

Carolina Water Service, Inc. of North Carolina  
Recommended Capital Structure and Cost Rates  
for Ratemaking Purposes  
at September 30, 2019

<u>Type Of Capital</u>	<u>Ratios (1)</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	50.90%	5.36% (1)	2.73%
Common Equity	<u>49.10%</u>	10.20% (2)	<u>5.01%</u>
Total	<u>100.00%</u>		<u>7.74%</u>

Notes:

(1) Company-Provided.

(2) From page 2 of this Schedule.

Carolina Water Service, Inc. of North Carolina  
Brief Summary of Common Equity Cost Rate

<u>Line No.</u>	<u>Principal Methods</u>	<u>Proxy Group of Six Water Companies</u>
1.	Discounted Cash Flow Model (DCF) (1)	8.81%
2.	Risk Premium Model (RPM) (2)	10.12%
3.	Capital Asset Pricing Model (CAPM) (3)	9.35%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	11.29%
5.	Indicated Common Equity Cost Rate before Adjustment for Size Risk	9.80%
6.	Size Risk Adjustment (5)	0.40%
7.	Recommended Common Equity Cost Rate after Adjustment for Size Risk	10.20%

- Notes: (1) From page 3 of this Schedule.  
(2) From page 10 of this Schedule.  
(3) From page 21 of this Schedule.  
(4) From page 26 of this Schedule.  
(5) From Schedule DWD-8 (direct testimony).

Carolina Water Service, Inc. of North Carolina  
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for the  
Proxy Group of Six Water Companies

	[1]	[2]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Six Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Co.	1.38 %	8.00 %	8.00 %	6.00 %	7.33 %	1.43 %	8.76 %
American Water Works Company Inc	1.63	9.50	8.10	8.20	8.60	1.70	10.30
Artesian Resources Corporation	2.76	NA	NA	4.00	4.00	2.82	6.82
California Water Service Group	1.46	8.00	10.00	9.80	9.27	1.53	10.80
Middlesex Water Co.	1.55	7.50	NA	2.70	5.10	1.59	6.69
York Water Co.	1.74	9.50	NA	4.90	7.20	1.80	9.00
						Average	8.73 %
						Median	8.88 %
						Average of Mean and Median	8.81 %

NA= Not Available

Notes:

- (1) Indicated dividend at 10/18/2019 divided by the average closing price of the last 60 trading days ending 10/18/2019 for each company.
- (2) From pages 4 through 9 of this Schedule.
- (3) Average of columns 2 through 5 excluding negative growth rates.
- (4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co.,  $1.38\% \times (1 + (1/2 \times 7.33\%)) = 1.43\%$ .
- (5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey  
www.reuters.com Downloaded on 10/18/2019  
www.zacks.com Downloaded on 10/18/2019  
www.yahoo.com Downloaded on 10/18/2019

AMER. STATES WATER NYSE-AWR										RECENT PRICE	90.00	P/E RATIO	42.3 (Trailing: 43.7 Median: 21.0)	RELATIVE P/E RATIO	2.55	DIV'D YLD	1.4%	VALUE LINE																					
TIMELINESS 1 Raised 8/9/19 SAFETY 2 Raised 7/20/12 TECHNICAL 2 Raised 10/11/19 BETA .65 (1.00 = Market) 18-Month Target Price Range Low-High Midpoint (% to Mid) \$72-\$103 \$98 (-5%)										High: 21.0 Low: 13.5	19.4 14.9	19.8 15.6	18.2 15.3	24.1 17.0	33.1 24.0	38.7 27.0	44.1 35.8	47.2 37.3	58.4 41.1	69.6 50.1	94.4 63.3	Target Price Range 2022 2023 2024																	
LEGENDS — 1.35 x Dividends p sh divided by Interest Rate ... Relative Price Strength 2-for-1 split 9/13 Options: Yes Shaded area indicates recession																																							
2022-24 PROJECTIONS High Price 75 Low Price 55 Ann'l Total Return 12% Gain (-15%) -2% (-40%) -9%										Institutional Decisions 4Q2018 1Q2019 3Q2019 to Buy 140 138 139 to Sell 102 105 109 Held(000) 26276 26624 26893 Percent 24 shares 12 traded 8																													
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020										© VALUE LINE PUBL. LLC 22-24																													
6.99 6.81 7.03 7.88 8.75 9.21 9.74 10.71 11.12 12.12 12.19 12.17 12.56 11.92 12.01 11.88 12.45 12.85 1.04 1.11 1.32 1.45 1.65 1.69 1.70 2.11 2.13 2.48 2.65 2.67 2.81 2.70 2.96 2.84 3.10 3.30 .39 .53 .66 .67 .81 .78 .81 1.11 1.12 1.41 1.61 1.57 1.61 1.62 1.88 1.72 2.10 2.20 .44 .44 .45 .46 .48 .50 .51 .52 .55 .64 .76 .83 .87 .91 .99 1.06 1.14 1.22										Revenues per sh 15.75 "Cash Flow" per sh 4.00 Earnings per sh ^ 2.75 Div'd Decl'd per sh ^ 1.70 Cap'l Spending per sh 3.25 Book Value per sh ^ 19.35 Common Shs Outst'g ^ 37.50										% TOT. RETURN 9/19 THIS STOCK VL ARITH. ^ 1 yr. 49.3 -5.2 3 yr. 137.4 24.7 5 yr. 226.7 40.8																			
1.88 2.51 2.12 1.95 1.45 2.23 2.09 2.12 2.13 1.77 2.52 1.89 2.39 3.55 3.08 3.44 3.45 3.50 6.98 7.51 7.86 8.32 8.77 8.97 9.70 10.13 10.84 11.80 12.72 13.24 12.77 13.52 14.45 15.19 15.85 16.60 30.42 33.50 33.60 34.10 34.46 34.60 37.06 37.26 37.70 38.53 38.72 38.29 36.50 36.57 36.68 36.76 36.90 37.00										BOLD FIGURES ARE VALUE LINE ESTIMATES										Avg Ann'l P/E Ratio 1.30 Avg Ann'l Div'd Yield 2.6%																			
CAPITAL STRUCTURE as of 6/30/19 Total Debt \$281.3 mill. Due in 5 Yrs \$100.7 mill. LT Debt \$281.0 mill. LT Interest \$24.0 mill. (33% of Cap'l) Leases, Uncapitalized: Annual rentals \$2.6 mill. Pension Assets-12/18 \$162.5 mill. Oblig. \$196.1 mill. Pfd Stock None Common Stock 36,831,867 shs. as of 8/2/19 MARKET CAP: \$3.3 billion (Mid Cap)										361.0 398.9 419.3 466.9 472.1 465.8 458.6 436.1 440.6 436.8 470 480 29.5 41.4 42.0 54.1 62.7 61.1 60.5 59.7 69.4 63.9 65.0 70.0 38.9% 43.2% 41.7% 39.9% 36.3% 38.4% 38.4% 36.8% 36.0% 22.0% 23.0% 23.0% 3.2% 5.8% 2.0% 2.5% -- -- -- 2.5% -- -- Nil 1.0%										Revenues (\$mill) 590 Net Profit (\$mill) 105 Income Tax Rate 23.0% AFUDC to Net Profit 1.0% Long-Term Debt Ratio 46.0% Common Equity Ratio 54.0% Total Capital (\$mill) 1350 Net Plant (\$mill) 1650 Return on Total Cap'l 9.0% Return on Shr. Equity 14.0% Return on Com Eq 14.0% Retained to Com Eq 5.5% All Div's to Net Prof 62%																			
CURRENT POSITION (2017 2018 6/30/19) Cash Assets 2 7.1 1.5 Accts Receivable 26.1 23.4 24.2 Other 129.2 101.0 96.3 Current Assets 155.5 131.5 122.0 Accts Payable 51.0 59.5 55.6 Debt Due 59.3 40.3 .3 Other 46.4 46.8 50.4 Current Liab. 156.7 146.6 106.3										BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 259,919 customers in 70 cities in 10 counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,353 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS sub. Sold Chaparral City Wtr. of AZ. (6/11). Employs about 815. BlackRock, Inc. owns 15.1% of out. shares; Vanguard, 11.5%; off. & dir. 1.2%. (4/19 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc. CA. Addr.: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.																													
ANNUAL RATES OF change (per sh) Revenues 3.5% "Cash Flow" 6.0% Earnings 9.0% Dividends 7.5% Book Value 5.0%										Shares of American States Water have performed well since our July report. The stock price, which had already been on a roll over the past one-, three-, and five year periods, surged over 20% in the last three months. By comparison, the S&P 500 Index returns have been flattish. We attribute the showing to the positive earnings and dividend news (more below). Rate relief is spurring the bottom line. In California, utilities petition for higher rates triennially. State regulators recently finalized the Golden States Water subsidiary's ruling. Hence, there was a \$0.08-a-share gain in the June quarter resulting from the new rates being retroactive to the beginning of the year. Wider margins also helped as the company has done a good job of cutting costs. To reflect this, we have raised our earnings-per-share estimates for 2019 and 2020, \$0.15 and \$0.10, respectively, to \$2.10 and \$2.20. Nonregulated activities are also providing a boost. Through its ASUS operations, the company provides water services to U.S. Army bases around the country. For the first half of the year, share-earnings contributions from this business doubled from 2018's \$0.11, to \$0.22. The inclusion of revenues generated from Fort Riley were part of the reason, as was an increase in management fees and construction at other bases. As more military complexes privatize their water services, we expect this segment to gain in importance. Moreover, profits made here are not regulated by state authorities. The most recent dividend hike was better than expected. In the last quarter, the payout was raised a hefty 11% to an annual rate of \$1.22 a share. Still, The yield on this equity has declined meaningfully. At 1.4%, AWR is now yielding about 80 basis points lower than the Value Line median. And, while much of this is due to the robust dividend growth prospects, the equity is now richly valued as to many key financial metrics. In any case, our ranking system pegs AWR to outperform the market in the year ahead. However, the stock is now trading above our 2022-2024 TPR. Price performance over the next 18-month period is also projected to be subpar. James A. Flood October 11, 2019																													
QUARTERLY REVENUES (\$mill.) Cal- Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2016 93.5 112.0 123.8 106.8 436.1 2017 98.8 113.2 124.4 104.2 440.6 2018 94.7 106.9 124.2 111.0 436.8 2019 101.7 124.6 138.7 105 470 2020 105 130 140 105 480										QUARTERLY EARNINGS PER SHARE ^ Cal- Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2016 .28 .45 .59 .30 1.62 2017 .34 .62 .57 .35 1.88 2018 .29 .44 .62 .37 1.72 2019 .35 .72 .65 .38 2.10 2020 .38 .67 .70 .45 2.20										QUARTERLY DIVIDENDS PAID ^ Cal- Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2015 .213 .213 .224 .224 .87 2016 .224 .224 .224 .242 .91 2017 .242 .242 .255 .255 .99 2018 .255 .255 .275 .275 1.06 2019 .275 .275 .305																			
(A) Primary earnings. Excludes nonrecurring gains/losses. '04, '76; '05, '13; '06, '36; '08, '14; '10, '23; '11, '10. Next earnings report due mid-November.										(B) Dividends historically paid in early March, June, September, and December. ^ Div'd reinvestment plan available.										(C) In 10-years, adjusted for split. (D) Includes intangibles. As of 6/30/19: \$1.1 million/\$0.03 a share.										Company's Financial Strength 85 Stock's Price Stability A Price Growth Persistence 95 Earnings Predictability 90									
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(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7c; '05, 13c; '06, 3c; '08, 14c; '10, (23c); '11, 10c. Next earnings report due mid-November.

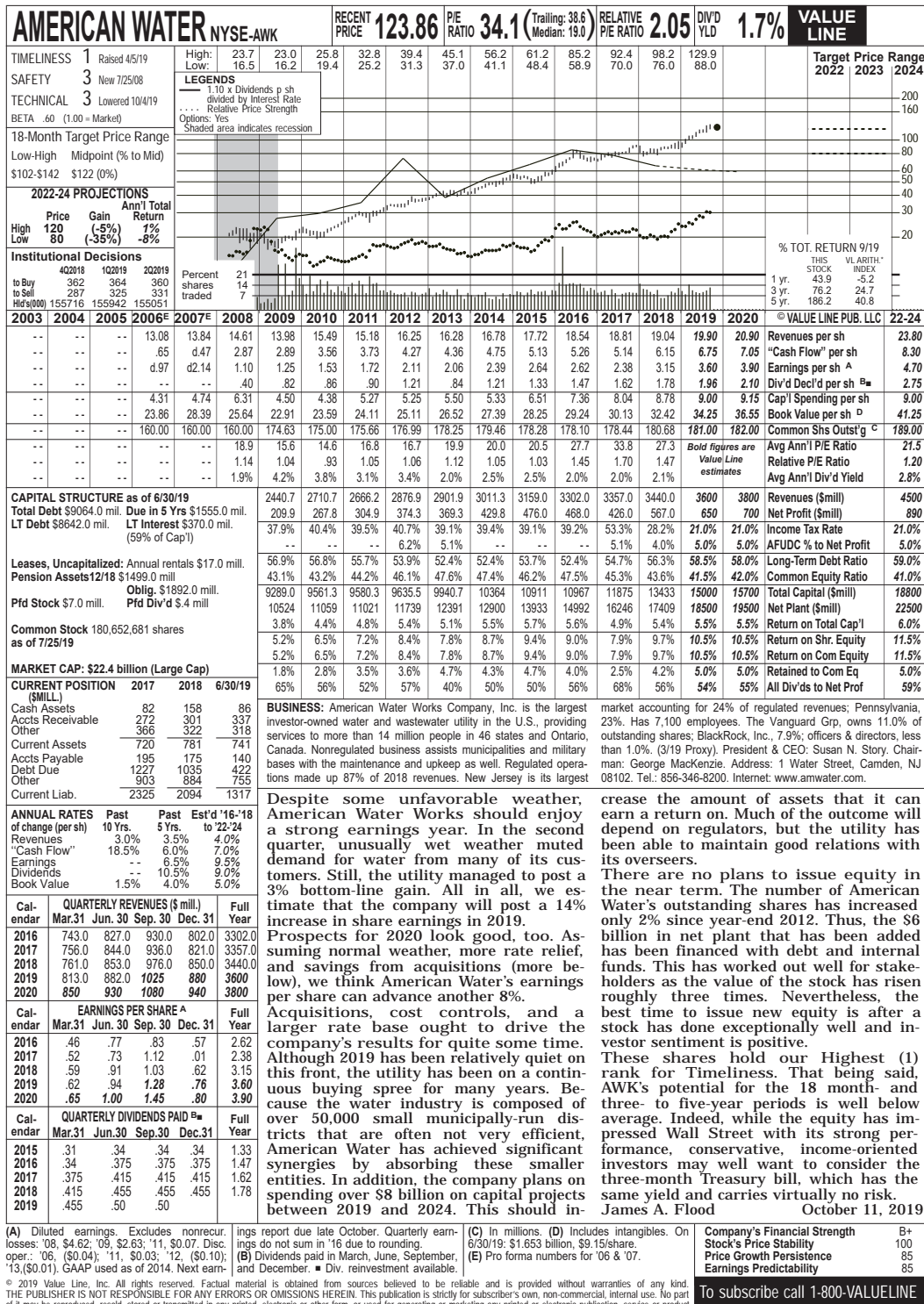
(B) Dividends historically paid in early March, June, September, and December. Div'd reinvestment plan available.

(C) In millions, adjusted for split.  
(D) Includes intangibles. As of 6/30/19; \$1.1 million/\$0.03 a share.

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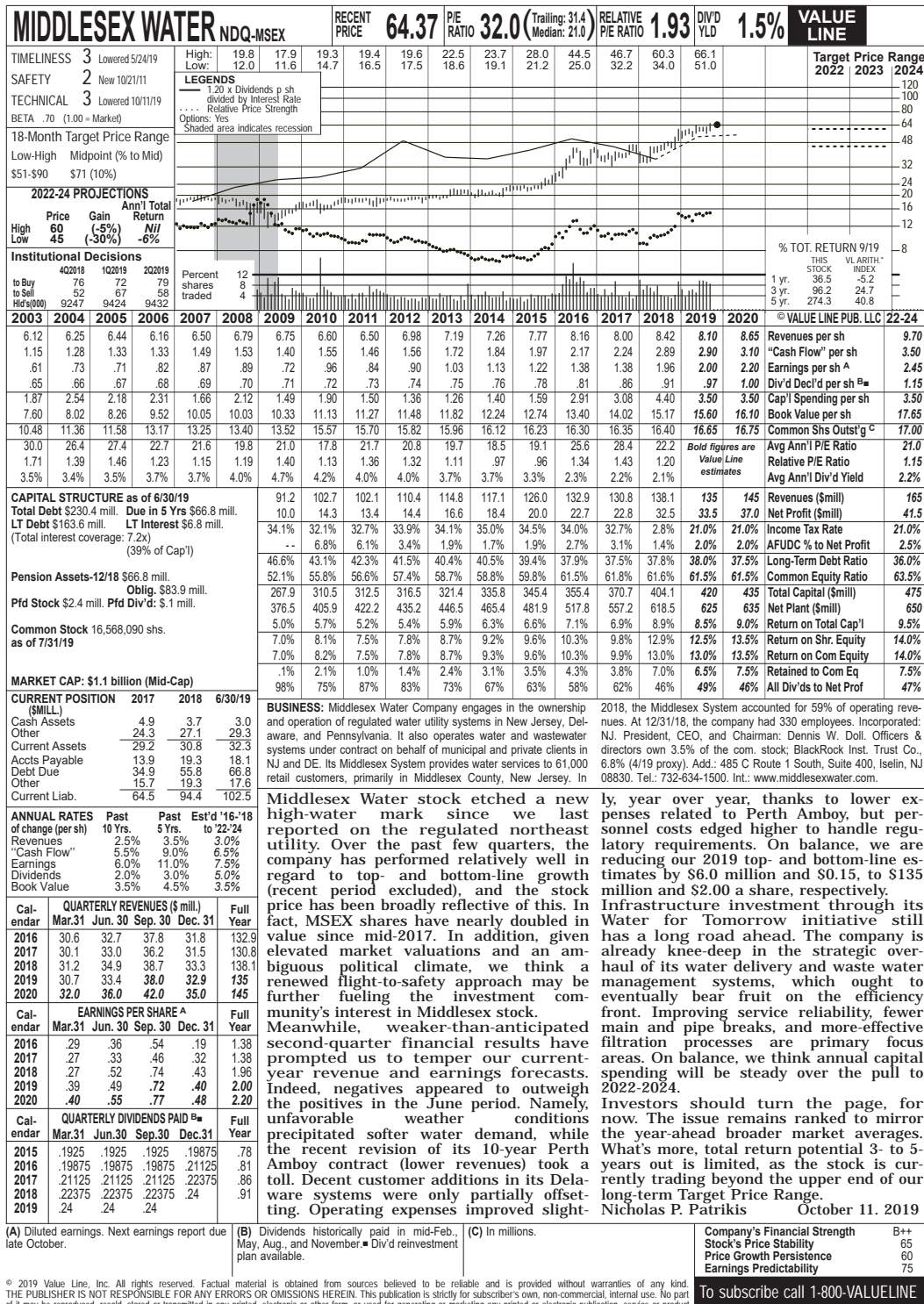
Nov 20 2019



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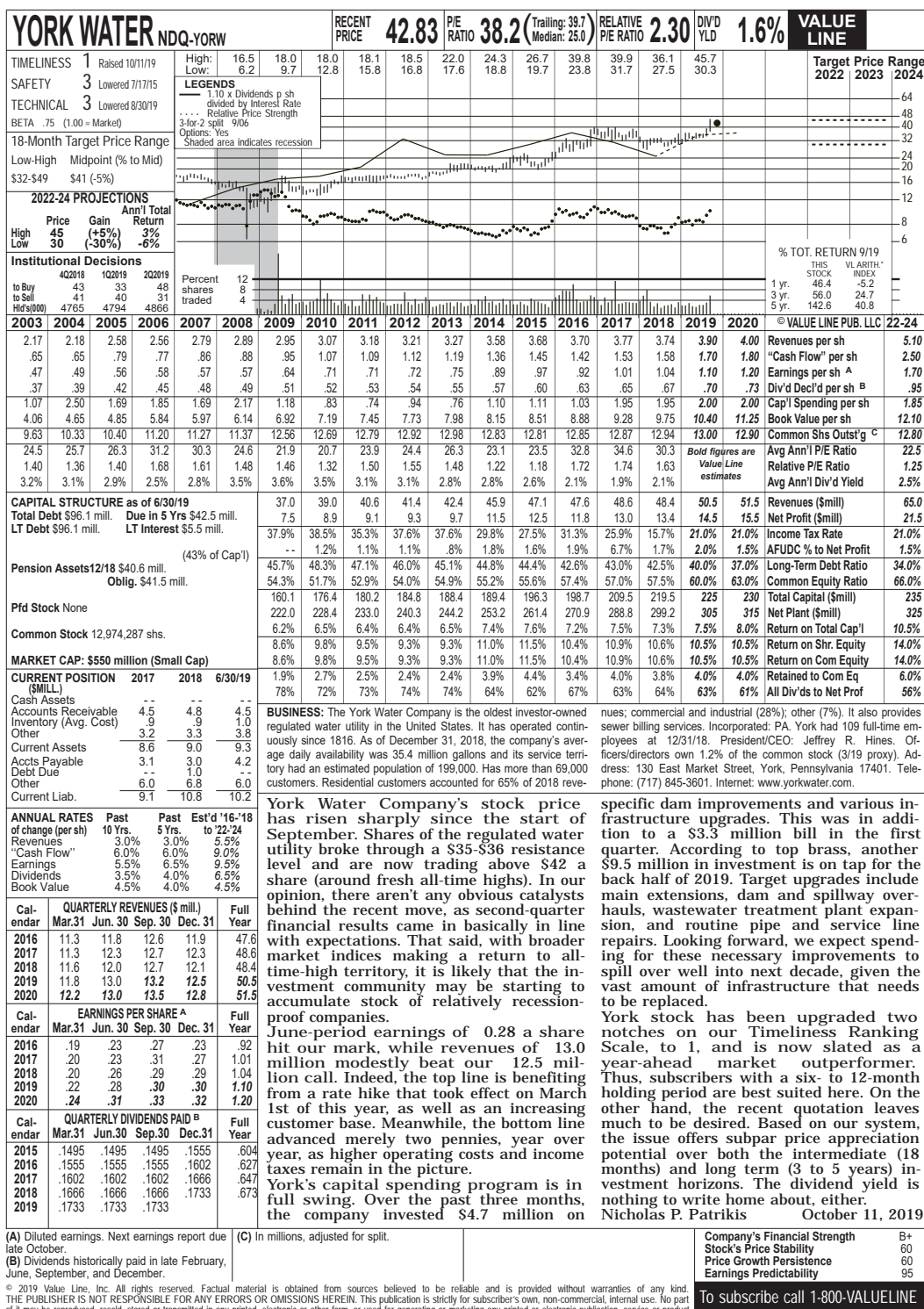


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Carolina Water Service, Inc. of North Carolina  
Summary of Risk Premium Models for the  
Proxy Group of Six Water Companies

	<u>Proxy Group of Six Water Companies</u>
Predictive Risk Premium Model (PRPM) (1)	10.84 %
Risk Premium Using an Adjusted Total Market Approach (2)	<u>9.39 %</u>
Average	<u><u>10.12 %</u></u>

Notes:

- (1) From page 11 of this Schedule.
- (2) From page 12 of this Schedule.

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Carolina Water Service, Inc. of North Carolina

Indicated ROE

Derived by the Predictive Risk Premium Model (1)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Six Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance (2)	GARCH Coefficient	Predicted Risk Premium (3)	Risk-Free Rate (4)	Indicated ROE (5)
American States Water Co.	0.38%	0.44%	0.41%	1.98126	10.16%	2.64%	12.80%
American Water Works Company Inc	NMF	NMF	NMF	6.51236	NMF	2.64%	NMF
Artesian Resources Corporation	0.32%	0.27%	0.29%	2.11410	7.74%	2.64%	10.38%
California Water Service Group	0.32%	0.27%	0.29%	2.02252	7.39%	2.64%	10.03%
Middlesex Water Co.	0.30%	0.24%	0.27%	2.18875	7.39%	2.64%	10.03%
York Water Co.	0.45%	0.31%	0.38%	2.20343	10.61%	2.64%	13.25%
						Average	11.30%
						Median	10.38%
						Average of Mean and Median	10.84%

NMF = Not Meaningful Figure

Notes:

(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.

(2) Average of columns [1] and [2].

(3)  $(1 + (\text{Column [3]} * \text{Column [4]})^{1/2}) - 1$ .

(4) From note 2 on page 22 of this Schedule.

(5) Column [5] + Column [6].

Carolina Water Service, Inc. of North Carolina  
Indicated Common Equity Cost Rate  
Through Use of a Risk Premium Model  
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Six Water Companies</u>
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.60 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	<u>0.35 (2)</u>
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	3.95 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	<u>0.06 (3)</u>
5.	Adjusted Prospective Bond Yield	4.01 %
6.	Equity Risk Premium (4)	<u>5.38</u>
7.	Risk Premium Derived Common Equity Cost Rate	<u><u>9.39 %</u></u>

- Notes:
- (1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 18-19 of this Schedule).
  - (2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.35% from page 13 of this Schedule.
  - (3) Adjustment to reflect the A2 / A3 Moody's LT issuer rating of the proxy group of six water companies as shown on page 14 of this Schedule. The 0.06% upward adjustment is derived by taking 1/6 of the spread between A2 and A3 Public Utility Bonds ( $1/6 * 0.37\% = 0.06\%$ ) as derived from page 13 of this Schedule.
  - (4) From page 15 of this Schedule.

Carolina Water Service, Inc. of North Carolina  
Interest Rates and Bond Spreads for  
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1]	[2]	[3]
	<u>Aaa Rated Corporate Bond</u>	<u>A Rated Public Utility Bond</u>	<u>Baa Rated Public Utility Bond</u>
Sep-2019	3.03 %	3.37 %	3.71 %
Aug-2019	2.98	3.29	3.63
Jul-2019	<u>3.29</u>	<u>3.69</u>	<u>4.13</u>
Average	<u><u>3.10 %</u></u>	<u><u>3.45 %</u></u>	<u><u>3.82 %</u></u>

Selected Bond Spreads

A Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:

0.35 % (1)

Baa Rated Public Utility Bonds Over A Rated Public Utility Bonds:

0.37 % (2)

Notes:

(1) Column [2] - Column [1].

(2) Column [3] - Column [2].

Source of Information:

Bloomberg Professional Service

Carolina Water Service, Inc. of North Carolina  
Comparison of Long-Term Issuer Ratings for  
Proxy Group of Six Water Companies

	Moody's		Standard & Poor's	
	Long-Term Issuer Rating		Long-Term Issuer Rating	
	October 2019		October 2019	
<u>Proxy Group of Six Water Companies</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting (1)</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting(1)</u>
American States Water Co. (2)	A2	6.0	A+	5.0
American Water Works Company Inc (3)	A3	7.0	A	6.0
Artesian Resources Corporation	NR	--	NR	--
California Water Service Group (4)	NR	--	A+	5.0
Middlesex Water Co.	NR	--	A	6.0
York Water Co.	NR	--	A-	7.0
Average	<u>A2/A3</u>	<u>6.5</u>	<u>A</u>	<u>5.8</u>

Notes:

- (1) From page 6 of Schedule DWD-4 (direct testimony).
- (2) Ratings that of Golden State Water Company.
- (3) Ratings that of New Jersey and Pennsylvania American Water Companies.
- (4) Ratings that of Aqua Pennsylvania, Inc.
- (5) Ratings that of California Water Service Company.

Source Information: Moody's Investors Service  
Standard & Poor's Global Utilities Rating Service



Carolina Water Service, Inc. of North Carolina  
Judgment of Equity Risk Premium for  
Proxy Group of Six Water Companies

<u>Line No.</u>		<u>Proxy Group of Six Water Companies</u>
1.	Calculated equity risk premium based on the total market using the beta approach (1)	5.66 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	<u>5.10</u>
3.	Average equity risk premium	<u><u>5.38 %</u></u>

Notes: (1) From page 16 of this Schedule.  
(2) From page 20 of this Schedule.

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Carolina Water Service, Inc. of North Carolina  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for the  
Proxy Group of Six Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Six Water Companies</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>		
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.70
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.12
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	10.23
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.92
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	<u>9.56</u>
7.	Conclusion of Equity Risk Premium	8.85 %
8.	Adjusted Beta (7)	<u>0.64</u>
9.	Forecasted Equity Risk Premium	<u><u>5.66</u></u> %

Notes provided on page 17 of this Schedule.

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Carolina Water Service, Inc. of North Carolina  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for the  
Proxy Group of Six Water Companies

Notes:

- (1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2018 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1926-2018.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of large company common stocks relative to Moody's average Aaa and Aa rated corporate bond yields from 1928-2018 referenced in Note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through September 2019.
- (4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.60% (from page 12 of this Schedule) from the projected 3-5 year total annual market return of 13.83% (described fully in note 1 on page 22 of this Schedule).
- (5) Using data from Value Line for the S&P 500, an expected total return of 14.52% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.60% results in an expected equity risk premium of 10.92%.
- (6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 13.16% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.60% results in an expected equity risk premium of 9.56%.
- (7) Average of mean and median beta from page 21 of this Schedule.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Industrial Manual and Mergent Bond Record Monthly Update.  
Value Line Summary and Index  
Blue Chip Financial Forecasts, October 1, 2019 and June 1, 2019  
Bloomberg Professional Service

2 ■ BLUE CHIP FINANCIAL FORECASTS ■ OCTOBER 1, 2019

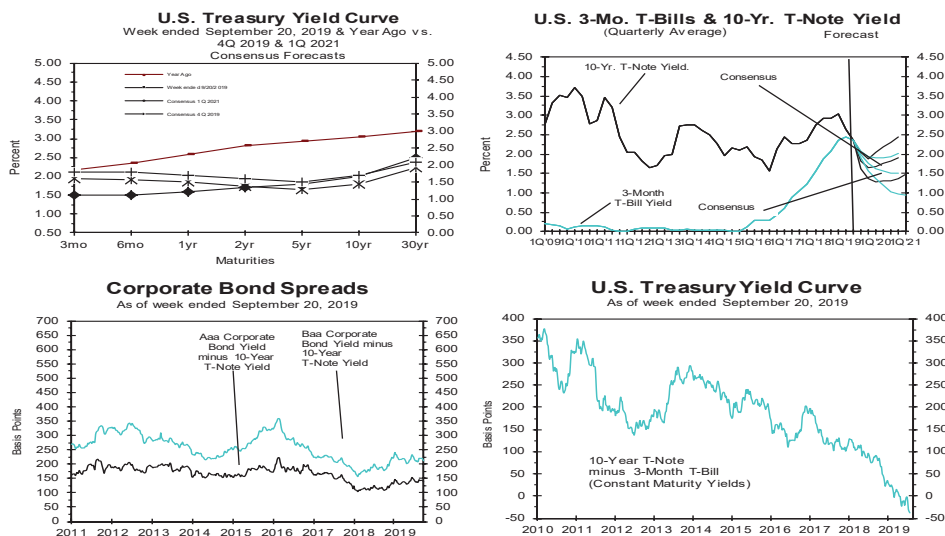
Consensus Forecasts of U.S. Interest Rates and Key Assumptions

Interest Rates	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month				4Q	1Q	2Q	3Q	4Q	1Q
	Sep 20	Sep 13	Sep 6	Aug 30	Aug	Jul	Jun	3Q 2019*	2019	2020	2020	2020	2020	2021
Federal Funds Rate	2.19	2.13	2.13	2.12	2.13	2.40	2.38	2.25	1.8	1.6	1.5	1.5	1.5	1.4
Prime Rate	5.25	5.25	5.25	5.25	5.25	5.50	5.50	5.35	4.9	4.8	4.7	4.7	4.6	4.6
LIBOR, 3-mo.	2.15	2.13	2.12	2.13	2.16	2.29	2.40	2.21	2.0	1.9	1.8	1.8	1.8	1.8
Commercial Paper, 1-mo.	2.07	2.04	2.03	2.06	2.08	2.25	2.35	2.14	1.9	1.7	1.6	1.6	1.6	1.5
Treasury bill, 3-mo.	1.95	1.96	1.97	1.99	1.99	2.15	2.22	2.04	1.8	1.6	1.6	1.5	1.5	1.5
Treasury bill, 6-mo.	1.92	1.89	1.88	1.90	1.93	2.08	2.17	1.98	1.8	1.7	1.6	1.5	1.6	1.5
Treasury bill, 1 yr.	1.86	1.81	1.72	1.75	1.77	1.96	2.00	1.85	1.7	1.6	1.6	1.6	1.6	1.6
Treasury note, 2 yr.	1.73	1.69	1.50	1.52	1.57	1.84	1.81	1.69	1.6	1.6	1.6	1.6	1.6	1.7
Treasury note, 5 yr.	1.66	1.61	1.38	1.40	1.49	1.83	1.83	1.63	1.5	1.6	1.6	1.7	1.7	1.8
Treasury note, 10 yr.	1.80	1.76	1.52	1.50	1.63	2.06	2.07	1.81	1.7	1.7	1.8	1.8	1.9	2.0
Treasury note, 30 yr.	2.24	2.22	2.00	1.98	2.12	2.57	2.57	2.30	2.1	2.2	2.2	2.3	2.4	2.5
Corporate Aaa bond	3.18	3.18	2.96	2.93	3.06	3.43	3.56	3.21	3.0	3.0	3.2	3.3	3.4	3.5
Corporate Baa bond	3.92	3.92	3.72	3.70	3.82	4.16	4.33	3.96	4.0	4.1	4.2	4.3	4.4	4.4
State & Local bonds	3.21	3.14	3.06	3.05	3.08	3.24	3.29	3.15	2.9	2.9	3.0	3.1	3.1	3.2
Home mortgage rate	3.73	3.56	3.49	3.58	3.62	3.77	3.80	3.66	3.6	3.6	3.7	3.7	3.8	3.8

Key Assumptions	History								Consensus Forecasts-Quarterly					
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q
	2017	2018	2018	2018	2018	2019	2019	2019**	2019	2020	2020	2020	2020	2021
Fed's AFE \$ Index	106.2	102.9	105.5	107.8	109.4	109.4	110.2	110.4	110.3	110.0	109.2	108.9	108.6	108.9
Real GDP	3.5	2.5	3.5	2.9	1.1	3.1	2.0	2.0	1.8	1.7	1.7	1.6	1.8	1.9
GDP Price Index	2.6	2.3	3.2	2.0	1.6	1.1	2.4	2.1	2.0	2.0	2.0	2.1	2.0	2.0
Consumer Price Index	3.1	3.2	2.1	2.0	1.5	0.9	2.9	2.0	2.0	2.1	2.0	2.0	2.0	2.0

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; LIBOR quotes from Intercontinental Exchange. All interest rate data are sourced from Haver Analytics. Historical data for Fed's Major Currency Index are from FRSR H.10. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). \*Interest rate data for 3Q 2019 are based on historical data through the week ended September 20. \*\*Data for 3Q 2019 for the Fed's AFE \$ Index based on data through week ended September 20. Figures for 3Q 2019 Real GDP, GDP Chained Price Index and Consumer Price Index are consensus forecasts based on a special question asked of the panelists this month.



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## Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2021 through 2025 and averages for the five-year periods 2021-2025 and 2026-2030. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

		Average For The Year					Five-Year Averages	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
1. Federal Funds Rate	CONSENSUS	2.4	2.4	2.6	2.7	2.8	2.6	2.8
	Top 10 Average	3.1	3.2	3.4	3.4	3.4	3.3	3.4
	Bottom 10 Average	1.5	1.6	1.7	2.1	2.2	1.8	2.1
2. Prime Rate	CONSENSUS	5.4	5.5	5.6	5.8	5.8	5.6	5.7
	Top 10 Average	6.1	6.2	6.4	6.4	6.4	6.3	6.2
	Bottom 10 Average	4.6	4.7	4.8	5.1	5.3	4.9	5.1
3. LIBOR, 3-Mo.	CONSENSUS	2.7	2.8	2.8	3.0	3.0	2.9	3.0
	Top 10 Average	3.3	3.4	3.6	3.6	3.6	3.5	3.6
	Bottom 10 Average	2.1	2.1	2.0	2.4	2.5	2.2	2.5
4. Commercial Paper, 1-Mo.	CONSENSUS	2.5	2.6	2.7	2.9	2.9	2.7	2.9
	Top 10 Average	3.1	3.2	3.4	3.4	3.5	3.3	3.4
	Bottom 10 Average	2.0	2.0	2.0	2.4	2.4	2.2	2.4
5. Treasury Bill Yield, 3-Mo.	CONSENSUS	2.4	2.4	2.5	2.7	2.8	2.6	2.8
	Top 10 Average	3.1	3.2	3.4	3.4	3.4	3.3	3.4
	Bottom 10 Average	1.5	1.6	1.7	2.0	2.2	1.8	2.1
6. Treasury Bill Yield, 6-Mo.	CONSENSUS	2.4	2.5	2.7	2.9	2.9	2.7	2.9
	Top 10 Average	3.1	3.3	3.5	3.5	3.5	3.4	3.5
	Bottom 10 Average	1.7	1.7	1.8	2.2	2.4	2.0	2.3
7. Treasury Bill Yield, 1-Yr.	CONSENSUS	2.5	2.6	2.8	3.0	3.0	2.8	3.0
	Top 10 Average	3.3	3.4	3.6	3.6	3.7	3.5	3.7
	Bottom 10 Average	1.8	1.8	2.0	2.3	2.4	2.0	2.3
8. Treasury Note Yield, 2-Yr.	CONSENSUS	2.6	2.7	2.9	3.0	3.1	2.9	3.1
	Top 10 Average	3.3	3.5	3.7	3.8	3.8	3.6	3.8
	Bottom 10 Average	1.8	1.9	2.0	2.3	2.4	2.1	2.3
10. Treasury Note Yield, 5-Yr.	CONSENSUS	2.8	2.9	3.1	3.2	3.3	3.0	3.3
	Top 10 Average	3.5	3.7	4.0	4.0	4.0	3.8	4.1
	Bottom 10 Average	2.0	2.1	2.2	2.3	2.5	2.2	2.4
11. Treasury Note Yield, 10-Yr.	CONSENSUS	3.0	3.1	3.3	3.3	3.4	3.2	3.4
	Top 10 Average	3.6	3.9	4.2	4.2	4.2	4.0	4.4
	Bottom 10 Average	2.3	2.4	2.4	2.5	2.6	2.4	2.6
12. Treasury Bond Yield, 30-Yr.	CONSENSUS	3.3	3.5	3.6	3.7	3.8	3.6	3.8
	Top 10 Average	4.0	4.3	4.5	4.6	4.6	4.4	4.8
	Bottom 10 Average	2.7	2.7	2.8	2.9	2.9	2.8	2.9
13. Corporate Aaa Bond Yield	CONSENSUS	4.4	4.6	4.7	4.7	4.8	4.6	4.8
	Top 10 Average	5.0	5.2	5.5	5.5	5.5	5.3	5.6
	Bottom 10 Average	3.8	3.9	3.9	4.0	4.0	3.9	4.0
13. Corporate Baa Bond Yield	CONSENSUS	5.3	5.6	5.7	5.7	5.7	5.6	5.8
	Top 10 Average	6.0	6.3	6.6	6.6	6.7	6.5	6.8
	Bottom 10 Average	4.7	4.8	4.7	4.8	4.8	4.7	4.8
14. State & Local Bonds Yield	CONSENSUS	4.1	4.2	4.3	4.3	4.3	4.2	4.4
	Top 10 Average	4.6	4.9	5.0	5.0	5.0	4.9	5.1
	Bottom 10 Average	3.5	3.6	3.6	3.6	3.6	3.6	3.6
15. Home Mortgage Rate	CONSENSUS	4.7	4.8	4.9	5.0	5.0	4.9	5.0
	Top 10 Average	5.3	5.5	5.8	5.8	5.8	5.6	5.9
	Bottom 10 Average	4.0	4.0	4.0	4.2	4.2	4.1	4.2
A. Fed's AFE Nominal \$ Index	CONSENSUS	108.5	108.2	108.0	107.6	106.9	107.8	106.7
	Top 10 Average	110.8	110.5	110.9	110.8	110.6	110.7	111.2
	Bottom 10 Average	106.6	105.8	104.9	104.6	103.6	105.1	102.9
		Year-Over-Year, % Change					Five-Year Averages	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
B. Real GDP	CONSENSUS	1.9	1.9	2.0	2.1	2.1	2.0	2.1
	Top 10 Average	2.3	2.4	2.4	2.5	2.5	2.4	2.6
	Bottom 10 Average	1.5	1.4	1.6	1.8	1.8	1.6	1.8
C. GDP Chained Price Index	CONSENSUS	2.1	2.1	2.0	2.0	2.0	2.1	2.0
	Top 10 Average	2.4	2.4	2.2	2.2	2.2	2.3	2.2
	Bottom 10 Average	1.8	1.8	1.8	1.9	1.9	1.9	1.8
D. Consumer Price Index	CONSENSUS	2.1	2.2	2.2	2.1	2.1	2.1	2.1
	Top 10 Average	2.5	2.4	2.4	2.4	2.4	2.4	2.4
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.8

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Carolina Water Service, Inc. of North Carolina  
Derivation of Mean Equity Risk Premium Based Studies  
Using Holding Period Returns and  
Projected Market Appreciation of the S&P Utility Index

<u>Line No.</u>		<u>Implied Equity Risk Premium</u>
	<u>Equity Risk Premium based on S&amp;P Utility Index Holding Period Returns (1):</u>	
1.	Historical Equity Risk Premium	4.00 %
2.	Regression of Historical Equity Risk Premium (2)	6.30
3.	Forecasted Equity Risk Premium Based on PRPM (3)	3.92
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	6.30
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	<u>4.99</u>
6.	Average Equity Risk Premium (6)	<u><u>5.10 %</u></u>

- Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2018. Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of the S&P Utility Index relative to Moody's A rated public utility bond yields from 1928 - 2018 referenced in note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A rated public utility bonds from January 1928 - September 2019.
- (4) Using data from Value Line for the S&P Utilities Index, an expected return of 10.25% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 3.95%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 6.30%. (10.25% - 3.95% = 6.30%)
- (5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 8.94% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 3.95%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 4.99%. (8.94% - 3.95% = 4.99%)
- (6) Average of lines 1 through 5.



Carolina Water Service, Inc. of North Carolina  
Indicated Common Equity Cost Rate Through Use  
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

Proxy Group of Six Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
American States Water Co.	0.65	0.53	0.59	9.87 %	2.64 %	8.46 %	9.47 %	8.97 %
American Water Works Company Inc	0.60	0.57	0.59	9.87	2.64	8.46	9.47	8.97
Artesian Resources Corporation	0.65	0.55	0.60	9.87	2.64	8.56	9.55	9.05
California Water Service Group	0.70	0.61	0.66	9.87	2.64	9.15	9.99	9.57
Middlesex Water Co.	0.70	0.70	0.70	9.87	2.64	9.55	10.29	9.92
York Water Co.	0.75	0.62	0.69	9.87	2.64	9.45	10.21	9.83
Mean			<u>0.64</u>			<u>8.94 %</u>	<u>9.83 %</u>	<u>9.39 %</u>
Median			<u>0.63</u>			<u>8.86 %</u>	<u>9.77 %</u>	<u>9.31 %</u>
Average of Mean and Median			<u>0.64</u>			<u>8.90</u>	<u>9.80</u>	<u>9.35 %</u>

Notes on page 22 of this Schedule.

Carolina Water Service, Inc. of North Carolina  
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

- (1) The market risk premium (MRP) is derived by using six different measures from three sources: Ibbotson, Value Line, and Bloomberg as illustrated below:

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2018)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2018:	11.89 %
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.12
MRP based on Ibbotson Historical Data:	<u>6.77 %</u>

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2018)

9.69 %

Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - September 2019)

9.14 %

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending October 18, 2019)

Total projected return on the market 3-5 years hence*:	13.83 %
Projected Risk-Free Rate (see note 2):	2.64
MRP based on Value Line Summary & Index:	<u>11.19 %</u>
*Forecasted 3-5 year capital appreciation plus expected dividend yield	

Measure 5: Value Line Projected Return on the Market based on the S&P 500

Total return on the Market based on the S&P 500:	14.52 %
Projected Risk-Free Rate (see note 2):	2.64
MRP based on Value Line data	<u>11.88 %</u>

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.16 %
Projected Risk-Free Rate (see note 2):	2.64
MRP based on Bloomberg data	<u>10.52 %</u>

Average of Value Line, Ibbotson, and Bloomberg MRP: 9.87 %

- (2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 18-19 of this Schedule.) The projection of the risk-free rate is illustrated below:

Fourth Quarter 2019	2.10 %
First Quarter 2020	2.20
Second Quarter 2020	2.20
Third Quarter 2020	2.30
Fourth Quarter 2020	2.40
First Quarter 2021	2.50
2021-2025	3.60
2026-2030	3.80
	<u>2.64 %</u>

- (3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index  
Blue Chip Financial Forecasts, October 1, 2019 and June 1, 2019  
Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Bloomberg Professional Services

Carolina Water Service, Inc. of North Carolina  
Basis of Selection of the Group of Non-Price Regulated Companies  
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the Non-Price Regulated Proxy Group was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group was then selected based on the unadjusted beta range of 0.24 – 0.68 and residual standard error of the regression range of 2.7385 – 3.2661 of the Utility Proxy Group.

These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression. Plus or minus two standard deviations captures 95.50% of the distribution of unadjusted betas and residual standard errors of the regression.

The standard deviation of the Utility Proxy Group's residual standard error of the regression is 0.1319. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1070 = \frac{3.0023}{\sqrt{518}} = \frac{3.0023}{22.7596}$$

Source of Information: Value Line, Inc., September 2019  
Value Line Investment Survey (Standard Edition)

Carolina Water Service, Inc. of North Carolina  
Basis of Selection of Comparable Risk  
Domestic Non-Price Regulated Companies

	[1]	[2]	[3]	[4]
	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
<u>Proxy Group of Six Water Companies</u>				
American States Water Co.	0.65	0.45	2.6675	0.0960
American Water Works Company Inc	0.60	0.34	2.1751	0.0783
Artesian Resources Corporation	0.65	0.41	3.4253	0.1233
California Water Service Group	0.70	0.48	2.9094	0.1047
Middlesex Water Co.	0.70	0.54	3.3409	0.1202
York Water Co.	0.75	0.55	3.4957	0.1258
Average	0.68	0.46	3.0023	0.1081
Beta Range (+/- 2 std. Devs. of Beta)	0.24	0.68		
2 std. Devs. of Beta	0.22			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.7385	3.2661		
Std. dev. of the Res. Std. Err.	0.1319			
2 std. devs. of the Res. Std. Err.	0.2638			

Source of Information: Valueline Proprietary Database, September 2019

Carolina Water Service, Inc. of North Carolina  
Proxy Group of Non-Price Regulated Companies  
Comparable in Total Risk to the  
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]
Proxy Group of Ten Non-Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
AutoZone Inc.	0.80	0.64	2.8861	0.1039
Cheesecake Factory	0.75	0.55	2.8814	0.1037
Casey's Gen'l Stores	0.75	0.56	3.0241	0.1088
Cracker Barrel	0.70	0.54	3.0683	0.1104
Campbell Soup	0.65	0.46	2.9384	0.1057
Dunkin' Brands Group	0.70	0.47	2.8395	0.1022
Darden Restaurants	0.80	0.63	2.9091	0.1047
Tyson Foods 'A'	0.75	0.59	3.2539	0.1171
Texas Roadhouse	0.80	0.67	3.1481	0.1133
Viad Corp.	0.80	0.64	3.0017	0.1080
Average	0.75	0.58	3.0000	0.1100
Proxy Group of Six Water Companies	0.68	0.46	3.0023	0.1081

Source of Information:

Valueline Proprietary Database, September 2019

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Carolina Water Service, Inc. of North Carolina  
Summary of Cost of Equity Models Applied to  
Proxy Group of Ten Non-Price Regulated Companies  
Comparable in Total Risk to the  
Proxy Group of Six Water Companies

<u>Principal Methods</u>	<u>Proxy Group of Ten Non-Price Regulated Companies</u>
Discounted Cash Flow Model (DCF) (1)	11.63 %
Risk Premium Model (RPM) (2)	11.41
Capital Asset Pricing Model (CAPM) (3)	<u>10.44</u>
	Mean <u>11.16 %</u>
	Median <u>11.41 %</u>
	Average of Mean and Median <u>11.29 %</u>

Notes:

- (1) From page 27 of this Schedule.
- (2) From page 28 of this Schedule.
- (3) From page 31 of this Schedule.

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Carolina Water Service, Inc. of North Carolina  
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the  
Proxy Group of Six Water Companies

[1]	[2]	[4]	[5]	[6]	[7]	[8]	
Proxy Group of Ten Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
	-	13.50 %	12.20 %	10.25 %	11.98 %	-	NA %
	3.60	7.50	11.80	6.98	8.76	3.76	12.52
	0.77	5.50	9.10	7.88	7.49	0.80	8.29
	3.16	10.00	10.00	(0.40)	10.00	3.32	13.32
	3.13	1.00	6.00	(4.00)	3.50	3.18	6.68
	1.87	10.00	9.80	7.58	9.13	1.96	11.09
	2.95	11.00	8.90	8.63	9.51	3.09	12.60
	0.75	7.50	NA	6.25	6.88	0.78	7.66
	2.30	12.50	11.30	8.55	10.78	2.42	13.20
0.60	9.50	NA	14.00	11.75	0.64	12.39	
					Mean	10.86 %	
					Median	12.39 %	
					Average of Mean and Median	11.63 %	

NA= Not Available

NMF= Not Meaningful Figure

(1) The application of the DCF model to the domestic, non-price regulated comparable risk companies is identical to the application of the DCF to the utility proxy group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of October 18, 2019. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information:  
Value Line Investment Survey  
www.reuters.com Downloaded on 10/18/2019  
www.zacks.com Downloaded on 10/18/2019  
www.yahoo.com Downloaded on 10/18/2019

Carolina Water Service, Inc. of North Carolina  
Indicated Common Equity Cost Rate  
Through Use of a Risk Premium Model  
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Ten Non-Price Regulated Companies</u>
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	4.60 %
2.	Equity Risk Premium (2)	<u>6.81</u>
3.	Risk Premium Derived Common Equity Cost Rate	<u><u>11.41</u></u> %

Notes: (1) Average forecast of Baa corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2019 and June 1, 2019 (see pages 18 and 19 of this Schedule). The estimates are detailed below.

Fourth Quarter 2019	4.00 %
First Quarter 2020	4.10
Second Quarter 2020	4.20
Third Quarter 2020	4.30
Fourth Quarter 2020	4.40
First Quarter 2021	4.40
2021-2025	5.60
2026-2030	<u>5.80</u>
Average	<u><u>4.60</u></u> %

(2) From page 30 of this Schedule.

Carolina Water Service, Inc. of North Carolina  
Comparison of Long-Term Issuer Ratings for the  
Proxy Group of Ten Non-Price Regulated Companies of Comparable risk to the  
Proxy Group of Six Water Companies

Proxy Group of Ten Non- Price Regulated Companies	Moody's Long-Term Issuer Rating October 2019		Standard & Poor's Long-Term Issuer Rating October 2019	
	Long- Term Issuer Rating	Numerical Weighting (1)	Long- Term Issuer Rating	Numerical Weighting (1)
AutoZone Inc.	Baa1	8.0	BBB	9.0
Cheesecake Factory	NR	--	NR	--
Casey's Gen'l Stores	NR	--	NR	--
Cracker Barrel	WR	--	NR	--
Campbell Soup	Baa2	9.0	BBB-	10.0
Dunkin' Brands Group	NR	--	NR	--
Darden Restaurants	Baa2	9.0	BBB	9.0
Tyson Foods 'A'	Baa2	9.0	BBB	9.0
Texas Roadhouse	NR	--	NR	--
Viad Corp.	WR	--	NR	--
Average	<u>Baa2</u>	<u>8.8</u>	<u>BBB</u>	<u>9.3</u>

Notes:

(1) From page 6 of Schedule DWD-4 (direct testimony).

Source of Information:

Bloomberg Professional Services

Carolina Water Service, Inc. of North Carolina  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for  
Proxy Group of Ten Non-Price Regulated Companies of Comparable risk to the  
Proxy Group of Six Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Ten Non-Price Regulated Companies</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>		
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.70
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.12
5.	Equity Risk Premium Based on <u>Value Line</u> Summary and Index (4)	10.23
6.	Equity Risk Premium Based on <u>Value Line</u> S&P 500 Companies (5)	10.92
7.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	<u>9.56</u>
8.	Conclusion of Equity Risk Premium	8.85 %
9.	Adjusted Beta (7)	<u>0.77</u>
10.	Forecasted Equity Risk Premium	<u><u>6.81 %</u></u>

Notes:

- (1) From note 1 of page 16 of this Schedule.
- (2) From note 2 of page 16 of this Schedule.
- (3) From note 3 of page 16 of this Schedule.
- (4) From note 4 of page 16 of this Schedule.
- (5) From note 5 of page 16 of this Schedule.
- (6) From note 6 of page 16 of this Schedule.
- (7) Average of mean and median beta from page 31 of this Schedule.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Value Line Summary and Index  
Blue Chip Financial Forecasts, October 1, 2019 and June 1, 2019  
Bloomberg Professional Services

Carolina Water Service, Inc. of North Carolina  
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the  
Proxy Group of Six Water Companies

Proxy Group of Ten Non-Price Regulated Companies	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
AutoZone Inc.	0.75	0.67	0.71	9.87 %	2.64 %	9.65 %	10.36 %	10.00 %
Cheesecake Factory	0.75	0.76	0.76	9.87	2.64	10.14	10.73	10.44
Casey's Gen'l Stores	0.75	0.78	0.77	9.87	2.64	10.24	10.81	10.52
Cracker Barrel	0.70	0.72	0.71	9.87	2.64	9.65	10.36	10.00
Campbell Soup	0.65	0.64	0.65	9.87	2.64	9.05	9.92	9.49
Dunkin' Brands Group	0.70	0.83	0.77	9.87	2.64	10.24	10.81	10.52
Darden Restaurants	0.80	0.78	0.79	9.87	2.64	10.44	10.95	10.69
Tyson Foods 'A'	0.75	0.77	0.76	9.87	2.64	10.14	10.73	10.44
Texas Roadhouse	0.80	0.86	0.83	9.87	2.64	10.83	11.25	11.04
Viad Corp.	0.80	0.82	0.81	9.87	2.64	10.63	11.10	10.87
Mean			<u>0.76</u>			<u>10.10 %</u>	<u>10.70 %</u>	<u>10.40 %</u>
Median			<u>0.77</u>			<u>10.19 %</u>	<u>10.77 %</u>	<u>10.48 %</u>
Average of Mean and Median			<u>0.77</u>			<u>10.15 %</u>	<u>10.74 %</u>	<u>10.44 %</u>

Notes:

- (1) From note 1, page 22 of this Schedule.
- (2) From note 2, page 22 of this Schedule.
- (3) Average of CAPM and ECAPM cost rates.

Carolina Water Service, Inc. of North Carolina  
Hinton DCF Analysis using only Projected Growth in EPS

DCF ANALYSIS

Group of Water Utility Companies

		Value Line <sup>2</sup>	Yahoo	
		Forecast	Forecast <sup>3</sup>	
Company Name	Yield <sup>1</sup>	EPS	EPS	Average
		5-Yr	5-Yr	
1 Amer. States Water	1.43 %	8.00 %	8.20 %	8.10 %
2 Amer. Water Works	1.70	9.50	6.00	7.75
3 Aqua America	2.16	8.00	6.10	7.05
4 California Water	1.48	8.00	9.80	8.90
5 Middlesex Water	1.57	7.50	2.70	5.10
6 SJW Group	1.82	6.00	14.00	10.00
7 York Water Co.	1.78	9.50	4.90	7.20
Average	1.71 %	8.07 %	7.39 %	7.73 %
Estimated Cost of Equity		9.78 %	9.09 %	9.43 %

Sources:

- <sup>1</sup> Value Line Investment Survey, Summary and Index from July 26, 2019 to October 18, 2019.
- <sup>2</sup> Value Line Investment Survey, Standard Edition, October 11, 2019.
- <sup>3</sup> Yahoo Earnings Forecast as of October 17, 2019.
- <sup>4</sup> Value Line Investment Survey, Standard Edition, August 30, 2019.

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Carolina Water Service, Inc. of North Carolina  
Demonstration of the Inadequacy of  
a DCF Return Rate Related to Book Value  
When Market Value is Greater than Book Value

		[A]	[B]
		Based on Mr. Hinton's Water Proxy Group	
Line No.		Market Value	Book Value
1.	Per Share	\$ 67.07 (1)	\$ 18.62 (2)
2.	DCF Cost Rate (3)	8.64%	8.64%
3.	Return in Dollars (4)	\$ 5.795	\$ 1.609
4.	Dividends (5)	\$ 1.140	\$ 1.140
5.	Growth in Dollars (6)	\$ 4.655	\$ 0.469
6.	Return on Market Value (7)	8.64%	2.40%
7.	Rate of Growth on Market Value (8)	6.94%	0.70%

Notes:

- (1) Average of the 13-week ending October 18, 2019 prices from Value Line Summary & Index.
- (2) Average book value dividing total common equity at year-end 2018 by common shares outstanding at year-end 2018 for each proxy group company.
- (3) Mr. Hinton's Recommended DCF cost rate on from Public Staff Hinton Exhibit 8.
- (4) Line 1 x Line 2.
- (5) Dividends are based on the average 1.7% dividend yield for Mr. Hinton's water proxy group from Public Staff Hinton Exhibit 4.
- (6) Line 3 - Line 4.
- (7) Line 3 / Line 1.
- (8) Line 5 / Line 1.

Carolina Water Service, Inc. of North Carolina  
Calculation of Indicated DCF Applied to Book Value Capital Structure  
of Mr. Hinton's Proxy Group

Un-lever Indicated Market Capital Structure DCF

$$\begin{aligned}
 K_u &= K_e - \left( \left( \left( K_u - i \right) \left( 1 - t \right) \right) \frac{D}{E} \right) - \left( \left( K_u - d \right) \frac{P}{E} \right) \\
 K_u &= 8.64\% - \left( \left( \left( K_u - 5.22\% \right) \left( 1 - 21\% \right) \right) \frac{23.31\%}{76.65\%} \right) - \left( \left( K_u - 7.38\% \right) \frac{0.04\%}{76.65\%} \right) \\
 K_u &= 8.64\% - \left( \left( \left( K_u - 5.22\% \right) \left( 79.00\% \right) \right) \frac{30.41\%}{76.65\%} \right) - \left( \left( K_u - 7.38\% \right) \frac{0.05\%}{76.65\%} \right) \\
 K_u &= 8.64\% - \left( \left( 79.00\% * K_u - 4.1247\% \right) \frac{30.41\%}{76.65\%} \right) - \left( 0.05\% * K_u - 0.00\% \right) \\
 K_u &= 8.64\% - \left( 24.03\% * K_u - 1.25\% \right) \frac{30.41\%}{76.65\%} - \left( 0.05\% * K_u - 0.00\% \right) \\
 K_u &= 8.64\% - 24.03\% * K_u + 1.25\% \frac{30.41\%}{76.65\%} - 0.05\% * K_u + 0.00\% \\
 K_u &= 9.90\% - 24.08\% * K_u \\
 124.08\% * K_u &= 9.90\% \\
 K_u &= \mathbf{7.98\%}
 \end{aligned}$$

Re-lever to Indicated Book Value Capital Structure DCF

$$\begin{aligned}
 K_e &= K_u + \left( \left( \left( K_u - i \right) \left( 1 - t \right) \right) \frac{D}{E} \right) + \left( \left( K_u - d \right) \frac{P}{E} \right) \\
 K_e &= 7.98\% + \left( \left( \left( 7.98\% - 5.22\% \right) \left( 1 - 21\% \right) \right) \frac{45.17\%}{54.74\%} \right) + \left( \left( 7.98\% - 7.38\% \right) \frac{0.09\%}{54.74\%} \right) \\
 K_e &= 7.98\% + \left( \left( 2.76\% \right) \left( 79\% \right) \right) \frac{82.51\%}{54.74\%} + \left( 0.60\% \right) \frac{0.17\%}{54.74\%} \\
 K_e &= 7.98\% + \left( 2.18\% \right) \frac{82.51\%}{54.74\%} + \left( 0.00\% \right) \frac{0.17\%}{54.74\%} \\
 K_e &= 7.98\% + 1.80\% + 0.00\% \\
 K_e &= \mathbf{9.78\%}
 \end{aligned}$$

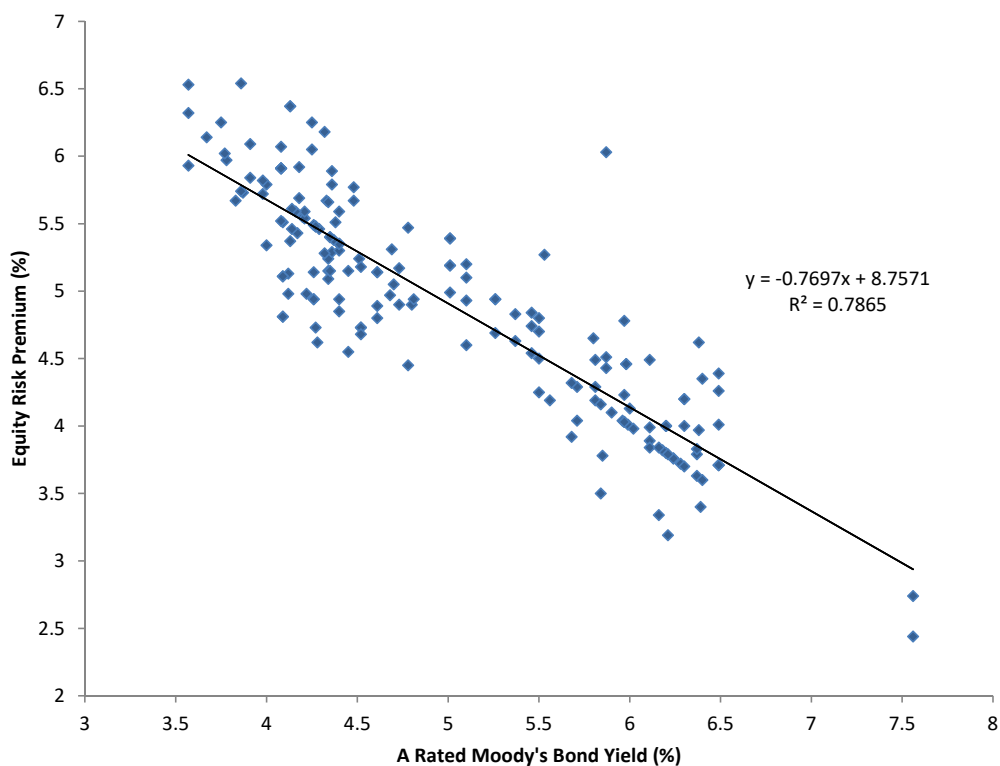
Where:

- K<sub>u</sub> = Un-levered (i.e., 100% equity) cost of common equity
- K<sub>e</sub> = Market determined cost of common equity
- i = Cost of debt
- t = Income tax rate
- D = Debt ratio
- E = Equity ratio
- d = Cost of preferred stock
- P = Preferred equity ratio

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Carolina Water Service, Inc. of North Carolina  
Prediction of Equity Risk Premiums Relative to  
Moody's A Rated Utility Bond Yields



Constant	Slope	Prospective A Rated Utility Bond (1)	Prospective Equity Risk Premium	Indicated ROE
8.757137 %	-0.769728	3.95 %	5.72 %	9.67 %

Notes:

(1) From line 3 of page 12 of Schedule DWD-1R.

Sources of Information:

Blue Chip Financial Forecasts October 1, 2019 and June 1, 2019  
Regulatory Research Associates  
Bloomberg Professional Services

Carolina Water Service, Inc. of North Carolina  
Corrected CAPM using a Projected Risk-Free Rate, Projected Risk Premiums  
and the use of the ECAPM

## Capital Asset Pricing Model

### Expected Market Return using Arithmetic Mean

	(R <sub>fi</sub> )	(β)	(R <sub>m</sub> )	(K)		
	Risk free	Value Line	Expected			
Company	Rate <sup>1</sup>	Beta <sup>2</sup>	Return on	CAPM	ECAPM	Average
1 American States Water	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
2 American Water Works	2.64%	0.60	12.87%	8.78%	9.80%	9.29%
3 Aqua America	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
4 California Water	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
5 Middlesex Water	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
6 SJW Group	2.64%	0.60	12.87%	8.78%	9.80%	9.29%
7 York Water	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
					Mean	10.05%
					Median	10.18%
					Average	10.12%

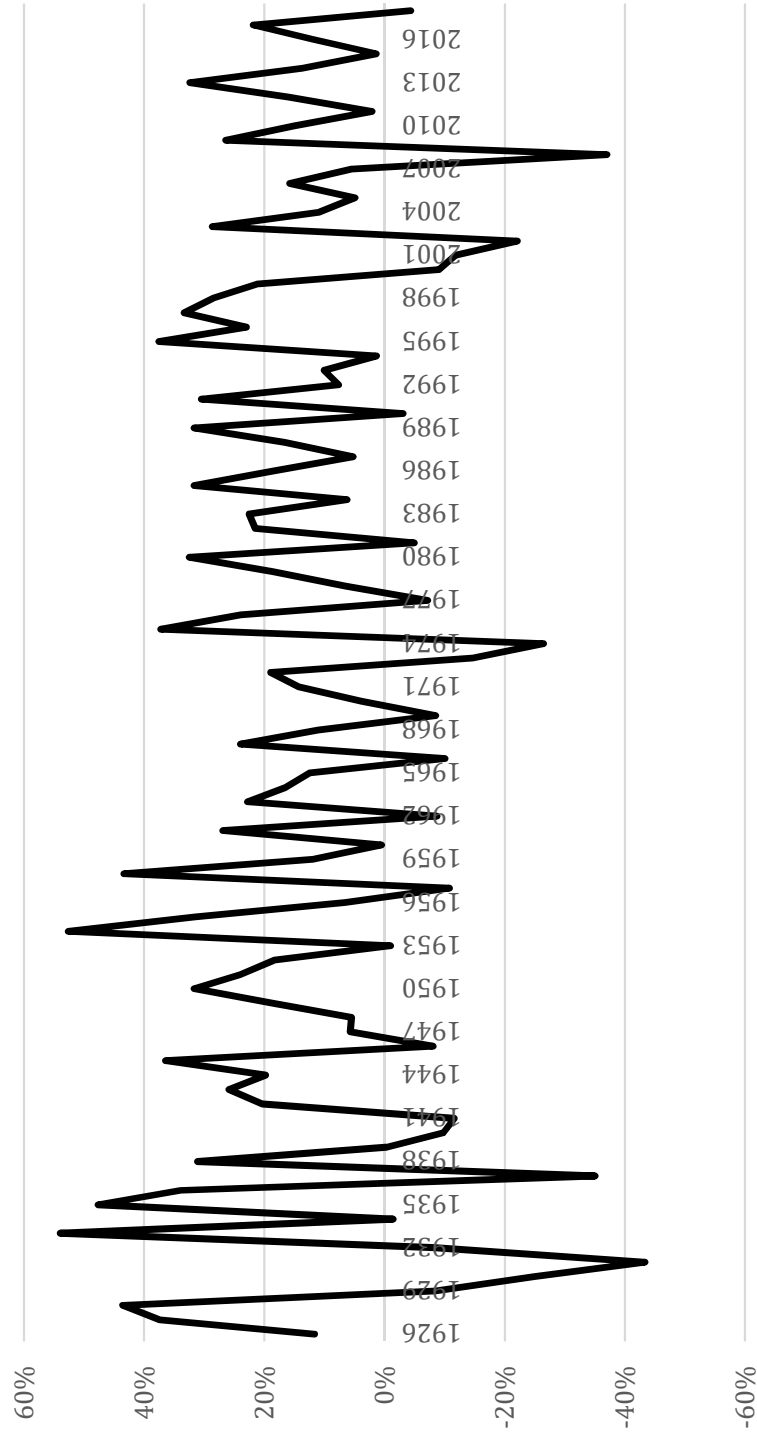
Sources:

<sup>1</sup> From note 2 of page 22 of Schedule DWD-1R.

<sup>2</sup> Value Line Investment Survey, October 18, 2019.

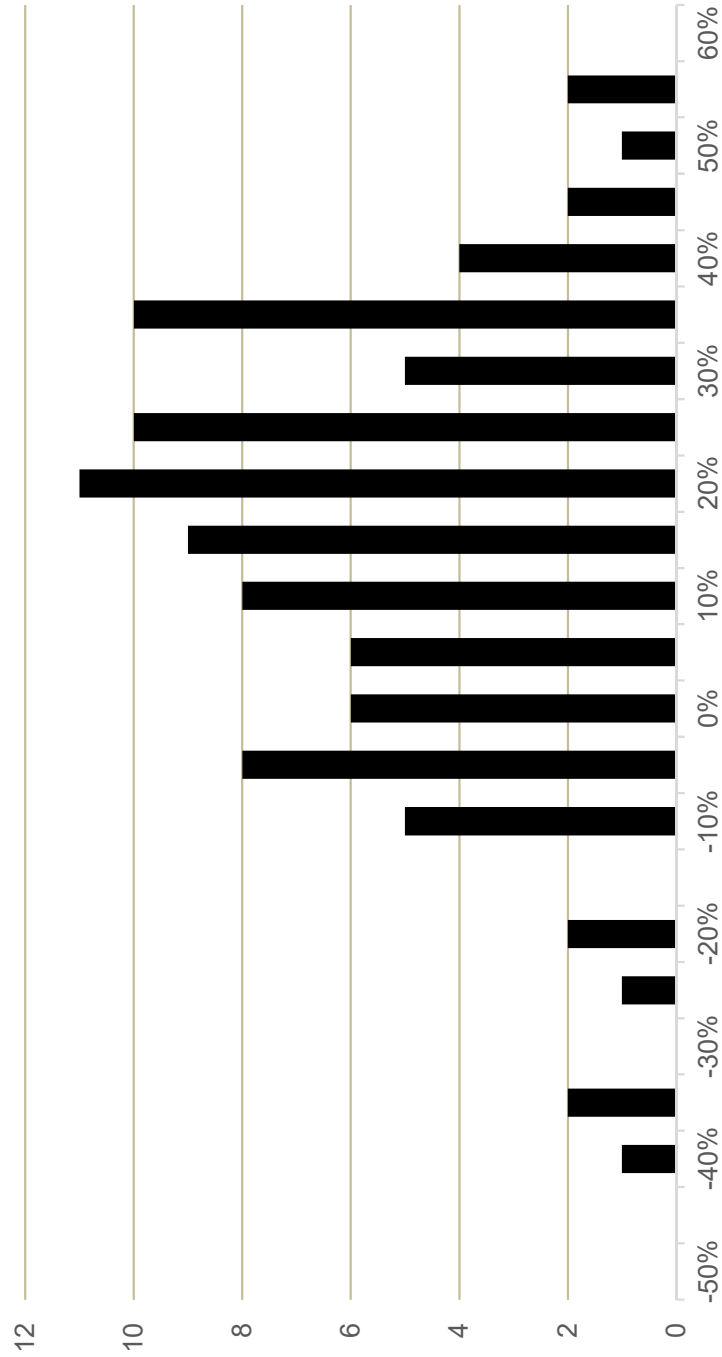
<sup>3</sup> Duff and Phelps, SBBI Valuation Edition, 2019 Yearbook, Exhibit 2.3 and Measure 4 of the expected market return shown on note 1 of page 22 of Schedule DWD-1R.

## U.S. Large Company Stock Returns 1926-2018



Source of Information: Duff & Phelps, SBBI 2019 Yearbook: Stocks, Bonds, Bills, and Inflation  
1926-2018, Appendix A

## Frequency Distribution of Observed Market Returns 1926-2018



Source of Information: Duff & Phelps, SBBI 2019 Yearbook: Stocks, Bonds, Bills, and Inflation 1926-2018, Appendix A

Carolina Water Service, Inc. of North Carolina  
Basis of Selection of the Group of Non-Price Regulated Companies  
Comparable in Total Risk to the Mr. Hinton's Water Proxy Group

The criteria for selection of the Non-Price Regulated Proxy Group was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group was then selected based on the unadjusted beta range of 0.24 – 0.66 and residual standard error of the regression range of 2.6222 – 3.1274 of Mr. Hinton's water proxy group.

These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression. Plus or minus two standard deviations captures 95.50% of the distribution of unadjusted betas and residual standard errors of the regression.

The standard deviation of the Mr. Hinton's water proxy group's residual standard error of the regression is 0.1263. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1263 = \frac{2.8748}{\sqrt{518}} = \frac{2.8748}{22.7596}$$

Source of Information: Value Line, Inc., September 2019  
Value Line Investment Survey (Standard Edition)

Carolina Water Service, Inc. of North Carolina  
Basis of Selection of Comparable Risk  
Domestic Non-Price Regulated Companies

	[1]	[2]	[3]	[4]
	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
<u>Mr. Hinton's Water Proxy Group</u>				
Amer. States Water	0.65	0.45	2.6675	0.0960
Amer. Water Works	0.60	0.34	2.1751	0.0783
Aqua America	0.65	0.46	2.2680	0.0816
California Water	0.70	0.48	2.9094	0.1047
Middlesex Water	0.70	0.54	3.3409	0.1202
SJW Group	0.60	0.34	3.2668	0.1176
York Water Co. (The)	0.75	0.55	3.4957	0.1258
Average	0.66	0.45	2.8748	0.1035
Beta Range (+/- 2 std. Devs. of Beta)	0.24	0.66		
2 std. Devs. of Beta	0.21			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.6222	3.1274		
Std. dev. of the Res. Std. Err.	0.1263			
2 std. devs. of the Res. Std. Err.	0.2526			

Source of Information: Value Line Proprietary Database - September 2019



Carolina Water Service, Inc. of North Carolina  
Proxy Group of Non-Price Regulated Companies  
Comparable in Total Risk to the  
Mr. Hinton's Water Proxy Group

	[1]	[2]	[3]	[4]
Proxy Group of Twelve Non-Price Regulated Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
AutoZone Inc.	0.80	0.64	2.8861	0.1039
Cheesecake Factory	0.75	0.55	2.8814	0.1037
Casey's Gen'l Stores	0.75	0.56	3.0241	0.1088
Cboe Global Markets	0.70	0.51	2.6739	0.0962
Cracker Barrel	0.70	0.54	3.0683	0.1104
Campbell Soup	0.65	0.46	2.9384	0.1057
Dunkin' Brands Group	0.70	0.47	2.8395	0.1022
Darden Restaurants	0.80	0.63	2.9091	0.1047
Forrester Research	0.75	0.57	2.6277	0.0946
Cedar Fair L.P.	0.75	0.60	2.6331	0.0948
Hormel Foods	0.65	0.44	2.6587	0.0957
Viad Corp.	0.80	0.64	3.0017	0.1080
Average	0.73	0.55	2.8452	0.1024
Mr. Hinton's Water Proxy Group	0.66	0.45	2.8748	0.1035

Source of Information: Value Line Proprietary Database - September 2019

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Carolina Water Service, Inc. of North Carolina  
Selection of a Non-Price Regulated Proxy Group using  
Mr. Hinton's Measures of Risk from Value Line

<u>Company Name</u>	<u>Beta</u>	<u>Safety Ranking</u>	<u>Earnings Predictability</u>	<u>Financial Strength Rating</u>	<u>Price Stability</u>
Campbell Soup Co	0.65	2	85	B++	80
Flowers Foods Inc	0.70	3	80	B+	65
Lancaster Colony Corporation	0.70	2	80	A	90
Altria Group Inc	0.70	2	85	B++	85
Tyson Foods	0.75	3	90	B++	65
WD 40 Co	0.70	2	90	A	95
Yum Brands Inc	0.65	2	80	B+	100
Selection Criteria	0.60 - 0.75	2 - 3	65 - 90	B+ to A	65 - 100

Source of Information: Value Line Investment Analyzer

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Carolina Water Service, Inc. of North Carolina  
Summary of Cost of Equity Models Applied to  
Proxy Group of Twelve Non-Price Regulated Companies  
Comparable in Total Risk to the  
Mr. Hinton's Water Proxy Group

<u>Principal Methods</u>	<u>Proxy Group of Twelve Non-Price Regulated Companies</u>
Discounted Cash Flow Model (DCF) (1)	10.11 %
Capital Asset Pricing Model (CAPM) (2)	<u>10.53 %</u>
Mean	<u>10.32 %</u>

Notes:

- (1) Average indicated ROE from both comparable groups as shown on page 6 of this Schedule.
- (2) Average indicated ROE from both comparable groups as shown on page 7 of this Schedule.

Carolina Water Service, Inc. of North Carolina

DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the  
Hinton Proxy Companies

	[1]	[2]	[3]	[4]	[5]
Proxy Group of Twelve Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Indicated Common Equity Cost Rate (1)
AutoZone Inc.	- %	13.50	10.25 %	11.88 %	NA %
Cheesecake Factory	3.19	7.50	6.98	7.24	10.43
Casey's Gen'l Stores	0.84	5.50	7.88	6.69	7.53
Cboe Global Markets	1.20	14.50	2.75	8.63	9.83
Cracker Barrel	6.87	10.00	(0.40)	10.00	16.87
Campbell Soup Co	3.50	1.00	(4.00)	1.00	4.50
Dunkin' Brands Group	3.13	10.00	7.58	8.79	11.92
Darden Restaurants	2.93	11.00	8.63	9.82	12.75
Forrester Research	1.95	8.50	12.00	10.25	12.20
Cedar Fair L.P.	-	10.50	6.00	8.25	NA
Hormel Foods	2.09	9.00	5.00	7.00	9.09
Viad Corp.	0.60	9.50	14.00	11.75	12.35
				Mean	10.75 %
				Median	11.18 %
				Average of Mean and Median	10.97 %
Proxy Group of Seven Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Indicated Common Equity Cost Rate (1)
Campbell Soup Co	3.19 %	1.00 %	(4.00) %	1.00 %	4.19 %
Flowers Foods Inc	3.39	6.00	4.00	5.00	8.39
Lancaster Colony Corporation	1.78	7.50	3.00	5.25	7.03
Altria Group Inc	7.29	8.50	6.59	7.55	14.84
Tyson Foods	1.82	7.50	6.25	6.88	8.70
WD 40 Co	1.34	8.50	10.00	9.25	10.59
Yum Brands Inc	1.52	12.00	14.63	13.32	14.84
				Mean	9.80 %
				Median	8.70 %
				Average of Mean and Median	9.25 %

NA= Not Available

NMF= Not Meaningful Figure

- (1) The application of the DCF model to the domestic, non-price regulated comparable risk companies is identical to the corrected application of the DCF to Mr. Hinton's water proxy group. The dividend yield is derived by using the 13 week average price and the projected dividend as of October 18, 2019 and is added to the average expected EPS growth rate from Value Line and Yahoo! Finance.

Source of Information:

Value Line Investment Survey  
www.yahoo.com Downloaded on 10/18/2019

Carolina Water Service, Inc. of North Carolina  
CAPM Results for the Proxy Groups of Non-Price-Regulated Companies  
Comparable in Total Risk to the Hinton Proxy Companies

	(R <sub>fi</sub> )	(β)	(R <sub>m</sub> )	(K)		
			Expected Return on			
Proxy Group of Twelve Non-Price Regulated Companies	Risk-Free Rate <sup>1</sup>	Value Line Beta <sup>2</sup>	the Market <sup>3</sup>	CAPM	ECAPM	Average
1 AutoZone Inc.	2.64%	0.80	12.87%	10.82%	11.33%	11.08%
2 Cheesecake Factory	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
3 Casey's Gen'l Stores	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
4 Cboe Global Markets	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
5 Cracker Barrel	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
6 Campbell Soup	2.64%	0.65	12.87%	9.29%	10.18%	9.73%
7 Dunkin' Brands Group	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
8 Darden Restaurants	2.64%	0.80	12.87%	10.82%	11.33%	11.08%
9 Forrester Research	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
10 Cedar Fair L.P.	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
11 Hormel Foods	2.64%	0.65	12.87%	9.29%	10.18%	9.73%
12 Viad Corp.	2.64%	0.80	12.87%	10.82%	11.33%	11.08%
					Mean	10.48%
					Median	10.63%
					Average	10.55%

	(R <sub>fi</sub> )	(β)	(R <sub>m</sub> )	(K)		
			Expected Return on			
Proxy Group of Seven Non-Price Regulated Companies	Risk-Free Rate <sup>1</sup>	Value Line Beta <sup>2</sup>	the Market <sup>3</sup>	CAPM	ECAPM	Average
1 Campbell Soup Co	2.64%	0.65	12.87%	9.29%	10.18%	9.73%
2 Flowers Foods Inc	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
3 Lancaster Colony Corporation	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
4 Altria Group Inc	2.64%	0.70	12.87%	9.80%	10.56%	10.18%
5 Tyson Foods	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
6 WD 40 Co	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
7 Yum Brands Inc	2.64%	0.75	12.87%	10.31%	10.95%	10.63%
					Mean	10.37%
					Median	10.63%
					Average	10.50%

Sources:

<sup>1</sup> From note 2 of page 22 of Schedule DWD-1R.

<sup>2</sup> Value Line Investment Survey, Standard Edition, Various Issues

<sup>3</sup> Duff and Phelps, SBBI Valuation Edition, 2019 Yearbook, Exhibit 2.3 and Measure 4 of the expected market return shown on note 1 of page 22 of Schedule DWD-1R.

Carolina Water Service, Inc. of North Carolina  
Calculation of Range of ROEs needed  
to Obtain a Single "A" Rating

	Capitalization Ratio (1) (a)	Embedded Cost (b)	Overall Cost Rate (2) (c)	Pre-Tax Cost of Capital (d)
<u>Company Proposed Rates</u>				
Debt	50.90%	5.36% (1)	2.73%	2.73%
Equity	49.10%	10.20% (3)	5.01%	6.54% (4)
Total	100.00%		7.74%	9.26%
Pre-Tax Interest Coverage				3.28
<u>Public Staff Proposed Rates</u>				
Debt	50.90%	5.36% (1)	2.73%	2.73%
Equity	49.10%	9.10% (5)	4.47%	5.83% (4)
Total	100.00%		7.20%	8.56%
Pre-Tax Interest Coverage				3.03
<u>Highest Rate Scenario</u>				
Debt	50.90%	5.36% (1)	2.73%	2.73%
Equity	49.10%	22.22%	10.91%	14.24% (4)
Total	100.00%		13.64%	16.97%
Pre-Tax Interest Coverage				6.00
<u>Lowest Rate Scenario</u>				
Debt	50.90%	5.36% (1)	2.73%	2.73%
Equity	49.10%	9.00%	4.42%	5.77% (4)
Total	100.00%		7.15%	8.49%
Pre-Tax Interest Coverage				3.00

Notes

- (1) From Schedule DWD-1R, page 1.
- (2) Column (a) x Column (b)
- (3) Updated recommended ROE as shown on Schedule DWD-1R, page 1.
- (4) Overall Equity Cost Rate x Tax Conversion Factor
- (5) Hinton Direct Testimony

Carolina Water Service, Inc. of North Carolina  
Portfolio Ranks by Size and Risk Premiums over CAPM Results  
as Compiled by Duff and Phelps, 2019 Guide to Cost of Capital

Portfolio Rank by Size	B-1		B-2		B-3		B-4		B-5		B-6		B-7		B-8	
	Market Val. of Equity (in \$millions)	Smootherd Premium over CAPM	Average Book Val. (in \$millions)	Smootherd Premium over CAPM	5-yr Net Income (in \$millions)	Smootherd Premium over CAPM	Market Value of Invested Capital (in \$millions)	Smootherd Premium over CAPM	Total Assets (in \$millions)	Smootherd Premium over CAPM	5-yr EBITDA (in \$millions)	Smootherd Premium over CAPM	Sales (in \$millions)	Smootherd Premium over CAPM	Average Number of Employees	Smootherd Premium over CAPM
1	\$183,530 and Up	-1.58%	\$39,064 and Up	0.70%	\$6,979 and Up	0.55%	\$218,547 and Up	-0.91%	\$118,454 and Up	0.42%	\$14,966 and Up	0.77%	\$83,836 and Up	0.66%	224,700 and Up	0.32%
2	\$68,770 - \$118,530	-0.17%	\$14,329 - \$39,064	1.38%	\$2,414 - \$6,979	1.31%	\$76,098 - \$218,547	0.17%	\$49,025 - \$118,454	1.13%	\$5,581 - \$14,966	1.45%	\$38,836 - \$83,836	1.41%	87,395 - 224,700	1.17%
3	\$36,102 - \$68,770	0.39%	\$9,390 - \$14,329	1.63%	\$1,520 - \$2,414	1.37%	\$46,827 - \$76,098	0.65%	\$32,779 - \$49,025	1.40%	\$3,721 - \$5,581	1.69%	\$10,880 - \$38,836	1.81%	58,282 - 87,395	1.52%
4	\$18,511 - \$36,102	1.00%	\$4,506 - \$9,390	1.83%	\$802 - \$1,520	1.08%	\$23,500 - \$46,827	0.94%	\$16,429 - \$32,779	1.47%	\$1,962 - \$3,721	2.06%	\$4,146 - \$10,880	2.18%	34,146 - 58,282	1.75%
5	\$9,093 - \$18,511	1.08%	\$2,371 - \$4,506	2.02%	\$477 - \$802	2.10%	\$12,089 - \$23,500	1.48%	\$8,294 - \$16,429	1.87%	\$1,062 - \$1,962	2.66%	\$1,610 - \$4,146	2.17%	34,146 - 58,282	1.82%
6	\$1,850 - \$9,093	1.39%	\$421.6 - \$4,972	2.12%	\$574 - \$740	2.19%	\$20,123 - \$25,989	1.43%	\$13,244 - \$16,793	2.02%	\$1,512 - \$1,961	2.22%	\$9,116 - \$14,969	2.31%	27,046 - 34,651	2.10%
7	\$12,298 - \$14,850	1.58%	\$3,539 - \$4,216	2.20%	\$457 - \$574	2.32%	\$16,337 - \$20,123	1.62%	\$10,530 - \$13,244	2.18%	\$1,250 - \$1,512	2.24%	\$7,727 - \$9,116	2.43%	21,476 - 27,046	2.29%
8	\$10,216 - \$12,298	1.78%	\$2,887 - \$3,539	2.32%	\$372 - \$457	2.46%	\$13,373 - \$16,337	1.80%	\$8,750 - \$10,530	2.31%	\$1,038 - \$1,250	2.43%	\$6,699 - \$7,727	2.52%	17,789 - 21,476	2.44%
9	\$8,627 - \$10,216	1.96%	\$2,403 - \$2,887	2.42%	\$312 - \$372	2.56%	\$11,385 - \$13,373	1.96%	\$7,383 - \$8,750	2.42%	\$825 - \$1,038	2.56%	\$5,696 - \$6,699	2.61%	15,100 - 17,789	2.57%
10	\$7,351 - \$8,627	2.12%	\$2,055 - \$2,403	2.52%	\$264 - \$312	2.66%	\$9,706 - \$11,385	2.09%	\$6,290 - \$7,383	2.53%	\$697 - \$825	2.74%	\$4,671 - \$5,696	2.73%	13,149 - 15,100	2.68%
11	\$6,241 - \$7,351	2.29%	\$1,799 - \$2,055	2.59%	\$230 - \$264	2.75%	\$8,364 - \$9,706	2.21%	\$5,360 - \$6,290	2.62%	\$619 - \$697	2.89%	\$3,861 - \$4,671	2.87%	11,535 - 13,149	2.77%
12	\$5,361 - \$6,241	2.46%	\$1,588 - \$1,799	2.66%	\$204 - \$230	2.82%	\$6,974 - \$8,364	2.37%	\$4,546 - \$5,360	2.73%	\$553 - \$619	2.89%	\$3,312 - \$3,861	2.97%	10,137 - 11,535	2.87%
13	\$4,586 - \$5,361	2.60%	\$1,400 - \$1,588	2.73%	\$179 - \$204	2.89%	\$6,030 - \$6,974	2.50%	\$3,885 - \$4,546	2.83%	\$466 - \$553	2.89%	\$2,867 - \$3,312	3.07%	8,921 - 10,137	2.96%
14	\$3,813 - \$4,586	2.75%	\$1,230 - \$1,400	2.80%	\$159 - \$179	3.07%	\$5,180 - \$6,030	2.63%	\$3,146 - \$3,885	2.90%	\$406 - \$466	3.07%	\$2,209 - \$2,867	3.26%	7,763 - 8,921	3.06%
15	\$3,053 - \$3,813	2.95%	\$1,070 - \$1,230	2.87%	\$139 - \$159	3.20%	\$4,489 - \$5,180	2.75%	\$2,709 - \$3,146	3.05%	\$357 - \$406	3.04%	\$1,720 - \$2,209	3.26%	6,574 - 7,763	3.29%
16	\$2,915 - \$3,053	3.09%	\$930 - \$1,070	2.95%	\$104 - \$124	3.19%	\$3,887 - \$4,489	2.87%	\$2,423 - \$2,709	3.14%	\$311 - \$357	3.11%	\$1,944 - \$2,209	3.32%	5,574 - 6,574	3.29%
17	\$2,530 - \$2,915	3.22%	\$811 - \$930	3.02%	\$89 - \$104	3.28%	\$3,305 - \$3,887	3.00%	\$2,092 - \$2,423	3.23%	\$266 - \$311	3.20%	\$1,723 - \$1,944	3.41%	4,653 - 5,574	3.42%
18	\$2,120 - \$2,530	3.38%	\$686 - \$811	3.10%	\$74 - \$89	3.37%	\$2,707 - \$3,305	3.16%	\$1,750 - \$2,092	3.33%	\$222 - \$266	3.28%	\$1,526 - \$1,723	3.48%	3,852 - 4,653	3.56%
19	\$1,713 - \$2,120	3.59%	\$574 - \$686	3.20%	\$60 - \$74	3.49%	\$2,178 - \$2,707	3.35%	\$1,441 - \$1,750	3.46%	\$178 - \$222	3.40%	\$1,278 - \$1,526	3.56%	3,145 - 3,852	3.70%
20	\$1,379 - \$1,713	3.82%	\$483 - \$574	3.30%	\$47 - \$60	3.62%	\$1,794 - \$2,178	3.53%	\$1,184 - \$1,441	3.58%	\$142 - \$178	3.52%	\$1,007 - \$1,278	3.71%	2,529 - 3,145	3.86%
21	\$1,112 - \$1,379	4.03%	\$404 - \$483	3.39%	\$36 - \$47	3.77%	\$1,453 - \$1,794	3.68%	\$934 - \$1,184	3.72%	\$112 - \$142	3.65%	\$797 - \$1,007	3.87%	1,986 - 2,529	4.02%
22	\$867 - \$1,112	4.27%	\$331 - \$404	3.49%	\$27 - \$36	3.92%	\$1,118 - \$1,453	3.90%	\$708 - \$934	3.89%	\$88 - \$112	3.79%	\$626 - \$797	4.01%	1,495 - 1,986	4.21%
23	\$633 - \$867	4.59%	\$256 - \$331	3.61%	\$19 - \$27	4.09%	\$807 - \$1,118	4.13%	\$512 - \$708	4.07%	\$65 - \$88	3.92%	\$460 - \$626	4.19%	1,079 - 1,495	4.45%
24	\$344 - \$633	4.94%	\$150 - \$256	3.78%	\$10 - \$19	4.32%	\$416 - \$807	4.49%	\$287 - \$512	4.31%	\$35 - \$65	4.13%	\$247 - \$460	4.42%	593 - 1,079	4.69%
25	Up to \$344	6.13%	Up to \$150	4.31%	Up to \$10	4.56%	Up to \$416	5.54%	Up to \$287	4.94%	Up to \$35	4.73%	Up to \$247	5.17%	Up to 593	5.35%
Proxy Group of Six Water Companies	\$ 4,292	14	\$ 1,489	13	\$ 128	15	\$ 6,360	15	\$ 5,085	12	\$ 371	15	\$ 857	21	1,475	23
Carolina Water Service, Inc. of North Carolina	\$ 217.49	25	\$ 92.67	25	\$ 1.21	25	\$ 222.99	25	\$ 155.82	25	\$ 9.39	25	\$ 31.10	25	87	25
Indicated Risk Premium	3.36%		1.58%		1.81%		2.79%		2.21%		1.71%		1.30%		1.08%	

Sources of Information:  
Duff & Phelps 2019 Cost of Capital Navigator  
S&P Premiums  
Company Form 10-K

Carolina Water Service, Inc. of North Carolina  
R-Squareds of Mr. Hinton's Proxy Group

<u>Mr. Hinton's Water Proxy Group</u>	<u>R-Squared</u>
American States Water Co.	0.0670
American Water Works	0.0776
Aqua America inc.	0.1096
California Water Service Group	0.0743
Middlesex Water	0.0732
SJW Group	0.0307
York Water Company	0.0704
Average	<u><u>0.0718</u></u>

Source of Information:

Value Line Proprietary Database, September 2019

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Nov 20 2019



Carolina Water Service, Inc. of North Carolina  
Rate Mechanisms In Place at Proxy Group Operating Subsidiaries

Ticker	Company (hold if parent)	State	Decoupling?	Mechanism Name	Type of Mechanism		Source
					Water Revenue Adjustment Mechanism (WRAM)	Full Decoupling (Actual to Target Revenues)	
AWR	American States Water Company	CA	Yes				Annual Report, tariff
	Golden State Water Company	CA	Yes				Annual Report, tariff
AWK	American Water			Water Revenue Adjustment Mechanism (WRAM); Modified Cost Balancing Adjustment (MCBA)	Full Decoupling (Actual to Target Revenues)		Annual Report, tariff
		CA	Yes				Annual Report
		HI	No				Annual Report; tariff; Commission Order dated December 13, 2016, Docket No. 16-0093
		IL	Yes	Volume Balancing Adjustment Rider (VBAR); Qualifying Infrastructure Plant (QIP) System Improvement Charge (DSIC)	Full Decoupling (Actual to Target Revenues); Capital Recovery		Annual Report, tariff
		IN	No		Capital Recovery		Annual Report, tariff
		IA	No				Annual Report, tariff
		KY	No				Annual Report, tariff
		MD	No				Annual Report, tariff
		MI	No				Annual Report
		MO	No	Infrastructure System Replacement Surcharge	Capital Recovery		Annual Report, tariff
		NJ	No				Annual Report, tariff
		NY	Yes	Revenue And Production Cost Recovery (RAPC) Rider and Property Tax Charge (BAC/PTC) Charge (DSIC)	Full Decoupling (Actual to Target Revenues)		Annual Report; tariff; Commission Order dated 05/08 and Case 16-W-0259
WTR	Aqua America	PA	No		Capital Recovery		Annual Report, tariff
		TN	No				Annual Report, tariff
		VA	No	Water & Wastewater Infrastructure System Improvement Charge (DSIC)	Capital Recovery		Annual Report, tariff
		WV	No		Capital Recovery		Annual Report, tariff
		IL	Yes	Volume Balancing Adjustment Rider (VBAR)	Full Decoupling (Actual to Target Revenues)		Order in Docket No. 17-0259
		IN	No				Annual Report, tariff
		NJ	No	Distribution System Improvement Charge (DSIC)	Capital Recovery		Annual Report, tariff
		NC	No				Annual Report
		OH	No				Annual Report
		PA	No	Distribution System Improvement Charge (DSIC)	Capital Recovery		Annual Report; tariff
CWT	California Water Service Group	TX	No				Annual Report
		VA	No				Annual Report
MSX	Middlesex Water Company			Water Revenue Adjustment Mechanism (WRAM); Modified Cost Balancing Adjustment (MCBA); and Sales Reconciliation Mechanism (SRM)	Full Decoupling (Actual to Target Revenues)		Annual Report, tariff
		CA	Yes				Annual Report, tariff
		MD	No				Annual Report, tariff
		WA	No				Annual Report, tariff
		HI	No				Annual Report, tariff
		NJ	No				Annual Report, tariff
		DE	No				Annual Report
		DE	No	Distribution System Improvement Charge (DSIC)	Capital Recovery		Annual Report; tariff
SIW	SIW Group	PA	No				Annual Report, tariff
		CA	No				Annual Report
		TX	No				Annual Report, tariff
		CT	Yes	Water Revenue Adjustment (WRA); Water Infrastructure and Conservation Adjustment (WICA); Full Decoupling (Actual to Target Revenues); Capital Recovery	Full Decoupling (Actual to Target Revenues); Capital Recovery		Annual Report; tariff
		CT	Yes	Water Revenue Adjustment (WRA); Water Infrastructure and Conservation Adjustment (WICA)	Full Decoupling (Actual to Target Revenues); Capital Recovery		Annual Report; tariff
		CT	Yes	Water Revenue Adjustment (WRA); Water Infrastructure and Conservation Adjustment (WICA)	Full Decoupling (Actual to Target Revenues); Capital Recovery		Annual Report; tariff
		ME	No	Water Infrastructure Charge (WISC)	Capital Recovery		Annual Report; tariff
		PA	No	Distribution System Improvement Charge (DSIC)	Capital Recovery		Annual Report; tariff
		PA	No				Annual Report
		PA	No				Annual Report
YORW	York Water Company			Water Revenue Adjustment Mechanism (WRAM); Modified Cost Balancing Adjustment (MCBA); and Sales Reconciliation Mechanism (SRM)	Full Decoupling (Actual to Target Revenues)		Annual Report, tariff
		CA	Yes				Annual Report, tariff
		MD	No				Annual Report, tariff
		WA	No				Annual Report, tariff
		HI	No				Annual Report, tariff
		NJ	No				Annual Report
		DE	No	Distribution System Improvement Charge (DSIC)	Capital Recovery		Annual Report; tariff
		DE	No				Annual Report
		PA	No				Annual Report, tariff
		PA	No				Annual Report, tariff