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Case No.: WR-2018-0170
Date Testimony Prepared: August 7, 2018

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

SURREBUTTAL TESTIMONY

OF

KEITH MAGEE

SCOTTMADDEN, INC.

SUBMITTED ON BEHALF OF

**LIBERTY UTILITIES (MISSOURI WATER) LLC
d/b/a LIBERTY UTILITIES**

AUGUST 2018



SURREBUTTAL TESTIMONY
OF
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1 **I. WITNESS IDENTIFICATION**

2 **Q. PLEASE STATE YOUR NAME, AFFILIATION AND BUSINESS ADDRESS.**

3 A. My name is Keith Magee. I am a Director at ScottMadden, Inc. (“ScottMadden”). My
4 business address is 1900 West Park Drive, Suite 250, Westborough, MA 01581.

5 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?**

6 A. I am submitting this surrebuttal testimony (“Surrebuttal Testimony”) before the Missouri
7 Public Service Commission (“Commission”) on behalf of Liberty Utilities (Missouri
8 Water) LLC (“Liberty Water” or “Company”), an indirect wholly owned subsidiary of
9 Algonquin Power & Utilities Corp. (“Algonquin”).

10 **Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL**
11 **EXPERIENCE.**

12 A. I hold a Bachelor’s degree in Economics from Whitman College, and an MBA with a
13 concentration in Finance from the F.W. Olin Graduate School of Business at Babson
14 College. I also hold the professional designation of Chartered Financial Analyst (“CFA”)
15 awarded by the CFA Institute, and the professional designation of Certified Rate of
16 Return Analyst (“CRRA”) awarded by the Society of Utility and Regulatory Financial
17 Analysts.

18 As a consultant in the utility and energy industry, I have provided consulting
19 services on a range of financial and economic issues including areas such as rate case

1 activities (*e.g.*, cost of capital, cost of service, financial reporting filing requirements and
2 rate design) and policy and strategy issues (*e.g.*, capital investment related activities).
3 Many of my engagements have included developing cost of capital analyses and
4 testimony. A summary of my professional and educational background is included in
5 Attachment A to my Direct Testimony.

6 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THIS**
7 **COMMISSION?**

8 A. Yes, I have. I submitted testimony in Case No. GR-2018-0013 on behalf of Liberty
9 Utilities (Midstates Natural Gas) Corp., d/b/a Liberty Utilities.

10
11 **II. PURPOSE OF SURREBUTTAL TESTIMONY**

12 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

13 A. In her direct testimony, Company witness Schwartz attached a copy of my direct
14 testimony from Case No. GR-2018-0013 (“Liberty Midstates Direct Testimony”) in
15 support of the Company’s proposed 10.25 percent ROE and 53.00 percent equity ratio.
16 The purpose of my Surrebuttal Testimony is to respond to certain portions of the rebuttal
17 testimonies filed by Mr. Dave Murray on behalf of the Staff of the Missouri Public
18 Service Commission and Mr. William Stannard on behalf of Silverleaf Resorts, Inc. and
19 Orange Lake Country Club as they relate to the Company’s ROE¹ and capital structure.
20 My analyses and conclusions are supported by the data presented in Schedules KM-S1
21 through Schedule KM-S12, which have been prepared by me or under my direction.

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

1 **Q. HOW IS THE REMAINDER OF YOUR SURREBUTTAL TESTIMONY**
2 **ORGANIZED?**

3 A. The remainder of my Surrebuttal Testimony is organized as follows:

4 Section III – Provides a summary and overview of my Surrebuttal Testimony;

5 Section IV – Provides my response to Mr. Murray regarding the Company’s cost of
6 capital and capital structure;

7 Section V – Provides my response to Mr. Stannard regarding the Company’s cost of
8 capital;

9 Section VI – Summarizes my conclusions and recommendations.

10 **III. SUMMARY AND OVERVIEW OF SURREBUTTAL TESTIMONY**

11 **Q. PLEASE SUMMARIZE THE KEY RECOMMENDATIONS AND**
12 **CONCLUSIONS ADDRESSED IN YOUR SURREBUTTAL TESTIMONY.**

13 A. My primary recommendations and conclusions are:

- 14 • I agree with Staff and the Company that the cost of capital developed for Liberty
15 Midstates is reasonable and appropriate for Liberty Water.
- 16 • Updating the ROE and capital structure analysis from my recent Liberty
17 Midstates testimony continues to support an ROE range of 9.90 percent to 10.35
18 percent (with a point estimate of 10.25 percent) and a capital structure consisting
19 of 53.00 percent equity and 47.00 percent long-term debt, which are the same
20 ROE and capital structure I recommended for Liberty Midstates in Case No. GR-
21 2018-0013.
- 22 • Mr. Murray’s recommended 42.83 percent equity ratio is unreasonably low
23 relative to the capital structures in place at the proxy group companies and the

1 universe of water companies covered by Value Line, which have mean equity
2 ratios of 53.64 percent and 54.66 percent, respectively (*see* Schedule KM-S9).
3 Mr. Murray's recommendation is also well below Value Line's near-term
4 projected capital structures for those companies (*see* Table 2, below).

- 5 • The unreasonableness of Mr. Murray's 42.83 percent recommended equity ratio is
6 also demonstrated by the fact that the average authorized water utility equity ratio
7 reported by Regulatory Research Associates for January through June 2018 was
8 53.85 percent.²
- 9 • Adoption of an equity ratio as low as the one proposed by Mr. Murray would
10 serve to increase the Company's total risk by decreasing cashflow (which is a key
11 component of financial integrity and credit metrics) and reducing investor
12 confidence in the regulatory support for the Company's operations. The
13 increased overall risk would imply a significantly higher cost of equity.
- 14 • In Case No. GR-2018-0013 Mr. Murray based his recommendation on the 9.80
15 percent ROE and 54.20 percent equity ratio recently authorized for Spire
16 Missouri. The 20 basis point ROE premium Mr. Murray recommends to account
17 for an equity ratio that is 11.37 percentage points lower than Spire Missouri's
18 recently authorized equity ratio does not sufficiently compensate equity holders
19 for the increased risk they face from a significant increase in financial leverage.
- 20 • Assuming an equity ratio consistent with the proxy group average, I find Mr.
21 Murray's 10.00 percent ROE recommendation reasonable; it falls within my
22 recommended ROE range of 9.90 percent to 10.35 percent.

² Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 1.

- 1 • Mr. Stannard’s 7.97 percent ROE recommendation is unduly low relative to
2 authorized returns for other utilities. His recommendation relies on a single ROE
3 model, and is based on a method that has consistently produced ROE estimates
4 more than 100 basis points below average authorized returns since at least 2012.
- 5 • Other approaches to estimating the Company’s cost of equity, including the
6 Discounted Cash Flow (“DCF”), Capital Asset Pricing Model (“CAPM”) and
7 expected earnings approach demonstrate the reasonableness of my ROE
8 recommendation (*see* Schedules KM-S1 through KM-S8).
- 9 • Mr. Stannard’s suggestion that Liberty Water is less risky because the Company
10 is a subsidiary of a larger publicly-traded company is misplaced. Individual
11 projects and business operations have their own cost of capital. The salient issue
12 for determining Liberty Water’s required ROE is the size of the Company and the
13 risks it faces. Duff & Phelps, the source of Mr. Stannard’s risk premium data, for
14 example, notes size risk premiums apply to business segments and subsidiaries.
15 Duff & Phelps provides a size risk premium of 5.58 percent for the micro-cap
16 decile in which the Company would fall – however, Mr. Stannard did not account
17 for that risk premium in his ROE analyses.
- 18 • Lastly, estimating the cost of capital is a risk-comparable exercise. Mr. Stannard
19 did not fully consider the prevalence of straight-fixed variable rate designs,
20 decoupling, infrastructure riders, future test years and other rate mechanisms
21 available to utilities when suggesting my recommended ROE is unreasonable.

1 **IV. RESPONSE TO REBUTTAL TESTIMONY OF STAFF WITNESS MURRAY**

2 **Q. PLEASE SUMMARIZE MR. MURRAY’S REBUTTAL TESTIMONY.**

3 A. Mr. Murray agrees with Company witness Schwartz’ that it is reasonable to apply the
4 Rate of Return (“ROR”) recently developed for Liberty Midstates for purposes of setting
5 the ROR for Liberty Water in this proceeding.³ Mr. Murray, therefore, recommends a
6 10.00 percent ROE and a 42.83 percent equity ratio for Liberty Water,⁴ which are the
7 same recommendations he made for Liberty Midstates in Case No. GR-2018-0013.⁵

8 However, Mr. Murray also notes that Staff and the Company did not agree on the
9 specific parameters of ROE and capital structure in the Liberty Midstates case.⁶ With
10 regard to capital structure, Mr. Murray’s 42.83 percent common equity recommendation
11 is based on his estimate of the capital structure for Liberty Utilities Company (“LUCo”)
12 as of December 31, 2017.⁷

13 **Q. DO YOU AGREE THAT THE ROE AND CAPITAL STRUCTURE**
14 **RECOMMENDATIONS RECENTLY DEVELOPED FOR LIBERTY**
15 **MIDSTATES ARE APPROPRIATE FOR LIBERTY WATER IN THIS**
16 **PROCEEDING?**

17 A. Yes, I do. As Mr. Murray notes, gas utilities and water utilities generally have similar
18 business risk profiles.⁸ As shown in Table 1 below, the proxy group I used in the Liberty
19 Midstates case has business and financial risk characteristics generally comparable to the

3 Substitute Rebuttal Testimony of David Murray, at 1-2.

4 Staff Review and Audit of Liberty Utilities (Missouri Water). LLC (Water) d/b/a Liberty Utilities, June 22, 2018, at 2.

5 See, Missouri Public Service Commission, Case No. GR-2018-0013, Rebuttal Testimony of David Murray, at 2.

6 Substitute Rebuttal Testimony of David Murray, at 2.

7 Substitute Rebuttal Testimony of David Murray, at 3.

8 Substitute Rebuttal Testimony of David Murray, at 2.

1 universe of 11 water utility companies covered by Value Line (*see* Table 1 below).⁹

2 **Table 1: Business and Financial Risk Measures Comparison**¹⁰

	Beta Coefficient	S&P Corporate Credit Rating	2018 Common Equity Ratio
Magee gas proxy group	0.70	A- / A	52.50%
Value Line water companies	0.75	A	55.00%

3
 4 The water utilities covered by Value Line are investor-owned companies with
 5 water distribution operations, and range in size from approximately \$200 million to
 6 \$15.80 billion.¹¹

7 **Q. IS IT REASONABLE TO ASSUME, AS MR. MURRAY HAS DONE, THAT**
 8 **LUCO’S CONSOLIDATED CAPITAL STRUCTURE REFLECTS AN**
 9 **APPROPRIATE REGULATORY CAPITAL STRUCTURE FOR LIBERTY**
 10 **WATER?**

11 A. No, it is not. LUCo is an intermediate holding company, and its capital structure will
 12 change over time as it pursues its own strategic corporate initiatives and priorities.
 13 LUCo’s consolidated capital structure has, and likely will continue to, reflect business
 14 activities, such as mergers and acquisitions, that are not directly germane to Liberty
 15 Water’s operations or financing. Even if LUCo’s business focus were solely on operating
 16 its existing diverse regulated utility portfolio, its capital structure will not necessarily be

9 Beta coefficient is the measure of company-specific risk used in the Capital Asset Pricing Model, and it reflects the volatility of a company’s stock price as well as its sensitivity to fluctuations in the overall stock market.

10 Median values. *See* Schedule KM-S10. Sources: Value Line (beta coefficient and common equity ratio) and Standard & Poor’s Market Intelligence (credit rating).

11 Source: Value Line. The companies include (1) Artesian Resources Corp., (2) American Water Works, (3) American States Water Co, (4) Connecticut Water Services Inc, (5) Consolidated Water, (6) California Water Service Group, (7) Global Water Resources Inc, (8) Middlesex Water Co, (9) SJW Group, (10) Aqua America Inc, and (11) York Water Company.

1 an appropriate benchmark for Liberty Water’s capital structure.

2 **Q. WHY DO YOU SAY THAT?**

3 A. LUCo is composed of over 30 water, gas and electric utilities that are regulated by 12
4 different regulatory commissions. Liberty Water’s customers make up less than 1.00
5 percent of the 762,000 customers served by LUCo.¹² Over time, Liberty Midstates
6 regulatory capital structure should not be driven by the decisions of other commissions
7 for other utilities, which may have been made under significantly different capital market
8 circumstances or regulatory constructs. That is, using LUCo’s capital structure would
9 potentially remove the capital structure from Missouri regulators’ hands. This was a
10 concern that led in part to the Commission’s decision to adopt an operating company
11 capital structure in Spire’s recent rate cases and I think it is equally applicable in this
12 instance.¹³

13 **Q. IS IT REASONABLE TO ASSUME LUCO’S CAPITAL STRUCTURE**
14 **REFLECTS THE FUNDS USED TO FINANCE LIBERTY WATER?**

15 A. No, it is not. The disconnect is plainly illustrated by the fact that the consolidated capital
16 structure used by Mr. Murray includes debt such as Empire District Electric (“EDE”)
17 First Mortgage bonds which were issued prior to the merger and specifically related to
18 the financing of legacy Empire District Electric assets. A sizeable portion of the debt in
19 LUCo’s capital structure is therefore not related to Liberty Water, and should not be used
20 to set the Company’s regulatory capital structure.

¹² Liberty Water has approximately 1,200 Missouri customers (*see* Direct Testimony of Jill Schwartz, at 9.) LUCo customer counts from Algonquin Power & Utilities Corp., Investor Presentation, March 2018, at 6. The company reports 265,000 electric, 337,000 gas and 160,000 water customers.

¹³ *See*, Missouri Public Service Commission, Report and Order, Case Nos. GR-2017-0215 and GR-2017-0216, at 42 (Issued February 21, 2018).

1 Moreover, cash is fungible, which is to say it is not possible to trace a dollar of
2 capital from source to ultimate use. Importantly, the cost of capital is a function of the
3 risks and characteristics of the investment, in this case Liberty Water, not the source of
4 the capital funding the investment.¹⁴ As stated by Morningstar:

5 It should also be noted that the cost of capital is a function of the
6 investment, not the investor.

7
8 The cost of capital is an opportunity cost. Some people consider
9 the phrase ‘opportunity cost of capital’ to be more correct. The
10 opportunity cost of an investment is the expected return that would
11 be earned on the next best investment. In a competitive world with
12 many investment choices, a given investment and the next best
13 alternative have practically identical expected returns.¹⁵

14 The Company’s cost of capital, therefore, should be assessed on a stand-alone basis, and
15 reflect the risk and operational needs of Liberty Water’s water distribution business. The
16 proxy group’s mean equity ratio is a reasonable benchmark of industry-established
17 financing practices for companies with risk characteristics similar to Liberty Water.

18 The adjusted consolidated LUCo capital structure proposed by Mr. Murray, on the
19 other hand, reflects the financing practices of an intermediate diversified utility holding
20 company with strategic corporate initiatives, some of which may be unrelated to stand-
21 alone utility operations (such as pursuing mergers and acquisitions).

22 **Q. HAVE YOU UPDATED THE CAPITAL STRUCTURE ANALYSIS YOU**
23 **PERFORMED IN LIBERTY MIDSTATES RECENT RATE CASE?**

24 **A.** Yes, I have. Looking at the gas proxy company financing data reported by Standard &
25 Poor’s Market Intelligence, over the eight quarters ending Q1 2018 (the most recent data

¹⁴ See, for example, Brealey Myers and Allen, *Principles of Corporate Finance*, 8th Edition, at 204-205. See also, CFA Level II Curriculum, Volume 4, page 45 and 48.

¹⁵ Morningstar, Inc., *Ibbotson SBBI 2013 Valuation Yearbook*, at 21-22.

1 available) the proxy group’s average equity ratio was 53.64 percent and average long-
 2 term debt ratio was 47.06 percent. Over the same period, the Value Line universe of
 3 water utilities’ average equity ratio was 54.11 percent and the average long-term debt
 4 ratio was 45.89 percent over the same period.¹⁶

5 As shown in Table 2, Value Line equity ratio projections for the proxy companies
 6 and for the water utility companies average between 52.50 percent and 57.00 percent (*see*
 7 *also* Schedule KM-S9).

8 **Table 2: Value Line Projections - Capital Structure¹⁷**

	Common Equity Ratio		Long-Term Debt Ratio	
	2018	2021-23	2018	2021-23
Proxy Group (gas) - average	55.11%	56.06%	44.89%	43.94%
Proxy Group (gas) – median	52.50%	53.50%	47.50%	46.50%
Water Companies – average	55.45%	59.61%	44.55%	40.39%
Water Companies – median	57.00%	55.00%	43.00%	46.00%

9
 10 **Q. BASED ON THOSE ANALYSES, DO YOU BELIEVE A 53.00 PERCENT**
 11 **EQUITY RATIO IS APPROPRIATE FOR LIBERTY WATER?**

12 A. Yes, I do. My equity ratio recommendation of 53.00 percent for Liberty Midstates is also
 13 reasonable and appropriate for Liberty Water based on the updated analysis discussed
 14 above.

15 **Q. IS MR. MURRAY’S RECOMMENDED 42.83 PERCENT EQUITY RATIO**
 16 **CONSISTENT WITH RELEVANT INDUSTRY BENCHMARKS?**

17 A. No, it is not. Mr. Murray’s proposed equity ratio is more than 10.00 percentage points

¹⁶ Source: Bloomberg. Standard & Poor’s Market Intelligence standardized data was not available for the water utility companies.

¹⁷ See Schedule KM-S9.

1 below the average equity ratios for both the proxy group and the Value Line water
2 universe.

3 **Q. WHAT WOULD BE THE EFFECT OF INCLUDING A COMPARATIVELY**
4 **HIGH LEVEL OF FINANCIAL LEVERAGE IN THE COMPANY'S**
5 **RATEMAKING CAPITAL STRUCTURE?**

6 A. Increasing financial leverage (*i.e.*, the percentage of debt) increases financial risk which
7 effects the cost of, and access to, capital. Authorizing a capital structure with
8 significantly less equity than industry benchmarks (such as the equity ratios in place at
9 the proxy companies) would also likely be seen as a negative regulatory outcome and
10 therefore a sign of higher regulatory risk, which is a key component of investors'
11 perception of business risk.¹⁸ Ultimately, an increase in risk perception and a
12 deterioration in financial strength can impair the utility's ability to attract capital and
13 fulfill its service obligations at a reasonable cost.¹⁹

14 **Q. MR. MURRAY NOTES THAT IN LIBERTY MIDSTATES' 2014 RATE CASE**
15 **(CASE NO. GR-2014-0152), THE COMMISSION ADOPTED LUCO'S CAPITAL**
16 **STRUCTURE WHEN SETTING RATES FOR LIBERTY MIDSTATES.²⁰ WHY**
17 **HAVE YOU NOT RECOMMENDED USING LUCO'S CAPITAL STRUCTURE**
18 **IN THIS CASE?**

19 A. LUCo's capital structure is inconsistent with the industry benchmarks noted above. While
20 the Commission authorized an equity ratio based on LUCo's *unadjusted* book capital

¹⁸ Moody's, for example, notes that the regulatory environment "is the most important consideration for this sector." *See* Moody's Investor Service, Rating Methodology: Regulated Electric and Gas Utilities, December 23, 2013 at 3 and 9.

¹⁹ *Ibid.*, at 22.

²⁰ Substitute Rebuttal Testimony of David Murray, at 3.

1 structure in Case No. GR-2014-0152, LUCo's characteristics and circumstances are not
2 the same as they were at the time of the Company's last case. LUCo has been growing
3 through acquisitions, and it is likely they will continue to do so. In 2017, LUCo
4 completed the acquisition of Empire District Electric Company as well as additional
5 smaller utilities including St. Lawrence Gas Company, Inc., Perris Water Distribution
6 System, and Park Water System.²¹ As discussed above, LUCo is now an intermediate
7 holding company composed of approximately 30 electric, gas and water distribution
8 utilities regulated across 12 jurisdictions. APUC has also noted that LUCo will continue
9 to seek earnings growth through accretive acquisitions of additional utility systems.²²
10 This significant change in the number and location of the utilities owned by LUCo means
11 that its capital structure is increasingly a function of the different financing practices and
12 decisions of other utilities and regulatory commissions – a factor that the Commission
13 cited in rejecting the use of a holding company's capital structure in the recent Spire case.

14 LUCo's assets have approximately tripled from the end of 2014. The majority of
15 LUCo's current debt was not part of its, or its then-affiliated companies', capital
16 structures at the time of Liberty Midstates 2014 rate case.²³ The equity ratio authorized
17 in the Company's last case was somewhat low relatively to industry averages, but within
18 the range of authorized equity ratios nationally. The 42.83 percent equity ratio proposed
19 by Mr. Murray in this proceeding, however, is below the range of recently authorized
20 water and natural gas utility equity ratios and is highly inconsistent with peer financing

²¹ Algonquin Power & Utilities Corp., 2017 Annual Report, at 81-83.

²² Algonquin Power & Utilities Corp., 2017 Annual Report, at 4.

²³ Includes all debt assumed with the acquisition of Empire District Electric Company.

1 practices.²⁴

2 **Q. HAVE YOU CONDUCTED ANY ANALYSIS TO DETERMINE THE**
3 **INCREMENTAL RETURN ON EQUITY REQUIRED TO OFFSET THE**
4 **HIGHER FINANCIAL RISK IMPLIED BY MR. MURRAY'S 42.83 PERCENT**
5 **ROE RECOMMENDATION RELATIVE TO THE 54.20 PERCENT RATIO**
6 **RECENTLY APPROVED FOR SPIRE MISSOURI?**²⁵

7 A. Yes, I have. I used the Hamada Equation to determine the difference in cost of equity
8 implied by the CAPM method.²⁶ The Hamada Equation reflects the increased risk from
9 additional financial leverage by adjusting the beta component of the model. Using the
10 risk-free rate and beta coefficient assumptions from my CAPM analysis, the Hamada
11 Equation indicates a 11.37 percentage point reduction in equity ratio results in a 157 basis
12 point increase in the required ROE (*see* Schedule KM-S11).

13 **Q. CAN YOU ILLUSTRATE THE INSUFFICIENCY OF MR. MURRAY'S**
14 **PROPOSED 20 BASIS POINT ROE ADJUSTMENT RELATIVE TO HIS VERY**
15 **LOW 42.83 PERCENT EQUITY RATIO RECOMMENDATION?**

16 A. Yes. One approach is to look at the effect on the overall rate of return. For illustrative
17 purposes, combining the 9.80 percent ROE and 54.20 percent equity ratio recently
18 authorized for Spire with Staff's recommended cost of debt of 4.65 percent results in an

²⁴ Source: Regulatory Research Associates; based on authorized returns from January 1, 2018 through July 13, 2018.

²⁵ Mr. Murray notes his allowed ROE recommendation is 20 basis points higher than the Commission's allowed ROE of 9.80 percent for Spire Missouri to account for his more leverage capital structure recommendation. *See* Substitute Rebuttal Testimony of David Murray, at 3.

²⁶ Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweihs, Valuing a Business, Fourth Edition, at 169.

1 after-tax rate of return of 7.44 percent.²⁷ That rate of return is only 8 basis points
 2 removed from the 7.52 mean authorized rate of return for 2018 shown in Table 7 (below).

3 Assuming Mr. Murray’s proposed 42.83 percent equity ratio, a 20 basis point
 4 ROE increase would result in a 6.94 percent rate of return – a decrease of 50 basis points
 5 from the benchmark scenario. As shown in Table 3 (below), an ROE of 11.16 percent
 6 would be necessary to achieve a 7.44 percent overall rate of return, which is a 136 basis
 7 point premium.

8 **Table 3: ROE and Equity Ratio Adjustments – Effect on Rate of Return²⁸**

	<i>Benchmark Scenario: Spire ROE / Equity Ratio</i>	<i>Murray Equity Ratio & ROE + 20bp</i>	<i>Murray Equity Ratio & 11.16% ROE</i>
ROE	9.80%	10.00%	11.16%
Staff Cost of Debt	4.65%	4.65%	4.65%
Equity Ratio	54.20%	42.83%	42.83%
Rate of Return	7.44%	6.94%	7.44%

9 Mr. Murray’s 20 basis point ROE adder is clearly insufficient to offset the revenue effect
 10 of his lower recommended equity ratio. Moreover, to the extent investor confidence in
 11 the regulatory support for Liberty Midstates operations would be negatively affected by
 12 an equity ratio below industry norms, there would be upward pressure on the cost of
 13 capital suggesting a higher overall rate of return would be required. That is, the 136 basis
 14 point estimate likely understates the required incremental increase in ROE to offset such
 15 a low equity ratio.
 16

²⁷ See Staff Review and Audit of Liberty Utilities (Missouri Water). LLC (Water) d/b/a Liberty Utilities, June 22, 2018, at 2 for 4.65% cost of debt recommendation.

²⁸ After-tax rate of return = cost of equity x equity ratio + cost of debt x (1 – equity ratio).

1 **Q. HAVE YOU UPDATED THE ROE ANALYSES PRESENTED IN YOUR**
 2 **LIBERTY MIDSTATES TESTIMONY?**

3 A. Yes. I have updated my DCF (both constant growth and quarterly forms), CAPM, bond
 4 yield plus risk premium, and expected earnings analyses using data as of July 13, 2018. I
 5 rely on the same proxy companies, inputs and methodologies used in my Liberty
 6 Midstates rebuttal testimony.

7 **Q. PLEASE SUMMARIZE YOUR UPDATED DCF MODEL RESULTS.**

8 A. For the growth component, I use projected earnings growth rates from Zacks, First Call
 9 and Value Line and an estimate of Retention Growth. For the stock price component, I
 10 alternately use 30, 90, and 180-day average stock prices. Stock prices, analyst
 11 projections, and dividend payment data are as of July 13, 2018. See Schedules KM-S1
 12 and KM-S2.

13 **Table 4: DCF Model Results²⁹**

	<i>Mean Low</i>	<i>Mean</i>	<i>Mean High</i>
Constant Growth, 30-day Stock Prices	7.63%	9.06%	10.87%
Constant Growth, 90-day Stock Prices	7.73%	9.16%	10.97%
Constant Growth, 180-day Stock Prices	7.72%	9.17%	10.96%
Quarterly Growth, 30-day Stock Prices	7.79%	9.17%	11.14%
Quarterly Growth, 90-day Stock Prices	7.90%	9.27%	11.22%
Quarterly Growth, 180-day Stock Prices	7.89%	9.26%	11.21%

14

15 **Q. PLEASE SUMMARIZE YOUR UPDATED CAPM RESULTS.**

16 A. For the risk-free rate component, I refer alternatively to: (1) the 30-day average of the 30-
 17 year Treasury yield; and (2) a consensus forecast of the average 30-year Treasury yield

²⁹ DCF results presented in Table 4 are unadjusted (*i.e.*, prior to any adjustment for flotation costs).

1 for the coming six quarters. I also rely on published beta coefficients from Bloomberg
 2 and Value Line, and the ex-ante market risk premia described in my Direct Testimony
 3 (*i.e.*, the expected return on the S&P 500 Index less the current 30-year Treasury yield).
 4 As shown in Table 5 (below; *see also*, Schedule KM-S6), based upon updated market
 5 information, my CAPM analyses produce a range of ROE estimates from 10.99 percent
 6 to 12.77 percent.

7 **Table 5: Summary of CAPM Results³⁰**

	<i>Bloomberg MRP</i>	<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (3.02%)	12.46%	12.64%
Value Line Beta, Projected Risk-Free Rate (3.55%)	12.60%	12.77%
Bloomberg Beta, Current Risk-Free Rate (3.02%)	10.99%	11.14%
Bloomberg Beta, Projected Risk-Free Rate (3.55%)	11.19%	11.34%

8
 9 **Q. PLEASE SUMMARIZE YOUR UPDATED BOND YIELD PLUS RISK
 10 PREMIUM MODEL RESULTS.**

11 A. My updated risk premium analysis includes authorized gas utility ROEs as reported by
 12 Regulatory Research Associates (“RRA”) through July 13, 2018. For the purpose of
 13 calculating the expected risk premium and ROE, I have used current and projected long-
 14 term utility bond yields. As shown in Table 6 (below; *see also*, Schedule KM-S7), my
 15 results range from 9.70 percent to 10.33 percent.

³⁰ *See* Schedule KM-S6.

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Table 6: Summary of Risk Premium Results

	<i>Return on Equity</i>
Current Baa Utility Yield (4.69%)	9.70%
Near-Term Projected Baa Utility Yield (5.32%)	9.97%
Long-Term Projected Baa Utility Yield (6.15%)	10.33%

With regard to recent authorized returns for Water utilities, Table 7 provides data by state for rate cases reported by RRA with decisions issued between January and June 2018.

Table 7: Average Authorized Water Utility Returns by State - 2018³¹

	<i>Rate of Return</i>	<i>Return on Equity</i>	<i>Equity Ratio</i>	<i>No. of Cases</i>
Illinois	7.52%	9.60%	53.22%	1
California	7.66%	9.05%	54.77%	4
New Jersey	6.50%	9.60%	52.75%	1
Missouri	n/a	9.50%-10.00%	n/a	1
North Carolina	8.40%	10.50%	51.89%	1
Average:	7.52%	9.69%	53.16%	

However, it is important to consider that RRA currently only evaluates water utility regulation in 25 state jurisdictions, and only monitors proceedings involving rate change requests of at least \$0.5 million or greater.³² In Missouri, I note the Commission approved a stipulation and agreement specifying a return on equity range of 9.50 percent to 10.00 percent for Missouri American Water Company in May 2018, and the

³¹ Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 1. RRA does not provide an authorized return on equity for Missouri American Water Company; the referenced range is based on the stipulation agreement in Case No. WR-2017-0285 (Filed March 1, 2018).

³² Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 3.

1 Commission authorized a 12.00 percent ROE for Indiana Hills in February 2018.³³

2 **Q. PLEASE SUMMARIZE YOUR UPDATED EXPECTED EARNINGS ANALYSIS**
3 **RESULTS.**

4 A. I have updated my expected earnings analysis using Value Line's projections for return
5 on common equity, common share growth and book value per share for my gas proxy
6 group in the recent Liberty Midstates case as well as the water utility industry. Based on
7 data as of July 13, 2018, the proxy company results range from 9.14 percent to 13.63
8 percent, with mean and median results of 11.34 percent to 11.02 percent. The Value Line
9 water utility company results range from 10.84 percent to 14.31 percent, with mean and
10 median results of 12.55 percent to 12.74 percent (*see* Schedule KM-S8).

11 **Q. BASED ON THOSE ANALYSES, DO YOU BELIEVE A 10.25 PERCENT ROE IS**
12 **APPROPRIATE FOR LIBERTY WATER?**

13 A. Yes, I do. My ROE recommendation for Liberty Midstates was 10.25 percent, within a
14 range of 9.90 percent to 10.35 percent. That ROE recommendation remains reasonable
15 and appropriate for Liberty Water based on the updated analysis discussed above.

16

17 **V. RESPONSE TO REBUTTAL TESTIMONY OF MR. STANNARD**

18 **Q. PLEASE SUMMARIZE MR. STANNARD'S TESTIMONY AS IT RELATES TO**
19 **THE COMPANY'S COST OF CAPITAL.**

20 A. Mr. Stannard recommends an ROE of 7.97 percent based on the result of a risk premium
21 analysis that adds Duff & Phelps' equity risk premium ("ERP") to the 2.97 percent 30-

³³ *See*, Missouri Public Service Commission, Case No. WR-2017-0285, Report and Order (Issued May 2, 2018), at 2-3; Missouri Public Service Commission, Case No. WR-2017-0285, Stipulation and Agreement (Filed March 1, 2018), at 2-3; and, Missouri Public Service Commission, Case No. WR-2017-0259, Report and Order (Issued February 7, 2018), at 66.

1 year Treasury yield as of July 17, 2018.³⁴ He also recommends adopting Staff's proposed
2 capital structure.³⁵ Mr. Stannard argues the Company's proposed cost of capital and
3 capital structure are unreasonable because (1) the Company receives a portion of its
4 revenue from fixed cost recovery charges; and (2) Liberty Water is a subsidiary of a
5 larger publicly traded company.

6 **Q. DO YOU HAVE ANY CONCERNS WITH MR. STANNARD'S USE OF DUFF &**
7 **PHELPS' ERP ESTIMATE TO DEVELOP HIS RISK PREMIUM ANALYSIS?**

8 A. Yes, I do. It is not clear the return assumptions used to develop Duff & Phelps' 5.00
9 percent ERP estimate are comparable to the ROE used in utility ratemaking. To that
10 point, I compared Duff & Phelps' recommended risk premium the risk premium implied
11 by subtracting the quarterly average 30-year Treasury yield from the corresponding
12 average authorized gas utility return. As shown in Table 8 below, the Duff & Phelps risk
13 premium consistently understates the risk premium authorized for gas utilities.

³⁴ Rebuttal Testimony of William G. Stannard, at 9-10.

³⁵ Rebuttal Testimony of William G. Stannard, at 9.

1 **Table 8: Authorized Risk Premiums vs. Duff & Phelps Recommended ERP³⁶**

	<i>Gas Utility Average Authorized Risk Premium</i>	<i>Duff & Phelps Average Risk Premium</i>	<i>Difference</i>
2008	6.08%	5.25%	-0.83%
2009	6.06%	5.88%	-0.19%
2010	5.93%	5.50%	-0.43%
2011	5.96%	5.75%	-0.21%
2012	6.90%	5.50%	-1.40%
2013	6.17%	5.00%	-1.17%
2014	6.44%	5.00%	-1.44%
2015	6.74%	5.00%	-1.74%
2016	6.91%	5.50%	-1.41%
2017	6.83%	5.25%	-1.58%
2018	6.50%	5.00%	-1.50%

2
 3 It is apparent, therefore, that the Duff & Phelps’ ERP estimate is not an
 4 appropriate input for determining the authorized ROE for a utility, such as Liberty Water.
 5 Mr. Stannard’s use of the Duff & Phelps’ ERP estimate, therefore, leads to unduly low
 6 ROE estimates relative to the returns allowed for utilities nationally.

7 Lastly, I note Duff & Phelps also provides size premia for use in risk premium
 8 analysis (both the “build-up” method and CAPM approach) to compensate for the
 9 incremental risk associated with small size; the “Micro-Cap” risk premium associated
 10 with Liberty Water’s size would be 5.59 percent.³⁷ Mr. Stannard does not consider the
 11 size risk adjustment in his ROE estimate.

³⁶ See, Schedule KM-S12.

³⁷ See Duff & Phelps, 2017 Valuation Handbook, Appendix 3.

1 **Q. DO YOU AGREE WITH MR. STANNARD’S ASSESSMENT THAT THE**
2 **STRUCTURE OF THE COMPANY’S RATES SUGGEST A LOWER ROE?**³⁸

3 A. No, I do not. Fixed rate charges and other rate mechanisms, such as decoupling, are
4 common among utilities.³⁹ Adoption of the rate structure proposed by the Company
5 would only serve to provide Liberty Water a more reasonable opportunity to earn its
6 allowed return, and make its risk level comparable to other similar utilities. Because the
7 cost of equity is a comparative exercise, there is no need to adjust the ROE if the
8 proposed rate structure is adopted.

9 **Q. WHAT IS YOUR RESPONSE TO MR. STANNARD’S SUGGESTION THAT**
10 **LIBERTY WATER’S RISK IS MITIGATED BECAUSE IT IS OWNED BY A**
11 **LARGER PUBLICLY TRADED COMPANY.**⁴⁰

12 A. While I agree with Mr. Stannard that size is a factor that influences risk, the salient issue
13 is Liberty Water’s size, not the size of the parent holding company. Liberty Water
14 continues to have its own company-specific risk even though its ultimate parent is
15 Algonquin. As discussed by Duff and Phelps, size risk premia can apply to operating
16 units within a parent company:

17 The Risk Premium Report Study can be used to develop estimates of
18 cost of equity capital for **divisions, reporting units and closely held**
19 **businesses** without “guessing” at the value of the business before one
20 begins the analysis. Rather, fundamental measures of firm size (e.g.,
21 sales, net income, EBITDA) and risk (e.g., operating margin) can be
22 used to directly estimate cost of equity capital for non-public

³⁸ Rebuttal Testimony of William G. Stannard, at 9.

³⁹ Based on a review of their most recent annual SEC Form 10-K filings, all of the companies in my Liberty Midstates proxy group report having weather normalization adjustments, straight-fixed variable rate design or decoupling mechanisms in place that help mitigate weather risk for at least a portion of their gas customer bases. All but one of the proxy companies report using infrastructure recovery mechanisms, with the outlier (Northwest Natural Gas) having a decoupling mechanism.

⁴⁰ Rebuttal Testimony of William G. Stannard, at 9.

1 businesses.⁴¹ [emphasis added]

2 Regardless of its ownership structure, Liberty Water must compete for capital
3 with other entities, whether affiliated or not. To the degree that Liberty Water has more
4 risk by virtue of its comparatively small size, it will have to generate the returns required
5 by its owners as compensation for that risk.

6 **VI. CONCLUSIONS AND RECOMMENDATION**

7 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S COST OF**
8 **CAPITAL AND CAPITAL STRUCTURE?**

9 A. I believe an ROE of 10.25 percent, within a range of 9.90 percent to 10.35 percent, is an
10 appropriate estimate of Liberty Water's cost of equity. I also recommend a 53.00 percent
11 common equity ratio, which is consistent with industry practice and, therefore, reasonable
12 and appropriate.

13 **Q. HAVE YOU CONSIDERED WHETHER YOUR RECOMMENDED ROE MEETS**
14 **THE STANDARD OF A FAIR RATE OF RETURN?**

15 A. Yes. My recommendation is based upon my understanding of the *Hope* and *Bluefield*
16 cases, wherein those decisions established the standards for determining a fair and
17 reasonable allowed return on equity including: consistency of the allowed return with
18 other businesses having similar risk; adequacy of the return to provide access to capital
19 and support credit quality; and that the end result must lead to just and reasonable rates.⁴²

20 **Q. SUBJECT TO THE UPDATED ANALYSIS TO YOUR COST OF CAPITAL**
21 **TESTIMONY IN THE LIBERTY MIDSTATES CASE DESCRIBED ABOVE, DO**

⁴¹ Duff and Phelps 2018 Valuation Handbook, at Chapter 9, page 1 [emphasis added].

⁴² See Direct Testimony of Keith Magee, at 8.

1 **YOU ADOPT AND RESTATE YOUR TESTIMONY AS CONTAINED IN**
2 **SCHEDULE KM-S13 FOR PURPOSES OF THIS CASE?**

3 A. Yes, I do.

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

5 A. Yes, it does.

Constant Growth Discounted Cash Flow Model
30 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$88.66	2.19%	2.27%	7.00%	6.65%	7.50%	9.27%	7.60%	8.91%	9.88%	11.56%
Black Hills Corporation	BKH	\$1.90	\$59.44	3.20%	3.26%	4.10%	3.93%	5.00%	3.83%	4.21%	7.08%	7.48%	8.28%
Chesapeake Utilities	CPK	\$1.48	\$79.93	1.85%	1.92%	6.00%	6.00%	8.50%	10.84%	7.83%	7.91%	9.76%	12.79%
New Jersey Resources Corporation	NJR	\$1.09	\$43.95	2.48%	2.57%	6.00%	6.43%	9.50%	7.82%	7.44%	8.55%	10.01%	12.10%
Northwest Natural Gas Company	NWN	\$1.89	\$61.95	3.05%	3.13%	4.30%	4.50%	n/a	7.08%	5.29%	7.42%	8.42%	10.24%
One Gas Inc	OGS	\$1.84	\$73.81	2.49%	2.56%	5.70%	5.50%	7.00%	4.42%	5.66%	6.97%	8.22%	9.58%
Southwest Gas Corporation	SWX	\$2.08	\$76.61	2.71%	2.81%	NA	4.00%	9.00%	7.54%	6.85%	6.77%	9.66%	11.84%
Spire Inc	SR	\$2.25	\$70.13	3.21%	3.29%	4.00%	3.47%	7.50%	6.52%	5.37%	6.73%	8.67%	10.83%
Vectren Corporation	VVC	\$1.80	\$71.11	2.53%	2.62%	7.00%	8.00%	6.50%	5.74%	6.81%	8.35%	9.43%	10.63%
Proxy Group Mean				2.63%	2.72%	5.51%	5.39%	7.56%	7.01%	6.34%	7.63%	9.06%	10.87%
Proxy Group Median				2.53%	2.62%	5.85%	5.50%	7.50%	7.08%	6.81%	7.42%	9.43%	10.83%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
90 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$86.06	2.25%	2.34%	7.00%	6.65%	7.50%	9.27%	7.60%	8.98%	9.94%	11.63%
Black Hills Corporation	BKH	\$1.90	\$56.56	3.36%	3.43%	4.10%	3.93%	5.00%	3.83%	4.21%	7.25%	7.64%	8.44%
Chesapeake Utilities	CPK	\$1.48	\$76.13	1.94%	2.02%	6.00%	6.00%	8.50%	10.84%	7.83%	8.00%	9.85%	12.89%
New Jersey Resources Corporation	NJR	\$1.09	\$42.11	2.59%	2.68%	6.00%	6.43%	9.50%	7.82%	7.44%	8.67%	10.12%	12.21%
Northwest Natural Gas Company	NWN	\$1.89	\$59.86	3.16%	3.24%	4.30%	4.50%	n/a	7.08%	5.29%	7.53%	8.53%	10.35%
One Gas Inc	OGS	\$1.84	\$70.45	2.61%	2.69%	5.70%	5.50%	7.00%	4.42%	5.66%	7.09%	8.34%	9.70%
Southwest Gas Corporation	SWX	\$2.08	\$72.76	2.86%	2.96%	NA	4.00%	9.00%	7.54%	6.85%	6.92%	9.80%	11.99%
Spire Inc	SR	\$2.25	\$70.51	3.19%	3.28%	4.00%	3.47%	7.50%	6.52%	5.37%	6.72%	8.65%	10.81%
Vectren Corporation	VVC	\$1.80	\$68.11	2.64%	2.73%	7.00%	8.00%	6.50%	5.74%	6.81%	8.46%	9.54%	10.75%
Proxy Group Mean				2.73%	2.82%	5.51%	5.39%	7.56%	7.01%	6.34%	7.73%	9.16%	10.97%
Proxy Group Median				2.64%	2.73%	5.85%	5.50%	7.50%	7.08%	6.81%	7.53%	9.54%	10.81%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
180 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$85.60	2.27%	2.35%	7.00%	6.65%	7.50%	9.27%	7.60%	8.99%	9.96%	11.64%
Black Hills Corporation	BKH	\$1.90	\$56.70	3.35%	3.42%	4.10%	3.93%	5.00%	3.83%	4.21%	7.24%	7.64%	8.43%
Chesapeake Utilities	CPK	\$1.48	\$76.18	1.94%	2.02%	6.00%	6.00%	8.50%	10.84%	7.83%	8.00%	9.85%	12.89%
New Jersey Resources Corporation	NJR	\$1.09	\$41.49	2.63%	2.73%	6.00%	6.43%	9.50%	7.82%	7.44%	8.71%	10.16%	12.25%
Northwest Natural Gas Company	NWN	\$1.89	\$60.35	3.13%	3.21%	4.30%	4.50%	n/a	7.08%	5.29%	7.50%	8.51%	10.32%
One Gas Inc	OGS	\$1.84	\$71.37	2.58%	2.65%	5.70%	5.50%	7.00%	4.42%	5.66%	7.06%	8.31%	9.67%
Southwest Gas Corporation	SWX	\$2.08	\$74.92	2.78%	2.87%	NA	4.00%	9.00%	7.54%	6.85%	6.83%	9.72%	11.90%
Spire Inc	SR	\$2.25	\$71.75	3.14%	3.22%	4.00%	3.47%	7.50%	6.52%	5.37%	6.66%	8.59%	10.75%
Vectren Corporation	VVC	\$1.80	\$66.28	2.72%	2.81%	7.00%	8.00%	6.50%	5.74%	6.81%	8.54%	9.62%	10.82%
Proxy Group Mean				2.72%	2.81%	5.51%	5.39%	7.56%	7.01%	6.34%	7.72%	9.15%	10.96%
Proxy Group Median				2.72%	2.81%	5.85%	5.50%	7.50%	7.08%	6.81%	7.50%	9.62%	10.82%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Quarterly Discounted Cash Flow Model
30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$88.66	7.00%	6.65%	7.50%	9.27%	7.60%	9.07%	10.00%	11.77%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$59.44	4.10%	3.93%	5.00%	3.83%	4.21%	7.29%	7.58%	8.52%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$79.93	6.00%	6.00%	8.50%	10.84%	7.83%	7.87%	9.71%	12.82%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$43.95	6.00%	6.43%	9.50%	7.82%	7.44%	8.79%	10.20%	12.74%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$61.95	4.30%	4.50%	n/a	7.08%	5.29%	7.68%	8.61%	10.58%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$73.81	5.70%	5.50%	7.00%	4.42%	5.66%	7.04%	8.25%	9.71%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$76.61	NA	4.00%	9.00%	7.54%	6.85%	6.90%	9.78%	12.10%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$70.13	4.00%	3.47%	7.50%	6.52%	5.37%	6.93%	8.80%	11.15%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$71.11	7.00%	8.00%	6.50%	5.74%	6.81%	8.53%	9.56%	10.86%
Proxy Group Mean											5.51%	5.39%	7.56%	7.01%	6.34%	7.79%	9.17%	11.14%
Proxy Group Median											5.85%	5.50%	7.50%	7.08%	6.81%	7.68%	9.56%	11.15%

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional Service
- [3] Source: Bloomberg Professional Service
- [4] Source: Bloomberg Professional Service
- [5] Equals Col. [1] x (1 + Col. [14])
- [6] Equals Col. [2] x (1 + Col. [14])
- [7] Equals Col. [3] x (1 + Col. [14])
- [8] Equals Col. [4] x (1 + Col. [14])
- [9] Source: Blomberg Professional Service, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-S3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Quarterly Discounted Cash Flow Model
90 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$86.06	7.00%	6.65%	7.50%	9.27%	7.60%	9.15%	10.07%	11.85%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$56.56	4.10%	3.93%	5.00%	3.83%	4.21%	7.48%	7.76%	8.71%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$76.13	6.00%	6.00%	8.50%	10.84%	7.83%	7.96%	9.81%	12.92%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$42.11	6.00%	6.43%	9.50%	7.82%	7.44%	8.91%	10.32%	12.55%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$59.86	4.30%	4.50%	n/a	7.08%	5.29%	7.80%	8.72%	10.71%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$70.45	5.70%	5.50%	7.00%	4.42%	5.66%	7.17%	8.37%	9.84%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$72.76	NA	4.00%	9.00%	7.54%	6.85%	7.06%	9.94%	12.27%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$70.51	4.00%	3.47%	7.50%	6.52%	5.37%	6.91%	8.78%	11.13%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$68.11	7.00%	8.00%	6.50%	5.74%	6.81%	8.66%	9.68%	11.00%
Proxy Group Mean											5.51%	5.39%	7.56%	7.01%	6.34%	7.90%	9.27%	11.22%
Proxy Group Median											5.85%	5.50%	7.50%	7.08%	6.81%	7.80%	9.68%	11.13%

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional Service
- [3] Source: Bloomberg Professional Service
- [4] Source: Bloomberg Professional Service
- [5] Equals Col. [1] x (1 + Col. [14])
- [6] Equals Col. [2] x (1 + Col. [14])
- [7] Equals Col. [3] x (1 + Col. [14])
- [8] Equals Col. [4] x (1 + Col. [14])
- [9] Source: Bloomberg Professional Service, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-S3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Quarterly Discounted Cash Flow Model
180 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$85.60	7.00%	6.65%	7.50%	9.27%	7.60%	9.16%	10.09%	11.87%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$56.70	4.10%	3.93%	5.00%	3.83%	4.21%	7.47%	7.75%	8.70%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$76.18	6.00%	6.00%	8.50%	10.84%	7.83%	7.96%	9.80%	12.92%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$41.49	6.00%	6.43%	9.50%	7.82%	7.44%	8.96%	10.37%	12.59%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$60.35	4.30%	4.50%	n/a	7.08%	5.29%	7.77%	8.70%	10.68%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$71.37	5.70%	5.50%	7.00%	4.42%	5.66%	7.13%	8.34%	9.80%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$74.92	NA	4.00%	9.00%	7.54%	6.85%	6.97%	9.85%	12.17%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$71.75	4.00%	3.47%	7.50%	6.52%	5.37%	6.85%	8.72%	11.06%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$66.28	7.00%	8.00%	6.50%	5.74%	6.81%	8.74%	9.76%	11.09%
Proxy Group Mean											5.51%	5.39%	7.56%	7.01%	6.34%	7.89%	9.26%	11.21%
Proxy Group Median											5.85%	5.50%	7.50%	7.08%	6.81%	7.77%	9.76%	11.09%

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional Service
- [3] Source: Bloomberg Professional Service
- [4] Source: Bloomberg Professional Service
- [5] Equals Col. [1] x (1 + Col. [14])
- [6] Equals Col. [2] x (1 + Col. [14])
- [7] Equals Col. [3] x (1 + Col. [14])
- [8] Equals Col. [4] x (1 + Col. [14])
- [9] Source: Blomberg Professional Service, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-S3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Retention Growth Estimate

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Company	Ticker	Five-Year Projected Earnings per share	Five-Year Projected Dividend Declared per share	Retention Ratio (B)	Projected Book Value per Share 2018	Five-Year Projected Book Value per Share	Return on Average Book Value (R)	B x R	Projected Common Shares 2018	Five-Year Projected Common Shares	Common Shares Growth Rate	2017 High Price	2017 Low Price	2017 Price Midpoint	Book Value per Share 2017
Atmos Energy Corporation	ATO	5.15	2.50	51.46%	42.10	46.55	11.20%	5.76%	114.00	130.00	3.34%	93.60	72.50	\$ 83.05	36.74
Black Hills Corporation	BKH	4.00	2.45	38.75%	35.25	41.25	9.88%	3.83%	59.50	59.50	0.00%	72.00	57.00	\$ 64.50	31.92
Chesapeake Utilities	CPK	4.50	2.00	55.56%	32.30	45.50	10.26%	5.70%	17.00	20.00	4.15%	86.40	63.00	\$ 74.70	29.75
New Jersey Resources Corporation	NJR	2.95	1.24	57.97%	15.95	22.70	13.50%	7.82%	86.50	86.50	0.00%	45.40	33.70	\$ 39.55	14.33
Northwest Natural Gas Company	NWN	3.50	2.20	37.14%	26.35	29.40	12.06%	4.48%	29.50	32.00	2.05%	69.50	56.50	\$ 63.00	25.85
One Gas Inc	OGS	4.00	2.50	37.50%	40.25	43.40	9.30%	3.49%	52.50	55.00	1.17%	79.50	61.40	\$ 70.45	37.47
Southwest Gas Corporation	SWX	5.50	2.60	52.73%	39.80	52.85	10.74%	5.66%	49.00	53.00	1.98%	86.90	72.30	\$ 79.60	37.74
Spire Inc	SR	5.00	2.50	50.00%	41.60	48.10	10.57%	5.29%	51.00	55.00	1.91%	82.90	62.30	\$ 72.60	41.26
Vectren Corporation	VVC	3.65	2.35	35.62%	23.60	29.05	12.87%	4.58%	83.50	86.00	0.74%	69.90	51.50	\$ 60.70	22.28

		[15]	[16]	[17]	[18]	[19]
Company	Ticker	Market/ Book Ratio	"S"	"V"	S x V	BR + SV
Atmos Energy Corporation	ATO	2.26	7.55%	55.76%	4.21%	9.27%
Black Hills Corporation	BKH	2.02	0.00%	50.51%	0.00%	3.83%
Chesapeake Utilities	CPK	2.51	10.41%	60.17%	6.27%	10.84%
New Jersey Resources Corporation	NJR	2.76	0.00%	63.77%	0.00%	7.82%
Northwest Natural Gas Company	NWN	2.44	5.01%	58.97%	2.95%	7.08%
One Gas Inc	OGS	1.88	2.20%	46.81%	1.03%	4.42%
Southwest Gas Corporation	SWX	2.11	4.18%	52.59%	2.20%	7.54%
Spire Inc	SR	1.76	3.35%	43.17%	1.45%	6.52%
Vectren Corporation	VVC	2.72	2.02%	63.29%	1.28%	5.74%

Mean: 7.01%
Median: 7.08%

Notes:

- | | | |
|--|--|---------------------------------------|
| [1] Source: Value Line | [7] Equals [3] x [6] | [13] Equals Average ([11], [12]) |
| [2] Source: Value Line | [8] Source: Value Line | [14] Source: Value Line |
| [3] Equals 1 - [2] / [1] | [9] Source: Value Line | [15] Equals [13] / [14] |
| [4] Source: Value Line | [10] Equals ([9] / [8]) ^(1/4) - 1 | [16] Equals [10] x [15] |
| [5] Source: Value Line | [11] Source: Value Line | [17] Equals 1 - (1 / [15]) |
| [6] Equals [1] / ([4] + (3.5/4) x ([5] - [4])) | [12] Source: Value Line | [18] Equals [16] x [17] |
| | | [19] Equals ([7] + [18]) / (1 + [16]) |

Ex-Ante Market Risk Premium
Market DCF Method Based - Value Line & Bloomberg

	Bloomberg	Value Line
Est. S&P 500 Return [1]:	15.70%	15.94%
Current Risk-Free Rate [2]:	3.02%	3.02%
Near-Term Projected Risk-Free Rate [3]:	3.55%	3.55%
Current Market Risk Premium [4]:	12.68%	12.91%
Near-Term Projected Market Risk Premium [5]:	12.15%	12.39%

Company	Ticker	[6] Market Capitalization (\$MM)	[7] Dividend Yield	[9] Bloomberg			[12] Value Line		
				[8] Growth Rate	[10] DCF Result	[10] Weight in Index	[11] Growth Rate	[12] DCF Result	[13] Weight in Index
AGILENT TECHNOLOGIES INC	A	20,278.57	0.95%	-0.45%	0.49%	0.08%	12.00%	13.00%	0.09%
AMERICAN AIRLINES GROUP INC	AAL	17,377.83	1.14%	16.36%	17.60%	0.07%	3.50%	4.66%	0.07%
ADVANCE AUTO PARTS INC	AAP	10,315.52	0.18%	16.64%	16.84%	0.04%	13.00%	13.19%	0.04%
APPLE INC	AAPL	940,413.35	1.43%	11.46%	12.97%	3.75%	13.00%	14.52%	3.98%
ABBVIE INC	ABBV	153,340.16	4.00%	12.93%	17.20%	0.61%	14.50%	18.79%	0.65%
AMERISOURCEBERGEN CORP	ABC	19,322.98	1.72%	9.78%	11.58%	0.08%	7.00%	8.78%	0.08%
ABIOMED INC	ABMD	18,694.22	0.00%	37.00%	37.00%	0.07%	23.00%	23.00%	0.08%
ABBOTT LABORATORIES	ABT	110,556.02	1.78%	13.00%	14.90%	0.44%	9.50%	11.37%	0.47%
ACCENTURE PLC-CL A	ACN	107,864.65	1.59%	11.15%	12.83%	0.43%	9.50%	11.16%	0.46%
ADOBE SYSTEMS INC	ADBE	126,621.87	0.00%	18.66%	18.66%	0.51%	25.50%	25.50%	0.54%
ANALOG DEVICES INC	ADI	36,392.44	1.93%	9.47%	11.48%	0.15%	13.00%	15.05%	0.15%
ARCHER-DANIELS-MIDLAND CO	ADM	26,600.39	2.75%	10.00%	12.89%	0.11%	6.00%	8.83%	0.11%
AUTOMATIC DATA PROCESSING	ADP	60,501.34	1.80%	13.50%	15.42%	0.24%	11.00%	12.90%	0.26%
ALLIANCE DATA SYSTEMS CORP	ADS	13,489.84	0.94%	12.40%	13.39%	0.05%	13.00%	14.00%	0.06%
AUTODESK INC	ADSK	30,068.90	0.00%	34.00%	34.00%	0.12%	N/A	N/A	N/A
AMEREN CORPORATION	AEE	14,893.21	3.05%	8.97%	12.16%	0.06%	7.50%	10.66%	0.06%
AMERICAN ELECTRIC POWER	AEP	34,649.03	3.57%	5.64%	9.31%	0.14%	4.50%	8.15%	0.15%
AES CORP	AES	8,717.25	4.02%	8.19%	12.38%	0.03%	N/A	N/A	N/A
AETNA INC	AET	62,767.22	1.04%	10.41%	11.51%	0.25%	10.00%	11.10%	0.27%
AFLAC INC	AFL	32,979.52	2.45%	8.04%	10.59%	0.13%	8.50%	11.05%	0.14%
ALLERGAN PLC	AGN	60,065.12	1.66%	7.88%	9.60%	0.24%	4.50%	6.20%	0.25%
AMERICAN INTERNATIONAL GROUP	AIG	48,690.35	2.36%	11.00%	13.49%	0.19%	52.00%	54.97%	0.21%
APARTMENT INVT & MGMT CO -A	AIV	6,712.56	3.57%	6.02%	9.70%	0.03%	4.50%	8.15%	0.03%
ASSURANT INC	AIZ	6,814.98	2.14%	N/A	N/A	N/A	5.50%	7.70%	0.03%
ARTHUR J GALLAGHER & CO	AJG	12,551.32	2.36%	10.32%	12.81%	0.05%	17.00%	19.57%	0.05%
AKAMAI TECHNOLOGIES INC	AKAM	13,193.14	0.00%	11.71%	11.71%	0.05%	17.00%	17.00%	0.06%
ALBEMARLE CORP	ALB	10,585.64	1.41%	12.23%	13.73%	0.04%	10.00%	11.48%	0.04%
ALIGN TECHNOLOGY INC	ALGN	29,130.39	0.00%	30.05%	30.05%	0.12%	27.50%	27.50%	0.12%
ALASKA AIR GROUP INC	ALK	7,571.49	2.08%	10.03%	12.22%	0.03%	4.50%	6.63%	0.03%
ALLSTATE CORP	ALL	32,628.71	1.94%	9.00%	11.03%	0.13%	12.00%	14.06%	0.14%
ALLEGION PLC	ALLE	7,569.21	0.95%	12.18%	13.19%	0.03%	9.50%	10.50%	0.03%
ALEXION PHARMACEUTICALS INC	ALXN	30,231.17	0.00%	18.87%	18.87%	0.12%	26.50%	26.50%	0.13%
APPLIED MATERIALS INC	AMAT	46,501.24	1.30%	14.46%	15.85%	0.19%	20.00%	21.43%	0.20%
ADVANCED MICRO DEVICES	AMD	15,771.23	0.00%	23.60%	23.60%	0.06%	N/A	N/A	N/A
AMETEK INC	AME	17,067.37	0.76%	11.54%	12.34%	0.07%	10.50%	11.30%	0.07%
AFFILIATED MANAGERS GROUP	AMG	8,064.71	0.80%	12.56%	13.41%	0.03%	6.50%	7.33%	0.03%
AMGEN INC	AMGN	129,634.82	2.64%	5.11%	7.81%	0.52%	8.00%	10.74%	0.55%
AMERIPRISE FINANCIAL INC	AMP	20,536.46	2.49%	N/A	N/A	N/A	16.00%	18.69%	0.09%
AMERICAN TOWER CORP	AMT	63,258.95	2.18%	13.23%	15.56%	0.25%	11.50%	13.81%	0.27%
AMAZON.COM INC	AMZN	879,730.93	0.00%	41.63%	41.63%	3.51%	48.00%	48.00%	3.72%
ANDEAVOR	ANDV	20,475.59	1.81%	7.95%	9.84%	0.08%	5.50%	7.36%	0.09%
ANSYS INC	ANSS	15,099.51	0.00%	13.05%	13.05%	0.06%	10.50%	10.50%	0.06%
ANTHEM INC	ANTM	63,929.97	1.20%	10.09%	11.35%	0.26%	15.50%	16.79%	0.27%
AON PLC	AON	35,258.70	1.08%	11.42%	12.56%	0.14%	9.50%	10.63%	0.15%
SMITH (A.O.) CORP	AOS	10,307.89	1.20%	11.50%	12.76%	0.04%	13.00%	14.27%	0.04%
APACHE CORP	APA	18,133.22	2.11%	-17.09%	-15.16%	0.07%	N/A	N/A	N/A
ANADARKO PETROLEUM CORP	APC	38,420.43	1.04%	19.23%	20.38%	0.15%	N/A	N/A	N/A
AIR PRODUCTS & CHEMICALS INC	APD	34,485.74	2.70%	11.42%	14.27%	0.14%	8.00%	10.81%	0.15%
AMPHENOL CORP-CL A	APH	26,740.37	0.96%	10.51%	11.52%	0.11%	8.50%	9.50%	0.11%
APTIV PLC	APTIV	24,790.33	0.94%	10.59%	11.58%	0.10%	10.00%	10.99%	0.10%
ALEXANDRIA REAL ESTATE EQUIT	ARE	13,172.50	2.87%	6.78%	9.74%	0.05%	N/A	N/A	N/A
ARCONIC INC	ARNC	8,391.62	1.39%	15.95%	17.45%	0.03%	N/A	N/A	N/A
ACTIVISION BLIZZARD INC	ATVI	62,038.19	0.42%	14.21%	14.66%	0.25%	13.50%	13.95%	0.26%
AVALONBAY COMMUNITIES INC	AVB	23,958.50	3.39%	5.61%	9.09%	0.10%	6.50%	10.00%	0.10%

BROADCOM INC	AVGO	87,398.11	3.46%	13.58%	17.27%	0.35%	44.50%	48.73%	0.37%
AVERY DENNISON CORP	AVY	9,125.28	1.93%	9.83%	11.86%	0.04%	12.50%	14.55%	0.04%
AMERICAN WATER WORKS CO INC	AWK	15,614.80	2.06%	8.00%	10.14%	0.06%	10.00%	12.16%	0.07%
AMERICAN EXPRESS CO	AXP	86,466.40	1.45%	17.30%	18.88%	0.35%	8.50%	10.02%	0.37%
AUTOZONE INC	AZO	18,160.81	0.00%	12.87%	12.87%	0.07%	12.50%	12.50%	0.08%
BOEING CO/THE	BA	204,363.58	1.99%	15.33%	17.48%	0.82%	18.00%	20.17%	0.86%
BANK OF AMERICA CORP	BAC	289,478.57	2.00%	13.40%	15.53%	1.16%	13.00%	15.13%	1.22%
BAXTER INTERNATIONAL INC	BAX	40,217.21	0.97%	13.06%	14.09%	0.16%	13.50%	14.53%	0.17%
BB&T CORP	BBT	39,712.76	3.08%	14.57%	17.87%	0.16%	9.00%	12.22%	0.17%
BEST BUY CO INC	BBY	21,200.26	2.37%	11.22%	13.72%	0.08%	10.50%	13.00%	0.09%
BECTON DICKINSON AND CO	BDX	66,025.57	1.24%	13.91%	15.24%	0.26%	10.00%	11.31%	0.28%
FRANKLIN RESOURCES INC	BEN	17,464.93	10.69%	10.00%	21.23%	0.07%	7.50%	18.59%	0.07%
BROWN-FORMAN CORP-CLASS B	BF/B	24,629.55	1.30%	12.85%	14.23%	0.10%	14.00%	15.39%	0.10%
BRIGHTHOUSE FINANCIAL INC	BHF	4,854.40	0.00%	8.00%	8.00%	0.02%	N/A	N/A	N/A
BAKER HUGHES A GE CO	BHGE	36,313.02	1.96%	66.45%	69.05%	0.14%	N/A	N/A	N/A
BIOGEN INC	BIIB	73,532.05	0.00%	4.86%	4.86%	0.29%	6.50%	6.50%	0.31%
BANK OF NEW YORK MELLON CORP	BK	53,596.16	1.95%	8.10%	10.13%	0.21%	9.00%	11.04%	0.23%
BOOKING HOLDINGS INC	BKNG	97,864.55	0.00%	14.12%	14.12%	0.39%	14.00%	14.00%	0.41%
BLACKROCK INC	BLK	81,710.61	2.31%	11.00%	13.44%	0.33%	12.00%	14.45%	0.35%
BALL CORP	BLL	13,138.44	1.02%	5.50%	6.55%	0.05%	22.00%	23.14%	0.06%
BRISTOL-MYERS SQUIBB CO	BMY	92,939.86	2.82%	9.85%	12.80%	0.37%	13.50%	16.51%	0.39%
BROADRIDGE FINANCIAL SOLUTIO	BR	13,911.01	1.24%	10.00%	11.30%	0.06%	14.00%	15.32%	0.06%
BERKSHIRE HATHAWAY INC-CL B	BRK/B	473,873.19	0.00%	1.30%	1.30%	1.89%	N/A	N/A	N/A
BOSTON SCIENTIFIC CORP	BSX	46,016.68	0.00%	21.34%	21.34%	0.18%	16.00%	16.00%	0.19%
BORGWARNER INC	BWA	9,471.39	1.50%	4.68%	6.21%	0.04%	9.00%	10.57%	0.04%
BOSTON PROPERTIES INC	BXP	19,653.62	2.54%	5.91%	8.52%	0.08%	3.50%	6.08%	0.08%
CITIGROUP INC	C	170,845.54	2.23%	14.46%	16.85%	0.68%	11.00%	13.36%	0.72%
CA INC	CA	18,424.54	2.34%	3.08%	5.45%	0.07%	7.00%	9.42%	0.08%
CONAGRA BRANDS INC	CAG	14,099.21	2.54%	10.35%	13.02%	0.06%	6.50%	9.12%	0.06%
CARDINAL HEALTH INC	CAH	15,782.80	3.64%	9.93%	13.75%	0.06%	11.00%	14.84%	0.07%
CATERPILLAR INC	CAT	84,161.43	2.28%	25.37%	27.93%	0.34%	17.50%	19.97%	0.36%
CHUBB LTD	CB	61,551.09	2.21%	10.00%	12.32%	0.25%	9.50%	11.82%	0.26%
CBOE GLOBAL MARKETS INC	CBOE	11,575.25	1.12%	13.64%	14.83%	0.05%	17.00%	18.21%	0.05%
CBRE GROUP INC - A	CBRE	16,684.62	0.00%	10.75%	10.75%	0.07%	11.50%	11.50%	0.07%
CBS CORP-CLASS B NON VOTING	CBS	22,375.36	1.31%	15.39%	16.80%	0.09%	10.50%	11.88%	0.09%
CROWN CASTLE INTL CORP	CCI	46,070.24	3.85%	12.77%	16.86%	0.18%	12.00%	16.08%	0.19%
CARNIVAL CORP	CCL	40,953.97	3.30%	13.80%	17.33%	0.16%	12.50%	16.01%	0.17%
CADENCE DESIGN SYS INC	CDNS	12,767.52	0.00%	12.00%	12.00%	0.05%	10.50%	10.50%	0.05%
CELGENE CORP	CELG	62,110.44	0.00%	18.97%	18.97%	0.25%	14.50%	14.50%	0.26%
CERNER CORP	CERN	20,396.62	0.00%	11.68%	11.68%	0.08%	9.00%	9.00%	0.09%
CF INDUSTRIES HOLDINGS INC	CF	9,873.45	2.84%	11.75%	14.76%	0.04%	47.00%	50.51%	0.04%
CITIZENS FINANCIAL GROUP	CFG	19,078.84	2.49%	21.56%	24.32%	0.08%	15.50%	18.18%	0.08%
CHURCH & DWIGHT CO INC	CHD	13,676.40	1.56%	10.24%	11.88%	0.05%	9.00%	10.63%	0.06%
C.H. ROBINSON WORLDWIDE INC	CHRW	12,077.56	2.16%	9.58%	11.85%	0.05%	10.50%	12.78%	0.05%
CHARTER COMMUNICATIONS INC-A	CHTR	80,256.21	0.00%	29.32%	29.32%	0.32%	19.50%	19.50%	0.34%
CIGNA CORP	CI	42,107.29	0.02%	11.84%	11.87%	0.17%	12.50%	12.53%	0.18%
CINCINNATI FINANCIAL CORP	CINF	11,426.20	3.05%	N/A	N/A	N/A	7.00%	10.15%	0.05%
COLGATE-PALMOLIVE CO	CL	57,355.09	2.53%	8.43%	11.06%	0.23%	11.00%	13.67%	0.24%
CLOROX COMPANY	CLX	17,413.64	2.57%	8.53%	11.21%	0.07%	8.00%	10.67%	0.07%
COMERICA INC	CMA	15,381.15	1.67%	26.80%	28.69%	0.06%	16.50%	18.31%	0.07%
COMCAST CORP-CLASS A	CMCSA	159,676.91	2.18%	15.40%	17.75%	0.64%	12.50%	14.82%	0.68%
CME GROUP INC	CME	56,843.81	3.87%	15.00%	19.16%	0.23%	4.50%	8.46%	0.24%
CHIPOTLE MEXICAN GRILL INC	CMG	12,707.40	0.00%	19.29%	19.29%	0.05%	18.00%	18.00%	0.05%
CUMMINS INC	CMI	22,550.82	3.23%	9.06%	12.44%	0.09%	8.50%	11.87%	0.10%
CMS ENERGY CORP	CMS	13,518.89	2.98%	6.35%	9.43%	0.05%	7.00%	10.09%	0.06%
CENTENE CORP	CNC	27,602.70	0.00%	15.49%	15.49%	0.11%	11.50%	11.50%	0.12%
CENTERPOINT ENERGY INC	CNP	11,977.70	4.03%	5.77%	9.91%	0.05%	8.50%	12.70%	0.05%
CAPITAL ONE FINANCIAL CORP	COF	46,011.81	1.72%	16.09%	17.95%	0.18%	5.50%	7.27%	0.19%
CABOT OIL & GAS CORP	COG	10,587.39	1.01%	39.25%	40.46%	0.04%	N/A	N/A	N/A
ROCKWELL COLLINS INC	COL	22,640.82	1.08%	11.60%	12.74%	0.09%	12.50%	13.64%	0.10%
COOPER COS INC/THE	COO	12,134.61	0.03%	10.50%	10.53%	0.05%	16.50%	16.53%	0.05%
CONOCOPHILLIPS	COP	84,244.77	1.59%	6.00%	7.64%	0.34%	N/A	N/A	N/A
COSTCO WHOLESALE CORP	COST	94,961.79	0.99%	11.51%	12.56%	0.38%	9.00%	10.03%	0.40%
COTY INC-CL A	COTY	10,687.65	3.51%	15.63%	19.42%	0.04%	7.00%	10.63%	0.05%
CAMPBELL SOUP CO	CPB	12,341.50	3.49%	3.30%	6.85%	0.05%	4.50%	8.07%	0.05%
COPART INC	CPRT	13,776.42	0.00%	N/A	N/A	N/A	13.50%	13.50%	0.06%
SALESFORCE.COM INC	CRM	109,654.90	0.00%	26.30%	26.30%	0.44%	N/A	N/A	N/A
CISCO SYSTEMS INC	CSCO	196,486.43	2.98%	6.15%	9.22%	0.78%	7.50%	10.59%	0.83%
CSX CORP	CSX	56,644.13	1.36%	15.44%	16.90%	0.23%	17.50%	18.98%	0.24%
CINTAS CORP	CTAS	20,886.35	0.83%	12.13%	13.01%	0.08%	14.50%	15.39%	0.09%
CENTURYLINK INC	CTL	21,447.47	10.87%	-15.40%	-5.37%	0.09%	2.50%	13.50%	0.09%
COGNIZANT TECH SOLUTIONS-A	CTSH	47,873.80	0.92%	15.03%	16.03%	0.19%	11.50%	12.48%	0.20%

CITRIX SYSTEMS INC	CTXS	14,876.62	0.00%	11.00%	11.00%	0.06%	6.50%	6.50%	0.06%
CVS HEALTH CORP	CVS	69,772.44	2.91%	11.14%	14.22%	0.28%	9.00%	12.05%	0.29%
CHEVRON CORP	CVX	237,035.48	3.61%	54.01%	58.59%	0.95%	31.00%	35.17%	1.00%
CONCHO RESOURCES INC	CXO	22,074.17	0.00%	32.85%	32.85%	0.09%	33.00%	33.00%	0.09%
DOMINION ENERGY INC	D	45,689.47	4.77%	5.55%	10.45%	0.18%	6.50%	11.42%	0.19%
DELTA AIR LINES INC	DAL	35,098.89	2.53%	15.41%	18.13%	0.14%	10.50%	13.16%	0.15%
DEERE & CO	DE	44,615.07	2.01%	7.67%	9.76%	0.18%	15.50%	17.67%	0.19%
DISCOVER FINANCIAL SERVICES	DFS	24,085.20	2.13%	9.18%	11.41%	0.10%	8.00%	10.22%	0.10%
DOLLAR GENERAL CORP	DG	26,621.97	1.15%	15.96%	17.21%	0.11%	12.50%	13.73%	0.11%
QUEST DIAGNOSTICS INC	DGX	15,612.19	1.67%	10.90%	12.66%	0.06%	9.50%	11.25%	0.07%
DR HORTON INC	DHI	15,651.40	1.17%	20.52%	21.81%	0.06%	12.00%	13.24%	0.07%
DANAHER CORP	DHR	69,298.41	0.61%	8.15%	8.79%	0.28%	11.00%	11.64%	0.29%
WALT DISNEY CO/THE	DIS	163,542.56	1.54%	12.20%	13.83%	0.65%	9.00%	10.61%	0.69%
DISCOVERY INC - A	DISCA	19,308.77	0.00%	N/A	N/A	N/A	15.00%	15.00%	0.08%
DISH NETWORK CORP-A	DISH	15,699.30	0.00%	-11.61%	-11.61%	0.06%	1.00%	1.00%	0.07%
DIGITAL REALTY TRUST INC	DLR	24,955.48	3.47%	7.28%	10.88%	0.10%	8.00%	11.61%	0.11%
DOLLAR TREE INC	DLTR	20,627.03	0.00%	13.99%	13.99%	0.08%	19.50%	19.50%	0.09%
DOVER CORP	DOV	11,586.91	2.58%	12.63%	15.37%	0.05%	13.00%	15.74%	0.05%
DUKE REALTY CORP	DRE	10,325.31	2.79%	-4.09%	-1.35%	0.04%	7.00%	9.88%	0.04%
DARDEN RESTAURANTS INC	DRI	13,875.57	2.65%	10.09%	12.87%	0.06%	13.00%	15.82%	0.06%
DTE ENERGY COMPANY	DTE	19,271.70	3.32%	5.53%	8.95%	0.08%	7.00%	10.44%	0.08%
DUKE ENERGY CORP	DUK	56,514.62	4.53%	4.45%	9.08%	0.23%	5.50%	10.16%	0.24%
DAVITA INC	DVA	12,523.87	0.00%	20.25%	20.25%	0.05%	11.00%	11.00%	0.05%
DEVON ENERGY CORP	DVN	23,406.45	0.69%	10.58%	11.30%	0.09%	29.00%	29.79%	0.10%
DOWDUPONT INC	DWDP	154,007.40	2.38%	8.23%	10.72%	0.61%	N/A	N/A	N/A
DXC TECHNOLOGY CO	DXC	24,462.34	0.89%	6.15%	7.07%	0.10%	17.00%	17.96%	0.10%
ELECTRONIC ARTS INC	EA	45,528.03	0.00%	13.10%	13.10%	0.18%	12.00%	12.00%	0.19%
EBAY INC	EBAY	37,383.51	0.00%	10.17%	10.17%	0.15%	12.50%	12.50%	0.16%
ECOLAB INC	ECL	41,304.59	1.13%	13.30%	14.50%	0.16%	9.00%	10.18%	0.17%
CONSOLIDATED EDISON INC	ED	24,690.64	3.61%	3.00%	6.66%	0.10%	3.00%	6.66%	0.10%
EQUIFAX INC	EFX	15,274.92	1.23%	7.76%	9.05%	0.06%	8.00%	9.28%	0.06%
EDISON INTERNATIONAL	EIX	21,386.25	3.69%	5.26%	9.05%	0.09%	4.50%	8.28%	0.09%
ESTEE LAUDER COMPANIES-CL A	EL	51,565.30	1.05%	19.60%	20.75%	0.21%	13.50%	14.62%	0.22%
EASTMAN CHEMICAL CO	EMN	14,201.64	2.29%	7.65%	10.03%	0.06%	8.50%	10.89%	0.06%
EMERSON ELECTRIC CO	EMR	44,471.76	2.75%	11.91%	14.83%	0.18%	12.00%	14.92%	0.19%
EOG RESOURCES INC	EOG	72,913.37	0.57%	9.50%	10.09%	0.29%	N/A	N/A	N/A
EQUINIX INC	EQIX	35,233.96	2.06%	16.11%	18.33%	0.14%	26.00%	28.32%	0.15%
EQUITY RESIDENTIAL	EQR	23,749.78	3.34%	5.73%	9.17%	0.09%	-15.00%	-11.91%	0.10%
EQT CORP	EQT	14,740.11	0.22%	17.50%	17.74%	0.06%	40.50%	40.76%	0.06%
EVERSOURCE ENERGY	ES	18,740.63	3.42%	6.27%	9.80%	0.07%	5.00%	8.51%	0.08%
EXPRESS SCRIPTS HOLDING CO	ESRX	45,753.55	0.00%	6.52%	6.52%	0.18%	14.50%	14.50%	0.19%
ESSEX PROPERTY TRUST INC	ESS	15,825.99	3.09%	6.65%	9.84%	0.06%	0.50%	3.59%	0.07%
E*TRADE FINANCIAL CORP	ETFC	15,771.25	0.00%	29.86%	29.86%	0.06%	17.50%	17.50%	0.07%
EATON CORP PLC	ETN	34,004.45	3.35%	9.04%	12.54%	0.14%	9.00%	12.50%	0.14%
ENTERGY CORP	ETR	16,057.13	4.39%	3.01%	7.47%	0.06%	2.00%	6.44%	0.07%
ENVISION HEALTHCARE CORP	EVHC	5,421.30	0.00%	14.96%	14.96%	0.02%	N/A	N/A	N/A
EVERGY INC	EVRG	15,168.41	3.34%	9.34%	12.84%	0.06%	N/A	N/A	N/A
EDWARDS LIFESCIENCES CORP	EW	31,222.71	0.00%	15.33%	15.33%	0.12%	15.00%	15.00%	0.13%
EXELON CORP	EXC	40,905.80	3.27%	5.31%	8.67%	0.16%	8.00%	11.40%	0.17%
EXPEDITORS INTL WASH INC	EXPD	12,791.82	1.23%	10.83%	12.12%	0.05%	9.00%	10.29%	0.05%
EXPEDIA GROUP INC	EXPE	19,061.26	0.96%	16.76%	17.79%	0.08%	21.00%	22.06%	0.08%
EXTRA SPACE STORAGE INC	EXR	12,208.64	3.38%	6.04%	9.52%	0.05%	5.00%	8.46%	0.05%
FORD MOTOR CO	F	43,754.79	5.82%	-7.42%	-1.82%	0.17%	2.50%	8.39%	0.18%
FASTENAL CO	FAST	15,851.04	2.78%	13.85%	16.82%	0.06%	9.00%	11.90%	0.07%
FACEBOOK INC-A	FB	600,339.69	0.00%	21.49%	21.49%	2.40%	28.50%	28.50%	2.54%
FORTUNE BRANDS HOME & SECURI	FBHS	8,052.02	1.45%	12.68%	14.22%	0.03%	13.50%	15.05%	0.03%
FREEMONT-MCMORAN INC	FCX	24,339.74	1.08%	-0.58%	0.50%	0.10%	N/A	N/A	N/A
FEDEX CORP	FDX	62,461.55	1.07%	15.40%	16.56%	0.25%	11.00%	12.13%	0.26%
FIRSTENERGY CORP	FE	17,092.43	4.02%	-0.33%	3.68%	0.07%	3.00%	7.08%	0.07%
F5 NETWORKS INC	FFIV	10,758.00	0.00%	10.31%	10.31%	0.04%	10.50%	10.50%	0.05%
FIDELITY NATIONAL INFO SERV	FIS	35,792.59	1.18%	4.40%	5.61%	0.14%	16.00%	17.28%	0.15%
FISERV INC	FISV	31,710.88	0.00%	11.00%	11.00%	0.13%	10.00%	10.00%	0.13%
FIFTH THIRD BANCORP	FITB	19,941.07	2.60%	6.00%	8.68%	0.08%	6.50%	9.19%	0.08%
FOOT LOCKER INC	FL	6,157.60	2.63%	6.58%	9.29%	0.02%	7.50%	10.22%	0.03%
FLIR SYSTEMS INC	FLIR	7,249.03	1.20%	N/A	N/A	N/A	11.50%	12.77%	0.03%
FLUOR CORP	FLR	6,952.03	1.74%	27.68%	29.65%	0.03%	8.50%	10.31%	0.03%
FLOWERVE CORP	FLS	5,504.17	1.84%	18.96%	20.97%	0.02%	7.50%	9.41%	0.02%
FLEETCOR TECHNOLOGIES INC	FLT	19,740.91	0.00%	16.50%	16.50%	0.08%	15.00%	15.00%	0.08%
FMC CORP	FMC	11,882.99	0.90%	14.17%	15.13%	0.05%	22.50%	23.50%	0.05%
TWENTY-FIRST CENTURY FOX - B	FOX	87,811.99	0.83%	9.95%	10.82%	0.35%	N/A	N/A	N/A
FEDERAL REALTY INVS TRUST	FRT	9,159.27	3.25%	4.40%	7.72%	0.04%	3.50%	6.81%	0.04%
TECHNIPFMC PLC	FTI	14,285.68	1.71%	8.57%	10.35%	0.06%	N/A	N/A	N/A

FORTIVE CORP	FTV	26,944.34	0.38%	11.26%	11.66%	0.11%	N/A	N/A	N/A
GENERAL DYNAMICS CORP	GD	57,250.22	1.90%	11.45%	13.46%	0.23%	9.00%	10.98%	0.24%
GENERAL ELECTRIC CO	GE	120,639.34	3.54%	4.03%	7.65%	0.48%	6.00%	9.65%	0.51%
GGP INC	GGP	20,030.41	4.46%	1.10%	5.59%	0.08%	-2.50%	1.91%	0.08%
GILEAD SCIENCES INC	GILD	100,614.18	2.92%	-5.21%	-2.36%	0.40%	-6.50%	-3.67%	0.43%
GENERAL MILLS INC	GIS	26,648.15	4.47%	8.67%	13.33%	0.11%	4.00%	8.56%	0.11%
CORNING INC	GLW	23,914.05	2.50%	4.96%	7.52%	0.10%	13.00%	15.66%	0.10%
GENERAL MOTORS CO	GM	55,475.63	3.89%	11.05%	15.15%	0.22%	3.50%	7.46%	0.23%
ALPHABET INC-CL C	GOOG	830,718.63	0.00%	18.96%	18.96%	3.31%	12.50%	12.50%	3.51%
GENUINE PARTS CO	GPC	13,683.30	3.06%	-2.49%	0.54%	0.05%	9.00%	12.20%	0.06%
GLOBAL PAYMENTS INC	GPN	18,818.32	0.03%	22.03%	22.07%	0.08%	11.00%	11.04%	0.08%
GAP INC/THE	GPS	11,391.60	3.30%	9.25%	12.71%	0.05%	6.50%	9.91%	0.05%
GARMIN LTD	GRMN	11,920.25	3.32%	5.90%	9.32%	0.05%	7.00%	10.43%	0.05%
GOLDMAN SACHS GROUP INC	GS	88,825.06	1.40%	11.80%	13.28%	0.35%	9.00%	10.47%	0.38%
GOODYEAR TIRE & RUBBER CO	GT	5,439.32	2.34%	N/A	N/A	N/A	12.50%	14.98%	0.02%
WW GRAINGER INC	GWV	17,392.22	1.75%	13.40%	15.27%	0.07%	8.50%	10.32%	0.07%
HALLIBURTON CO	HAL	39,725.53	1.61%	67.55%	69.70%	0.16%	N/A	N/A	N/A
HASBRO INC	HAS	12,355.71	2.60%	8.17%	10.87%	0.05%	9.50%	12.22%	0.05%
HUNTINGTON BANCSHARES INC	HBAN	16,141.31	3.30%	13.99%	17.52%	0.06%	11.00%	14.49%	0.07%
HANESBRANDS INC	HBI	7,812.83	2.78%	5.87%	8.73%	0.03%	6.00%	8.86%	0.03%
HCA HEALTHCARE INC	HCA	37,217.83	1.31%	12.58%	13.97%	0.15%	12.50%	13.89%	0.16%
HCP INC	HCP	12,139.55	5.74%	-0.44%	5.29%	0.05%	35.50%	42.26%	0.05%
HOME DEPOT INC	HD	229,197.58	2.03%	13.25%	15.41%	0.91%	12.00%	14.15%	0.97%
HESS CORP	HES	19,969.51	1.56%	-9.34%	-7.85%	0.08%	N/A	N/A	N/A
HOLLYFRONTIER CORP	HFC	12,124.92	1.95%	8.92%	10.95%	0.05%	17.50%	19.62%	0.05%
HARTFORD FINANCIAL SVCS GRP	HIG	18,813.05	1.98%	9.50%	11.57%	0.08%	13.00%	15.10%	0.08%
HUNTINGTON INGALLS INDUSTRIE	HII	10,011.72	1.27%	27.50%	28.94%	0.04%	12.50%	13.85%	0.04%
HILTON WORLDWIDE HOLDINGS IN	HLT	24,324.76	0.75%	11.23%	12.02%	0.10%	8.50%	9.28%	0.10%
HARLEY-DAVIDSON INC	HOG	7,145.12	3.43%	8.25%	11.83%	0.03%	9.00%	12.59%	0.03%
HOLOGIC INC	HOLX	11,469.19	0.00%	9.51%	9.51%	0.05%	22.00%	22.00%	0.05%
HONEYWELL INTERNATIONAL INC	HON	110,172.15	2.07%	10.91%	13.09%	0.44%	9.50%	11.66%	0.47%
HELMERICH & PAYNE	HP	7,022.87	4.35%	122.99%	130.01%	0.03%	56.50%	62.08%	0.03%
HEWLETT PACKARD ENTERPRISE	HPE	23,451.26	2.44%	-4.05%	-1.66%	0.09%	6.00%	8.51%	0.10%
HP INC	HPQ	38,185.25	2.36%	5.45%	7.87%	0.15%	6.00%	8.43%	0.16%
H&R BLOCK INC	HRB	5,007.48	4.15%	11.00%	15.37%	0.02%	10.50%	14.86%	0.02%
HORMEL FOODS CORP	HRL	19,936.45	1.99%	8.05%	10.12%	0.08%	9.50%	11.58%	0.08%
HARRIS CORP	HRS	17,677.55	1.53%	N/A	N/A	N/A	12.00%	13.63%	0.07%
HENRY SCHEIN INC	HSIC	11,530.31	0.00%	8.36%	8.36%	0.05%	9.00%	9.00%	0.05%
HOST HOTELS & RESORTS INC	HST	15,701.52	3.93%	3.98%	7.98%	0.06%	N/A	N/A	N/A
HERSHEY CO/THE	HSY	19,669.00	2.91%	8.10%	11.13%	0.08%	7.50%	10.52%	0.08%
HUMANA INC	HUM	43,661.77	0.63%	13.13%	13.80%	0.17%	13.00%	13.67%	0.18%
INTL BUSINESS MACHINES CORP	IBM	133,931.58	4.25%	1.97%	6.26%	0.53%	0.50%	4.76%	0.57%
INTERCONTINENTAL EXCHANGE IN	ICE	43,268.33	1.29%	10.14%	11.49%	0.17%	11.50%	12.86%	0.18%
IDEXX LABORATORIES INC	IDXX	20,686.47	0.00%	16.91%	16.91%	0.08%	17.00%	17.00%	0.09%
INTL FLAVORS & FRAGRANCES	IFF	10,124.02	2.17%	9.40%	11.67%	0.04%	8.50%	10.76%	0.04%
ILLUMINA INC	ILMN	45,127.53	0.00%	16.59%	16.59%	0.18%	16.00%	16.00%	0.19%
INCYTE CORP	INCY	14,878.12	0.00%	58.81%	58.81%	0.06%	N/A	N/A	N/A
IHS MARKIT LTD	INFO	20,490.70	0.00%	11.27%	11.27%	0.08%	18.50%	18.50%	0.09%
INTEL CORP	INTC	243,345.20	2.28%	8.98%	11.37%	0.97%	12.50%	14.93%	1.03%
INTUIT INC	INTU	54,835.48	0.73%	16.29%	17.07%	0.22%	14.50%	15.28%	0.23%
INTERNATIONAL PAPER CO	IP	22,008.96	3.67%	8.67%	12.49%	0.09%	17.00%	20.98%	0.09%
INTERPUBLIC GROUP OF COS INC	IPG	8,982.61	3.63%	6.24%	9.98%	0.04%	9.50%	13.30%	0.04%
IPG PHOTONICS CORP	IPGP	12,504.37	0.00%	12.00%	12.00%	0.05%	14.00%	14.00%	0.05%
IQVIA HOLDINGS INC	IQV	21,702.23	0.00%	14.65%	14.65%	0.09%	14.50%	14.50%	0.09%
INGERSOLL-RAND PLC	IR	22,577.23	2.02%	10.92%	13.05%	0.09%	11.50%	13.64%	0.10%
IRON MOUNTAIN INC	IRM	10,476.25	6.20%	9.00%	15.48%	0.04%	12.50%	19.09%	0.04%
INTUITIVE SURGICAL INC	ISRG	59,405.15	0.00%	11.75%	11.75%	0.24%	17.50%	17.50%	0.25%
GARTNER INC	IT	12,769.98	0.00%	15.00%	15.00%	0.05%	13.50%	13.50%	0.05%
ILLINOIS TOOL WORKS	ITW	48,697.13	2.47%	10.16%	12.75%	0.19%	11.50%	14.11%	0.21%
INVESCO LTD	IVZ	10,523.74	4.68%	8.50%	13.37%	0.04%	7.50%	12.35%	0.04%
HUNT (JB) TRANSPRT SVCS INC	JBHT	13,371.53	0.78%	12.72%	13.55%	0.05%	13.00%	13.83%	0.06%
JOHNSON CONTROLS INTERNATION	JCI	32,528.30	3.02%	10.47%	13.65%	0.13%	3.00%	6.07%	0.14%
JACOBS ENGINEERING GROUP INC	JEC	9,403.64	0.91%	19.36%	20.36%	0.04%	11.00%	11.96%	0.04%
JEFFERIES FINANCIAL GROUP IN	JEF	7,786.63	1.77%	18.00%	19.93%	0.03%	20.50%	22.45%	0.03%
JOHNSON & JOHNSON	JNJ	337,763.14	2.88%	7.39%	10.37%	1.35%	9.00%	12.01%	1.43%
JUNIPER NETWORKS INC	JNPR	9,727.38	2.38%	8.68%	11.16%	0.04%	4.50%	6.93%	0.04%
JPMORGAN CHASE & CO	JPM	362,132.07	2.44%	9.80%	12.36%	1.45%	9.50%	12.06%	1.53%
NORDSTROM INC	JWN	8,734.33	2.87%	8.45%	11.44%	0.03%	5.50%	8.44%	0.04%
KELLOGG CO	K	24,685.20	3.12%	8.02%	11.26%	0.10%	7.00%	10.22%	0.10%
KEYCORP	KEY	20,766.14	2.77%	16.47%	19.47%	0.08%	12.50%	15.44%	0.09%
KRAFT HEINZ CO/THE	KHC	77,844.15	3.98%	6.58%	10.69%	0.31%	9.50%	13.67%	0.33%
KIMCO REALTY CORP	KIM	7,027.80	6.84%	2.92%	9.86%	0.03%	-0.50%	6.32%	0.03%

WEYERHAEUSER CO	WY	27,585.59	3.56%	9.25%	12.97%	0.11%	21.50%	25.44%	0.12%
WYNN RESORTS LTD	WYNN	17,942.92	1.77%	18.70%	20.63%	0.07%	27.00%	29.00%	0.08%
CIMAREX ENERGY CO	XEC	9,540.14	0.52%	73.00%	73.71%	0.04%	38.50%	39.12%	0.04%
XCEL ENERGY INC	XEL	23,544.81	3.29%	5.85%	9.23%	0.09%	5.50%	8.88%	0.10%
XL GROUP LTD	XL	14,557.06	1.56%	N/A	N/A	N/A	42.00%	43.89%	0.06%
XILINX INC	XLNX	17,125.59	2.12%	10.80%	13.04%	0.07%	7.50%	9.70%	0.07%
EXXON MOBIL CORP	XOM	352,720.75	3.86%	13.05%	17.16%	1.41%	18.00%	22.21%	1.49%
DENTSPLY SIRONA INC	XRAY	10,314.34	0.79%	8.95%	9.77%	0.04%	8.50%	9.32%	0.04%
XEROX CORP	XRX	6,446.42	3.92%	N/A	N/A	N/A	9.00%	13.09%	0.03%
XYLEM INC	XYL	12,328.21	1.19%	N/A	N/A	N/A	15.50%	16.78%	0.05%
YUM! BRANDS INC	YUM	25,579.40	1.87%	12.40%	14.38%	0.10%	9.50%	11.45%	0.11%
ZIMMER BIOMET HOLDINGS INC	ZBH	23,353.84	0.86%	4.01%	4.89%	0.09%	5.00%	5.88%	0.10%
ZIONS BANCORPORATION	ZION	10,202.67	1.90%	10.23%	12.22%	0.04%	15.00%	17.04%	0.04%
ZOETIS INC	ZTS	41,680.17	0.58%	17.87%	18.50%	0.17%	13.50%	14.12%	0.18%
Total Market Capitalization:		25,252,673		15.70%			15.94%		
W/ Bloomberg Growth Est.:		25,060,545							
W/ Value Line Growth Est.:		23,652,612							

Notes:

[1] Equals sumproduct of Cols. [9] x [10], and Cols. [12] x [13]

[2] Source: Bloomberg Professional

[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 7, July 1, 2018, at 2. (6 quarters ending December 2019)

[4] Equals [1] - [2]

[5] Equals [1] - [3]

[6] Source: Bloomberg Professional

[7] Source: Bloomberg Professional

[8] Source: Bloomberg Professional

[9] Equals (([7] x (1 + (0.5 x [8]))) + [8])

[10] Equals weight in S&P 500 based on market capitalization, excluding N/As

[11] Source: Value Line

[12] Equals (([7] x (1 + (0.5 x [11]))) + [11])

[13] Equals weight in S&P 500 based on market capitalization, excluding N/As

Value Line and Bloomberg Coefficients

Company	Ticker	[1]	[2]
		Value Line	Bloomberg
Atmos Energy Corporation	ATO	0.70	0.59
Black Hills Corporation	BKH	0.90	0.61
Chesapeake Utilities	CPK	0.70	0.72
New Jersey Resources Corporation	NJR	0.80	0.77
Northwest Natural Gas Company	NWN	0.70	0.62
One Gas Inc	OGS	0.70	0.62
Southwest Gas Corporation	SWX	0.80	0.81
Spire Inc	SR	0.70	0.49
Vectren Corporation	VVC	0.70	0.44
Mean		0.74	0.63

Notes:

[1] Source: Value Line

[2] Source: Bloomberg Professional Service

Capital Asset Pricing Model Results

	[1]	[2]	[3]	[4]	[5]	[6]
					CAPM Result	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
VALUE LINE BETA COEFFICIENT						
Current 30-Year Treasury (30-day average) [7]	3.02%	0.744	12.68%	12.91%	12.46%	12.64%
Near-Term Projected Treasury Yield [8]	3.55%	0.744	12.15%	12.39%	12.60%	12.77%
BLOOMBERG BETA COEFFICIENT						
Current 30-Year Treasury (30-day average) [7]	3.02%	0.629	12.68%	12.91%	10.99%	11.14%
Near-Term Projected Treasury Yield [8]	3.55%	0.629	12.15%	12.39%	11.19%	11.34%

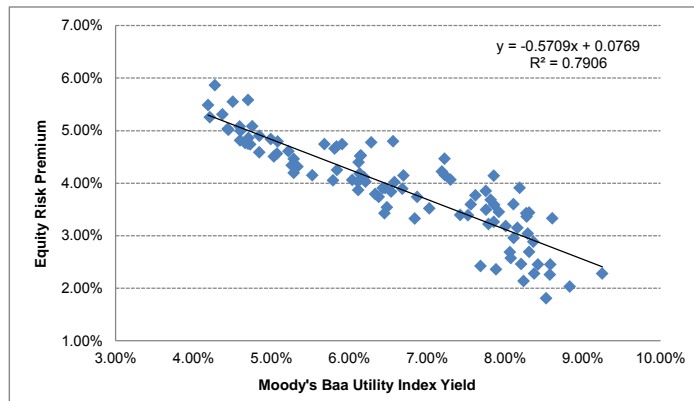
	Summary of Results
Mean:	11.89%
Minimum:	10.99%
Maximum:	12.77%

Notes:

- [1] See Notes [7], [8]
 [2] Source: Schedule KM-S5
 [3] Source: Schedule KM-S4
 [4] Source: Schedule KM-S4
 [5] Equals Col. [1] + (Col. [2] x Col. [3])
 [6] Equals Col. [1] + (Col. [2] x Col. [4])
 [7] Source: Bloomberg Professional
 [8] Source: Blue Chip Financial Forecasts, Vol. 37, No. 7, July 1, 2018, at 2. (6 quarters ending December 2019)

Bond Yield Plus Risk Premium

Scenario	[1] Moody's Baa Constant	[2] Moody's Baa Slope	[3] Baa Utility Bond Yield	[4] Risk Premium	[5] Return on Equity
Current Utility Bond Yield	7.69%	-0.571	4.69%	5.01%	9.70%
Near-Term Projected Utility Bond Yield	7.69%	-0.571	5.32%	4.65%	9.97%
Long-Term Projected Utility Bond Yield	7.69%	-0.571	6.15%	4.17%	10.33%



Notes:

- [1] Constant of regression equation
- [2] Slope of regression equation
- [3] Projected yields = Current yield + Blue Chip's projected change in corporate Baa bond yields
Sources: Current = Bloomberg Professional (30-day average);
Near Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 7, July, 1, 2018, at 2;
Long Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 16, June 1, 2018, at 14
- [4] Equals [1] + [3] x [2]
- [5] Equals [3] + [4]
- [6] Source: S&P Global Market Intelligence (excludes quarters without rate case activity)
- [7] Source: S&P Global Market Intelligence
- [8] Source: Bloomberg Professional
- [9] Equals [7] - [8]
- [10] Source: S&P Global Market Intelligence

	[6]	[7]	[8]	[9]	[10]
Date of Natural Gas Rate Case	Return on Equity	Moody's Baa Utility Bond Yield	Moody's Baa Risk Premium	Number of Cases	
1992 Q4	11.94%	8.61%	3.33%	15	
1993 Q1	11.75%	8.31%	3.44%	4	
1993 Q2	11.71%	8.11%	3.60%	6	
1993 Q3	11.39%	7.62%	3.77%	12	
1993 Q4	11.16%	7.56%	3.59%	18	
1994 Q1	11.12%	7.86%	3.26%	5	
1994 Q2	10.84%	8.58%	2.26%	4	
1994 Q3	10.87%	8.83%	2.03%	3	
1994 Q4	11.53%	9.25%	2.28%	12	
1995 Q2	11.00%	8.31%	2.69%	1	
1995 Q3	11.07%	8.11%	2.95%	3	
1995 Q4	11.61%	7.76%	3.85%	9	
1996 Q1	11.45%	7.86%	3.59%	2	
1996 Q2	10.88%	8.42%	2.45%	6	
1996 Q3	11.25%	8.37%	2.88%	2	
1996 Q4	11.19%	8.01%	3.18%	7	
1997 Q1	11.31%	8.16%	3.15%	7	
1997 Q2	11.70%	8.27%	3.43%	1	
1997 Q3	12.00%	7.86%	4.14%	1	
1997 Q4	10.92%	7.53%	3.39%	3	
1998 Q2	11.37%	7.30%	4.07%	3	
1998 Q3	11.41%	7.19%	4.22%	3	
1998 Q4	11.69%	7.23%	4.46%	4	
1999 Q1	10.82%	7.43%	3.39%	3	
1999 Q2	11.25%	7.76%	3.49%	1	

1999 Q4	10.38%	8.24%	2.13%	2
2000 Q1	10.66%	8.38%	2.28%	2
2000 Q2	11.03%	8.58%	2.45%	3
2000 Q3	11.33%	8.30%	3.04%	5
2000 Q4	12.10%	8.19%	3.91%	3
2001 Q1	11.38%	7.92%	3.45%	2
2001 Q2	10.75%	8.06%	2.69%	1
2001 Q4	10.65%	8.08%	2.57%	2
2002 Q1	10.67%	8.21%	2.46%	3
2002 Q2	11.64%	8.28%	3.36%	4
2002 Q3	11.50%	7.82%	3.68%	3
2002 Q4	11.01%	7.79%	3.22%	9
2003 Q1	11.38%	7.23%	4.15%	5
2003 Q2	11.36%	6.57%	4.80%	4
2003 Q3	10.61%	6.87%	3.74%	5
2003 Q4	10.84%	6.70%	4.14%	11
2004 Q1	11.06%	6.28%	4.78%	5
2004 Q2	10.57%	6.68%	3.89%	3
2004 Q3	10.37%	6.46%	3.91%	8
2004 Q4	10.66%	6.14%	4.52%	6
2005 Q1	10.65%	5.91%	4.74%	2
2005 Q2	10.54%	5.84%	4.70%	5
2005 Q3	10.47%	5.81%	4.66%	5
2005 Q4	10.32%	6.14%	4.18%	14
2006 Q1	10.68%	6.15%	4.53%	5
2006 Q2	10.60%	6.58%	4.02%	1
2006 Q3	10.34%	6.43%	3.91%	4
2006 Q4	10.14%	6.11%	4.03%	5
2007 Q1	10.52%	6.12%	4.40%	11
2007 Q2	10.13%	6.34%	3.79%	3
2007 Q3	10.03%	6.49%	3.54%	8
2007 Q4	10.12%	6.38%	3.74%	13
2008 Q1	10.38%	6.54%	3.84%	7
2008 Q2	10.17%	6.84%	3.32%	3
2008 Q3	10.55%	7.03%	3.52%	9
2008 Q4	10.34%	8.53%	1.81%	13
2009 Q1	10.24%	7.88%	2.36%	4
2009 Q2	10.11%	7.69%	2.42%	8
2009 Q3	9.88%	6.45%	3.43%	2
2009 Q4	10.31%	6.19%	4.11%	16
2010 Q1	10.24%	6.21%	4.03%	9
2010 Q2	9.99%	6.12%	3.87%	11
2010 Q3	10.43%	5.68%	4.74%	6
2010 Q4	10.09%	5.84%	4.25%	13
2011 Q1	10.10%	6.04%	4.06%	5
2011 Q2	9.85%	5.79%	4.05%	4
2011 Q3	9.65%	5.34%	4.31%	2
2011 Q4	9.88%	5.08%	4.79%	4
2012 Q1	9.63%	5.07%	4.56%	5
2012 Q2	9.83%	4.99%	4.84%	8
2012 Q3	9.75%	4.85%	4.90%	1
2012 Q4	10.06%	4.51%	5.55%	20
2013 Q1	9.57%	4.71%	4.86%	3
2013 Q2	9.47%	4.73%	4.74%	6
2013 Q3	9.60%	5.26%	4.34%	1
2013 Q4	9.83%	5.22%	4.61%	11
2014 Q1	9.54%	5.03%	4.51%	6
2014 Q2	9.84%	4.75%	5.08%	8
2014 Q3	9.45%	4.70%	4.75%	6
2014 Q4	10.28%	4.70%	5.58%	6
2015 Q1	9.47%	4.45%	5.02%	3
2015 Q2	9.43%	4.85%	4.59%	3
2015 Q3	9.75%	5.29%	4.46%	1
2015 Q4	9.68%	5.53%	4.15%	9
2016 Q1	9.48%	5.29%	4.20%	6
2016 Q2	9.42%	4.60%	4.81%	6
2016 Q3	9.47%	4.21%	5.25%	4
2016 Q4	9.67%	4.59%	5.08%	9
2017 Q1	9.60%	4.60%	5.00%	3
2017 Q2	9.47%	4.44%	5.03%	7
2017 Q3	10.14%	4.28%	5.86%	6
2017 Q4	9.68%	4.19%	5.49%	8
2018 Q1	9.68%	4.37%	5.31%	6
2018 Q2	9.43%	4.67%	4.76%	7

Average Risk Premium: 3.92%

Expected Earnings Analysis - Proxy Group

Company	Ticker	[1] Five-Year Projected Expected ROE	[2] Projected Common Shares 2018	[3] Five-Year Projected Common Shares	[4] Projected BPS 2018	[5] Five-Year Projected BPS	[6] Book Value Growth Rate	[7] Adjusted ROE
Atmos Energy Corporation	ATO	11.00%	114.00	130.00	42.10	46.55	5.97%	11.34%
Black Hills Corporation	BKH	10.00%	59.50	59.50	35.25	41.25	4.01%	10.20%
Chesapeake Utilities Corporation	CPK	10.00%	17.00	20.00	32.30	45.50	13.46%	10.72%
New Jersey Resources Corporation	NJR	13.00%	86.50	86.50	15.95	22.70	9.22%	13.63%
Northwest Natural Gas Company	NWN	12.00%	29.50	32.00	26.35	29.40	4.89%	12.30%
One Gas Inc	OGS	9.00%	52.50	55.00	40.25	43.40	3.09%	9.14%
Southwest Gas Corporation	SWX	10.50%	49.00	53.00	39.80	52.85	9.47%	11.02%
Spire Inc	SR	10.50%	51.00	55.00	41.60	48.10	5.67%	10.81%
Vectren Corporation	VVC	12.50%	83.50	86.00	23.60	29.05	6.11%	12.89%
							Mean:	11.34%
							Median:	11.02%

Expected Earnings Analysis - Value Line Water Universe

Company	Ticker	[1] Five-Year Projected Expected ROE	[2] Projected Common Shares 2018	[3] Five-Year Projected Common Shares	[4] Projected BPS 2018	[5] Five-Year Projected BPS	[6] Book Value Growth Rate	[7] Adjusted ROE
Artesian Resources Corporation	ARTNA	N/A	N/A	N/A	N/A	N/A	N/A	N/A
American Water	AWK	10.50%	179.00	187.50	31.75	42.00	8.50%	10.97%
American States Water Company	AWR	14.00%	36.80	37.50	15.20	17.35	3.85%	14.27%
Connecticut Water Service, Inc.	CTWS	11.00%	12.15	12.50	24.70	26.80	2.79%	11.16%
Consolidated Water Company	CWCO	10.50%	15.00	16.00	10.45	12.50	6.28%	10.84%
California Water Service Group	CWT	11.50%	48.50	50.00	14.45	16.70	4.48%	11.76%
Global Water Resources Inc	GWRS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Middlesex Water Company	MSEX	12.50%	16.50	17.00	14.85	16.75	3.83%	12.74%
SJW Group	SJW	14.00%	21.00	23.00	22.65	24.55	4.38%	14.31%
Aqua America	WTR	12.50%	178.25	180.00	11.00	14.50	7.41%	12.98%
York Water Company	YORW	13.50%	12.80	12.75	9.35	11.75	5.77%	13.90%
							Mean:	12.55%
							Median:	12.74%

Notes:

[1] Source: Value Line

[2] Source: Value Line

[3] Source: Value Line

[4] Source: Value Line

[5] Source: Value Line

[6] Equals $(([3] \times [5]) / ([2] \times [4]))^{(1/4)-1}$

[7] Equals $[1] \times (1 / (1 - 0.5 \times [6]))$

Gas Proxy Group Capital Structure - Current

Company	Ticker	% Common Equity								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Atmos Energy Corporation	ATO	60.61%	59.80%	55.97%	55.99%	59.92%	59.06%	58.68%	58.54%	58.57%
Black Hills Corporation	BKH	36.87%	35.43%	35.07%	34.62%	34.23%	33.42%	33.28%	33.14%	34.51%
Chesapeake Utilities Corporation	CPK	68.59%	70.16%	68.49%	68.36%	75.61%	74.95%	73.80%	70.88%	71.35%
New Jersey Resources	NJR	55.77%	53.59%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	53.29%
Northwest Natural Gas Company	NWN	50.45%	48.78%	52.07%	54.58%	54.86%	54.17%	56.69%	57.35%	53.62%
ONE Gas, Inc.	OGS	62.87%	62.16%	61.82%	61.84%	61.98%	61.29%	60.97%	61.14%	61.76%
Southwest Gas Holdings, Inc.	SWX	48.16%	49.87%	49.36%	50.05%	51.89%	50.97%	49.74%	52.67%	50.34%
Spire Inc.	SR	49.70%	49.33%	48.73%	51.30%	49.44%	46.45%	46.06%	49.49%	48.81%
Vectren Corporation	VVC	50.52%	50.14%	50.13%	51.14%	51.09%	50.78%	50.25%	49.82%	50.48%
Mean		53.73%	53.25%	52.58%	53.57%	54.81%	53.60%	53.40%	54.16%	53.64%
Median		50.52%	50.14%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	53.29%

Company	Ticker	% Long-Term Debt								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Atmos Energy Corporation	ATO	39.39%	40.20%	44.03%	44.01%	40.08%	40.94%	41.32%	41.46%	41.43%
Black Hills Corporation	BKH	63.13%	64.57%	64.93%	65.38%	65.77%	66.58%	66.72%	66.86%	65.49%
Chesapeake Utilities Corporation	CPK	31.41%	29.84%	31.51%	31.64%	24.39%	25.05%	26.20%	29.12%	28.65%
New Jersey Resources	NJR	44.23%	46.41%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	46.71%
Northwest Natural Gas Company	NWN	49.55%	51.22%	47.93%	45.42%	45.14%	45.83%	43.31%	42.65%	46.38%
ONE Gas, Inc.	OGS	37.13%	37.84%	38.18%	38.16%	38.02%	38.71%	39.03%	38.86%	38.24%
Southwest Gas Holdings, Inc.	SWX	51.84%	50.13%	50.64%	49.95%	48.11%	49.03%	50.26%	47.33%	49.66%
Spire Inc.	SR	50.30%	50.67%	51.27%	48.70%	50.56%	53.55%	53.94%	50.51%	51.19%
Vectren Corporation	VVC	49.48%	49.86%	49.87%	48.86%	48.91%	49.22%	49.75%	50.18%	49.52%
Mean		46.27%	46.75%	47.42%	46.43%	45.19%	46.40%	46.60%	45.84%	46.36%
Median		49.48%	49.86%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	46.71%

Value Line Water Group Capital Structure - Current

Company	Ticker	% Common Equity								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Artesian Resources Corporation	ARTNA	57.46%	57.83%	57.42%	56.99%	56.57%	57.29%	56.67%	56.49%	57.09%
American Water	AWK	44.41%	44.12%	42.82%	45.90%	45.52%	45.17%	47.00%	46.56%	45.19%
American States Water Company	AWR	62.32%	62.25%	62.07%	61.49%	60.78%	60.60%	60.44%	59.74%	61.21%
Connecticut Water Service, Inc.	CTWS	52.83%	52.91%	52.80%	55.26%	54.68%	54.14%	53.92%	53.08%	53.70%
Consolidated Water	CWCO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
California Water Service Group	CWT	56.64%	56.60%	55.31%	54.35%	53.87%	54.17%	53.72%	53.12%	54.72%
Global Water Resources Inc	GWRS	10.82%	11.50%	10.48%	10.39%	11.08%	11.58%	12.17%	12.11%	11.27%
Middlesex Water Company	MSEX	61.05%	61.10%	61.46%	60.92%	60.71%	60.82%	61.43%	60.80%	61.04%
SJW Group	SJW	51.50%	51.80%	51.21%	50.30%	49.29%	49.31%	52.27%	51.31%	50.87%
Aqua America	WTR	47.65%	47.99%	48.76%	49.10%	49.34%	49.49%	50.30%	49.68%	49.04%
York Water Company	YORW	57.50%	56.98%	56.92%	56.65%	57.44%	57.40%	57.31%	56.96%	57.14%
Mean		54.74%	54.83%	54.48%	54.67%	54.48%	54.54%	55.02%	54.53%	54.66%
Median		56.64%	56.60%	55.31%	55.26%	54.68%	54.17%	53.92%	53.12%	54.72%

Company	Ticker	% Long-Term Debt								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Artesian Resources Corporation	ARTNA	42.54%	42.17%	42.58%	43.01%	43.43%	42.71%	43.33%	43.51%	42.91%
American Water	AWK	55.59%	55.88%	57.18%	54.10%	54.48%	54.83%	53.00%	53.44%	54.81%
American States Water Company	AWR	37.68%	37.75%	37.93%	38.51%	39.22%	39.40%	39.56%	40.26%	38.79%
New Jersey Resources	NJR	47.17%	47.09%	47.20%	44.74%	45.32%	45.86%	46.08%	46.92%	46.30%
Consolidated Water	CWCO	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
California Water Service Group	CWT	43.36%	43.40%	44.69%	45.65%	46.13%	45.83%	46.28%	46.88%	45.28%
Global Water Resources Inc	GWRS	89.18%	88.50%	89.52%	89.61%	88.92%	88.42%	87.83%	87.89%	88.73%
Middlesex Water Company	MSEX	38.95%	38.90%	38.54%	39.08%	39.29%	39.18%	38.57%	39.20%	38.96%
SJW Group	SJW	48.50%	48.20%	48.79%	49.70%	50.71%	50.69%	47.73%	48.69%	49.13%
Aqua America	WTR	52.35%	52.01%	51.24%	50.90%	50.66%	50.51%	49.70%	50.32%	50.96%
York Water Company	YORW	42.50%	43.02%	43.08%	43.35%	42.56%	42.60%	42.69%	43.04%	42.86%
Mean		45.26%	45.17%	45.52%	45.33%	45.52%	45.46%	44.98%	45.47%	45.34%
Median		43.36%	43.40%	44.69%	44.74%	45.32%	45.83%	46.08%	46.88%	45.28%

Sources: S&P Global Market Intelligence; Bloomberg

Gas Proxy Group Equity Ratio - Value Line Projections

Company	% Common Equity			
	Ticker	2018	2019	21-23
Atmos Energy Corporation	ATO	60.00%	60.00%	55.00%
Black Hills Corporation	BKH	41.50%	39.00%	46.00%
Chesapeake Utilities Corporation	CPK	70.00%	70.00%	70.00%
New Jersey Resources Corporation	NJR	55.50%	57.50%	62.00%
Northwest Natural Gas Company	NWN	52.50%	53.00%	53.50%
ONE Gas, Inc.	OGS	65.00%	62.00%	62.00%
Southwest Gas Holdings, Inc.	SWX	48.50%	49.50%	52.00%
Spire Inc.	SR	50.50%	50.50%	51.00%
Vectren Corporation	VVC	52.50%	53.00%	53.00%
Mean		55.11%	54.94%	56.06%
Median		52.50%	53.00%	53.50%

Value Line Water Group Equity Ratio - Value Line Projections

Company	% Common Equity			
	Ticker	2018	2019	21-23
Artesian Res. Corp.	ARTNA	59.00%	N/A	N/A
American Water	AWK	43.50%	42.50%	42.50%
Amer. States Water	AWR	58.50%	58.00%	54.00%
Connecticut Water	CTWS	53.50%	54.50%	55.00%
Consol. Water Co.	CWCO	100.00%	100.00%	100.00%
California Water	CWT	57.00%	57.50%	58.00%
Global Water Resources Inc	GWRS	11.00%	N/A	N/A
Middlesex Water	MSEX	62.50%	62.50%	62.50%
SJW Group	SJW	51.50%	52.00%	52.00%
Aqua America	WTR	49.00%	46.50%	46.50%
York Water	YORW	64.50%	65.00%	66.00%
Mean		55.45%	59.83%	59.61%
Median		57.00%	57.50%	55.00%

Source: Value Line as of July 13, 2018

Risk Metrics

Proxy Group

Company	Ticker	Beta	S&P Credit Rating	2018 Equity Ratio
Atmos Energy Corporation	ATO	0.70	A	60.00%
Black Hills Corporation	BKH	0.90	BBB	41.50%
Chesapeake Utilities	CPK	0.70	n/a	70.00%
New Jersey Resources Corporation	NJR	0.80	A	55.50%
Northwest Natural Gas Company	NWN	0.70	A+	52.50%
One Gas Inc	OGS	0.70	A	65.00%
Southwest Gas	SWX	0.80	BBB+	48.50%
Spire Inc	SR	0.70	A-	50.50%
Vectren Corporation	VVC	0.70	A-	52.50%
Mean		0.74	A-	55.11%
Median		0.70	A-/A	52.50%

Value Line Water Utilities

Company	Ticker	Beta	S&P Credit Rating	2018 Equity Ratio
Artesian Res. Corp.	ARTNA	0.65	n/a	59.00%
American Water	AWK	0.65	A	43.50%
Amer. States Water	AWR	0.80	A+	58.50%
Connecticut Water	CTWS	0.65	A	53.50%
Consol. Water Co.	CWCO	0.95	n/a	100.00%
California Water	CWT	0.80	A+	57.00%
Global Water Resources Inc	GWRS	0.35	n/a	11.00%
Middlesex Water	MSEX	0.80	A	62.50%
SJW Group	SJW	0.75	n/a	51.50%
Aqua America	WTR	0.75	n/a	49.00%
York Water	YORW	0.80	A-	64.50%
Mean		0.72	A	55.45%
Median		0.75	A	57.00%

Effect of Murray's Proposed Leverage on ROE
CAPM Estimate Using Hamada Equation

CALCULATIONS AND ASSUMPTIONS		NOTES
Tax Rate	21.00%	Corporate tax rate under the Tax Cut and Jobs Act
Starting Equity Ratio	54.20%	Spire's equity ratio in Case No. GR-2017-0216
Starting D/E Ratio	0.85	(1 - Current Equity Ratio) / Current Equity Ratio
Adjusted Equity Ratio	42.83%	Murray Recommendation
Adjusted D/E Ratio	1.33	(1 - Adjusted Equity Ratio) / Adjusted Equity Ratio
Sector Equity Beta	0.69	Schedule KM-S4; average of Value Line and Bloomberg betas
Sector Asset Beta (unlevered)	0.41	Equals Equity Beta / (1 + (1 - Tax Rate) * Current D/E Ratio)
Check: Re-Lever Beta	0.69	Equals Asset Beta x (1 + Starting D/E Ratio * (1 - Tax Rate))
Re-Levered Beta at 42.83% Equity	0.85	Equals Asset Beta x (1 + New D/E Ratio * (1 - Tax Rate))
Difference in Re-Levered Beta	0.16	Equals Re-Levered Equity Beta - Sector Equity Beta
Assumed MRP	9.87%	Implied MRP assuming Spire's 9.80% ROE, and 3.02% current risk-free rate and 0.69 beta
Cost of Equity Effect	1.57%	Equals Difference in Re-Levered Beta x MRP

Notes:

Hamada's Equation:

$$B_a = \frac{B_e}{(1 + (1 - T) \times \frac{D}{E})}$$

or, rearranged:

$$B_e = B_a \times (1 + (1 - T) \times \frac{D}{E})$$

Where:

B_a	= Asset Beta
B_e	= Equity Beta
T	= Tax Rate
D/E	= Debt/Equity Ratio

Authorized Gas Utility Risk Premiums vs. Duff & Phelps Equity Risk Premium

Year	Authorized Risk Premium	Duff & Phelps ERP	Difference
2008	6.08%	5.25%	-0.83%
2009	6.06%	5.88%	-0.19%
2010	5.93%	5.50%	-0.43%
2011	5.96%	5.75%	-0.21%
2012	6.90%	5.50%	-1.40%
2013	6.17%	5.00%	-1.17%
2014	6.44%	5.00%	-1.44%
2015	6.74%	5.00%	-1.74%
2016	6.91%	5.50%	-1.41%
2017	6.83%	5.25%	-1.58%
2018	6.50%	5.00%	-1.50%

Quarter	Average ROE	Average Treasury	Authorized Risk Premium	Number of Cases	Duff & Phelps ERP	Difference
2008 Q1	10.38%	4.41%	5.96%	7	5.00%	-0.96%
2008 Q2	10.17%	4.57%	5.59%	3	5.00%	-0.59%
2008 Q3	10.55%	4.45%	6.10%	9	5.00%	-1.10%
2008 Q4	10.34%	3.66%	6.68%	13	6.00%	-0.68%
2009 Q1	10.24%	3.46%	6.79%	4	6.00%	-0.79%
2009 Q2	10.11%	4.17%	5.94%	8	6.00%	0.06%
2009 Q3	9.88%	4.32%	5.56%	2	6.00%	0.44%
2009 Q4	10.31%	4.34%	5.97%	16	5.50%	-0.47%
2010 Q1	10.24%	4.62%	5.61%	9	5.50%	-0.11%
2010 Q2	9.99%	4.37%	5.61%	11	5.50%	-0.11%
2010 Q3	10.43%	3.86%	6.57%	6	5.50%	-1.07%
2010 Q4	10.09%	4.17%	5.93%	13	5.50%	-0.43%
2011 Q1	10.10%	4.56%	5.54%	5	5.50%	-0.04%
2011 Q2	9.85%	4.34%	5.51%	4	5.50%	-0.01%
2011 Q3	9.65%	3.69%	5.96%	2	6.00%	0.04%
2011 Q4	9.88%	3.04%	6.83%	4	6.00%	-0.83%
2012 Q1	9.63%	3.14%	6.49%	5	5.50%	-0.99%
2012 Q2	9.83%	2.94%	6.89%	8	5.50%	-1.39%
2012 Q3	9.75%	2.74%	7.01%	1	5.50%	-1.51%
2012 Q4	10.06%	2.86%	7.19%	20	5.50%	-1.69%
2013 Q1	9.57%	3.13%	6.43%	3	5.00%	-1.43%
2013 Q2	9.47%	3.14%	6.33%	6	5.00%	-1.33%
2013 Q3	9.60%	3.71%	5.89%	1	5.00%	-0.89%
2013 Q4	9.83%	3.79%	6.04%	11	5.00%	-1.04%
2014 Q1	9.54%	3.68%	5.86%	6	5.00%	-0.86%
2014 Q2	9.84%	3.44%	6.39%	8	5.00%	-1.39%
2014 Q3	9.45%	3.27%	6.18%	6	5.00%	-1.18%
2014 Q4	10.28%	2.97%	7.32%	6	5.00%	-2.32%
2015 Q1	9.47%	2.55%	6.92%	3	5.00%	-1.92%
2015 Q2	9.43%	2.88%	6.55%	3	5.00%	-1.55%
2015 Q3	9.75%	2.96%	6.79%	1	5.00%	-1.79%
2015 Q4	9.68%	2.96%	6.72%	9	5.00%	-1.72%
2016 Q1	9.48%	2.72%	6.76%	6	5.50%	-1.26%
2016 Q2	9.42%	2.57%	6.85%	6	5.50%	-1.35%
2016 Q3	9.47%	2.28%	7.19%	4	5.50%	-1.69%
2016 Q4	9.67%	2.83%	6.84%	9	5.50%	-1.34%
2017 Q1	9.60%	3.05%	6.55%	3	5.50%	-1.05%
2017 Q2	9.47%	2.90%	6.57%	7	5.50%	-1.07%
2017 Q3	10.14%	2.82%	7.32%	6	5.00%	-2.32%
2017 Q4	9.68%	2.82%	6.86%	8	5.00%	-1.86%
2018 Q1	9.68%	3.03%	6.65%	6	5.00%	-1.65%
2018 Q2	9.43%	3.09%	6.34%	7	5.00%	-1.34%

AFFIDAVIT OF KEITH MAGEE

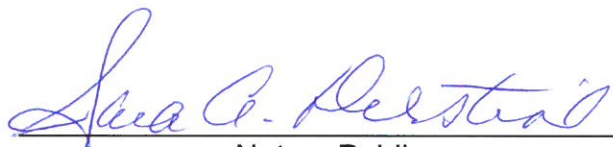
COMMONWEALTH OF MASSACHUSETTS)
) ss
COUNTY OF WORCESTER)

On the 3rd day of August, 2018, before me appeared Keith Magee, to me personally known, who, being by me first duly sworn, states that he a Director at ScottMadden, Inc. and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.



Keith Magee

Subscribed and sworn to before me this 3rd day of August, 2018.



Notary Public

My commission expires: November 8, 2024

