction in business risk
13 introduced through the mechanism is reasonable to be enacted in
14 this proceeding. However, quantifying this benefit is difficult. In a
15 prior California PUC Order, 91-10-042, the PUC equated the
16 mechanism with having the effect of a 20 basis point reduction in
17 ROE due to reduced business risk relating to the request of certain
18 small and medium sized (Class C and D) water utilities. In
19 recognition of the subjective nature involved, I believe that a 10
20 basis point reduction in the cost rate for common equity provides a
21 minimal degree of sharing in the benefits of the CAM. Assuming a

1 CAM is approved by the Commission, my recommended cost of
2 common equity for CWSNC would be reduced by 10 basis points to
3 9.00%.

4 **Q. WHAT OTHER EVIDENCE DID YOU CONSIDER IN YOUR**
5 **ASSESSMENT OF THE REASONABLENESS OF YOUR**
6 **RECOMMENDED RETURN?**

7 A. In regard to reasonableness assessment with financial risk, I
8 considered the pre-tax interest coverage ratio produced by my cost
9 of capital recommendation. Based on the recommended capital
10 structure, cost of debt, and equity return of 9.00%, the pre-tax
11 interest coverage ratio is approximately 3.1 times, and the funds
12 flow to debt ratio of 17.8%. This level of pre-tax interest coverage
13 and funds flow coverage should allow CWSNC to qualify for a
14 single "A" bond rating.

15 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
16 **RETURN ON EQUITY TAKE INTO CONSIDERATION THE**
17 **IMPACT OF CHANGING ECONOMIC CONDITIONS ON**
18 **CWSNC'S CUSTOMERS?**

19 A. I am aware of no clear numerical basis for quantifying the impact of
20 changing economic conditions on customers in determining an

1 appropriate return on equity in setting rates for a public utility.
2 Rather, the impact of changing economic conditions nationwide is
3 inherent in the methods and data used in my study to determine the
4 cost of equity for utilities that are comparable to CWSNC. I have
5 reviewed certain information on the economic conditions in the
6 areas served by CWSNC, specifically, the 2016 and 2017 data on
7 total personal income from the Bureau of Economic Analysis (BEA)
8 and the 2019 Development Tier Designations published by the
9 North Carolina Department of Commerce for the counties in which
10 CWSNC's systems are located. The BEA data indicates that total
11 personal income weighted by the number of water customers by
12 county grew at a compound annual growth rate (CAGR) of
13 approximately 3.1%.

14 The North Carolina Department of Commerce annually ranks the
15 state's 100 counties based on economic well-being and assigns
16 each a Tier designation. The most distressed counties are rated a
17 "1," and the most prosperous counties are rated a "3." The
18 rankings examine several economic measures such as household
19 income, poverty rates, unemployment rates, population growth, and
20 per capita property tax base. For 2017, the average Tier ranking
21 that has been weighted by the number of water customers by

1 county is 2.5. Both of these economic measures indicate that there
2 have been improvements in the economic conditions for CWSNC's
3 service area relative to the three previous rate increases in Docket
4 Nos. W-354, Subs 360, 356, and 344 that were approved in 2018,
5 2017, and 2015, respectively.

6 As discussed above, it is the Commission's duty to set rates as low
7 as reasonably possible consistent within constitutional constraints.
8 This duty exists regardless of the customers' ability to pay.
9 Moreover, the rate of return on common equity is only one
10 component of the rate established by the Commission. N.C. Gen.
11 Stat. § 62-133 sets out an intricate formula for the Commission to
12 follow in determining a utility's overall revenue requirement. It is the
13 combination of rate base, expenses, capital structure, cost rates for
14 debt and equity capital, and capital structure that determines how
15 much customers pay for utility service and how much investors
16 receive in return for their investment. The Commission must
17 exercise its best judgment in balancing the interests of both groups.
18 My analysis indicates that my recommended rate of return on
19 equity will allow the Company to properly maintain its facilities,
20 provide adequate service to its customers, attract capital on terms
21 that are fair and reasonable to its customers and investors, and will

1 result in rates that are just and reasonable.

2 V. **CONCERNS WITH COMPANY WITNESS D'ASCENDIS'**

3 **TESTIMONY**

4 Q. DO YOU HAVE CONCERNS ABOUT COMPANY WITNESS
5 D'ASCENDIS' TESTIMONY?

6 A. Yes. I have identified several areas of concern with his testimony.

7 **Interest Rate Forecasts for Ratemaking**

8 As noted, I have concerns with forecast errors associated with the
9 use of interest rate forecasts to determine the cost of equity. In this
10 proceeding, Mr. D'Ascendis relies on the Blue Chip Consensus
11 Forecasts of 30-year treasury yields of 3.33% in his CAPM
12 analysis, as shown in his Exhibit 1, Schedule DWD-5. However, it
13 is worth noting that the witness relied on a similar average of
14 forecasts for 30-year yields in his predictive CAPM analysis in the
15 2018 rate case. The calculation of the 3.69% risk free rate is
16 derived from eight individual points in time forecasts from the
17 second quarter 2018 through 2028; however, six of the eight point
18 forecasts, which cover the period through the third quarter 2019,
19 have already transpired which allow one to review the accuracy of
20 these forecasts. Since the filing of his 2018 rate case testimony,

1 the highest yield observed over the third quarter of 2019 is 2.65%,
2 the average was 2.29%, and the lowest yield was 1.94%. As
3 observed in prior rate cases, interest rate forecasts have a
4 tendency to over-estimate the future level of interest rates by a
5 significant degree, which I maintain are inappropriate for
6 ratemaking.

7 **Risk Adjustment for Small Size**

8 Another concern with his testimony is his 40 basis point adjustment
9 for the size of CWSNC. I do not believe that it is appropriate to add
10 a risk premium to the cost of equity due to the size of a regulated
11 utility. CWSNC is owned by the Corix Utilities, Inc., which is owned
12 by the British Columbia Investment Management Corporation
13 (BCIMC). Corix Utilities has a significant influence over the
14 balances of common equity and long-term debt of Utilities, Inc. and
15 CWSNC. Corix determines the amounts of dividend payments to
16 BCIMC and the frequency of those payments. My reasons are as
17 follows: first, from a regulatory policy perspective, ratepayers
18 should not be required to pay higher rates because they are located
19 in the franchise area of a utility of a size which is arbitrarily
20 considered to be small. Further, if such adjustments were routinely
21 allowed, an incentive would exist for large existing utilities to form

1 subsidiaries when merging or even to form subsidiaries as to obtain
2 higher allowed returns. Lastly, CWSNC operates in a franchise
3 environment that insulates the Company from competition, and it
4 operates with procedures in place that allow for rate adjustments
5 for eligible capital improvements, cost increases, and other unusual
6 circumstances that impact its earnings.

7 CWSNC operates in the water and sewer industry, where
8 expensive bottled water provides the only alternative to utility
9 service. It is factually correct that rating agencies and investors
10 add a risk factor for small companies with relatively limited capital
11 resources; however, the inherent protection from competition
12 removes this risk that would otherwise be a concern to investors.

13 I testified to these same concerns in the last CWSNC rate case,
14 Docket No. W-354, Sub 360, where the Commission found that a
15 size adjustment was not warranted. Similar arguments have been
16 made in a 1997 CWS System, Inc., rate case, Docket No. W-778,
17 Sub 31, where witness Hanley of AUS Consultants, who relied on
18 similar cost of capital methods as witness D'Ascendis, as noted on
19 pages 824-825 in its Eighty-Seventh Report of Orders and
20 Decisions. In a 1994 CWSNC rate case where in both cases the

1 Commission was not persuaded to accept an adjustment for small
2 size and its elevated risk, as noted in on page 520 in its Eighty-
3 Fourth Report of Orders and Decisions. The explicit consideration
4 of the small size of a regulated utility has been argued before this
5 Commission in a rate case involving North Carolina Natural Gas,
6 Inc. (NCNG), Docket No. G-21, Sub 293. In an Order dated
7 December 6, 1991, the Commission disagreed with the Company
8 witness who testified that the Company's small size warranted the
9 selection of other small sized companies in his proxy group. The
10 Commission stated on page 563 in its Eighty-First Report of Orders
11 and Decisions:

12 "Dr. Andrews selected a group of 16 companies,
13 including NCNG, in his DCF model (and his CAPM)
14 because they are all publicly traded, they are all small in
15 size, and they are all principally in the local gas
16 distribution business. He testified that these companies
17 were the "best available* in terms of being comparable to
18 NCNG. In contrasting his comparable group to those of
19 witness Hinton, Dr. Andrews stated that it was better to
20 have some similarity in size among the companies even
21 if this meant some dissimilarity in financial attributes. The
22 Commission disagrees. If a group of companies is to be
23 screened for comparability in terms of investor
24 expectations, financial attributes are far more relevant
25 than size."

26 While there are published studies that address how the small size
27 of a company relates to higher risks, I am aware of only one study

1 by Dr. Annie Wong⁵ that focuses on the size of regulated utilities
2 and risk. Whereas published journal articles generally rely on
3 company size and return data for a multitude of privately held
4 companies covered by the Center for Research in Security Prices⁶
5 (CRSP); any correlation with the smaller size of a company and
6 higher stock returns is dominated by industrial firms as Dr. Wong
7 notes in her published article. Dr. Wong has tested the data for a
8 size premium in utilities and concluded that “unlike industrial stocks,
9 utility stocks do not exhibit a significant size premium. As
10 explained, there are several reasons why such a size premium
11 would not be attributable to utilities because they are regulated
12 closely by state and federal agencies and commissions, and hence,
13 their financial performance is monitored on an ongoing basis by
14 both the state and federal governments.”

15 Lastly, after reviewing Mr. D’Ascendis’ study where he performed a
16 statistical analysis known as the coefficient of variation (CoV) and
17 divided the standard deviation of the annual net profits of Value
18 Line’s utility groups companies from 2009 through 2018 and the
19 market capitalizations. With this data, he performed a regression

⁵ Annie Wong, “Utility Stocks and the Size Effect: An Empirical Analysis,” Journal of the Midwest Finance Association, pp. 95-101, (1993).

⁶ Center for Research in Security Prices, University of Chicago, Booth School of Business, Chicago, IL.

1 on the Company's CoV of net profits with its market capitalization,
2 which generated his R-Squared values. I reviewed his analysis and
3 was not persuaded that his analysis adequately supports his
4 conclusion that a 40 basis point adjustment is warranted. His
5 review of the variation of a company's net profits as a proxy for the
6 riskiness of a company may be reasonable; however, it would seem
7 logical to rely on other better known measures of risk; such as
8 market to book ratio, bond ratings, safety rank, or others identified
9 in my Exhibit 3. Adequate time has not allowed me to repeat this
10 study with alternate measures of risk and thoroughly review his
11 findings. Furthermore, it is a lot to ask of this Commission to
12 change from its previous findings on this issue of whether small-
13 sized regulated utilities should receive a risk premium, especially
14 with a non-peer reviewed study.

15 **CAPITAL STRUCTURE OF A PARENT CORPORATION AS**
16 **COMPARED TO THAT OF A REGULATED UTILITY**

17 I have concerns with Mr. D'Ascendis's comparison of the
18 ratemaking capital structure of Utilities, Inc. and that of his water
19 utility proxy group. Page 2 of his Schedule DWD-2 displays the
20 55.57% average equity ratio for his six corporate parent or holding
21 companies. He opines that the proposed capital structure with a

1 47.96% equity ratio contains a conservative level of equity as
2 compared to his average capital structure ratios. While he is
3 correct that the Company proposed an equity ratio of 47.96% is
4 significantly less than 55.57% average ratio and my recommended
5 49.10% equity ratio is also less than his 5-year average equity ratio.
6 However, I offer that this comparison is deficient, in that, it is better
7 to contrast recently Commission approved common equity ratios for
8 regulated water and wastewater utilities than to make comparisons
9 with equity ratios of a corporate parent or a holding company.
10 Often, parent corporations are invested in other non-regulated
11 businesses that involve higher risks and higher rates of returns, as
12 compared to the regulated operations of a water and wastewater
13 utility. Secondly, the acquisition policies of large corporate utilities
14 may result in equity ratios that may not be comparable to CWSNC
15 or Utilities, Inc. As such, I believe a better comparison of financial
16 risk in connection with an equity ratio is demonstrated in my Exhibit
17 9 which has the average annual approved common equity ratios for
18 water and wastewater utilities of 50.81% for the years 2014 through
19 2018 and the first six months of 2019 as compiled by the
20 Regulatory Research Associates of S&P Global Market Intelligence.
21 Similarly, the average all of the individual rate case decisions is

1 51.04%. The data indicates that the average approved equity ratios
2 of water and wastewater utilities are significantly less than the 5-
3 year average equity ratio identified on page 2 of Schedule DWD-2,
4 and it is relatively close to the Public Staff's recommended equity
5 ratio.

6 **Q. DO YOU AGREE WITH CONCERNS TO ADD BASIS POINTS TO**
7 **THE DCF BASED COST OF EQUITY TO ACCOUNT FOR**
8 **MARKET TO BOOK RATIOS SIGNIFICANTLY GREATER THAN**
9 **1.0?**

10 A. No. Witness D'Ascendis Rebuttal Testimony filed in Docket No. W-
11 354, Sub 360, argued that the fact that the market to book ratios of
12 the water utility proxy group was approximately 2.25 times and that
13 the high ratio was causing inaccuracies in the DCF model.
14 Furthermore, one needed to de-leverage the implied cost of equity
15 with the use of the Modigliani/Miller equation, which would increase
16 his 8.70% cost of equity to 9.91% cost of equity⁷. This argument
17 presumes that the value of assets prescribed by regulated
18 accounting methods and market valuation is in some degree of
19 lock-step, which I do not accept. Secondly, FERC and the FCC
20 have ruled in prior cost of capital investigations that claims that
21 market-to-book valuations being greater than 1.0 leads to the DCF

1 model understatement of the cost of equity⁷. FERC found that
2 during periods of falling interest rates, the cost of equity falls;
3 however, the result is a tendency for utilities to earn more than their
4 shareholders require and market values will exceed book values.
5 FERC went on to say there is a similar tendency with rising interest
6 rates and rising costs of equity. In that, utilities will file frequent
7 rate cases in order to protect their shareholders, and the result will
8 be to maintain its market-to-book ratio during periods of rising
9 equity costs. Furthermore, in 1988, the FERC noted that this
10 argument "is an old one, and the problem of circularity inherent in
11 that approach has been long and widely recognized."

12 **VI. SUMMARY AND RECOMMENDATIONS**

13 **Q. WOULD YOU PLEASE SUMMARIZE YOUR RECOMMEND-**
14 **ATIONS CONCERNING THE COST OF CAPITAL?**

15 A. Based upon the results of this study, it is my recommendation that
16 the appropriate capital structure to employ for ratemaking purposes
17 in this proceeding consists of 50.90% long-term debt and 49.10%
18 common equity. The appropriate embedded cost of long-term debt
19 associated with this capital structure is 5.36%, and the

⁷ Federal Communications Commission Record 91-389, p. 7196 and Federal Register, Vol 53, No. 24, pages 3,347 and 3,348.

1 recommended cost of common equity of 9.00%. My recommended
2 overall weighted cost of capital produced is 7.15%, as shown in my
3 Exhibit 10.

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

5 A. Yes.

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. I joined the Public Staff in May of 1985. I 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 Nos. E-7, Sub 1026 and E-7, Sub 1146. I have filed testimony on the Integrated Resource Plans (IRPs) filed in Docket No. E-100, Subs 114 and 125, and I have reviewed numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual IRPs and IRP updates.

I have been the lead analyst for the Public Staff in numerous avoided cost proceedings, filing testimony in Docket No. E-100, Subs 106, 136, 140, 148, and Sub 158. I have filed a Statement of Position in the arbitration

case involving EPCOR and Progress Energy Carolinas in Docket No. E-2, Sub 966. I have filed testimony in avoided cost related to the cost recovery of energy efficiency programs and demand side management programs in Dockets Nos. E-7, Sub 1032, E-7, Sub 1130, E-2, Sub 1145, and E-2, Sub 1174.

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, E-7, Sub 791, and E-7, Sub 1134.

I filed testimony on the merger of Dominion Energy, Inc. and SCANA Corp. in Docket Nos. E-22, Sub 551, and G-5, Sub 585.

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; W-218, Sub 319, E-22, Sub 532, and W-218, Sub 497, W-354, Sub 360; G-9, Sub 743, and in several smaller water utility rate cases. I have filed testimony on credit metrics and the risk of a downgrade in Docket No. E-7, Sub 1146.

I have filed testimony on the hedging of natural gas prices in Docket No. E-2, Subs 1001 and 1018. I have filed testimony on the expansion of natural gas in Docket No. G-5, Subs 337 and 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-1000, Sub 5. I have filed testimony on rainfall normalization with respect 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. I have published an article in the National Regulatory Research Institute's Quarterly Bulletin entitled Evaluating Water Utility Financial Capacity.

RISK MEASURES

VALUE LINE SAFETY RANK

The Safety Rank is a measure of the total risk of a stock. It includes factors unique to the company's business such as its financial condition, management competence, etc. The Safety Rank is derived by averaging two variables: the stock's Price Stability Index, and the Financial Strength Rating of the company. The Safety Rank ranges from 1 (Highest) to 5 (Lowest).

VALUE LINE BETA (β)

The Beta is derived from a regression analysis between weekly percent changes in the price of a stock and weekly percent price changes in the New York Stock Exchange Composite Index over a period of five years.

There has been a tendency over the years for high Beta stocks to become lower and for low Beta stocks to become higher. This tendency can be measured by studying Betas of stocks in five consecutive intervals. The Betas published in the Value Line Investment Survey are adjusted for this tendency and hence are likely to be better predictors of future Betas than those based exclusively on the experience of the past five years.

The New York Stock Exchange Composite Index is used as the basis for calculating the Beta because this index is a good proxy for the complete equity portfolio. Since Beta's significance derives primarily from its usefulness in portfolios rather than individual stocks, it is best constructed by relating to an overall market portfolio. The Value Line Index, because it weights all stocks equally, would not serve as well.

The security's return is regressed against the return on the New York Stock Exchange Composite Index over the past five years so that 259 observations of weekly price changes are used. Value Line adjusts its estimate of Beta (β_i) for regression described by Blume (1971). The estimated Beta is adjusted as follows:

$$\text{Adjusted } \beta_i = 0.35 + 0.67\beta$$

VALUE LINE FINANCIAL STRENGTH RATING

The Financial Strength Ratings are primarily a measure of the relative financial strength of a company. The rating considers key variables such as coverage of debt, variability of return, stock price stability, and company size. The Financial Strength Ratings range from the highest at A++ to the lowest at C.

VALUE LINE PRICE STABILITY INDEX

The Price Stability Index is based upon a ranking of the standard deviation of weekly percent changes in the price of a stock over the last five years. The top 5% carry a Price Stability Index of 100; the next 5%, 95; and so on down to an Index of 5.

VALUE LINE EARNINGS PREDICTABILITY INDEX

The Earnings Predictability Index is a measure of the reliability of an earnings forecast. The most reliable forecasts tend to be those with the highest rating (100), the least reliable (5).

S&P BETA (β)

The Beta is derived from a regression analysis between 60 months of price changes in a company's stock price (plus corresponding dividend yield) and the monthly price changes in the S&P 500 Index (plus corresponding dividend yield). Prices and dividends are adjusted for all subsequent stock splits and stock dividends.

S&P BOND RATING

The S&P Bond Ratings is an appraisal of the credit quality based on relevant risk factors. S&P reviews both the company's financial and business profiles. Shown below are the rankings:

- AAA An extremely strong capacity to pay interest and repay principal.
- AA+ A very strong capacity to pay interest and repay principal.
- AA There is only a small degree of difference between "AAA" or "AA." debt issues.
- AA- debt issues.
- A+ A strong capacity to pay interest and repay principal. These
- A these ratings indicate the obligor is more susceptible to
- A- changes in economic conditions than AAA" or "AA" debt issues.
- BBB+ An adequate capacity to pay interest and repay principal.
- BBB economic conditions or changing circumstances are more likely to
- BBB- lead to a weakened capacity to pay interest and repay principal.
- BB+ "BB" indicates less near-term vulnerability to default than other
- BB speculative issues. However, these bonds face major ongoing
- BB- uncertainties or exposure to adverse conditions that could lead to inadequate capacity to meet timely interest and principal payments.

S&P STOCK RANKING

The S&P Stock Rankings is an appraisal of the growth and stability of the company's earnings and dividends over the past 10 years. The final score for each stock is measured against a scoring matrix determined by an analysis of the scores of a large and representative sample of stocks. Shown below are the rankings:

- A+ Highest
- A High
- A- Above average
- B+ Average
- B Below Average
- B- Lower
- C Lowest
- D In Reorganization
- NR Not rated

MOODY'S BOND RATING

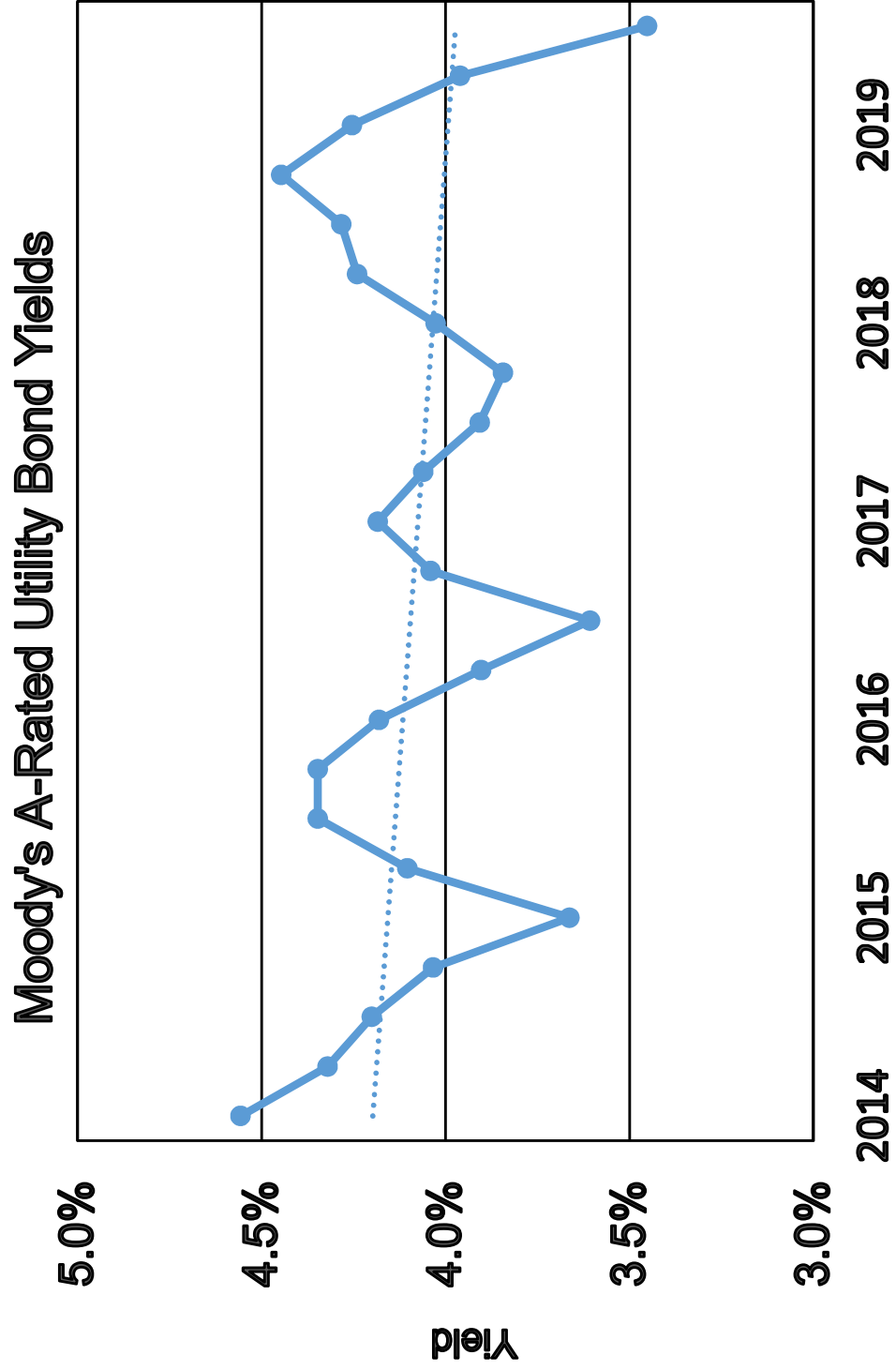
Moody's Bond Ratings assign a rating on the creditworthiness of an obligor. Such ratings reflect both the likelihood of default and any financial loss suffered in the event of a default. Shown below are the rankings:

- Aaa Obligations rated Aaa are judged to be of the highest quality with minimal risk.
- Aa Obligations rated Aa are judged to be of the high quality and are subject to low credit risk.
- A Obligations rated A are considered upper-medium-grade and are subject to low credit risk.
- Baa Obligations rated Baa are subject to moderate credit-risk. They are considered medium-grade and are subject to substantial credit risk.
- Ba Obligations rated Ba are subject to have speculative and are subject to substantial credit risk.
- B Obligations rated B are considered speculative and are subject to high credit risk.
- Caa Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
- Ca Obligations rated Ca are highly speculative and are likely in, or very near default with some prospect of recovery in principle and interest.
- C Obligations rated C are the lowest-grade class of bonds and are typically in default, with little prospect of recovery in principle and interest.

Sources:

- ¹ Value Line Investment Analyzer, Version 3.0.15a, New York, NY.
- ² Standard & Poor's, Utility Compustat II, September 15, 1993, New York, NY.

Public Staff
Hinton Exhibit I



UTILITIES, INC. AND SUBSIDIARY COMPANIES

CONSOLIDATED STATEMENTS OF CAPITALIZATION
AT SEPTEMBER 30, 2019 AND DECEMBER 31, 2018

	Unaudited September 30, 2019	December 31, 2018
COMMON SHAREHOLDERS' EQUITY:		
Common shares, \$.10 par value; authorized and issued 1,000 shares	\$ 110	\$ 110
Paid-in capital	213,572,606	197,572,606
Retained earnings	73,165,336	66,128,926
TOTAL COMMON SHAREHOLDERS' EQUITY	<u>\$ 286,738,052</u>	<u>\$ 263,701,642</u>
LONG-TERM DEBT:		
Collateral trust notes- 6.58%, \$9,000,000 due in annual installments beginning in 2017 through 2035	\$ 152,287,330	\$ 152,255,504
Collateral trust notes- 4.37%, Series 2018, due 10/4/2033	\$ 99,512,631	\$ 99,486,522
Revolving Loan Balance	<u>\$ 45,500,000</u>	<u>12,000,000</u>
TOTAL LONG-TERM DEBT	\$ 297,299,961	\$ 263,742,026
Less-Current maturities	<u>-</u>	<u>-</u>
TOTAL LONG-TERM DEBT, NET	<u>\$ 297,299,961</u>	<u>\$ 263,742,026</u>
CAPITALIZATION, exclusive of short-term financial	<u>\$ 584,038,013</u>	<u>\$ 527,443,668</u>

Source: Company response to Item 10 of Public Staff Data Request No. 14.

Investment Risk Measures

Group of Water Utility Companies

Company Name	Safety Rank	Beta	Value Line ¹			S&P ² Beta	S&P ² Quality Ranking	S&P ³ Bond Rating	Moody's ³ Bond Rating
			Price Stability	Earnings Predict.	Financial Strength				
1 American States Water	2	0.70	85	90	A	-0.06	A	A+	NA
2 American Water Works	3	0.60	100	85	B+	0.12	B+	A+	Baa1
3 Aqua America	2	0.70	95	85	A	0.38	A	NA	Baa2
4 California Water	3	0.70	80	65	B++	0.29	A-	NA	NA
5 Middlesex Water	2	0.75	70	80	B++	0.36	A	A	NA
6 SJW Group	3	0.60	70	45	B+	0.03	A-	NA	NA
7 York Water	3	0.75	60	95	B+	0.19	A	A-	NA
Average	2.6	0.69	80	78		0.19			

Group of Natural Gas Utility Companies

Company Name	Safety Rank	Beta	Value Line ⁴			S&P ⁵ Beta	S&P ⁵ Quality Ranking	S&P ⁶ Bond Rating	Moody's ⁶ Bond Rating
			Price Stability	Earnings Predict.	Financial Strength				
1 Atmos Energy	1	0.60	100	100	A+	0.21	A-	A	A2
2 Chesapeake Utilities	2	0.65	75	90	A	0.23	A	NA	B1
3 New Jersey Resources	1	0.70	85	45	A+	0.39	A-	NA	NA
4 Northwest Natural	1	0.60	95	5	A	0.28	B	A+	Baa1
5 ONE Gas Inc.	2	0.65	90	95	A	0.32	NR	A	A2
6 South Jersey Inds.	2	0.80	80	65	A	0.72	B+	BBB	NA
7 Southwest Gas	3	0.70	85	90	B++	0.30	A-	BBB+	Baa1
8 Spire Inc.	2	0.65	95	65	B++	0.21	A-	A-	Baa2
9 UGI Corp.	2	0.80	90	80	B++	0.59	A-	NA	A2
Average	1.8	0.68	88	71		0.36			

Sources:

¹ Value Line Investment Survey, Standard Edition, July 12, 2019

² S&P Global Market Intelligence, CFRA Stock Report, September 27, 2019.

³ S&P Global Market Intelligence, downloaded on October 2, 2019.

⁴ Value Line Investment Survey, Standard Edition, August 30, 2019.

⁵ S&P Global Market Intelligence, CFRA Stock Report, September 28, 2019.

⁶ S&P Global Market Intelligence, downloaded on September 25, 2019.

Public Staff
Hinton Exhibit 4

DCF ANALYSIS

Group of Water Utility Companies

Company Name	Yield ¹	Value Line ² Historical						Value Line ² Forecast			Yahoo Forecast ³
		EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS	EPS
		10-Yr	10-Yr	10-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr
1 Amer. States Water	1.4	9.0	7.5	5.0	4.5	9.0	4.0	8.0	9.5	5.0	8.2
2 Amer. Water Works	1.7	NA	NA	1.5	6.5	10.5	4.0	9.5	9.0	5.0	6.0
3 Aqua America	2.2	8.0	7.5	6.5	5.5	8.0	6.5	8.0	8.0	9.0	6.1
4 California Water	1.5	5.0	2.0	4.5	5.5	3.0	4.5	8.0	6.5	2.5	9.8
5 Middlesex Water	1.6	6.0	2.0	3.5	11.0	3.0	4.5	7.5	5.0	3.5	2.7
6 SJW Group	1.8	8.0	4.5	5.5	18.5	5.0	8.0	6.0	7.0	6.5	14.0
7 York Water Co.	1.8	5.5	3.5	4.5	6.5	4.0	4.0	9.5	6.5	4.5	4.9
Average	1.7	6.9	4.5	4.4	8.3	6.1	5.1	8.1	7.4	5.1	7.4
Estimated Cost of Equity		8.6	6.2	6.1	10.0	7.8	6.8	9.8	9.1	6.8	9.1

Group of Natural Gas Utility Companies

Company Name	Yield ¹	Value Line ⁴ Historical						Value Line ⁴ Forecast			Yahoo Forecast ³
		EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS	EPS
		10-Yr	10-Yr	10-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr
1 Atmos Energy	2.0	6.5	3.5	5.5	10.0	5.5	7.0	7.5	7.0	7.0	7.0
2 Chesapeake Utilities	1.8	9.0	5.0	10.0	8.0	6.0	10.5	9.0	9.0	9.0	6.0
3 New Jersey Resources	2.6	7.0	7.5	7.0	5.5	6.5	8.0	3.5	4.0	6.5	6.0
4 Northwest Nat. Holding	2.7	-10.5	2.5	2.0	-18.0	1.0	NA	27.0	2.5	1.0	4.0
5 ONE Gas, Inc.	2.3	NA	NA	NA	NA	NA	NA	8.0	8.5	4.5	5.0
6 South Jersey Inds.	3.8	1.5	8.0	6.5	-2.5	6.0	6.0	10.5	4.0	4.5	4.6
7 Southwest Gas Holding	2.5	7.0	8.5	5.5	4.5	10.5	6.0	9.0	5.0	7.5	8.2
8 Spire Inc.	2.8	4.0	4.0	7.5	7.5	5.0	8.0	5.5	4.0	4.5	3.2
9 UGI Corp.	2.6	7.0	7.5	9.0	11.5	6.5	7.0	10.5	6.5	12.5	5.0
	2.6	6.0	5.8	6.6	6.4	5.9	7.5	7.9	5.6	6.3	5.4
Estimated Cost of Equity		8.6	8.4	9.2	8.9	8.5	10.1	10.5	8.2	8.9	8.0

Sources:

¹ Value Line Investment Survey, Summary and Index from July 26, 2019 to October 18, 2019.

² Value Line Investment Survey, Standard Edition, October 11, 2019.

³ Yahoo Earnings Forecast as of October 17, 2019.

⁴ Value Line Investment Survey, Standard Edition, August 30, 2019.

Note:

Negative growth rates and NorthWest Natural Holding Co.'s 27% forecasted earnings growth rate are considered non-sustainable and excluded from the average calculation.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY

	[A] Water Utilities Approved Returns on Equity ¹	[B] Moody's A-Rated Bond Yields ²	[C]=[A]-[B] Water Utility Risk Premium
Year			
2006	10.23%	6.07%	4.16%
2007	10.07%	6.05%	4.02%
2008	10.24%	6.51%	3.73%
2009	10.18%	6.04%	4.15%
2010	10.18%	5.47%	4.71%
2011	10.04%	5.04%	5.00%
2012	9.90%	4.13%	5.77%
2013	9.73%	4.48%	5.25%
2014	9.59%	4.28%	5.31%
2015	9.76%	4.12%	5.65%
2016	9.71%	3.93%	5.78%
2017	9.56%	4.00%	5.56%
2018	9.43%	4.17%	5.26%
2019	9.63%	4.05%	5.58%
		Average	5.00%
		Maximum	5.78%
		Minimum	3.73%

Sources:

¹ Regulatory Research Associates, Water Advisory, June 8, 2017 and July 29, 2019.

² Moody's Credittrends with yield data as of July 31, 2019.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY

<i>Regression Statistics</i>	
Multiple R	0.8892
R Square	0.7906
Adjusted R Square	0.7732
Standard Error	0.0013
Observations	14

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	7.99457E-05	7.99457E-05	45.317804	2.09781E-05
Residual	12	2.11693E-05	1.76411E-06		
Total	13	0.000101115			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.0859919	0.0019281	44.5981785	0.000000
X Variable 1	0.2614784	0.0388420	6.7318500	0.000080

Moody's A-Rated Public Utility Bond Yield	
Jun-19	4.08%
Jul-19	3.98%
Aug-19	3.82%
Jul-18	3.69%
Aug-18	3.29%
Sep-18	3.37%
Average	3.71%

Predicted Cost of Equity **9.57%**

Note:

*Predicted Cost of Equity of 9.57% = 0.0859919 + 0.26147784 * 3.71.*

Comparable Earnings Analysis

Group of Water Utility Companies

Company ¹	2015	2016	2017	2018	2019
1 American States Water	13.00%	12.10%	13.10%	11.40%	12.00%
2 American Water Works	9.40%	9.00%	7.90%	9.70%	10.50%
3 Aqua America	11.70%	12.70%	12.20%	9.60%	7.50%
4 California Water	7.00%	7.40%	9.70%	9.00%	8.50%
5 Connecticut Water	10.10%	9.90%	8.50%	5.70%	8.50%
6 Middlesex Water	9.60%	10.30%	9.90%	13.00%	13.00%
7 SJW Group	9.90%	12.50%	12.80%	4.40%	6.50%
8 York Water	11.50%	10.40%	10.90%	10.60%	10.50%
Average	10.28%	10.54%	10.63%	9.18%	9.63%

Group of Natural Gas Utility Companies

Company ²	2015	2016	2017	2018	2019
1 Atmos Energy	9.90%	10.10%	9.80%	9.30%	9.00%
2 Chesapeake Utilities	11.20%	10.00%	9.00%	10.90%	9.50%
3 New Jersey Resources	13.90%	11.80%	12.10%	17.10%	11.00%
4 Northwest Natural	6.90%	6.90%	NMF	8.80%	9.00%
5 ONE Gas Inc.	6.50%	7.40%	8.20%	8.40%	8.50%
6 South Jersey Inds.	9.50%	8.00%	8.20%	9.20%	6.50%
7 Southwest Gas	8.70%	9.10%	9.60%	8.10%	8.50%
8 Spire Inc.	8.70%	8.20%	8.10%	9.50%	7.50%
9 UGI Corp.	13.10%	12.60%	12.90%	13.20%	9.00%
Average	9.82%	9.34%	9.74%	10.50%	8.72%

Average

Historical Water & Gas ROEs, 85 observations 9.83%

Sources:

¹ Value Line Investment Survey, Standard Edition, October 11, 2019.

² Value Line Investment Survey, Standard Edition, August 30, 2019.

Capital Asset Pricing Model

Expected Market Return using Geometric Mean

	(R _{fi})	(β)	(R _m)	(K)
	Risk free	Value Line	Expected	
Company	Rate ¹	Beta ²	Return on	CAPM
			Market ³	
1 American States Water	2.53%	0.70	10.00%	7.76%
2 American Water Works	2.53%	0.60	10.00%	7.01%
3 Aqua America	2.53%	0.70	10.00%	7.76%
4 California Water	2.53%	0.70	10.00%	7.76%
5 Middlesex Water	2.53%	0.75	10.00%	8.13%
6 SJW Group	2.53%	0.60	10.00%	7.01%
7 York Water	2.53%	0.75	10.00%	8.13%
Average				7.65%

Expected Market Return using Arithmetic Mean

	(R _{fi})	(β)	(R _m)	(K)
	Risk free	Value Line	Expected	
Company	Rate ¹	Beta ²	Return on	CAPM
			Market ³	
1 American States Water	2.53%	0.70	11.90%	9.09%
2 American Water Works	2.53%	0.60	11.90%	8.15%
3 Aqua America	2.53%	0.70	11.90%	9.09%
4 California Water	2.53%	0.70	11.90%	9.09%
5 Middlesex Water	2.53%	0.75	11.90%	9.56%
6 SJW Group	2.53%	0.60	11.90%	8.15%
7 York Water	2.53%	0.75	11.90%	9.56%
Average				8.96%

Note:

CAPM formula, $K = R_{fi} + \beta(R_m - R_{fi})$

Sources:

¹ Federal Reserve System, U.S. Long-Term Treasury Yields, 30-year.

² Value Line Investment Survey, May 31, 2019.

³ Duff and Phelps, SBBI Valuation Edition, 2019 Yearbook, Exhibit 2.3.

Capital Asset Pricing Model

Expected Market Return using Geometric Mean

	(R _{fi})	(β)	(R _m)	(K)
	Risk free	Value Line	Expected	
Company	Rate ¹	Beta ²	Return on	CAPM
			Market ³	
1 Atmos Energy	2.53%	0.65	10.00%	7.39%
2 Chesapeake Utilities	2.53%	0.65	10.00%	7.39%
3 New Jersey Resources	2.53%	0.70	10.00%	7.76%
4 Northwest Natural	2.53%	0.60	10.00%	7.01%
5 ONE Gas Inc.	2.53%	0.65	10.00%	7.39%
6 South Jersey Inds.	2.53%	0.80	10.00%	8.51%
7 Southwest Gas	2.53%	0.70	10.00%	7.76%
8 Spire Inc.	2.53%	0.65	10.00%	7.39%
9 UGI Corp.	2.53%	0.80	10.00%	8.51%
Average				7.68%

Expected Market Return using Arithmetic Mean

	(R _{fi})	(β)	(R _m)	(K)
	Risk free	Value Line	Expected	
Company	Rate ¹	Beta ²	Return on	CAPM
			Market ³	
1 Atmos Energy	2.53%	0.70	11.90%	9.09%
2 Chesapeake Utilities	2.53%	0.60	11.90%	8.15%
3 New Jersey Resources	2.53%	0.70	11.90%	9.09%
4 Northwest Natural	2.53%	0.70	11.90%	9.09%
5 ONE Gas Inc.	2.53%	0.55	11.90%	7.68%
6 South Jersey Inds.	2.53%	0.75	11.90%	9.56%
7 Southwest Gas	2.53%	0.60	11.90%	8.15%
8 Spire Inc.	2.53%	0.75	11.90%	9.56%
9 UGI Corp.	2.53%	0.80	11.90%	10.03%
Average				8.93%

Note:

CAPM formula, $K = R_{fi} + \beta(R_m - R_{fi})$

Sources:

¹ Federal Reserve System, U.S. Long-Term Treasury Yields, 30-year.

² Value Line Investment Survey, May 31, 2019.

³ Duff and Phelps, SBBI Valuation Edition, 2019 Yearbook, Exhibit 2.3.

Capital Asset Pricing Model

Risk Free Rate

US Treasury

30-Year Treasury Yields¹

Apr-19	2.94%
May-19	2.82%
Jun-19	2.57%
Jul-19	2.57%
Aug-19	2.12%
Sep-19	2.16%
Average	2.53%

Source:

¹ Federal Reserve System, U.S. Long-Term Treasury Yields.

<https://fred.stlouisfed.org/series/GS30>

Downloaded on October 11, 2019.

Cost of Equity Summary

<u>DCF Method (Water and Natural Gas Groups)</u>	
Based on Historical & Forecasted Growth Rates	8.48%
Based on Predicted Growth Rates	8.80%
<hr/>	
Average of the two growth rates	8.64%
Risk Premium Method	9.57%
<hr/>	
Average of DCF and Risk Premium Results	9.11%

COMMISSION APPROVED COMMON EQUITY RATIOS

State	Utility	Docket No.	Order date	Equity Ratio
IA	Iowa American Water Co.	RPU-2013-0002	2/28/14	52.57%
NC	Carolina Water Service of NC	W-354, Sub 336.	3/10/14	50.27%
NC	Aqua North Carolina	W-218, Sub 363	5/2/14	50.00%
HI	Waikoloa Utilities	2011-0331	5/23/14	50.00%
NJ	Middlesex Water Co.	WR-13111059	6/18/14	50.71%
NY	SUEZ Water New York Inc.	13-W-0295	6/24/14	44.00%
NY	SUEZ Water Westchester	13-W-0564	6/24/14	47.00%
DE	Tidewater Utilities, Inc.	13-466	8/19/14	50.96%
NJ	Aqua New Jersey	WR-14010019	8/20/14	52.47%
OH	Aqua Ohio Water Co.	13-2124-WW-AIR	9/10/14	51.60%
NY	SUEZ Water New Rochelle, Inc.	13-W-0539	11/14/14	47.00%
Average				49.69%
HI	Waikoloa Water	2012-0148	2/19/15	50.00%
ME	Maine Water	2014-00349	3/11/15	48.50%
IL	Aqua Illinois	14-0419	3/25/15	53.26%
HI	Kona Water Service	2013-0375	6/29/15	53.00%
NJ	SUEZ Toms River	WR-15020269	8/19/15	53.00%
NJ	Middlesex Water Co.	WR-15030391	8/19/15	51.36%
NJ	New Jersey American Water Co.	WR-15010035	9/11/15	52.00%
NC	Carolina Water Service of NC	W-354, Sub 344	12/7/15	51.00%
Average				51.52%
VA	Aqua Virginia, Inc.	PUE-2014-00045	1/7/16	49.20%
DE	Artesian Water	14-132	1/19/16	50.54%
NV	Utilities, Inc. of Central Nevada	15-06063	1/25/16	49.45%
WV	West Virginia American Water Co.	15-0676-W-42T	2/24/16	45.84%
NC	CWS Systems, Inc.	W-778 Sub 91	2/24/16	51.00%
NJ	SUEZ New Jersey Inc.	WR-15101177	4/27/16	53.00%
NJ	Aqua New Jersey	WR16010089	8/9/16	52.86%
HI	Hawaii Water Service	2015-0230	9/12/16	53.00%
IL	Illinois American Water Co.	16-0093	12/13/16	49.80%
Average				50.52%
NY	SUEZ Water New York	C-16-W-0130	1/27/17	46.00%
IA	Iowa American Water	D-RPU-2016-0002	2/27/17	52.04%
NY	New York American Water Co.	C-16-W-0259	5/18/17	46.00%
VA	Virginia-American Water	C-PUE-2015-00097	5/24/17	46.09%
NC	Carolina Water Service, Inc. of NC	W-354 Sub 356	11/8/17	52.00%
Average				48.43%
IL	Aqua Illinois	D-17-0259	3/7/18	53.22%
CA	California American Water Co.	A17-04-003	3/22/18	55.39%
CA	California Water Service Co.	A17-04-006	3/22/18	53.40%
CA	Golden State Water Co.	A17-04-002	3/22/18	57.00%
CA	San Jose Water Co.	A17-04-001	3/22/18	53.28%
NJ	Middlesex Water Co.	D-WR-17-101049	3/24/18	52.75%
SC	Carolina Water Service, Inc.	D-2017-292-WS	5/2/18	51.89%
NY	SUEZ Water Owego-Nicols Inc.	C-17-W-0528	7/13/18	46.00%
IL	Utility Services of IL. Inc. Water	D-17-1106	9/24/18	52.15%
IL	Utility Services of IL. Inc. Water/Water	D-17-1106	9/24/18	52.15%
RI	Suez Water Rhode Island	D-R-4800	10/5/18	53.91%
NJ	New Jersey American Water	D-WR-17-090985	10/29/18	54.00%
MD	Aquarion Water Co. of Mass.	D.P.U. 17-90	10/31/18	47.04%
NJ	SUEZ Water New Jersey	D-WR-18050593	11/19/18	54.00%
NC	Aqua North Carolina	D-W-218, Sub 497	12/18/18	50.00%
CA	Suburban Water Systems	A-18-05-004	12/20/18	60.00%
VA	Massanutten Public Service Corp.	C-PUR-2017-00069	12/21/18	52.19%
Average				52.85%
HI	Hawaii Water Service	D-2017-0350	1/7/19	53.40%
MD	Maryland American Water	C-9487	2/5/19	48.66%
WV	West Virginia American Water Co.	C-18-0573-W-42T	2/8/19	49.79%
NC	Carolina Water Service of NC	D-W-354, Sub 360	2/21/19	50.91%
NJ	Aqua New Jersey	WR-18121351	5/28/19	53.00%
KY	Kentucky American Water Co.	2018-00358	6/27/19	48.76%
Average				50.75%
Average of Annual Averages				50.81%
Average Across Years				51.04%

Carolina Water Service, Inc. of North Carolina
Cost of Capital as of September 30, 2019

Item	Ratios	Cost Rate	Weighted Cost Rate	Pre-Tax Cost of Capital ¹
Long-Term Debt	50.90%	5.36%	2.73%	2.73%
Common Equity	49.10%	9.00%	4.42%	5.75%
Total	100.00%		7.15%	8.48%

Pre-Tax Interest Coverage ²	3.1
Funds Flow to Debt ³	17.8%

Notes:

¹ The pre-tax cost of debt and equity is grossed up by tax retention factors.

² Pre-Tax Interest Coverage: $3.1 = 8.51 / 2.73$.

³ Funds Flow to Debt = (Recommended rate base*weighted debt cost rate) / (Net Income for Return + Depreciation + Amortization-Deferred taxes).

$17.8\% = (\$138,378,386 * 2.73\%) / (\$12,844,498 + \$6,877,484 + \$1,555,071 - 89,746)$.