

ORIGINAL



0000141077

BEFORE THE ARIZONA CORPORATION

RECEIVED

2012 DEC 19 P 4:41

ARZ CORP COMMISSION  
DOCKET CONTROL

**COMMISSIONERS**

- GARY PIERCE - Chairman
- BOB STUMP
- SANDRA D. KENNEDY
- PAUL NEWMAN
- BRENDA BURNS

IN THE MATTER OF THE APPLICATION OF  
RAY WATER COMPANY, INC. FOR A RATE  
INCREASE.

DOCKET NO. W-01380A-12-0254

**STAFF'S NOTICE OF FILING  
COST OF CAPITAL  
DIRECT TESTIMONY**

The Utilities Division ("Staff") of the Arizona Corporation Commission ("Commission") hereby provides notice of filing the Direct Testimony related to Cost of Capital of Staff witness John A. Cassidy in the above-referenced matter.

RESPECTFULLY SUBMITTED this 19<sup>th</sup> day of December, 2012.

Scott M. Hesla, Staff Attorney  
Robin R. Mitchell, Staff Attorney  
Legal Division  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007  
(602) 542-3402

Original and thirteen (13) copies of the foregoing were filed this 19<sup>th</sup> day of December, 2012 with:

Docket Control  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

Copies of the foregoing were mailed this 19<sup>th</sup> day of December, 2012 to:

Steve Wene, Esq.  
MOYES SELLERS & HENDRICKS  
1850 N. Central Avenue, Suite 1100  
Phoenix, Arizona 85004

Arizona Corporation Commission  
DOCKETED

DEC 19 2012

DOCKETED

**BEFORE THE ARIZONA CORPORATION COMMISSION**

GARY PIERCE  
Chairman  
BOB STUMP  
Commissioner  
SANDRA D. KENNEDY  
Commissioner  
PAUL NEWMAN  
Commissioner  
BRENDA BURNS  
Commissioner

IN THE MATTER OF THE APPLICATION OF ) DOCKET NO. W-01380A-12-0254  
RAY WATER COMPANY, INC. FOR )  
APPROVAL OF A PERMANENT RATE )  
INCREASE. )  
\_\_\_\_\_ )

DIRECT  
TESTIMONY  
OF  
JOHN A. CASSIDY  
PUBLIC UTILITIES ANALYST  
UTILITIES DIVISION  
ARIZONA CORPORATION COMMISSION

DECEMBER 19, 2012

**TABLE OF CONTENTS**

	<b><u>PAGE</u></b>
<b>I. INTRODUCTION.....</b>	<b>1</b>
Summary of Testimony and Recommendations .....	2
RWC's Proposed Overall Rate of Return .....	3
<b>II. THE WEIGHTED AVERAGE COST OF CAPITAL.....</b>	<b>3</b>
<b>III. CAPITAL STRUCTURE.....</b>	<b>5</b>
Background.....	5
RWC's Capital Structure .....	6
Staff's Capital Structure .....	6
<b>IV. COST OF DEBT .....</b>	<b>7</b>
<b>V. RETURN ON EQUITY.....</b>	<b>8</b>
Background.....	8
Risk.....	11
<b>VI. ESTIMATING THE COST OF EQUITY.....</b>	<b>14</b>
Introduction .....	14
Discounted Cash Flow Model Analysis.....	15
<i>The Constant-Growth DCF</i> .....	16
<i>The Multi-Stage DCF</i> .....	25
Capital Asset Pricing Model.....	27
<b>VII. SUMMARY OF STAFF'S COST OF EQUITY ANALYSIS.....</b>	<b>31</b>
<b>VIII. Other COST OF EQUITY ESTIMATE factorS.....</b>	<b>34</b>
<b>X. STAFF RESPONSE TO COMPANY'S COST OF CAPITAL WITNESS MR.     MATTHEW J. ROWELL.....</b>	<b>36</b>
<b>XI. CONCLUSION .....</b>	<b>48</b>

**SCHEDULES**

Capital Structure and Weighted Cost of Capital..... JAC-1  
Intentionally Left Blank..... JAC-2  
Final Cost of Equity Estimates for Sample Water Utilities ..... JAC -3  
Average Capital Structure of Sample Water Utilities..... JAC -4  
Growth in Earnings & Dividends of Sample Water Utilities ..... JAC -5  
Sustainable Growth for Sample Water Utilities..... JAC -6  
Selected Financial Data of Sample Water Utilities..... JAC -7  
Calculation of Expected Infinite Annual Growth in Dividends..... JAC -8  
Multi-Stage DCF Estimates ..... JAC -9

**EXHIBITS**

Staff Restatement of Matthew J. Rowell Schedule MJR-1 (Calculation of Comparable Earnings  
ROE) ..... JAC -A

**EXECUTIVE SUMMARY  
RAY WATER COMPANY  
DOCKET NO. W-01380A-12-0254**

The direct testimony of Staff witness John A. Cassidy addresses the following issues:

Capital Structure – Staff recommends that the Commission adopt a capital structure for Ray Water Company (“Ray” or “Company”) for this proceeding consisting of 92.4 percent debt and 7.6 percent equity.

Cost of Equity – Staff recommends that the Commission adopt a 9.5 percent return on equity (“ROE”) for the Company. Staff’s estimated ROE for the Company is based on an economic assessment and the results of its DCF and CAPM cost of equity methodology estimates for the sample companies of 8.9 percent for the capital asset pricing model (“CAPM”) and 8.9 percent for the discounted cash flow method (“DCF”).

Cost of Debt – Staff recommends that the Commission adopt a 6.3 percent cost of debt for the Company.

Overall Rate of Return – Staff recommends that the Commission adopt a 9.3 percent overall rate of return.

Mr. Rowells’s Testimony – The Commission should reject the Company’s proposed 10.91 percent ROE for the following reasons:

Mr. Rowell’s methodology erroneously assumes that accounting based realized returns on equity (“ROE”) are reflective of investor expectations of the cost of equity, and he assigns a two-thirds weighting to the results derived from his comparable earnings analysis and only a one-third weighting to the combined results derived from his market-based DCF and CAPM analyses. The samples used by Mr. Rowell in his comparable earnings analysis differ from those in both his DCF and CAPM analyses, with his comparable earnings sample consisting of fourteen publicly-traded utility companies (7 water, 7 natural gas), his DCF sample consisting of fifteen companies (8 water, 7 natural gas) and his CAPM sample consisting of sixteen companies (8 water, 8 natural gas). A natural gas company excluded from his comparable earnings sample (AGL Resources) is included in his CAPM sample, and among the natural gas companies in that sample has the highest beta coefficient. Mr. Rowell calculates his realized ROE comparable earnings estimate on a weighted average basis, resulting in the gas sample companies having a disproportionate (i.e., 3-to-1) influence on his estimate relative to the water sample companies. The natural gas company (UGI Corporation) he selected to replace AGL Resources in his comparable earnings sample accounts for almost 20 percent (19.73%) of his overall comparable earnings estimate, yet Mr. Rowell makes no adjustment to reduce UGI’s weighting factor by removing that portion of UGI’s earnings/common equity not subject to domestic rate regulation in the United States (17 percent from its International Propane segment and 22 percent from its Midstream & Marketing segment). Mr.

Rowell's constant growth DCF estimates rely exclusively on analysts' forecasts for earnings per share growth, and the dividend yield has been upwardly adjusted by means of annual compounding. Mr. Rowell's CAPM analyses employ an historical average risk-free rate, measured over the period January 1, 1980 - December 31, 2011, rather than a current spot intermediate- or long-term U.S. Treasury rate. Mr. Rowell's recommended cost of equity includes a 65-basis point upward small-size risk adjustment.

1 **I. INTRODUCTION**

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

3 A. My name is John A. Cassidy. I am a Public Utilities Analyst employed by the Arizona  
4 Corporation Commission ("Commission") in the Utilities Division ("Staff"). My business  
5 address is 1200 West Washington Street, Phoenix, Arizona 85007.

6  
7 **Q. Briefly describe your responsibilities as a Public Utilities Analyst.**

8 A. I am responsible for the examination of financial and statistical information included in  
9 utility rate applications and other financial matters, including studies to estimate the cost  
10 of capital component in rate filings used to determine the overall revenue requirement, and  
11 for preparing written reports, testimonies and schedules to present Staff's  
12 recommendations to the Commission on these matters.

13  
14 **Q. Please describe your educational background and professional experience.**

15 A. I hold a Bachelor of Arts degree in History from Arizona State University, a Master of  
16 Library Science degree from the University of Arizona, and an MBA degree with an  
17 emphasis in Finance from Arizona State University. While pursuing my MBA degree, I  
18 was inducted into Beta Gamma Sigma, the National Business Honor Society. I have  
19 passed the CPA exam, but opted not to pursue certification. I have worked professionally  
20 as a librarian, financial consultant, tax auditor, and, as a former Commission employee  
21 served as Staff's cost of capital witness in rate case evidentiary proceedings.

22  
23 **Q. What is the scope of your testimony in this case?**

24 A. My testimony provides Staff's recommended capital structure, return on equity ("ROE")  
25 and overall rate of return ("ROR") for establishing the revenue requirements for Ray  
26 Water Company's ("RWC" or "Company") pending rate application.

1 **Q. Please provide a brief description of RWC.**

2 A. RWC is a Class "B" public service corporation engaged in providing water utility service  
3 in Pima County, Arizona pursuant to a certificate of convenience and necessity granted by  
4 the Arizona Corporation Commission. During the Test Year, the Company served  
5 approximately 1,511 water service connections.  
6

7 **Summary of Testimony and Recommendations**

8 **Q. Briefly summarize how Staff's cost of capital testimony is organized.**

9 A. Staff's cost of capital testimony is presented in eleven sections. Section I is this  
10 introduction. Section II discusses the concept of weighted average cost of capital  
11 ("WACC"). Section III presents the concept of capital structure and presents Staff's  
12 recommended capital structure for RWC in this proceeding. Section IV presents Staff's  
13 cost of debt for RWC. Section V discusses the concepts of ROE and risk. Section VI  
14 presents the methods employed by Staff to estimate RWC's ROE. Section VII presents  
15 the findings of Staff's ROE analysis. Section VIII presents additional factors considered  
16 in developing the cost of equity estimate for RWC. Section IX presents Staff's ROR  
17 recommendation. Section X presents Staff's comments on the direct testimony of the  
18 Company's witness, Mr. Matthew J. Rowell. Finally, section XI presents the conclusions.  
19

20 **Q. Have you prepared any exhibits to accompany your testimony?**

21 A. Yes. I prepared ten schedules (JAC-1 to JAC-9) and Exhibit JAC-A in support Staff's  
22 cost of capital analysis.  
23

24 **Q. What is Staff's recommended rate of return for RWC?**

25 A. Staff recommends a 9.3 percent overall ROR, as shown in Schedule JAC-1. The ROR is  
26 calculated from the capital structure, ROE and cost of debt. Staff's capital structure is

1 composed of 92.4 percent equity and 7.6 percent debt. Staff's estimated ROE for the  
2 Company is based on an economic assessment and the results of its DCF and CAPM cost  
3 of equity methodology estimates for the sample companies of 8.9 percent for the capital  
4 asset pricing model ("CAPM") and 8.9 percent for the discounted cash flow method  
5 ("DCF").  
6

7 **RWC's Proposed Overall Rate of Return**

8 **Q. Briefly summarize RWC's proposed capital structure, cost of debt, ROE and overall**  
9 **ROR for this proceeding.**

10 A. Table 1 summarizes the Company's proposed capital structure, cost of debt, ROE and  
11 overall ROR in this proceeding:  
12

13 **Table 1**

	<b>Weight</b>	<b>Cost</b>	<b>Weighted Cost</b>
Long-term Debt	7.4%	6.25%	0.46%
Common Equity	92.6%	10.91%	<u>10.10%</u>
<b>Cost of Capital/ROR</b>			<b>10.57%</b>

14  
15 RWC is proposing an overall rate of return of 10.57 percent.  
16

17 **II. THE WEIGHTED AVERAGE COST OF CAPITAL**

18 **Q. Briefly explain the cost of capital concept.**

19 A. The cost of capital is the opportunity cost of choosing one investment over others with  
20 equivalent risk. In other words, the cost of capital is the return that stakeholders expect  
21 for investing their financial resources in a determined business venture over another  
22 business venture.  
23

1 **Q. What is the overall cost of capital?**

2 A. The overall cost of capital for a firm issuing a variety of securities (i.e., stock and  
3 indebtedness) represents an average of the various cost rates on all securities issued by the  
4 firm adjusted to reflect the relative weighting of each security within the firm's capital  
5 structure. Thus, for any given firm, the overall cost of capital is the firm's weighted  
6 average cost of capital ("WACC").

7  
8 **Q. How is the WACC calculated?**

9 A. The WACC is calculated by adding the weighted expected returns of a firm's securities.

10 The WACC formula is:

11 Equation 1.

12  
13 
$$\text{WACC} = \sum_{i=1}^n W_i * r_i$$
  
14

15 In this equation,  $W_i$  is the weight given to the  $i^{\text{th}}$  security (the proportion of the  $i^{\text{th}}$  security  
16 relative to the portfolio) and  $r_i$  is the expected return on the  $i^{\text{th}}$  security.

17  
18 **Q. Can you provide an example demonstrating application of Equation 1?**

19 A. Yes. For this example, assume that an entity has a capital structure composed of 60  
20 percent debt and 40 percent equity. Also, assume that the embedded cost of debt is 6.0  
21 percent and the expected return on equity, i.e., the cost of equity, is 10.5 percent.

22 Calculation of the WACC is as follows:

23 
$$\text{WACC} = (60\% * 6.0\%) + (40\% * 10.5\%)$$

24 
$$\text{WACC} = 3.60\% + 4.20\%$$

25 
$$\text{WACC} = 7.80\%$$

1 The weighted average cost of capital in this example is 7.80 percent. The entity in this  
2 example would need to earn an overall rate of return of 7.80 percent to cover its cost of  
3 capital.

### 5 III. CAPITAL STRUCTURE

#### 6 Background

7 **Q. Please explain the capital structure concept.**

8 A. The capital structure of a firm is the relative proportions of each type of security:--short-  
9 term debt, long-term debt (including capital leases), preferred stock and common stock--  
10 that are used to finance the firm's assets.

11  
12 **Q. How is the capital structure expressed?**

13 A. The capital structure of a company is expressed as the percentage of each component of  
14 the capital structure (capital leases, short-term debt, long-term debt, preferred stock and  
15 common stock) relative to the entire capital structure.

16  
17 As an example, the capital structure for an entity that is financed by \$20,000 of short-term  
18 debt, \$85,000 of long-term debt (including capital leases), \$15,000 of preferred stock and  
19 \$80,000 of common stock is shown in Table 2.

20 **Table 2**

Component			%
Short-Term Debt	\$20,000	(\$20,000/\$200,000)	10.0%
Long-Term Debt	\$85,000	(\$85,000/\$200,000)	42.5%
Preferred Stock	\$15,000	(\$15,000/\$200,000)	7.5%
Common Stock	\$80,000	(\$80,000/\$200,000)	40.0%
Total	\$200,000		100%

1 The capital structure in this example is composed of 10.0 percent short-term debt, 42.5  
2 percent long-term debt, 7.5 percent preferred stock and 40.0 percent common stock.

3  
4 **RWC's Capital Structure**

5 **Q. What capital structure does RWC propose?**

6 A. The Company proposes a capital structure composed of 7.40 percent long-term debt and  
7 92.60 percent common equity. RWC's proposed capital structure reflects the projected  
8 long-term debt and common equity balances as of December 31, 2012.

9  
10 **Q. How does RWC's proposed capital structure compare to capital structures of**  
11 **publicly-traded water utilities?**

12 A. Schedule JAC-4 shows the capital structures of six publicly-traded water companies  
13 ("sample water companies" or "sample water utilities") as of December 2011. The  
14 average capital structure for the sample water utilities is comprised of approximately 51.6  
15 percent debt and 48.4 percent equity.

16  
17 **Staff's Capital Structure**

18 **Q. What is Staff's recommended capital structure for RWC?**

19 A. Staff recommends a pro forma capital structure composed of 7.6 percent debt and 92.4  
20 percent equity. Staff's recommended capital structure consists of \$87,346 long-term debt  
21 and \$1,059,748 common equity. Staff's long-term debt balance as of December 31, 2012,  
22 reflects 20-months of debt amortization on RWC's initial debt principal of \$100,000,  
23 issued on May 1, 2011.<sup>1</sup>

24  

---

<sup>1</sup> Pursuant to a Promissory Note, signed and negotiated by the Company on April 1, 2011, RWC made the first draw of \$100,000 from a \$500,000 line of credit executed on May 1, 2011.

1 **Q. Why does Staff's recommended capital structure differ from that proposed by the**  
2 **Company?**

3 A. The pro forma capital structure proposed by RWC consists of \$84,653 long-term debt and  
4 \$1,059,748 common equity. The Company's proposed long-term debt balance as of  
5 December 31, 2012, is reflective of 24-months of amortization on the original \$100,000  
6 debt principal issued May 1, 2011, rather than twenty months. Thus, having amortized its  
7 original long-term debt principal by an additional four months, RWC has understated its  
8 pro forma December 31, 2012 long-term debt balance by \$2,693 (\$87,346 - \$84,653), and  
9 it is this factor which is attributable to differences between the capital structure  
10 recommended by Staff and that proposed by the Company.

11  
12 **Q. For the reasons noted above, should RWC's proposed capital structure be relied**  
13 **upon for purposes of setting rates in this docket?**

14 A. No, it should not.

15  
16 **Q. Did Staff make other adjustments to RWC's capital structure?**

17 A. No, it did not. Staff calculated its recommended capital structure using \$87,346 of long-  
18 term debt and \$1,059,748 of common equity for a total capitalization of \$1,147,094.

19  
20 **IV. COST OF DEBT**

21 **Q. What is the basis for RWC's proposed 6.25 percent cost of debt?**

22 A. The Company's proposed cost of debt reflects its embedded cost of existing debt. In  
23 Decision No. 71691 (dated May 3, 2010), RWC's request for a loan in the amount of  
24 \$500,000 to finance the replacement of an existing well was approved by the Commission,  
25 at an interest rate not to exceed the prime rate plus 3.00 percent.<sup>2</sup>

---

<sup>2</sup> Docket No. W-01380A-09-0106.

1 **Q. Did Staff's review reveal any concerns related to the executed promissory note?**

2 A. Yes. Decision No. 71691 granted the Company authorization to incur \$500,000 of debt  
3 financing and for any unused authorization to issue that debt to expire on April 29, 2011.  
4 The executed a promissory note dated April 1, 2011, within the period authorized.  
5 However, the first draw was on May 1, 2011, subsequent to the end of the authorized  
6 borrowing period. Language in the promissory note states the agreement creates a line-of-  
7 credit from which the Company may draw from time to time. Exhibit 1 of the Company's  
8 application in the financing case<sup>3</sup> provides an example of the proposed promissory note.  
9 Exhibit A does not include a line-of credit provision and Decision No. 71691 makes no  
10 reference to authorizing a line-of-credit. Staff has made no adjustments in this rate case  
11 due to any concern regarding the timing or nature of the promissory note. Under either the  
12 provisions of the promissory note or the authorizations granted in Decision No. 71691, the  
13 Company's ability to borrow additional funds has expired.

14  
15 **Q. What cost of debt is Staff recommending?**

16 A. Staff recommends a cost of debt of 6.3 percent, as shown in Schedule JAC-1.  
17

## 18 **V. RETURN ON EQUITY**

### 19 **Background**

20 **Q. Please define the term "cost of equity capital."**

21 A. The cost of equity is the rate of return that investors expect to earn on their investment in a  
22 business entity given its risk. In other words, the cost of equity to the entity is the  
23 investors' expected rate of return on other investments of similar risk. As investors have a  
24 wide selection of stocks to choose from, they will choose stocks with similar risks but  
25 higher returns. Therefore, the market determines the entity's cost of equity.

---

<sup>3</sup> Docket No. W-01380A-09-0106.

1 **Q. Is there a correlation between interest rates and the cost of equity?**

2 A. Yes, there is a positive correlation between interest rates and the cost of equity, as the two  
3 tend to move in the same direction. This relationship is reflected in the CAPM formula.  
4 The CAPM is a market-based model employed by Staff for estimating the cost of equity.  
5 The CAPM is further discussed in Section VI of this testimony.  
6

7 **Q. What has been the general trend of interest rates in recent years?**

8 A. A chronological chart of interest rates is a good tool to show interest rate history and  
9 identify trends. Chart 1 graphs intermediate U.S. treasury rates from January 4, 2002, to  
10 September 28, 2012.  
11

12 **Chart 1: Average Yield on 5-, 7-, & 10-Year Treasuries**



1 Chart 1 shows that intermediate-term interest rates trended downward from 2002 to mid-  
2 2003, trended upward through mid-2007, trended downward through early-2009, trended  
3 upward through mid-2010, trended downward through late 2010, trended upward to mid-  
4 2011, and are currently trending down from the existing, relatively low rates.

5  
6 **Q. What has been the general trend in interest rates longer term?**

7 **A.** U.S. Treasury rates from January 1962- September 2012 are shown in Chart 2. The chart  
8 shows that interest rates trended upward through the mid-1980s and have trended  
9 downward over the last 25 years.



20  
21  
22  
23  
24  
25

Source: Federal Reserve

1 **Q. Do these trends suggest anything in terms of cost of equity?**

2 A. Yes. As previously noted, interest rates and the cost of equity tend to move in the same  
3 direction; therefore, the cost of equity has declined in the past 25 years.

4  
5 **Q. Do actual returns represent the cost of equity?**

6 A. No. The cost of equity represents investors' *expected* returns and not realized returns.

7  
8 **Q. Is there any information available that leads to an understanding of the relationship  
9 between the equity returns required for a regulated water utility and those required  
10 in the market as a whole?**

11 A. Yes. A comparison of betas, a component of the CAPM discussed in Section VI, for the  
12 water utility industry and the market provide insight into this relationship. In theory, the  
13 market has a beta value of 1.0, with stocks bearing greater risk (less risk) than the market  
14 having beta values higher than (lower than) 1.0, respectively. Furthermore, in accordance  
15 with the CAPM, the cost of equity capital moves in the same direction as beta. Therefore,  
16 because the average beta value (0.71)<sup>4</sup> for a water utility is less than 1.0, the required  
17 return on equity for a regulated water utility is below that of the market as a whole.

18  
19 **Risk**

20 **Q. Please define risk in relation to cost of capital.**

21 A. Risk, as it relates to an investment, is the variability or uncertainty of the returns on a  
22 particular security. Investors are risk averse and require a greater potential return to invest  
23 in relatively greater risk opportunities, i.e., investors require compensation for taking  
24 on additional risk. Risk is generally separated into two components. Those components

---

<sup>4</sup> See Schedule JAC-7.

1 are market risk (systematic risk) and non-market risk (unsystematic risk, diversifiable risk  
2 or firm-specific risk).

3  
4 **Q. What is market risk?**

5 A. Market risk, or systematic risk, is the risk associated with an investment that cannot be  
6 reduced through diversification. Market risk stems from factors that affect all securities,  
7 such as recessions, war, inflation and high interest rates. Since these factors affect the  
8 entire market they cannot be eliminated through diversification. Market risk does not  
9 impact each security to the same degree. The degree to which a given security's return is  
10 affected by market fluctuations can be measured using Beta. Beta reflects the business  
11 risk and the financial risk of a security.

12  
13 **Q. Please define business risk.**

14 A. Business risk is the fluctuation of earnings inherent in a firm's operations and  
15 environment, such as competition and adverse economic conditions that may impair its  
16 ability to provide returns on investment. Companies in the same industry or similar lines  
17 of business tend to experience the same fluctuations in business cycles.

18  
19 **Q. Please define financial risk.**

20 A. Financial risk is the fluctuation of earnings, inherent in the use of debt financing, that may  
21 impair a firm's ability to provide adequate return; the higher the percentage of debt in a  
22 firm's capital structure, the greater its exposure to financial risk.

23  
24 **Q. Do business risk and financial risk affect the cost of equity?**

25 A. Yes.

26

1 **Q. Is a firm subject to any other risk?**

2 A. Yes. Firms are also subject to unsystematic or firm-specific risk. Examples of  
3 unsystematic risk include losses caused by labor problems, nationalization of assets, loss  
4 of a big client or weather conditions. Investors can eliminate firm-specific risk by holding  
5 a diverse portfolio; thus, it is not of concern to diversified investors.

6  
7 **Q. How does RWC's financial risk exposure compare to that of Staff's sample group of  
8 water companies?**

9 A. JAC-4 shows the capital structures of Staff's six sample water companies as of December  
10 30, 2011, and RWC's adjusted capital structure as of the end of the test year, December  
11 31, 2011. As shown, the sample water utilities were capitalized with approximately 51.6  
12 percent debt and 48.4 percent equity, while RWC's capital structure consists of  
13 approximately 7.4 percent debt and 92.6 percent equity. Thus, RWC bears significantly  
14 less financial risk than does Staff's sample companies.

15  
16 **Q. Is firm-specific risk measured by beta?**

17 A. No. Firm-specific risk is not measured by beta.

18  
19 **Q. Is the cost of equity affected by firm-specific risk?**

20 A. No. Since firm-specific risk can be eliminated through diversification, it does not affect  
21 the cost of equity.

22  
23 **Q. Can investors expect additional returns for firm-specific risk?**

24 A. No. Investors who hold diversified portfolios can eliminate firm-specific risk and,  
25 consequently, do not require any additional return. Since investors who choose to be less

1 than fully-diversified must compete in the market with fully-diversified investors, the  
2 former cannot expect to be compensated for unique risk.

3

4 **VI. ESTIMATING THE COST OF EQUITY**

5 **Introduction**

6 **Q. Did Staff directly estimate the cost of equity for RWC?**

7 A. No. RWC is not a publicly-traded company, and as such Staff is unable to directly  
8 estimate its market cost of equity due to the lack of firm-specific market data. Instead,  
9 Staff must estimate the Company's cost of equity indirectly, using a representative sample  
10 group of publicly traded water utilities as a proxy for RWC. Use of a sample is  
11 appropriate, as it reduces the sample error resulting from random fluctuations in the  
12 market at the time the information is gathered.

13

14 **Q. What water utilities did Staff select for its proxy group of sample companies?**

15 A. Staff's sample consists of the following six publicly-traded water utilities: American  
16 States Water, California Water, Aqua America, Connecticut Water Services, Middlesex  
17 Water and SJW Corp. Staff chose these companies because they are publicly-traded and  
18 receive the majority of their earnings from regulated operations.

19

20 **Q. What models did Staff implement to estimate RWC's cost of equity?**

21 A. Staff used two market-based models to estimate the cost of equity for RWC: the DCF  
22 model and the CAPM.

23

1 **Q. Please explain why Staff chose the DCF and CAPM models.**

2 A. Staff chose to use the DCF and CAPM models because they are widely-recognized  
3 market-based models and have been used extensively to estimate the cost of equity. An  
4 explanation of the DCF and CAPM models follows.

5  
6 **Discounted Cash Flow Model Analysis**

7 **Q. Please provide a brief summary of the theory upon which the DCF method of**  
8 **estimating the cost of equity is based.**

9 A. The DCF method of stock valuation is based on the theory that the value of an investment  
10 is equal to the sum of the future cash flows generated from the aforementioned investment  
11 discounted to the present time. This method uses expected dividends, market price and  
12 dividend growth rate to calculate the cost of capital. Professor Myron Gordon pioneered  
13 the DCF method in the 1960s. The DCF method has become widely used to estimate the  
14 cost of equity for public utilities due to its theoretical merit and its simplicity. Staff used  
15 the financial information for the relevant six sample companies in the DCF model and  
16 averaged the results to determine an estimated cost of equity for the sample companies.

17  
18 **Q. Does Staff use more than one version of the DCF?**

19 A. Yes. Staff uses two versions of the DCF model: the constant-growth DCF and the multi-  
20 stage or non-constant growth DCF. The constant-growth DCF assumes that an entity's  
21 dividends will grow indefinitely at the same rate. The multi-stage growth DCF model  
22 assumes the dividend growth rate will change at some point in the future.

23

1 ***The Constant-Growth DCF***

2 **Q. What is the mathematical formula used in Staff's constant-growth DCF analysis?**

3 A. The constant-growth DCF formula used in Staff's analysis is:

4

Equation 2 :

$$K = \frac{D_1}{P_0} + g$$

where :      $K$      = the cost of equity  
               $D_1$     = the expected annual dividend  
               $P_0$     = the current stock price  
               $g$      = the expected infinite annual growth rate of dividends

5

6 Equation 2 assumes that the entity has a constant earnings retention rate and that its  
7 earnings are expected to grow at a constant rate. According to Equation 2, a stock with a  
8 current market price of \$10 per share, an expected annual dividend of \$0.45 per share and  
9 an expected dividend growth rate of 3.0 percent per year has a cost of equity to the entity  
10 of 7.5 percent reflected by the sum of the dividend yield ( $\$0.45 / \$10 = 4.5$  percent) and the  
11 3.0 percent annual dividend growth rate.

12

13 **Q. How did Staff calculate the expected dividend yield ( $D_1/P_0$ ) component of the**  
14 **constant-growth DCF formula?**

15 A. Staff calculated the expected yield component of the DCF formula by dividing the  
16 expected annual dividend ( $D_1$ ) by the spot stock price ( $P_0$ ) after the close of market on  
17 October 24, 2012, as reported by *MSN Money*.

1 **Q. Why did Staff use the October 24, 2012, spot price rather than a historical average**  
2 **stock price to calculate the dividend yield component of the DCF formula?**

3 A. The current, rather than historic, market price is used in order to be consistent with  
4 financial theory. In accordance with the Efficient Market Hypothesis, the current stock  
5 price is reflective of all available information relating to the stock, and as such reveals  
6 investors' expectations of future returns. Use of historical average stock prices illogically  
7 discounts the most recent information in favor of less recent information. The latter is  
8 stale and is representative of underlying conditions that may have changed.

9  
10 **Q. How did Staff estimate the dividend growth (g) component of the constant-growth**  
11 **DCF model represented by Equation 2?**

12 A. The dividend growth component used by Staff is determined by the average of six  
13 different estimation methods, as shown in Schedule JAC-8. Staff calculated historical and  
14 projected growth estimates on dividend-per-share ("DPS"),<sup>5</sup> earnings-per-share ("EPS")<sup>6</sup>  
15 and sustainable growth bases.

16  
17 **Q. Why did Staff examine EPS growth to estimate the dividend growth component of**  
18 **the constant-growth DCF model?**

19 A. Historic and projected EPS growth are used because dividends are related to earnings.  
20 Dividend distributions may exceed earnings in the short run, but cannot continue  
21 indefinitely. In the long term, dividend distributions are dependent on earnings.

---

<sup>5</sup> Derived from information provided by *Value Line*.

<sup>6</sup> Derived from information provided by *Value Line*.

1 **Q. How did Staff estimate historical DPS growth?**

2 A. Staff estimated historical DPS growth by calculating a compound annual DPS growth rate  
3 for each of its sample companies over the 10-year period, 2002-2011. As shown in  
4 Schedule JAC-5, the average historical DPS growth rate for the sample was 3.2 percent.

5  
6 **Q. How did Staff estimate projected DPS growth?**

7 A. Staff calculated an average of the projected DPS growth rates for the sample water utilities  
8 from *Value Line* through the period, 2015-2017. The average projected DPS growth rate  
9 is 4.1 percent, as shown in Schedule JAC-5.

10  
11 **Q. How did Staff estimate historical EPS growth rate?**

12 A. Staff estimated historical EPS growth by calculating a compound annual EPS growth rate  
13 for each of its sample companies over the 10-year period, 2002-2011. As shown in  
14 Schedule JAC-5, the average historical EPS growth rate for the sample was 4.2 percent.

15  
16 **Q. How did Staff estimate projected EPS growth?**

17 A. Staff calculated an average of the projected EPS growth rates for the sample water utilities  
18 from *Value Line* through the period, 2015-2017. The average projected EPS growth rate  
19 is 6.2 percent, as shown in Schedule JAC-5.

20  
21 **Q. How does Staff calculate its historical and projected sustainable growth rates?**

22 A. Historical and projected sustainable growth rates are calculated by adding their respective  
23 retention growth rate terms (br) to their respective stock financing growth rate terms (vs),  
24 as shown in Schedule JAC-6.

1 **Q. What is retention growth?**

2 A. Retention growth is the growth in dividends due to the retention of earnings. The  
3 retention growth concept is based on the theory that dividend growth cannot be achieved  
4 unless the company retains and reinvests some of its earnings. The retention growth is  
5 used in Staff's calculation of sustainable growth shown in Schedule JAC-6.

6  
7 **Q. What is the formula for the retention growth rate?**

8 A. The retention growth rate is the product of the retention ratio and the book/accounting  
9 return on equity. The retention growth rate formula is:

10 Equation 3 :

$$\text{Retention Growth Rate} = br$$

where :  $b$  = the retention ratio (1 – dividend payout ratio)  
 $r$  = the accounting/book return on common equity

11

12 **Q. How did Staff calculate the average historical retention growth rate (br) for the**  
13 **sample water utilities?**

14 A. Staff calculated the mean of the 10-year average historical retention rate for each sample  
15 company over the period, 2002-2011. As shown in Schedule JAC-6, the historical  
16 average retention (br) growth rate for the sample is 2.9 percent.

17

18 **Q. How did Staff estimate its projected retention growth rate (br) for the sample water**  
19 **utilities?**

20 A. Staff used the retention growth projections for the sample water utilities for the period,  
21 2015-2017, from *Value Line*. As shown in Schedule JAC-6, the projected average  
22 retention growth rate for the sample companies is 4.3 percent.

1 **Q. When can retention growth provide a reasonable estimate of future dividend**  
2 **growth?**

3 A. The retention growth rate is a reasonable estimate of future dividend growth when the  
4 retention ratio is reasonably constant and the entity's market price to book value ("market-  
5 to-book ratio") is expected to be 1.0. The average retention ratio has been reasonably  
6 constant in recent years. However, the market-to-book ratio for the sample water utilities  
7 is 1.9, notably higher than 1.0, as shown in Schedule JAC-7.

8  
9 **Q. Is there any financial implication of a market-to-book ratio greater than 1.0?**

10 A. Yes. A market-to-book ratio greater than 1.0 implies that investors expect an entity to  
11 earn an accounting/book return on its equity that exceeds its cost of equity. The  
12 relationship between required returns and expected cash flows is readily observed in the  
13 fixed securities market. For example, assume an entity contemplating issuance of bonds  
14 with a face value of \$10 million at either 6 percent or 8 percent and, thus, paying annual  
15 interest of \$600,000 or \$800,000, respectively. Regardless of investors' required return on  
16 similar bonds, investors will be willing to pay more for the bonds if issued at 8 percent  
17 than if the bonds are issued at 6 percent. For example, if the current interest rate required  
18 by investors is 6 percent, then they would bid \$10 million for the 6 percent bonds and  
19 more than \$10 million for the 8 percent bonds. Similarly, if equity investors require a 9  
20 percent return and expect an entity to earn accounting/book returns of 13 percent, the  
21 market will bid up the price of the entity's stock to provide the required return of 9  
22 percent.

1 **Q. How has Staff generally recognized a market-to-book ratio exceeding 1.0 in its cost of**  
2 **equity analyses in recent years?**

3 A. Staff has assumed that investors expect the market-to-book ratio to remain greater than  
4 1.0. Given that assumption, Staff has added a stock financing growth rate (vs) term to the  
5 retention ratio (br) term to calculate its historical and projected sustainable growth rates.  
6

7 **Q. Do the historical and projected sustainable growth rates Staff uses to develop its**  
8 **DCF cost of equity in this case continue to include a stock financing growth rate**  
9 **term?**

10 A. Yes.  
11

12 **Q. What is stock financing growth?**

13 A. Stock financing growth is the growth in an entity's dividends due to the sale of stock by  
14 that entity. Stock financing growth is a concept derived by Myron Gordon and discussed  
15 in his book *The Cost of Capital to a Public Utility*.<sup>7</sup> Stock financing growth is the product  
16 of the fraction of the funds raised from the sale of stock that accrues to existing  
17 shareholders (v) and the fraction resulting from dividing the funds raised from the sale of  
18 stock by the existing common equity (s).  
19

---

<sup>7</sup> Gordon, Myron J. *The Cost of Capital to a Public Utility*. MSU Public Utilities Studies, Michigan, 1974. pp 31-35.

1 **Q. What is the mathematical formula for the stock financing growth rate?**

2 A. The mathematical formula for stock financing growth is:

Equation 4:

$$\text{Stock Financing Growth} = vs$$

where:  $v$  = Fraction of the funds raised from the sale of stock that accrues  
to existing shareholders  
 $s$  = Funds raised from the sale of stock as a fraction of the existing  
common equity

3

4 **Q. How is the variable  $v$  presented above calculated?**

5 A. Variable  $v$  is calculated as follows:

Equation 5:

$$v = 1 - \left( \frac{\text{book value}}{\text{market value}} \right)$$

6

7 For example, assume that a share of stock has a \$30 book value and is selling for \$45.

8 Then, to find the value of  $v$ , the formula is applied:

$$v = 1 - \left( \frac{30}{45} \right)$$

9

In this example,  $v$  is equal to 0.33.

10

11 **Q. How is the variable  $s$  presented above calculated?**

12 A. Variable  $s$  is calculated as follows:

13 Equation 6:

14

15

$$s = \frac{\text{Funds raised from the issuance of stock}}{\text{Total existing common equity before the issuance}}$$

1 For example, assume that an entity has \$150 in existing equity, and it sells \$30 of stock.  
2 Then, to find the value of  $s$ , the formula is applied:

$$s = \left( \frac{30}{150} \right)$$

3 In this example,  $s$  is equal to 20.0 percent.  
4

5 **Q. What is the  $vs$  term when the market-to-book ratio is equal to 1.0?**

6 A. A market-to-book ratio of 1.0 reflects that investors expect an entity to earn a  
7 book/accounting return on their equity investment equal to the cost of equity. When the  
8 market-to-book ratio is equal to 1.0, none of the funds raised from the sale of stock by the  
9 entity accrues to the benefit of existing shareholders, i.e., the term  $v$  is equal to zero (0.0).  
10 Consequently, the  $vs$  term is also equal to zero (0.0). When stock financing growth is  
11 zero, dividend growth depends solely on the  $br$  term.  
12

13 **Q. What is the effect of the  $vs$  term when the market-to-book ratio is greater than 1.0?**

14 A. A market-to-book ratio greater than 1.0 reflects that investors expect an entity to earn a  
15 book/accounting return on their equity investment greater than the cost of equity.  
16 Equation 5 shows that, when the market-to-book ratio is greater than 1.0, the  $v$  term is also  
17 greater than zero. The excess by which new shares are issued and sold over book value  
18 per share of outstanding stock is a contribution that accrues to existing stockholders in the  
19 form of a higher book value. The resulting higher book value leads to higher expected  
20 earnings and dividends. Continued growth from the  $vs$  term is dependent upon the  
21 continued issuance and sale of additional shares at a price that exceeds book value per  
22 share.

1 **Q. What *vs* estimate did Staff calculate from its analysis of the sample water utilities?**

2 A. Staff estimated an average stock financing growth of 1.9 percent for the sample water  
3 utilities, as shown in Schedule JAC-6.

4  
5 **Q. What would occur if an entity had a market-to-book ratio greater than 1.0 as a result  
6 of investors expecting earnings to exceed its cost of equity, and subsequently  
7 experienced newly-authorized rates equal only to its cost of equity?**

8 A. *Ceteris paribus*, holding all other factors constant, one would expect market forces to  
9 move the company's stock price lower, closer to a market-to-book ratio of 1.0, to reflect  
10 investor expectations of reduced expected future cash flows.

11  
12 **Q. If the average market-to-book ratio of Staff's sample water utilities were to fall to 1.0  
13 due to authorized ROEs equaling their cost of equity, would inclusion of the *vs* term  
14 be necessary to Staff's constant-growth DCF analysis?**

15 A. No. As discussed above, when the market-to-book ratio is equal to 1.0, no portion of the  
16 funds raised from the sale of stock by the entity accrues to the benefit of existing  
17 shareholders because the *v* term is equal to zero; thus, the *vs* term is also equal to zero.  
18 When the market-to-book ratio equals 1.0, dividend growth depends solely on the *br* term.  
19 Staff's inclusion of the *vs* term assumes that the market-to-book ratio continues to exceed  
20 1.0, and that the sample water utilities will continue to issue and sell stock at prices above  
21 book value with the effect of benefitting existing shareholders.

22  
23 **Q. What are Staff's historical and projected sustainable growth rates?**

24 A. Staff's estimated historical sustainable growth rate is 4.8 percent based on an analysis of  
25 earnings retention for the sample water companies. Staff's projected sustainable growth

1 rate is 6.3 percent based on retention growth projected by *Value Line*. Schedule JAC-6  
2 presents Staff's estimates of the sustainable growth rate.

3

4 **Q. What is Staff's expected infinite annual growth rate in dividends?**

5 A. Staff's expected dividend growth rate (g) is 4.8 percent, which is the average of historical  
6 and projected DPS, EPS, and sustainable growth estimates. Staff's calculation of the  
7 expected infinite annual growth rate in dividends is shown in Schedule JAC-8.

8

9 **Q. What is Staff's constant-growth DCF estimate for the sample utilities?**

10 A. Staff's constant-growth DCF estimate is 8.9 percent, as shown in Schedule JAC-3.

11

12 ***The Multi-Stage DCF***

13 **Q. Why did Staff implement the multi-stage DCF model to estimate RWC's cost of  
14 equity?**

15 A. Staff generally uses the multi-stage DCF model to consider the assumption that dividends  
16 may not grow at a constant rate. The multi-stage DCF uses two stages of growth, the first  
17 stage (near-term) having a four-year duration, followed by the second stage (long-term) of  
18 constant growth.

19

1 **Q. What is the mathematical formula for the multi-stage DCF?**

2 A. The multi-stage DCF formula is shown in the following equation:

Equation 7 :

$$P_0 = \sum_{t=1}^n \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K-g_n} \left[ \frac{1}{(1+K)} \right]^n$$

Where :  $P_0$  = current stock price  
 $D_t$  = dividends expected during stage 1  
 $K$  = cost of equity  
 $n$  = years of non – constant growth  
 $D_n$  = dividend expected in year n  
 $g_n$  = constant rate of growth expected after year n

3

4 **Q. What steps did Staff take to implement its multi-stage DCF cost of equity model?**

5 A. First, Staff projected future dividends for each of the sample water utilities using near-  
6 term and long-term growth rates. Second, Staff calculated the internal rate of return (cost  
7 of equity) which equates the present value of the forecasted dividends to the current stock  
8 price for each of the sample water utilities. Lastly, Staff calculated an overall sample  
9 average cost of equity estimate.

10

11 **Q. How did Staff calculate near-term (stage-1) growth?**

12 A. The stage-1 growth rate is based on *Value Lines*'s projected dividends for the next twelve  
13 months, when available, and on the average dividend growth (g) rate of 4.8 percent,  
14 calculated in Staff's constant DCF analysis for the remainder of the stage.

1 **Q. How did Staff estimate long-term (stage-2) growth?**

2 A. Staff calculated the stage-2 growth rate using the arithmetic mean rate of growth in Gross  
3 Domestic Product (“GDP”) from 1929 to 2011.<sup>8</sup> Using the GDP growth rate assumes that  
4 the water utility industry is expected to grow at the same rate as the overall economy.

5  
6 **Q. What is the historical GDP growth rate that Staff used to estimate stage-2 growth?**

7 A. Staff used 6.5 percent to estimate the stage-2 growth rate.

8  
9 **Q. What is Staff’s multi-stage DCF estimate for the sample utilities?**

10 A. Staff’s multi-stage DCF estimate is 9.7 percent, as shown in Schedule JAC-3.

11  
12 **Q. What is Staff’s overall DCF estimate for the sample utilities?**

13 A. Staff’s overall DCF estimate is 8.9 percent. Staff calculated the overall DCF estimate by  
14 averaging the constant growth DCF (8.9%) and multi-stage DCF (8.9%) estimates, as  
15 shown in Schedule JAC-3.

16  
17 **Capital Asset Pricing Model**

18 **Q. Please describe the CAPM.**

19 A. The CAPM is used to determine the prices of securities in a competitive market. The  
20 CAPM model describes the relationship between a security’s investment risk and its  
21 market rate of return. Under the CAPM, an investor requires the expected return of a  
22 security to equal the rate on a risk-free security plus a risk premium. The model also  
23 assumes that investors will sufficiently diversify their investments to eliminate any non-  
24 systematic or unique risk.<sup>9</sup> In 1990, Professors Harry Markowitz, William Sharpe, and

---

<sup>8</sup> www.bea.doc.gov.

<sup>9</sup> The CAPM makes the following assumptions: 1) single holding period; 2) perfect and competitive securities market; 3) no transaction costs; 4) no restrictions on short selling or borrowing; 5) the existence of a risk-free rate; and 6) homogeneous expectations.

1 Merton Miller earned the Nobel Prize in Economic Sciences for their contribution to the  
2 development of the CAPM.

3  
4 **Q. Did Staff use the same sample water utilities in its CAPM and DCF cost of equity  
5 estimation analyses?**

6 A. Yes. Staff's CAPM cost of equity estimation analysis uses the same sample water  
7 companies as did its DCF cost of equity estimation analysis.

8  
9 **Q. What is the mathematical formula for the CAPM?**

10 A. The mathematical formula for the CAPM is:

11  
Equation 8 :

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

where:  $R_f$  = risk free rate  
 $R_m$  = return on market  
 $\beta$  = beta  
 $R_m - R_f$  = market risk premium  
 $K$  = expected return

12  
13 The equation shows that the expected return (K) on a risky asset is equal to the risk-free  
14 interest rate ( $R_f$ ) plus the product of the market risk premium ( $R_m - R_f$ ) multiplied by the  
15 beta ( $\beta$ ) coefficient, where beta represents the riskiness of the investment relative to the  
16 market.

17

1 **Q. What is the risk-free rate?**

2 A. The risk-free rate is the rate of return of an investment free of default risk.

3

4 **Q. What does Staff use as surrogates to represent estimations of the risk-free rates of**  
5 **interest in its historical and current market risk premium CAPM methods?**

6 A. Staff uses separate parameters as surrogates for the estimations of the risk-free rates of  
7 interest for the historical market risk premium CAPM cost of equity estimation and the  
8 current market risk premium CAPM cost of equity estimation. Staff uses the average of  
9 three (5-, 7-, and 10-year) intermediate-term U.S. Treasury securities' spot rates in its  
10 historical market risk premium CAPM cost of equity estimation, and the 30-year U.S.  
11 Treasury bond spot rate in its current market risk premium CAPM cost of equity  
12 estimation. Rates on U.S. Treasuries are largely verifiable and readily available.

13

14 **Q. What does beta measure?**

15 A. Beta is a measure of a security's price volatility, or systematic risk, relative to the market  
16 as a whole. Since systematic risk cannot be diversified away, it is the only risk that is  
17 relevant when estimating a security's required return. Using a baseline market beta of 1.0,  
18 a security having a beta value less than 1.0 will be less volatile (i.e., less risky) than the  
19 market. A security with a beta value greater than 1.0 will be more volatile (i.e., more  
20 risky) than the market.

21

22 **Q. How did Staff estimate RWC's beta?**

23 A. Staff used the average of the *Value Line* betas for the sample water utilities as a proxy for  
24 the Company's beta. Schedule JAC-7 shows the *Value Line* betas for each of the sample  
25 water utilities. The 0.71 average beta for the sample water utilities is Staff's estimated

1           beta for RWC. A security having a beta value of 0.71 is less volatile than the market as a  
2           whole, and thus requires a lower return on equity than does the overall market.

3  
4           **Q.    What is the market risk premium ( $R_m - R_f$ )?**

5           **A.**    The market risk premium is the expected return on the market, minus the risk-free rate.  
6           Simplified, it is the return an investor expects as compensation for market risk.

7  
8           **Q.    What did Staff use for the market risk premium?**

9           **A.**    Staff uses separate calculations for the market risk premium in its historical and current  
10          market risk premium CAPM methods.

11  
12          **Q.    How did Staff calculate an estimate for the market risk premium in its historical**  
13          **market risk premium CAPM method?**

14          **A.**    Staff uses the intermediate-term government bond income returns published in the  
15          Ibbotson Associates' *Stocks, Bonds, Bills, and Inflation 2012 Yearbook* to calculate the  
16          historical market risk premium. Ibbotson Associates calculates the historical risk  
17          premium by averaging the historical arithmetic differences between the S&P 500 and the  
18          intermediate-term government bond income returns for the period 1926-2011. Staff's  
19          historical market risk premium estimate is 7.2 percent, as shown in Schedule JAC-3.

20  
21          **Q.    How did Staff calculate an estimate for the market risk premium in its current**  
22          **market risk premium CAPM method?**

23          **A.**    Staff solves equation 8 above to arrive at a market risk premium using a DCF-derived  
24          expected return (K) of 14.77 ( $2.3 + 12.47^{10}$ ) percent using the expected dividend yield (2.3  
25          percent over the next twelve months) and the annual per share growth rate (12.47 percent)

---

<sup>10</sup> The three to five year price appreciation is 60%.  $1.60^{0.25} - 1 = 12.47\%$ .

1 that *Value Line* projects for all dividend-paying stocks under its review<sup>11</sup> along with the  
2 current long-term risk-free rate (30-year Treasury note at 2.93 percent) and the market's  
3 average beta of 1.0. Staff calculated the current market risk premium as 11.84 percent,<sup>12</sup>  
4 as shown in Schedule JAC-3.

5  
6 **Q. What is the result of Staff's historical market risk premium CAPM and current  
7 market risk premium CAPM cost of equity estimations for the sample utilities?**

8 A. Staff's cost of equity estimates are 6.4 percent using the historical market risk premium  
9 CAPM and 11.3 percent using the current market risk premium CAPM.

10  
11 **Q. What is Staff's overall CAPM estimate for the sample utilities?**

12 A. Staff's overall CAPM cost of equity estimate is 8.9 percent which is the average of the  
13 historical market risk premium CAPM (6.4 percent) and the current market risk premium  
14 CAPM (11.3 percent) estimates, as shown in Schedule JAC-3.

15  
16 **VII. SUMMARY OF STAFF'S COST OF EQUITY ANALYSIS**

17 **Q. What is the result of Staff's constant-growth DCF analysis to estimate the cost of  
18 equity for the sample water utilities?**

19 A. Schedule JAC-3 shows the result of Staff's constant-growth DCF analysis. The result of  
20 Staff's constant-growth DCF analysis is as follows:

21 
$$k = 3.3\% + 4.8\%$$

22  
23 
$$k = 8.1\%$$

24  

---

<sup>11</sup> October 26, 2012 issue date.

<sup>12</sup>  $14.77\% = 2.93\% + (1)(11.84\%)$ .

1 Staff's constant-growth DCF estimate of the cost of equity for the sample water utilities is  
2 8.1 percent.

3  
4 **Q. What is the result of Staff's multi-stage DCF analysis to estimate of the cost of equity**  
5 **for the sample utilities?**

6 A. Schedule JAC-9 shows the result of Staff's multi-stage DCF analysis. The result of  
7 Staff's multi-stage DCF analysis is:

8

9	<b>Company</b>	<b>Equity Cost</b>
10		<b>Estimate (k)</b>
11	American States Water	9.4%
12	California Water	10.0%
13	Aqua America	9.1%
14	Connecticut Water	9.6%
15	Middlesex Water	10.3%
16	SJW Corp	<u>9.5%</u>
17		
18	<b>Average</b>	<b>9.7%</b>

19

20 Staff's multi-stage DCF estimate of the cost of equity for the sample water utilities is 9.7  
21 percent.

22  
23 **Q. What is Staff's overall DCF estimate of the cost of equity for the sample utilities?**

24 A. Staff's overall DCF estimate of the cost of equity for the sample utilities is 8.9 percent.  
25 Staff calculated an overall DCF cost of equity estimate by averaging Staff's constant  
26 growth DCF (8.1 percent) and Staff's multi-stage DCF (9.7 percent) estimates, as shown  
27 in Schedule JAC-3.

28

1 **Q. What is the result of Staff's historical market risk premium CAPM analysis to**  
2 **estimate of the cost of equity for the sample utilities?**

3 A. Schedule JAC-3 shows the result of Staff's CAPM analysis using the historical risk  
4 premium estimate. The result is as follows:

5  $k = 1.3\% + 0.71 * 7.2\%$

6  $k = 6.4\%$

7  
8 Staff's CAPM estimate (using the historical market risk premium) of the cost of equity for  
9 the sample water utilities is 6.4 percent.

10  
11 **Q. What is the result of Staff's current market risk premium CAPM analysis to**  
12 **estimate the cost of equity for the sample utilities?**

13 A. Schedule JAC-3 shows the result of Staff's CAPM analysis using the current market risk  
14 premium estimate. The result is:

15  $k = 2.9\% + 0.71 * 11.8\%$

16  $k = 11.3\%$

17  
18 Staff's CAPM estimate (using the current market risk premium) of the cost of equity to the  
19 sample water utilities is 11.3 percent.

20  
21 **Q. What is Staff's overall CAPM estimate of the cost of equity for the sample utilities?**

22 A. Staff's overall CAPM estimate for the sample utilities is 8.9 percent. Staff's overall  
23 CAPM estimate is the average of the historical market risk premium CAPM (6.4 percent)  
24 and the current market risk premium CAPM (11.3 percent) estimates, as shown in  
25 Schedule JAC-3.

26

1 **Q. Please summarize the results of Staff's cost of equity analysis for the sample utilities.**

2 A. The following table shows the results of Staff's cost of equity analysis:

3 **Table 2**

<b>Method</b>	<b>Estimate</b>
Average DCF Estimate	8.9%
Average CAPM Estimate	8.9%
<b>Overall Average</b>	<b>8.9%</b>

4 Staff's average estimate of the cost of equity to the sample water utilities is 8.9 percent.

5  
6 **VIII. OTHER COST OF EQUITY ESTIMATE FACTORS**

7 **Q. Please compare RWC's capital structure to that of the six sample water companies.**

8 A. The average capital structure for the sample water utilities is composed of 48.4 percent  
9 equity and 51.6 percent debt, as shown in Schedule JAC-4. The Company's capital  
10 structure is composed of 92.4 percent equity and 7.6 percent debt. In this case, since  
11 RWC's capital structure is less leveraged than that of the average sample water utilities'  
12 capital structure, its stockholders bear less financial risk than the sample water utilities.

13  
14 **Q. Does RWC's reduced financial risk affect its cost of equity?**

15 A. Yes. As previously discussed, financial risk is a component of market risk and investors  
16 require compensation for market risk. Since RWC's financial risk is less than that of the  
17 average sample water companies, its cost of equity is lower than that of the sample water  
18 companies.

19  
20 **Q. Is Staff recommending a downward financial risk adjustment to RWC's cost of  
21 equity to recognize its lower financial risk?**

22 A. No. Staff normally applies two criteria in assessing whether application of a downward  
23 financial risk adjustment is appropriate. The first consideration is whether the utility has a

1 reasonably economical capital structure. Staff considers a capital structure composed of  
2 no more than 60 percent equity to meet this condition. If equity exceeds 60 percent, as it  
3 does for RWC, Staff considers application of a downward financial risk adjustment to be  
4 appropriate if the utility meets the second criteria. The second condition is whether the  
5 utility has access to equity capital markets. Although RWC's equity exceeds 60 percent, it  
6 does not have access to the equity capital markets; accordingly, Staff is not recommending  
7 a downward financial risk adjustment to RWC's cost of equity. Staff's methodology for  
8 applying a downward financial risk adjustment encourages a utility with access to the  
9 equity capital markets to use that access to manage its capital structure with economical  
10 efficiency and encourages a utility that lacks access to the equity capital markets to  
11 maintain a healthy capital structure.

12  
13 **Q. Did Staff consider factors other than the results of its technical models in its cost of**  
14 **equity analysis?**

15 A. Yes. In consideration of the relatively uncertain status of the economy and the market that  
16 currently exists, Staff is proposing an Economic Assessment Adjustment to the cost of  
17 equity. In this case, Staff recommends a 60 basis point (0.6 percent) upward Economic  
18 Assessment Adjustment, as shown in Schedule JAC-3.

19  
20 **IX. RATE OF RETURN RECOMMENDATION**

21 **Q. What overall rate of return did Staff determine for RWC?**

22 A. Staff determined an 9.3 percent ROR for the Company, as shown in Schedule JAC-1 and  
23 the following table:  
24  
25

**Table 3**

	<b>Weight</b>	<b>Cost</b>	<b>Weighted Cost</b>
Long-term Debt	7.6%	6.3%	0.5%
Common Equity	92.4%	9.5%	<u>8.8%</u>
<b>Overall ROR</b>			<b><u>9.3%</u></b>

**X. STAFF RESPONSE TO COMPANY'S COST OF CAPITAL WITNESS MR. MATTHEW J. ROWELL**

**Q. Please summarize Mr. Rowell's methodology and recommendations.**

A. Mr. Rowell recommends a 10.91 percent ROE based on estimates derived from two DCF analyses (constant growth and multi-stage), three CAPM analyses, and a comparable earnings analysis. In each of his cost of equity estimation methodologies, Mr. Rowell utilizes a sample which includes both publicly-traded water and natural gas utility companies; however, the make-up of each sample differs.<sup>13</sup> For purposes of his recommended cost of equity, Mr. Rowell assumes that realized returns on equity are reflective of investor expectations of the cost of equity, and he provides one-third weight to the market-based results derived from his DCF and CAPM analyses and two-thirds weight to the estimates derived from his comparable earnings analysis. For purposes of his comparable earnings analysis, Mr. Rowell calculates a weighted average sample ROE,

<sup>13</sup> For purposes of his comparable earnings analysis, Mr. Rowell's sample includes seven water companies (American States Water, Aqua America, California Water, Connecticut Water, Middlesex Water, SJW Corporation and York Water) and seven natural gas companies (Atmos Energy, Laclede Group, New Jersey Resources, Northwest Natural Gas, Piedmont Natural Gas, UGI Corporation and WGL Holdings). (Rowell Direct, pp. 16-17, and Schedule MJR-1) Mr. Rowell's DCF sample includes eight water companies (American States Water, Aqua America, California Water, Connecticut Water, Middlesex Water, SJW Corporation, York Water and Artesian Resources) and seven natural gas companies (Atmos Energy, Laclede Group, New Jersey Resources, Northwest Natural Gas, Piedmont Natural Gas, UGI Corporation and WGL Holdings). (Rowell Direct, Schedules MJR-2, MJR-3 and MJR-4) Mr. Rowell's CAPM sample includes eight water companies (American States Water, Aqua America, California Water, Connecticut Water, Middlesex Water, SJW Corporation, York Water and Artesian Resources) and eight natural gas companies (AGL Resources, Atmos Energy, Laclede Group, New Jersey Resources, Northwest Natural Gas, Piedmont Natural Gas, UGI Corporation and WGL Holdings). (Rowell Direct, Schedule MJR-6)

1           utilizing fiscal year 2011 financial information. Mr. Rowell's recommended ROE  
2           includes a 65-basis point upward risk adjustment for firm-specific risk.

3  
4           **Q. Does Staff consider it inappropriate for this Commission to rely on the cost of equity**  
5           **estimates derived from Mr. Rowell's comparable earnings analysis for purposes of**  
6           **establishing new rates for RWC in this docket?**

7           A. No. There are several reasons. First, the cost of equity is determined by investor activity  
8           in the capital markets, where market forces -- revealing of investor expectations --  
9           ultimately determine the value of equity securities traded on a daily basis. Mr. Rowell's  
10          comparable earnings analysis is predicated on the mistaken notion that realized ROE's,  
11          and not investor expectations, are the determinant of the cost of equity. Second, by its  
12          nature the cost of equity is a forward looking concept, revealing of an investor's  
13          opportunity cost associated with a given equity investment. By using realized ROEs as an  
14          indicator of the cost of equity in his comparable earnings analysis, however, Mr. Rowell  
15          uses what he, himself, terms "a backward looking accounting measurement" for the cost  
16          of equity.<sup>14</sup> Third, implicit in the adoption of Mr. Rowell's comparable earnings analysis  
17          as a proxy for RWC's cost of equity is the notion that the returns on equity authorized by  
18          other regulatory jurisdictions are appropriate for RWC, and that this Commission should  
19          embrace them for purposes of setting rates for RWC. Doing so, however, would be  
20          inappropriate, as this Commission has no knowledge of the rate-setting particulars  
21          surrounding each of Mr. Rowell's sample companies, or their relevance to RWC. Lastly,  
22          to set rates based upon Mr. Rowell's comparable earnings analysis gives rise to the issue  
23          of circularity, wherein returns set based upon comparisons with realized or authorized  
24          returns on equity established in other regulatory proceedings are assumed to be  
25          appropriate going forward, irrespective of the current market level of the cost of equity as

---

<sup>14</sup> Rowell Direct, page 3.

1 determined by investors. To rely on the results of a comparable earnings analysis serves  
2 to ignore market forces, which is why the Arizona Court of Appeals has strongly criticized  
3 the use of a comparable earnings analysis composed of a sample group of utilities for rate  
4 making purposes.<sup>15</sup>

5  
6 **Q. How did Mr. Rowell select his comparable earnings sample?**

7 A. As a universe from which to choose, Mr. Rowell began by considering the six publicly-  
8 traded water utility companies used by Staff in its cost of capital analysis (American  
9 States Water, Aqua America, California Water, Connecticut Water, Middlesex Water and  
10 SJW Corporation), and the nine natural gas companies used by the Residential Utility  
11 Consumer Office ("RUCO") in its cost of capital analysis (AGL Resources, Atmos  
12 Energy, Laclede Group, New Jersey Resources, Northwest Natural Gas, Piedmont Natural  
13 Gas, South Jersey Industries, Southwest Gas and WGL Holdings). From the group of nine  
14 natural gas companies considered, Mr. Rowell removed the companies having the highest  
15 (South Jersey Industries, 14.31%) and lowest (Southwest Gas, 4.51%) realized ROEs, and  
16 he also excluded AGL Resources from consideration due to significant one-time expenses  
17 associated with a merger. Mr. Rowell then replaced AGL Resources in the sample with  
18 another natural gas utility, UGI Corporation.

19  
20 **Q. In his testimony, does Mr. Rowell explain why he selected UGI Corporation to**  
21 **replace AGL Resources in his comparable earnings sample?**

22 A. No.  
23

---

<sup>15</sup> See *Sun City Water Co. v. Arizona Corp. Comm'n*, 26 Ariz. 464, 556 P.2d 1126 (1976).

1 **Q. What water companies does Mr. Rowell include in his comparable earnings sample?**

2 A. Mr. Rowell includes the six publicly-traded water utilities initially considered for  
3 inclusion noted above, plus a seventh water utility, York Water.

4

5 **Q. In his testimony, does Mr. Rowell indicate the reason for adding York Water to his  
6 comparable earnings sample?**

7 A. No, he does not. Mr. Rowell makes no mention of York Water in his discussion of the  
8 selection of his comparable earnings sample (See Rowell Direct, pp. 16-17).

9

10 **Q. Please explain Mr. Rowell's comparable earnings methodology and how he arrived  
11 at his 10.47 percent estimated cost of equity.**

12 A. Mr. Rowell's comparable earnings methodology employs a weighted average calculation  
13 to estimate the cost of equity. As shown in Schedule MJR-1, Mr. Rowell begins by  
14 calculating the realized ROE for each of his water and natural gas sample companies,  
15 utilizing the realized net income and equity positions of each for the 2011 fiscal year. Mr.  
16 Rowell then calculates an equity weighting factor for each sample company, dividing the  
17 equity position of each by the total combined sample equity (a figure not presented in  
18 MJR-1). For purposes of arriving at his comparable earnings estimated cost of equity, Mr.  
19 Rowell then multiplies the realized ROE achieved by each sample company by its  
20 respective equity weighting factor, with the sum of those values equating to his 10.47  
21 percent weighted average ROE.

22

23 **Q. In his testimony, does Mr. Rowell state the reason he elected to use a weighted  
24 average calculation for his comparable earnings estimate?**

25 A. Yes. Mr. Rowell utilized a weighted average ROE calculation in order to produce an  
26 estimate of the average return accruing to *each dollar* of equity in the sample. He

1 considered doing so appropriate, as “taking a simple average of returns produces a number  
2 that overstates the influence of the smaller utilities in the sample.” (See Rowell Direct, p.  
3 17)

4  
5 **Q. Has Staff prepared a schedule which would shed additional light upon Mr. Rowell’s**  
6 **comparable earnings methodology?**

7 A. Yes. Staff has prepared a restatement of Mr. Rowell’s Schedule MJR-1 for that purpose.  
8 Although his comparable earnings sample consists of seven water companies and seven  
9 natural gas companies, as shown in Exhibit JAC-A Mr. Rowell’s use of a weighted  
10 average calculation has significantly skewed the data such that his comparable earnings  
11 estimate is disproportionately influenced by the natural gas companies in the sample.  
12 Specifically, the relative weighting of the gas sample, as measured by common equity, is  
13 more than three times greater (75.45%) than that of the water sample (24.55%). That the  
14 average (i.e., simple average) realized return on equity of the gas sample (10.75%)  
15 exceeds by 139 basis points that of the water sample (9.36%) only serves to further  
16 exacerbate this disproportionate influence.<sup>16</sup>

17  
18 **Q. What is Staff’s comment on Mr. Rowell’s replacement of AGL Resources with UGI**  
19 **Corporation in his comparable earnings sample?**

20 A. As noted earlier, Mr. Rowell excluded AGL Resources from consideration for his  
21 comparable earnings sample, replacing it with UGI Corporation. As shown in Exhibit  
22 JAC-A, UGI Corporation experienced a realized ROE of 11.78 percent in fiscal year 2011.  
23 While other natural gas companies in Mr. Rowell’s sample experienced higher ROEs than  
24 did UGI Corporation, on a weighted average basis no other company in the sample had a

---

<sup>16</sup> Differences between the 10.49 percent sample weighted average ROE, as shown in Exhibit JAC-1, and the 10.47 percent weighted average ROE, as shown in Schedule MJR-1, are attributable to Mr. Rowell having used total equity, rather than common equity, in his ROE calculations.

1 larger impact upon Mr. Rowell's comparable earnings estimate, accounting for 19.73  
2 percent of the sample weighted average ROE ( $2.07\% / 10.49\% = 19.73\%$ ).

3  
4 **Q. Does Staff have any additional observations concerning Mr. Rowell's inclusion of**  
5 **UGI Corporation in his comparable earnings sample?**

6 A. Yes. As noted, of the fourteen companies selected by Mr. Rowell for inclusion in his  
7 comparable earnings sample, UGI Corporation had the single largest impact upon his  
8 weighted average estimate. However, among the Company's five operating segments,  
9 two are not subject to domestic rate regulation in the United States; UGI's International  
10 Propane segment, and its Midstream & Marketing segment, which accounted for 17 and  
11 22 percent, respectively, of 2011 UGI corporate net income.<sup>17</sup> For purposes of his  
12 comparable earnings analysis, Mr. Rowell should have made a downward adjustment of  
13 39 percent (17% + 22%) to both UGI's net income and common equity to reflect this fact,  
14 but no such adjustment was made. As a consequence, as presented in Schedule MJR-1,  
15 the weighted average ROE for UGI Corporation has been significantly overstated,  
16 resulting in a corresponding overstatement to Mr. Rowell's weighted average sample ROE  
17 estimate.

18  
19 **Q. Does Staff have reason to believe that a similar adjustment should be made to other**  
20 **natural gas companies included in Mr. Rowell's comparable earnings sample?**

21 A. Staff has not had an opportunity to research this issue as it relates to the other natural gas  
22 companies included in Mr. Rowell's sample and, therefore, can not say with certainty  
23 whether similar adjustments might be necessary. However, Staff intends to conduct  
24 research on the other natural gas companies, and thus reserves the right to raise the issue  
25 in Surrebuttal.

---

<sup>17</sup> 2011 UGI Annual Report to Shareholders.

1 **Q. Turning now to Mr. Rowell's DCF analyses, does his DCF sample consist of the same**  
2 **fourteen companies selected for inclusion in his comparable earnings sample?**

3 A. No, it does not. Although Mr. Rowell states in his testimony that the same companies  
4 presented in his comparable earnings sample are used in his DCF analyses (See Rowell  
5 Direct, p. 18), that statement is incomplete, as a review of Schedules MJR-2, MJR-3 and  
6 MJR-4 reveal that his DCF sample consists of fifteen companies; the same fourteen (7  
7 water, 7 gas) companies making up his comparable earnings sample, plus an additional  
8 water company, Artesian Resources Corporation.

9  
10 **Q. In his testimony, does Mr. Rowell state why he elected to include Artesian Resources**  
11 **in his DCF sample?**

12 A. No. The Direct testimony sponsored by Mr. Rowell makes no mention of Artesian  
13 Resources, and one learns that it has been included in his DCF sample only when referring  
14 to DCF schedules MJR-2, MJR-3, and MJR-4.

15  
16 **Q. Has Staff reviewed the above referenced schedules to determine if Mr. Rowell's**  
17 **inclusion of Artesian Resources in his DCF sample served to benefit his overall DCF**  
18 **results?**

19 A. Yes. Review of Schedule MJR-2 indicates that Artesian Resources is one of six sample  
20 companies having a current dividend yield in excess of four percent (4.05%). Review of  
21 Schedule MJR 3 indicates that Artesian Resources has the second highest dividend growth  
22 rate (9.21%) of all companies in the sample. Finally, review of Schedule MJR-4 indicates  
23 that Artesian Resources is one of five sample companies having a multistage DCF growth  
24 rate in excess of ten percent (10.02%). Based upon this cursory review, it appears that  
25 inclusion of Artesian Water in Mr. Rowell's DCF sample served to benefit his overall  
26 DCF estimate.

1 **Q. For purposes of his CAPM analyses, does Mr. Rowell use the same sample companies**  
2 **in his CAPM sample as he did in his DCF sample?**

3 A. No. Although Mr. Rowell makes a statement to suggest that he does (Rowell Direct at  
4 page 26), there are actually sixteen companies in his CAPM sample - the fifteen  
5 companies included in his DCF sample plus the natural gas company which he had  
6 previously excluded from his comparable earnings sample, AGL Resources.

7  
8 **Q. Does this mean that Mr. Rowell has included both UGI Corporation and AGL**  
9 **Resources in the same sample?**

10 A. Yes. Although Mr. Rowell had previously excluded AGL Resources from his comparable  
11 earnings sample and replaced it with UGI Corporation, he has included both companies in  
12 his CAPM sample. A review of Schedule MJR-6 shows that both are included in the  
13 sample, with AGL Resources having the highest beta coefficient (0.75) of all the natural  
14 gas companies included in the sample.

15  
16 **Q. Does Mr. Rowell provide an explanation as to why he has included AGL Resources**  
17 **in his CAPM sample?**

18 A. No, he does not.

19  
20 **Q. Is it a concern that Mr. Rowell used different companies in his various samples**  
21 **without an adequate explanation?**

22 A. Yes. In this instance, there is no apparent good reason for the variances in the samples  
23 selected.

24

1 **Q. Does Staff have any comments on Mr. Rowell's sole reliance on analysts' forecasts to**  
2 **estimate DPS growth in his constant growth DCF analysis?**

3 A. Yes. Generally, analysts' forecasts are known to be overly optimistic. Sole use of  
4 analysts' forecasts to calculate the expected dividend growth rate, (g), serves to inflate that  
5 component of the DCF model and, consequently, the estimated cost of equity. Also,  
6 exclusive reliance on analysts' forecasts of earnings growth to forecast DPS is  
7 inappropriate because it assumes that investors do not look at other relevant information  
8 such as historical dividend and earnings growth.

9  
10 **Q. How does Staff respond to Mr. Rowell's statement that "the value g in the DCF**  
11 **model is defined as the *expected future growth rate*," and that analysts' forecasts are**  
12 **"the best proxy we have for the expected future growth rate of a given company"?<sup>18</sup>**

13 A. The appropriate growth rate to use in the DCF model is the dividend growth rate expected  
14 by *investors*, not by analysts. Investors are assumed to be rational, and as such will want  
15 to take into consideration all relevant available information prior to making an investment  
16 decision. Therefore, it is reasonable to assume that investors would consider both  
17 historical measures of past growth, as well as analysts' forecasts of future growth.

18  
19 **Q. Does Staff have evidence to support its assertion that exclusive reliance on analysts'**  
20 **forecasts of earnings growth in the DCF model would result in inflated cost of equity**  
21 **estimates?**

22 A. Yes. Experts in the financial community have commented on the optimism in analysts'  
23 forecasts of future earnings.<sup>19</sup> A study cited by David Dreman in his book *Contrarian*

---

<sup>18</sup> Direct testimony of Mr. Matthew J. Rowell, page 19.

<sup>19</sup> See Seigel, Jeremy J. *Stocks for the Long Run*. 2002. McGraw-Hill. New York. p. 100. Dreman, David. *Contrarian Investment Strategies: The Next Generation*. 1998. Simon & Schuster. New York. pp. 97-98. Malkiel, Burton G. *A Random Walk Down Wall Street*. 2003. W.W. Norton & Co. New York. p. 175. Testimony of Professors Myron J. Gordon and Lawrence I. Gould, consultant to the Trial Staff (Common Carrier Bureau), FCC Docket 79-63, p. 95.

1           *Investment Strategies: The Next Generation* found that *Value Line* analysts were  
2           optimistic in their forecasts by 9 percent annually, on average for the 1987 – 1989 period.  
3           Another study conducted by David Dreman found that between 1982 and 1997, analysts  
4           overestimated the growth of earnings of companies in the S&P 500 by 188 percent.

5           Burton Malkiel, of Princeton University, conducted a study of the 1- and 5-year earnings  
6           forecasts made by some of the most respected names in the investment business. His  
7           results showed that when compared with actual earnings growth rates, the 5-year forecasts  
8           made by professional analysts were far less accurate than estimates derived from several  
9           naïve forecasting models, such as the long-run growth rate in national income. In the  
10          following excerpt from his book, *A Random Walk Down Wall Street*, Professor Malkiel  
11          discusses the results of his study:

12                   When confronted with the poor record of their five-year growth  
13                   estimates, *the security analysts honestly, if sheepishly, admitted*  
14                   *that five years ahead is really too far in advance to make reliable*  
15                   *projections.* They protested that although long-term projections  
16                   are admittedly important, they really ought to be judged on their  
17                   ability to project earnings changes one year ahead. Believe it or  
18                   not, it turned out that their one-year forecasts were even worse than  
19                   their five-year projections.

20                   The analysts fought back gamely. They complained that it was  
21                   unfair to judge their performance on a wide cross section of  
22                   industries, because earnings for high-tech firms and various  
23                   “cyclical” companies are notoriously hard to forecast. “*Try us on*  
24                   *utilities,*” *one analyst confidently asserted.* *At the time they were*  
25                   *considered among the most stable group of companies because of*  
26                   *government regulation. So we tried it and they didn’t like it. Even*  
27                   *the forecasts for the stable utilities were far off the mark.*<sup>20</sup>  
28                   (Emphasis added)

29

---

<sup>20</sup> Malkiel, Burton G. *A Random Walk Down Wall Street*. 2003. W.W. Norton & Co. New York. p. 175

1 **Q. Are investors aware of the problems related to analysts' forecasts?**

2 A. Yes. In addition to books, there are numerous published articles appearing in *The Wall*  
3 *Street Journal* and other financial publications that cast doubt on the accuracy of research  
4 analysts' forecasts.<sup>21</sup> Investors, being keenly aware of these inherent biases in forecasts,  
5 will use other methods to assess future growth.

6  
7 **Q. Should DPS growth be considered in a DCF analysis?**

8 A. Yes. As previously stated in section VI of this testimony, the current market price of a  
9 stock is equal to the present value of all expected future dividends, not future earnings.

10 Professor Jeremy Siegel from the Wharton School of Finance stated:

11  
12 Note that the price of the stock is always equal to the present value  
13 of all future *dividends* and not the present value of future earnings.  
14 Earnings not paid to investors can have value only if they are paid  
15 as dividends or other cash disbursements at a later date. Valuing  
16 stock as the present discounted value of future earnings is  
17 manifestly wrong and greatly overstates the value of the firm.<sup>22</sup>  
18

19 For valuation purposes, therefore, earnings paid out in the form of a dividend have  
20 paramount relevancy to investors. Dividends, unlike earnings, can not be manipulated or  
21 overstated. Thus, historical DPS growth should receive appropriate consideration when  
22 estimating the market cost of equity in the DCF model.

23  

---

<sup>21</sup> See Smith, Randall & Craig, Suzanne. "Big Firms Had Research Ploy: Quiet Payments Among Rivals." *The Wall Street Journal*. April 30, 2003. Brown, Ken. "Analysts: Still Coming Up Rosy." *The Wall Street Journal*. January 27, 2003. p. C1. Karmin, Craig. "Profit Forecasts Become Anybody's Guess." *The Wall Street Journal*. January 21, 2003. p. C1. Gasparino, Charles. "Merrill Lynch Investigation Widens." *The Wall Street Journal*. April 11, 2002. p. C4. Elstein, Aaron. "Earnings Estimates Are All Over the Map." *The Wall Street Journal*. August 2, 2001. p. C1. Dreman, David. "Don't Count on those Earnings Forecasts." *Forbes*. January 26, 1998. p. 110.

<sup>22</sup> Siegel, Jeremy J. *Stocks for the Long Run*. 2002. McGraw-Hill. New York. P. 93.

1 **Q. Turning to Mr. Rowell's CAPM analyses, what risk-free rates does Mr. Rowell use in**  
2 **his three CAPM methodology?**

3 A. In his CAPM analyses, Mr. Rowell uses historical risk-free rates ( $R_f$ ) in each of his three  
4 CAPM analyses. The risk-free rates used represent a 32-year average intermediate-term  
5 (8.4%) and long-term (10.2%) U.S. Treasury rate, covering the period January 1, 1980 –  
6 December 31, 2011.

7  
8 **Q. Does Staff agree with Mr. Rowell's use of an historical risk-free interest rate?**

9 A. No. The appropriate risk-free interest rate to be used is the current rate borne by investors  
10 in the market. Use of an historical risk-free rate in the CAPM should be avoided, as it  
11 reflects stale information. Cost of equity has a positive correlation with interest rates both  
12 of which vary over time.

13  
14 **Q. Does Staff have any comment regarding Mr. Rowell's proposed 65-basis point**  
15 **upward small company risk premium?**

16 A. Yes. The Commission previously ruled in Decision No. 64282<sup>23</sup> for Arizona Water that  
17 firm size does not warrant recognition of a risk premium stating, "We do not agree with  
18 the Company's proposal to assign a risk premium to Arizona Water based on its size  
19 relative to other publicly traded water utilities...." The Commission confirmed its  
20 previous ruling in Decision No. 64727<sup>24</sup> for Black Mountain Gas agreeing with Staff that  
21 "the 'firm size phenomenon' does not exist for regulated utilities, and that therefore there  
22 is no need to adjust for risk for small firm size in utility regulation." All companies have  
23 firm-specific risks; therefore, the existence of unique risks for a company does not lead to  
24 the conclusion that its total risk is greater than other entities. Moreover, as previously

---

<sup>23</sup> Dated December 28, 2001.

<sup>24</sup> Dated April 17, 2002.

1           discussed, investors cannot expect compensation for firm-specific risk since it can be  
2           eliminated through diversification.

3

4   **XI. CONCLUSION**

5   **Q. Please summarize Staff's recommendations.**

6   A. Staff recommends that the Commission adopt an 9.3 percent overall rate of return for the  
7       Company based on a capital structure composed of 7.6 percent debt and 92.4 percent  
8       equity, Staff's 9.5 percent cost of equity estimate and 6.3 percent cost of debt.

9

10 **Q. Does this conclude your direct testimony?**

11 A. Yes, it does.

**Ray Water Company Cost of Capital Calculation**  
 Capital Structure  
 And Weighted Average Cost of Capital  
 Staff Recommended and Company Proposed

[A]	[B]	[C]	[D]
<u>Description</u>	<u>Weight (%)</u>	<u>Cost</u>	<u>Weighted Cost</u>
Staff Recommended Structure			
Debt	7.6%	6.3%	0.5%
Common Equity	92.4%	9.4%	8.7%
Weighted Average Cost of Capital			<b>9.2%</b>
Company Proposed Structure			
Debt	7.4%	6.3%	0.5%
Common Equity	92.6%	10.9%	10.1%
Weighted Average Cost of Capital			<b>10.6%</b>

[D] : [B] x [C]

Supporting Schedules: JAC-3 and JAC-4.

Intentionally left blank

Ray Water Company Cost of Capital Calculation  
 Final Cost of Equity Estimates  
 Sample Water Utilities

[A]	[B]	[C]	[D]	[E]
<b>DCF Method</b>		$D_i/P_o$ <sup>1</sup>	+	$\sigma^2$
Constant Growth DCF Estimate		3.3%	+	4.8%
Multi-Stage DCF Estimate				
Average DCF Estimate				<b>8.9%</b>
<b>CAPM Method</b>		$R_f$	+	$\beta^5$
Historical Market Risk Premium <sup>3</sup>	1.3%		+	0.71
Current Market Risk Premium <sup>4</sup>	2.9%		+	0.71
Average CAPM Estimate				
			x	$(R_p)$
			x	7.2% <sup>6</sup>
			x	11.8% <sup>7</sup>
				<b>8.9%</b>
				<b>8.9%</b>
				<b>0.5%</b>
				<b>9.4%</b>
				<b>0.0%</b>
				<b>9.4%</b>

1 MSN Money and Value Line  
 2 Schedule JAC-8  
 3 Risk-free rate (Rf) for 5, 7, and 10 year Treasury rates from the U.S. Treasury Department at www.ustreas.gov  
 4 Risk-free rate (Rf) for 30 Year Treasury bond rate from the U.S. Treasury Department at www.ustreas.gov  
 5 Value Line  
 6 Historical Market Risk Premium (Rp) calculated from Ibbotson Associates S&P 2011 Yearbook data  
 7 Testimony

Ray Water Company Cost of Capital Calculation  
Average Capital Structure of Sample Water Utilities

[A] <u>Company</u>	[B] <u>Debt</u>	[C] <u>Common Equity</u>	[D] <u>Total</u>
American States Water	46.0%	54.0%	100.0%
California Water	53.3%	46.7%	100.0%
Aqua America	53.9%	46.1%	100.0%
Connecticut Water	57.1%	42.9%	100.0%
Middlesex Water	43.3%	56.7%	100.0%
SJW Corp	<u>55.7%</u>	<u>44.3%</u>	<u>100.0%</u>
Average Sample Water Utilities	<b>51.6%</b>	<b>48.4%</b>	<b>100.0%</b>
AWC - Actual Capital Structure	<b>7.6%</b>	<b>92.4%</b>	<b>100.0%</b>

Source:

Sample Water Companies from Value Line

Ray Water Company Cost of Capital Calculation  
Growth in Earnings and Dividends  
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]
Company	Dividends Per Share 2002 to 2011 <u>DPS<sup>1</sup></u>	Dividends Per Share Projected <u>DPS<sup>1</sup></u>	Earnings Per Share 2002 to 2011 <u>EPS<sup>1,2</sup></u>	Earnings Per Share Projected <u>EPS<sup>1</sup></u>
American States Water	2.4%	7.8%	5.1%	4.7%
California Water	1.0%	3.0%	6.2%	8.6%
Aqua America	7.7%	4.9%	7.3%	5.6%
Connecticut Water	1.6%	No Projection	0.4%	No Projection
Middlesex Water	1.6%	1.8%	2.4%	8.3%
SJW Corp	<u>4.8%</u>	<u>3.0%</u>	<u>3.7%</u>	<u>4.0%</u>
Average Sample Water Utilities	<b>3.2%</b>	<b>4.1%</b>	<b>4.2%</b>	<b>6.2%</b>

<sup>1</sup> Value Line

<sup>2</sup> Negative values are inconsistent with the DCF, accordingly, they are excluded from the average.

Ray Water Company Cost of Capital Calculation  
Sustainable Growth  
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]
Company	Retention Growth 2002 to 2011 <u>br</u>	Retention Growth Projected <u>br</u>	Stock Financing Growth <u>vs</u>	Sustainable Growth 2002 to 2011 <u>br + vs</u>	Sustainable Growth Projected <u>br + vs</u>
American States Water	3.6%	5.3%	2.2%	5.8%	7.5%
California Water	2.2%	4.8%	2.1%	4.3%	6.9%
Aqua America	4.4%	5.2%	2.2%	6.7%	7.5%
Connecticut Water	2.2%	No Projection	1.0%	3.2%	No Projection
Middlesex Water	1.3%	3.3%	3.5%	4.9%	6.8%
SJW Corp	<u>3.7%</u>	<u>2.9%</u>	<u>0.1%</u>	<u>3.8%</u>	<u>3.0%</u>
Average Sample Water Utilities	<b>2.9%</b>	<b>4.3%</b>	<b>1.9%</b>	<b>4.8%</b>	<b>6.3%</b>

[B]: Value Line  
[C]: Value Line  
[D]: Value Line and MSN Money  
[E]: [B]+[D]  
[F]: [C]+[D]

Ray Water Company Cost of Capital Calculation  
 Selected Financial Data of Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]	[G]
Company	Symbol	Spot Price 10/24/2012	Book Value	Mkt To Book	Value Line Beta $\beta$	Raw Beta $\beta_{raw}$
American States Water	AWR	43.70	22.03	2.0	0.70	0.52
California Water	CWT	18.33	11.29	1.6	0.65	0.45
Aqua America	WTR	24.82	9.39	2.6	0.60	0.37
Connecticut Water	CTWS	30.27	13.59	2.2	0.75	0.60
Middlesex Water	MSEX	18.88	11.86	1.6	0.70	0.52
SJW Corp	SJW	23.50	15.21	1.5	0.85	0.75
Average				1.9	0.71	0.53

[C]: Msn Money

[D]: Value Line

[E]: [C] / [D]

[F]: Value Line

[G]: (-0.35 + [F]) / 0.67

Ray Water Company Cost of Capital Calculation  
 Calculation of Expected Infinite Annual Growth in Dividends  
 Sample Water Utilities

[A]	[B]
<u>Description</u>	<u>g</u>
DPS Growth - Historical <sup>1</sup>	3.2%
DPS Growth - Projected <sup>1</sup>	4.1%
EPS Growth - Historical <sup>1</sup>	4.2%
EPS Growth - Projected <sup>1</sup>	6.2%
Sustainable Growth - Historical <sup>2</sup>	4.8%
<u>Sustainable Growth - Projected<sup>2</sup></u>	<u>6.3%</u>
Average	<b>4.8%</b>

<sup>1</sup> Schedule JAC-5

<sup>2</sup> Schedule JAC-6

Ray Water Company Cost of Capital Calculation  
 Multi-Stage DCF Estimates  
 Sample Water Utilities

[A] Company	[B] Current Mkt. Price (P <sub>0</sub> ) <sup>1</sup> 10/24/2012	[C] d <sub>1</sub>	[D] d <sub>2</sub>	[E] d <sub>3</sub>	[F] d <sub>4</sub>	[H] Stage 2 growth <sup>3</sup> (g <sub>n</sub> )	[I] Equity Cost Estimate (K) <sup>4</sup>
		Projected Dividends <sup>2</sup> (Stage 1 growth) (D <sub>t</sub> )					
American States Water	43.7	1.30	1.37	1.43	1.50	6.5%	9.4%
California Water	18.3	0.66	0.69	0.73	0.76	6.5%	10.0%
Aqua America	24.8	0.67	0.70	0.73	0.77	6.5%	9.1%
Connecticut Water	30.3	0.98	1.03	1.08	1.13	6.5%	9.6%
Middlesex Water	18.9	0.75	0.78	0.82	0.86	6.5%	10.3%
SJW Corp	23.5	0.74	0.78	0.82	0.86	6.5%	9.5%

Average 9.7%

$$P_0 = \sum_{t=1}^n \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K - g_n} \left[ \frac{1}{(1+K)} \right]^n$$

Where : P<sub>0</sub> = current stock price  
 D<sub>t</sub> = dividends expected during stage 1  
 K = cost of equity  
 n = years of non - constant growth  
 D<sub>n</sub> = dividend expected in year n  
 g<sub>n</sub> = constant rate of growth expected after year n

1 [B] see Schedule JAC-7  
 2 Derived from Value Line Information  
 3 Average annual growth in GDP 1929 - 2011 in current dollars.  
 4 Internal Rate of Return of Projected Dividends

<b>Ray Water Company Cost of Capital Calculation</b>					
<b>Capitalization</b>					
	<u>Interest Rate</u>	<u>Annual Interest</u>	<u>Amount outstanding</u>	<u>as of 12/31/2011</u>	<u>Percentage of</u>
					<u>Capital Structure</u>
Long-Term Debt	6.25%	5,459		87,346	
		\$ -			
		\$ -			
<b>Long-Term Debt</b>		5,459	\$	87,346	7.61%
<b>Short-Term Debt</b>		-	\$	-	0.00%
<b>Total Debt</b>	6.25%	\$ 5,459	\$	87,346.00	7.61%
Common Equity					
Common Shares Outstanding					
Paid in Capital					
Retained Earnings					
<b>Total Common Equity</b>			\$	1,059,748	92.39%
<b>Total Capitalization</b>			\$	1,147,094	100.00%

**Staff Restatement of Matthew J. Rowell Schedule MJR-1  
Calculation of Comparable Earnings ROE**

		Fiscal Year 2011					
Sample Companies		[A]	[B]	[C]	[D]	[E]	
		Net Income	Common Equity	Realized ROE	Equity Weight	Weighted ROE	
1	American States Water	AWR	\$ 45,859	\$ 408,666	11.22%	3.63%	0.41%
2	Aqua America	WTR	143,069	1,251,313	11.43%	11.11%	1.27%
3	California Water	CWT	37,712	449,829	8.38%	3.99%	0.33%
4	Connecticut Water	CTWS	11,262	118,189	9.53%	1.05%	0.10%
5	Middlesex Water	MSEX	13,241	176,981	7.48%	1.57%	0.12%
6	SJW Corp	SJW	20,878	264,004	7.91%	2.34%	0.19%
7	York Water Co.	YORW	9,084	95,265	9.54%	0.85%	0.08%
8	Atmos Energy Corp	ATO	207,601	2,255,421	9.20%	20.03%	1.84%
9	Laclede Group, inc.	LG	63,825	573,331	11.13%	5.09%	0.57%
10	New jersey Resources Corporation	NJR	101,299	776,257	13.05%	6.89%	0.90%
11	Northwest Natural Gas Co.	NWN	63,898	714,488	8.94%	6.34%	0.57%
12	Piedmont Natural Gas Company	PNY	113,568	996,923	11.39%	8.85%	1.01%
13	UGI CORP	UGI	232,900	1,977,700	11.78%	17.56%	2.07%
14	WGL Holdings, inc	WGL	117,050	1,202,715	9.73%	10.68%	1.04%
15							
16	Sample Total Common Equity			\$ 11,261,082		100.00%	
17							
18	Sample Weighted Average ROE						<u>10.49%</u>
19							
20							
21							
22							
23							
24							
25							
26							

  

<b>Relative Weightings: Water Sample</b>	24.55%
<b>Gas Sample</b>	75.45%

  

<b>Average Realized ROE: Water Sample</b>	9.36%
<b>Gas Sample</b>	10.75%

**Key:**

- [A]: Net Income (Source: SEC Form 10-K, Income Statement, Fiscal Year 2011)
- [B]: Common Equity (Source: SEC Form 10-K, Balance Sheet, for period ending Fiscal Year 2011)
- [C]: [A]/[B]
- [D]: [B]/Sample Total Common Equity
- [E]: [C]\*[D]

Note: Differences between the 10.49% sample weighted average ROE above and the 10.47% weighted ROE, as shown in Schedule MJR-1, are attributable to Mr. Rowell basing his calculations on Total Equity, not Common Equity.