BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES
OFFICE OF ADMINISTRATIVE LAW

IN THE MATTER OF THE PETITION OF	**:**
NEW JERSEY-AMERICAN WATER COMPANY,	**:**
INC. FOR APPROVAL OF INCREASED TARIFF	**:**
RATES AND CHARGES FOR WATER AND	**: BPU Docket No. WR17090985**
WASTEWATER SERVICE, CHANGE IN	**: OAL Docket No. PUC14251-2017S**
DEPRECIATION AND OTHER	**:**
TARIFF MODIFICATIONS	**:**

DIRECT TESTIMONY OF

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On Behalf of the
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I. INTRODUCTION

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

A. My name is Dr. Marlon F. Griffing. I am a Senior Consultant with the economic consulting firm of PCMG & Associates Inc. ("PCMG"). My business address is 22 Brookes Drive, Gaithersburg, MD 20785.

Q. Please describe PCMG.

A. PCMG was founded in 2015 to conduct research on a consulting basis into the rates, revenues, costs and economic performance of regulated firms and industries. The firm has a professional staff of five economists, accountants, engineers and cost analysts. Most of its work involves the development, preparation, and presentation of expert witness testimony before federal and state regulatory agencies.

Q. Have you prepared a summary of your qualifications and experience?

A. Yes. Exhibit MFG-1 is a summary of my qualifications, experience, and testimony given before state regulatory agencies regarding cost of capital.

Q. For whom are you appearing in this proceeding before the New Jersey Board of Public Utilities ("the Board")?

A. I am appearing on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel").

Q. What are your responsibilities in this Board proceeding?

A. My responsibility is to determine a fair rate of return on common equity capital and a fair overall rate of return for the water and wastewater service company New Jersey-American Water Co., Inc. ("NJAWC" or "the Company"). NJAWC is a wholly owned subsidiary of American Water Works Company, Inc. ("AWW") (See NJAWC Exhibit PT-16, Page 3, lines 14-16). NJAWC is one of several water and wastewater service providers owned by AWW that are reported as part of its regulated businesses. These subsidiaries are generally subject to rate regulation by state utility commissions. See Exhibit MFG-2, pages 1-2 (American Water Works 2017 10K, pages 4-5).

Q. How do you address recommended rates for the Company?

A. To arrive at a recommended overall rate of return, I analyze the Company's capital structure and the costs for each component of that structure.

Q. How is your testimony organized?

A. My testimony is organized as follows.

- First, I discuss economic considerations and legal precedents underlying the cost of equity in regulatory proceedings.
- Second, I explain how I selected the members of the Comparison Group of companies used in my analysis.
- Third, I provide an overview of the Discounted Cash Flow (DCF) analysis.
- Fourth, I perform a DCF return on equity (ROE) analysis for the

Comparison Group, check it for reasonableness, and recommend a return on equity (ROE) for the Company.

- Fifth, I recommend a capital structure and overall rate of return (ROR) for the Company.
- Sixth, I critique the Company's rate of return analysis.
- Seventh, I summarize my testimony and recommendations.

Q. Please state your conclusions regarding the Company's ROE and ROR.

A. I recommend an ROE of 9.50 percent for the Company. When this number is included in the calculation of the ROR, the result is a weighted-average cost of capital of 7.41 percent for NJAWC.

II. THE COST OF EQUITY IN THE REGULATORY ENVIRONMENT

1. The Role of Economic Theory

Q. What is the basis in economic theory for regulating certain industries?

A. According to economic theory, the forces of supply and demand interacting in a competitive environment produce an allocation of resources that yields an optimal mix of goods and services. Firms and individuals maximize profits and satisfaction given the prices and incomes that the interplay of market forces generates. One description for this outcome is that it is economically efficient. Put simply, there is no better output of goods and services that can be produced with the available resources.

Q. Does the economically efficient outcome occur in all industries?

A. No, several conditions must be present, including many buyers and sellers, perfect information about prices, identical products, and so forth. If these conditions exist, then price is the only way for providers of goods and services to compete in markets. If the conditions for competition do not exist, however, then letting supply and demand work unfettered will not produce the socially desired efficient outcome.

Q. What condition for competition is missing in the water and wastewater industry?

A. The water and wastewater industry does not have several sellers. The large size of water and wastewater distribution systems[1] required to provide the product means that local distribution companies have high fixed costs. Consequently, it is difficult for firms to enter the market, resulting in less competition than would be the case if fixed costs were lower. High fixed costs in this context are known as a "barrier to entry."

Q. Are there legal obstacles to competition in public utility markets?

A. Even if a firm is willing and able to raise the capital needed to be a viable water company, state and local governments typically have permitting processes that govern where and when utilities can build facilities. Thus,

[1] The water utilities included in ROE analysis in this testimony have both water and wastewater operations. However, water distribution accounts for the greatest share of these companies' earnings. Hereafter, I will refer to NJAWC and the other companies as "water" companies.

high start-up costs are not the only barrier that must be overcome.

Q. What is a declining-cost industry?

A. A declining-cost industry is one where the average cost of service declines over the range of effective demand.

Q. Are public utilities declining-cost industries?

A. Yes. With their high fixed costs, public utilities have high initial average costs, but as their sales increase, the average cost drops. This fact alone does not make public utilities declining-cost industries. In most industries, average costs fall as sales increase from low volumes. It is also true, however, in most industries, that average costs turn upward at sales volumes that are much less than the total demand for the product. Consequently, a few to many firms can share the market. What sets public utilities, such as water distribution companies, apart from most industries is that their average costs continue to decline over very high volumes of sales--up to and beyond total, or effective, market demand. Thus, the firm with the largest market share has an increasing advantage over competitors. In effect, there is not enough room in the market for another distributor. The logical result is a market with one producer—often referred to as a natural monopoly—not the many firms envisioned in the theory of competition.

Q. How has society responded to the absence of competition in public utility markets?

A. Since sufficient competition does not exist in the markets for public utilities to ensure low prices and adequate service, society has typically turned to regulation to achieve these goals. Government regulators of utilities generally are charged with pursuing an outcome that approximates the efficient outcome of the competitive model. Regulation thus is viewed as a way to decrease prices and increase services provided by a natural monopoly. A challenge for regulators is to set policies which ensure that the regulated firm provides an appropriate supply of services at reasonable rates. A reasonable rate enables a public utility not only to recover its operating expenses, depreciation, and taxes, but also to compete for funds in capital markets.

2. Standards for Finding a Fair Rate of Return

Q. Do standards exist for determining a fair rate of return?

A. Yes. Two United States Supreme Court (Court) cases are the basis for rate of return regulation in the United States. They are the *Bluefield Water Works (Bluefield)*[2] and the *Hope Natural Gas (Hope)*[3] cases. In *Hope*, the Court established the following standards for the return on equity that must be allowed a regulated public utility to provide for a "reasonable return":

> . . . the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return,

[2] *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia,* 262 U.S. 679 (1923).

[3] *Federal Power Commission v. Hope Natural Gas Co.,* 320 U.S. 591 (1944).

> moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[4]

It can be seen from this excerpt that there are essentially three standards for determining an appropriate return on equity from the standpoint of the equity owners of a regulated utility. The first is the "comparable earnings" standard; i.e., that the earnings must be "commensurate with the returns on investments in other enterprises having corresponding risks." The second is that earnings must be sufficient to assure "confidence in the financial integrity of the enterprise," and the third is that they must allow the utility to attract capital.

Q. How can the comparable earnings standard be applied in estimating the rate of return on equity capital?

A. There is circularity to the comparable earnings standard because the competitive nature of the capital markets virtually ensures that the returns to all enterprises having corresponding risks are comparable with each other. Investors establish the price of each traded stock based on that stock's present and prospective earnings in comparison with the present and prospective earnings of all other stocks and other investments available to them. If the earnings of a firm are depressed, then investors will pay only a low price for that firm's stock. As a result, the return on the market value of that stock will be comparable to the return on the market value of the stock of other

[4] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603, 64 S.Ct. 281, 88 L.Ed. 333 (1944).

companies that are highly profitable but which, as a consequence of their profitability, have been bid up to a very high price. Thus, if "return" is defined as the earnings of an equity investment relative to its current market price, then the comparable earnings test becomes a nullity: All returns are comparable with all other returns.

Q. How is this circularity typically resolved in public utility regulation?

A. In public utility regulation, the conventional procedure for resolving this circularity is to identify the required equity return based on the market value of a utility's stock. That return is combined with the cost of debt, and the blended return to total capital is then applied to a rate base reflective of the book value of the utility's investment. The book value is the accountant's quantification of the depreciated original cost of the utility's assets adjusted for ratepayer contributions such as deposits and deferred taxes. Under this procedure, the market price of a stock is used only to determine the return that investors expect from that stock. That expectation is then applied to the book value of the utility's investment to identify the level of earnings that regulation will allow the utility's common shareholders to recover.

Q. How can the financial integrity and capital attraction standards enunciated in *Hope* be applied in estimating the rate of return on equity capital?

A. If a utility can earn a return on its investment comparable to that required by enterprises of comparable risk, then it should have no difficulty in attracting

capital and maintaining credit. Investors would have no reason to shun such a utility in favor of other investment opportunities. Thus, if the comparable earnings test is met, then the financial integrity and capital attraction standards are met as well.

Q. What is risk?

A. Risk is the chance of a loss or less-than-expected return on an investment. A business, for example, may introduce a new product with the expectation that it will sell well. There is, of course, no guarantee that consumers will take to the product. The risk investors attach to the company varies inversely with their view as to the probability of the product doing well. In general, the greater the risk of an investment, the greater the return required to attract investors, and vice versa.

Q. Does setting an allowed rate of return mean that the utility will earn that return?

A. No. There is no guarantee that the utility will earn the allowed rate of return. The utility has the reasonable *opportunity* to earn the allowed rate of return; in practice the utility may earn more or less than this return, depending on whether and how its management responds to technological and market developments, among other matters.

Q. What should the Board consider in setting an appropriate rate of return?

A. The Board should look to current market conditions as it balances investor and

consumer interests. The rate of return should reflect the condition of the capital markets in which NJAWC must compete with other firms for funding. Historically allowed rates and historical performances are not appropriate inputs in this forward-looking approach. This statement does not mean that historical rates and performance are irrelevant. They are factors because they affect investors' views of a company's prospects and, therefore, the investors' willingness to purchase its common-equity shares.

Q. Please explain how the methods you have used to determine the cost of common equity capital for the Company reflect current market conditions.

A. I used a market-oriented approach to determine the common-equity cost for the Company. I analyzed the equity return that investors currently expect to receive from investing in companies with risks similar to the Company. Many factors influence these investor expectations, among them: past performance of the companies, estimates of how the companies will perform in the future, possible technological change, tax rates, and predicted general economic conditions. As investors decide where to place their funds among the investment options available to them, they weigh the information they have. Then they decide how to pay to acquire common-equity shares, or to turn to the other side of the question, what price will lead them to sell the shares. Either way, the factors are reflected in current prices in capital markets. Thus, my analysis is forward-looking because it relies on investors' current assessment of what is likely to happen with their investments.

Q. What is the role of opportunity costs in your analysis?

A. An opportunity cost is the value of the next best choice forgone as the result of making a decision. Opportunity costs are central to my analysis. As investors decide where to place their assets, they have many opportunities from which to choose in the financial markets. Economic theory says they will choose the opportunity they think will provide them the best return, taking into account the level of risk with which they are comfortable. Thus, for NJAWC to attract capital, the Company's forward-looking fair rate of return must at least equal the rate of return for the best alternative opportunity with similar risk.

Q. How do you know what equity rate of return the Company must offer to investors to be an attractive opportunity?

A. No one knows with certainty what specific rate of return the Company must offer to investors that is just sufficient to make the Company an attractive opportunity. However, various methods based on finance theory have been derived for reliably estimating what investors currently think that rate is. I have used the Discounted Cash Flow (DCF) method, which is widely used in utility general rate cases, and is a method relied on by the NJBPU in determining rate of return. I use other methods and recently authorized returns for other water distribution operating companies as checks on the reasonableness of the DCF outcome.

Q. Please summarize the DCF method.

A. The DCF method uses the current dividend yield and the expected growth rate of this yield to determine a required rate of return on an investment opportunity. The required rate of return from a DCF analysis is derived from a formula for determining the net present value, or price, of a share of stock. There are variations of the DCF, but the constant-growth form I have selected assumes that dividends (D) are received at the end of each year, the annual growth rate of dividends (g) is constant to infinity, and the discount rate for dividends (k) is constant to infinity. The equation form of this constant-growth DCF model is:

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

Where:

- D_1 is the annual dividend one year from the present,
- P_0 is the current price of a stock share,
- g is the expected growth rate of the dividend, and
- k is the discount rate and also the fair rate of return for equity.

Q. What information is used to develop values for the various terms in the DCF equation?

A. The annual dividend one year from now is derived by applying the growth-rate estimate (g) to the actual current annual dividend (D_0).

Q. Does your equity rate of return analysis use information specific to the NJAWC?

A. No. As noted NJAWC is a wholly owned subsidiary of AWW. The Company is not publicly traded and, therefore, no common-equity share price information is available for performing a direct DCF analysis on the Company.

Q. Does your equity rate of return analysis use information for AWW?

A. Yes. AWW has a credit rating of "A" from Standard & Poor's ("S&P") that reflects that agency's evaluation of the risk for AWW as a U.S.-based water utility. NJAWC also has an "A" credit rating from S&P, as does American Water Capital Corporation ("AWCC"). See Exhibit MFG-3, Pages 1-3. AWCC is a subsidiary of AWW that issues some of the debt for NJAWC. See MFG-4, pages 1-3 (NJAWC Response to Data Request RCR-ROE-3). The identical credit ratings serve as one criterion for selecting water utilities that are similar in risk to NJAWC.

Q. Does your equity rate of return analysis use results from AWW?

A. The answer is a qualified "Yes." AWW does trade publicly and has a positive record of making dividend payments, so it can be part of a DCF ROE analysis. However, I prefer not to use a company under analysis or its parent company as a member of the Comparison Group for the company under analysis. If the company is included, it introduces circularity into the analysis. Nevertheless, I do include AWW in my analysis because there are only eight water distribution companies that qualify for the Comparison

Group. The AWW data point provides additional information for the small sample of companies. Therefore, I conduct analysis with AWW as a member of the Comparison Group and with AWW excluded from the Comparison Group, reporting both ROE outcomes.

Q. How do you use the DCF analysis to estimate the Company's required rate of return?

A. I perform DCF analysis on a group of water distribution utilities comparable to AWW whose members are publicly traded and have similar investment risk, as discussed below. The returns on equity for members of this group form the basis for my estimate of a fair rate of return for the Company.

III. SELECTING THE COMPARISON GROUP

Q. Please discuss your choice of the Comparison Group.

A. I set out to find a group of companies that are, from the perspective of investors, similar to the Company. Thus, I wanted firms that are water utilities that represent approximately the same investment risk as does the Company.

Q. Please describe how you found suitable candidate companies for the Comparison Group.

A. I looked at Value Line, a widely used investor service, for companies that Value Line classifies as part of the Water Utility Industry. The January 12,

2018 edition of Value Line's *Investment Survey*[5] includes 11 companies in this category. See Exhibit MFG-5.

Q. How did you use this information in your selection process?

A. I applied screens to the initial set of Value Line Water Utility companies to ensure that the companies included in my Comparison Group were similar in risk to the risk of the Company.

Q. Please list the criteria you applied in the selection of the Comparison Group.

A. I applied the following screens to the initial set of Water Utility companies:

1. U.S.-based firm;
2. shares publicly traded on a stock exchange;
3. have a record of paying dividends for three years without skipping or reducing the dividend amount;
4. not expected to sell, merge into or be acquired by another company, or be engaged in an unusual regulatory proceeding;
5. S&P investment-grade credit rating: BBB- and better;
6. have positive growth-rate projections from expert analysts; and
7. more than 70 percent of the three-year average of operating revenues, operating income or net income be derived from regulated water utility operations.

[5] The edition with the Water Supply Industry is published every 13 weeks.

Q. What is the purpose of applying the criterion that the companies be based in the United States?

A. I sought companies that face a business environment similar to that in which the Company operates. The Company's operating utility in this case is in New Jersey and subject to state regulation, statutes, and rules that are similar to those in the rest of the United States. Consolidated Water, which operates in the Caribbean area, is excluded for this reason. See Exhibit MFG-5.

Q. What purpose is served by requiring that the companies be publicly traded?

A. The primary analytical tool that I use for finding a company's ROE, the DCF model, requires information about common equity share prices, dividends, and growth-rate projections. The requirement that companies be publicly traded ensures that their common-equity share prices are available. All companies in the Value Line Water Utilities Industry list are publicly traded. See Exhibit MFG-5.

Q. What purpose is served by requiring that the companies have a record of paying dividends for three years?

A. The DCF model requires dividends as an input. If a company is not paying dividends or has a record of cutting dividends, then its DCF analysis is not reliable. Global Water Resources has not been paying dividends for the required three years and, therefore, is eliminated from consideration for the

Comparison Group. See Exhibit MFG-5.

Q. Why is it important that companies involved in sales, mergers, or acquisitions, be excluded from your analysis?

A. The share prices of companies involved in sales, mergers or acquisitions can be volatile. Extreme increases in the share prices of distribution companies that are part of sales, mergers, or acquisitions drive down the ROE results in DCF analysis, while extreme decreases in the share prices drive up the ROE results. Neither outcome yields meaningful DCF results. Therefore, it is appropriate to exclude such companies from the analysis.

Q. Are any companies in the initial set involved in sales, mergers, or acquisitions?

A. Yes. SJW Group and Connecticut Water Services announced March 14, 2018 that they plan to merge. See Exhibit MFG-6.

Q. Have you eliminated SJW Group and Connecticut Water Services from the Comparison Group?

A. No. The number of companies in the Value Line Water Utilities Industry is small. Therefore, I continued to collect information for SJW Group and Connecticut Water Services. Just as I did for AWW, I conducted separate ROE analyses with and without the two companies.

Q. What is the purpose of using the S&P credit rating as a screen?

A. S&P's experts incorporate financial risk and business risk into a firm's credit rating. Within these risk categories, S&P assesses such factors for public utilities as competitive advantage, operating efficiency, and scale, scope, and diversity. This last set of factors includes the effects of a utility's markets, service territories, and customer diversity on the company's cash-flow stability, and in turn on its risk level. After considering all the factors, S&P assigns a credit rating to a company. If companies have identical or similar credit ratings as determined by expert analysts, then their relative risks are similar. As S&P states:

> Creditworthiness is a multi-faceted phenomenon. Although there is no "formula" for combining the various facets, our credit ratings attempt to condense their combined effects into rating symbols along a simple, one-dimensional scale. Indeed, as discussed below, the relative importance of the various factors may change in different situations. [6]

Q. What S&P credit rating do you use as the basis of your screen?

A. As noted previously, NJAWC, AWW, and AWCC all have an S&P A credit rating. Therefore, I use that credit rating as the basis for my screen.

[6] *General Criteria: Understanding Standard & Poor's Rating Definitions*, second paragraph of "Key Attributes of Standard & Poor's Credit Ratings."
Available at the Standard & Poor's website:
https://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/5435305
Accessing the publication may require free registration.

Q. What credit rating do you use for the other companies from the Value Line Water Utilities Industry list?

A. Most parent companies have an S&P credit rating, but some parent companies carry out borrowing through subsidiary operating companies. In some of these cases, the parent company does not have an S&P credit rating, but S&P assigns a credit rating to the operating company. In those cases, I use the operating company's credit rating as the surrogate credit rating for the parent company. Three of the Value Line Water Utilities companies do not have S&P credit ratings but have subsidiaries that do. The companies are: Aqua America (Aqua Pennsylvania), California Water (California Water Service Company), and SJW Group (San Jose Water Company). See Exhibit MFG-7.

Q. As you apply your credit-rating screen, do you require that water companies have S&P ratings identical to the rating that is the basis of your screen?

A. No. In my application of the screen I balance the goal of having companies with risk similar to that of the operating company with the goal of having a reasonable number of companies in the Comparison Group. In the instant analysis, eight companies have S&P credit ratings, which range from A- to A+, one notch either side of NJAWC's A rating. Artesian Resources Corporation and Consolidated Water do not have S&P credit ratings. See Exhibit MFG-7.

Q. What is the result of applying your credit-rating screen?

A. Artesian Resources Corporation and Consolidated Water are excluded from the Comparison Group because they do not have S&P credit ratings. The remaining eight companies are clustered tightly around NJAWC's A rating and continue to be considered for inclusion.

Q. You require that water utilities have positive growth-rate projections to be included in the Comparison Group. What purpose does this screen serve?

A. If the growth-rate projections are negative or missing, then any DCF analysis performed on them is not meaningful. Value Line ratings are not available for Artesian Water Resources, Consolidated Water, and Global Water Resources, so they would be eliminated if they had not already been excluded for not meeting other criteria. See Exhibit MFG-5.

Q. Finally, you require that more than 70 percent of a company's three-year average of operating revenues, operating income or net income be derived from regulated water utility operations to be included in the Comparison Group. Please explain the purpose of this criterion.

A. For the firms to have similar risks, they must operate in similar business environments. The Company is predominantly a regulated water utility operation, so the firms considered for the Comparison Group also must have predominantly regulated operations. This criterion ensures that most of the Comparison Group firms' operations are in the same environment as that of

the Company.

Q. What is the outcome of your application of this screen?

A. All the remaining companies meet this screen. See Exhibit MFG-8. The lowest percentage is American States Water's three-year average of 70.2 percent for its regulated water operations as a percentage of operating income. Therefore, all the companies' earnings are dominated by their regulated water operations.

Q. Please describe the Comparison Group after your screening.

A. The full Comparison Group is composed of eight Water Utility firms. They are: American States Water, American Water Works, Aqua America, California Water, Connecticut Water Services, Middlesex Water, SJW Group, and The York Water Company. As noted above, I also perform ROE analyses on the group without Connecticut Water Services and SJW Group, and without American Water Works.

IV. DCF OVERVIEW

Q. What is the purpose of a DCF analysis?

A. The goal of this analysis is to estimate an appropriate, forward-looking rate of return on equity. A DCF analysis requires a determination of expected growth rates and dividend yields in order to estimate this return.

Q. Please discuss expected growth rates.

A. Because a DCF analysis is forward-looking, I want to estimate the expected growth rate of dividends. Historical growth rates would be good indicators of the expected growth rate if:

- the dividend payout ratio and the realized rate of return on equity capital were constant in the past and could be assumed to remain constant in the future; and
- any growth in book equity was attributable solely to retained earnings.

If, in practice, these conditions held, then earnings per share (EPS), dividends per share (DPS), and book value per share (BPS) would all grow at the same rate, and the past growth rates for these factors would be the rate at which they would grow in the future.

Q. Do you use historical growth rates in your analysis?

A. No. The conditions necessary for historical growth rates to be good indicators of future growth rates are rarely satisfied. Most utilities' returns on equity and payout ratios have not remained constant over time. Further, growth in book value has occurred not only due to retained earnings, but also due to the issuance of new shares of common stock. Consequently, past growth rates of earnings, dividends, and book equity are frequently unequal. Moreover, an industry may face a changed business environment, thereby making the past a poor basis for projecting the future. Historical growth rates can differ

significantly from forward-looking projected growth rates due to such factors as inflation rates, tax rates, the role of an industry in the economy, and the regulatory environment. In view of these limitations of using historical growth rates, I base my estimated growth rates on projected growth rates as publicly provided by "Zacks Investment Research," a respected investor services company, Yahoo! Finance, and the Value Line "Investment Survey."

Q. Please discuss the dividend yields used in your DCF analysis.

A. To estimate the required rate of return on equity capital today, I estimate the expected dividend yield, D_1/P_0 where P_0 is the price of a share of common equity today and D_1 is the dividend in the next period. The use of this dividend yield assumes that dividends are distributed at the end of each period (year). This version is known as the constant-growth DCF model. Since the current equity price per share incorporates all market information considered relevant by investors, generally speaking, non-recent historical prices should be avoided in calculating the dividend yield. However, since share prices are volatile in the short run, it is desirable to use a period of time long enough to avoid short-term aberrations in the capital market.

Q. What period do you use to establish average common equity share prices for the companies in the Comparison Group?

A. I use the trading period of March 5-30, 2018 to find average common equity share prices. This four-week period is long enough to dampen any short-term aberrations in the capital market. It is also close to the April 13, 2018 date of

this Testimony, thus making the results timely. I used closing prices for the Comparison Group member companies obtained at Yahoo! Finance. See Exhibit MFG-9, pages 1-2. The markets were closed for one trading day, on March 30, 2018, for the Good Friday holiday.

Q. You have used a month or five weeks of trading days to establish average common equity share prices in previous testimony before the BPU. Please explain why you have selected four weeks in this case.

A. Four weeks is my default period. I choose one of the longer periods if there is more than one day in the period when the equity markets are closed.

V. DCF ANALYSIS FOR THE COMPARISON GROUP

Q. Please discuss the required rate of return for the Comparison Group.

A. To estimate the required rate of return for the group, I estimate the expected growth rate, g, and the expected dividend yield, D_1/P_0.

Q. Please discuss the expected growth rate for the Comparison Group.

A. As noted above, it is appropriate in this proceeding to use only the forecasted growth rates to estimate the expected growth rate to be used in the DCF analysis. Zacks and Yahoo! Finance provide five-year growth-rate projections for EPS and Value Line provides five-year growth rate projections for EPS, DPS, and BPS. To maintain consistency across the sources, I used only the EPS estimates from Value Line.

Q. What information did you use from Zacks?

A. I used the Zacks EPS five-year growth projections available March 14, 2018 for the individual firms in the Comparison Group. See MFG Workpapers. pages 1-8.

Q. What information did you use from Yahoo! Finance?

A. I used the Yahoo! Finance EPS five-year growth projections available March 14, 2018 for the individual firms in the Comparison Group. See MFG Workpapers. pages 9-24.

Q. What information did you use from Value Line?

A. I used the Value Line EPS five-year growth projections for the individual firms in the Comparison Group as reported by Value Line in its January 12, 2018 issue. See MFG Workpapers. pages 25-32.

Q. How do you combine the Zacks, Yahoo! Finance, and Value Line estimates?

A. I weighted the Zacks, Yahoo! Finance, and Value Line EPS values equally to find my best estimate of the expected growth rate for each company in the Comparison Group.

Q. Please discuss your calculation of the expected dividend yield for the Comparison Group.

A. The appropriate dividend to use in the constant-growth DCF model is the annual dividend rate at the beginning of the next period (year). I begin my estimation of the expected dividend yield by finding the dividends that each Comparison Group member company is currently paying as reported by Value Line in its January 12, 2018 and by Zacks on March 14, 2018. I multiply the Value Line dividends by four to calculate the annualized dividend one year from now, whereas the Zacks dividends reported are for one year. See Exhibit MFG-10. I use the greater of these two options in my DCF analysis. See Exhibit MFG-11, Schedule 1. The dividends from the two sources are the same for American States Water, American Water Works, Aqua America, Connecticut Water Services, and York Water. The Value Line dividend for Middlesex Water is higher than the Zacks dividend, while the Zacks dividend is greater than the Value Line dividend for California Water and SJW Group.

Q. Please continue.

A. Next, I adjust the annualized dividends for expected growth. The dividends of all the companies in the Comparison Group are expected to increase over the next year. I apply a full year's growth rate for a firm to the annualized dividend and add the product to the annualized dividend yield to transform it into the expected dividend yield. The equation for this operation is:

$$D_1 = \frac{D_0}{P_0}(1 + g)$$

Applying this equation to the dividend yield for each company yields the D_1 values that I use in my estimates. See Exhibit MFG-11, Schedule 1.

VI. FLOTATION ADJUSTMENT TO ROE

Q. Please discuss flotation adjustments.

A. When companies issue equity, the price paid by investors for the new shares is higher than the revenues per share received by the company. The difference is issuance, or flotation, costs. These costs are the fees and expenses the company must pay as part of the issuance. The return on equity must be adjusted to recognize this difference, or a company will be denied the reasonable opportunity to earn its required rate of return.

Q. Have you made a flotation adjustment for the Company?

A. Yes. My recommended flotation-cost adjustment factor is 5.00 percent.

Q. Please describe your preferred approach to determining the flotation-cost adjustment factor.

A. I prefer to use actual fees and expenses from recent issuances for the company whose ROE is being analyzed. Such fees and expenses best capture the flotation costs for the company. Finding the average flotation cost percentage for a sample of similar companies is a fallback position when company-specific information is not available.

Q. Were you able to use your preferred approach in this docket?

A. No. The most recent issuance for AWW is June 4, 2009. This nine-year-old data may not reflect the costs for AWW if it were to issue common equity in the present. Therefore, using an average of flotation cost percentages for similar companies is how I determined the flotation-cost adjustment for NJAWC.

Q. How did you determine this flotation-adjustment cost factor?

A. NJAWC cost of capital witness Paul R. Moul has collected data about public offerings of common equity stock for companies in the Value Line Water Industry in his Schedule 9 [1 of 1]. The information is taken from the eight issuances made from 2009-2016. I have reviewed Mr. Moul's data and it is accurate. Moreover, I did not find that any of the companies made additional common equity issuances in 2017. Therefore, I accept his finding that the average of issuance and selling expenses as a percentage of the offering price of each issuance is 5.0 percent.

Q. How is the flotation-cost adjustment incorporated into your DCF analysis?

A. The DCF return on equity is modified in the following way to incorporate the adjustment for flotation cost. [7]

[7] Exhibit MFG-12, Morin, Roger, *New Regulatory Finance (2006)*, Public Utilities Reports, Inc., Vienna, Virginia, page 328.

$$k = \frac{D_1}{P_0}\left(\frac{1}{1-f}\right) + g$$

Where:

f is the flotation-cost percentage;
and all the other elements of the equation retain the meanings they had previously.

With the flotation cost of 5.00 percent incorporated, the expected dividend yield becomes the flotation-adjusted expected dividend yield. The adjustment increases the expected dividend yield by 12 basis points (with the result rounded to two decimal).

Q. What ROE did you find for the Comparison Group after adjusting for flotation costs?

A. The Comparison Group has a mean growth rate of 7.19 percent and a mean flotation-adjusted expected dividend yield of 2.44 percent. The combination of these two components yields an ROE of 9.63 percent. See Exhibit MFG-11, Schedule 1.

Q. What ROE did you find for the analysis with Connecticut Water Services and SJW Group excluded because they are merging?

A. With Connecticut Water Services and SJW Group excluded from the Comparison Group, the mean growth rate is 6.81 percent and the mean flotation-adjusted expected dividend yield is 2.45 percent. The combination

of these two components yields an ROE of 9.26 percent. See Exhibit MFG-11, Schedule 1.

Q. What ROE did you find for the calculation with American Water Works excluded because its subsidiary, NJAWC, is under analysis?

A. With Connecticut Water Services and SJW Group excluded from the Comparison Group, the mean growth rate is 7.07 percent and the mean flotation-adjusted expected dividend yield is 2.45 percent. The combination of these two components yields an ROE of 9.52 percent. See Exhibit MFG-11, Schedule 1.

Q. Did you conduct another DCF analysis for the Comparison Group?

A. Yes. I conducted a multistage DCF analysis. A multi-stage analysis assumes that the growth rate for companies in a proxy group will not continue at the current growth rate. In my analysis, I assumed that the long-term growth rate would be equal to the long-term forecast for nominal gross domestic product (GDP) growth of 4.0 percent for 2023-2027 published by the Congressional Budget Office (CBO) [8] or to the 4.3 percent Reference Case forecast for 2018-2050 published by the U.S. Energy Information Administration (EIA).[9]

Q. Please explain your multistage analysis.

A. I calculated DCF ROEs for the Comparison Group of eight companies with

[8] Exhibit MFG-11 Schedule 2.
[9] Exhibit MFG-11 Schedule 3

4.00 percent and 4.30 percent substituted for the mean of the growth-rate forecasts from Zacks, Yahoo! Finance, and Value Line. I then blended the two growth rates for each company, weighting the analysts' growth projections two-thirds and the GDP growth-rate forecasts of the respective federal agencies one-third.[10]

Q. What are the ROE results for your multistage analyses?

A. The results are a mean ROE of 8.57 percent with the CBO forecast and a mean ROE of 8.67 percent with the EIA forecast. See Exhibit MFG-11, Schedule 4.

Q. Have you adjusted your ROE to accommodate other factors?

A. No. The DCF model incorporates factors that affect investors' view of the world and does not require ad hoc adjustments. The share price of common equity is the mechanism through which these influences are translated. For example, if investors are optimistic about the economy in general or about a specific company, the share price of that company will be higher, all other things being equal. Or, to cite a recent event, if the federal income tax and depreciation rates are changed, as they have been in the United States, the views of investors about the effect of the changes on utilities earnings prospects also will be reflected in the price. Either case affects the ROE of the company. Other factors that are incorporated into share prices are water-quality regulations, interest-rate expectations, market volatility, and leverage

[10] Exhibit MFG-13, Morin, *New Regulatory Finance*, page 309.

of companies. Investors will ask for common equity prices that compensate them for the degree of risk that they believe these factors create.

Q. Please summarize the results of your DCF analysis.

A. The results of my three constant-growth DCF ROE analyses are presented below.

Constant-Growth DCF ROE Analysis

Group Analyzed	ROE with Flotation
Comparison Group	9.63%
CTWS and SJW excluded	9.26%
AWW excluded	9.52%

The results for my two multistage DCF analyses are shown below.

Multistage DCF ROE Analysis

Long-Term Forecast	ROE with Flotation
CBO	8.57%
EIA	9.67%

VII. REASONABLENESS CHECK AND RECOMMENDED ROE

Q. Have you checked the reasonableness of your DCF ROE estimate?

A. Yes. I checked the reasonableness of my DCF analyses' outcomes by performing CAPM analyses. I also compared the DCF ROEs with recent ROEs authorized in fully litigated water rate cases across the 48 contiguous states.

1. CAPM Analysis

Q. Have you checked the reasonableness of your ROE estimate?

A. Yes. I performed a Capital Asset Pricing Model (CAPM) analysis for the companies in the Comparison Group. I also conducted empirical CAPM (ECAPM) analyses on the same companies. The ECAPM is a version of the CAPM modified to adjust for identified shortcomings in the CAPM.

Q. Please discuss the CAPM method.

A. The basic premise of the CAPM method is that any risk which is company-specific can be diversified away by investors. Therefore, the only risk that matters is the systematic risk of the stock. This systematic risk is measured by beta (β). In its simplest form, the CAPM assumes the following form:

$k = r + \beta (k_m - r)$, where:

k is the required rate of return for the stock in question;

β is beta, the measure of systematic risk;

r is the rate of return on a riskless asset; and

k_m is the required rate of return on the broad market portfolio.

Q. What are the strengths and weaknesses of the CAPM method?

A. The CAPM is theoretically sound, but its application raises some issues. The analysis using CAPM selects a riskless asset, beta, and market risk premium. The ROE analysis can vary considerably depending on the analyst's choices for these variables. Thus, what at first may seem like a model that is straightforward depends heavily on the particular input values used by an analyst.

Q. Are you recommending rejecting CAPM?

A. No. I use the CAPM, but only to check the reasonableness of my DCF analysis, which is a more reliable method of measuring equity return. Because of the CAPM's extensive requirement for judgment in selecting each of the inputs I question its value in directly estimating a return on equity.

Q. Please explain the calculation of a CAPM ROE.

A. First, the analyst must select the rate of return for a riskless asset. Short-term assets such as 90-day Treasury Bills are considered to be virtually riskless; the default risk is next to nothing and the inflation risk is negligible. Equity investors, however, typically have a longer planning horizon than the 90-day maturity of these instruments, so the return on these bills is not suitable for this CAPM process. Long-Term Treasury bonds, on the other hand, match the planning horizon and have yields that are closer to common equity returns. But these instruments are subject to substantial inflation risk and, therefore, are not riskless. Intermediate Treasury securities, those with maturities of three to five years, are a compromise solution. The inflation risk is smaller than that for long-term bonds and the maturity period corresponds to the time span for the EPS growth-rate estimates made by expert analysts that are relied upon in DCF analysis. Typically, I would use the Intermediate Treasury securities in my analysis for these reasons. However, as I explain below, I do not use Intermediate Treasury securities in my CAPM analysis in the current docket.

Q. Are there reasons not to use the Intermediate Treasury securities in this docket?

A. Yes. Intermediate Treasury bonds' yields since the Federal Reserve took unusual measures to combat the Great Recession of December 2007-June 2009 have been low. Therefore, they are not appropriate for inclusion in CAPM analysis now.

Q. Which security do you use as the riskless asset in your CAPM analysis?

A. I use the average yield on a 30-year Treasury bond for March 5-29, 2018 as my riskless asset rate. This average yield is 3.09 percent. See Exhibit MFG-14, Schedule 1. However, the 30-year Treasury bond is not a free-risk asset. The yield on 30-year Treasury bonds incorporates a risk-premium associated with interest risk, which is the premium investors must be paid to induce them to forgo the opportunity of possibly earning higher interest rates later. Therefore, using 30-year Treasury bonds in a CAPM analysis may result in an upward bias of the ROE.

Q. What value do you use for beta (β)?

A. I use the betas for each company in the Comparison Group provided in their respective issues of the Value Line *Investment Survey*. The average beta for the eight companies in the Comparison Group is 0.74. With Connecticut Water Service and SJW Group excluded, the average beta is 0.77; with American Water Works excluded, the average beta is 0.76. See Exhibit MFG-14, Schedule 2. A beta of 1 indicates that a company's share price will

move with the market, while a beta higher than 1 indicates that a stock will be more volatile than the market, and a beta lower than 1 indicates that a stock will be less volatile than the market.

Q. What else is involved in your calculation?

A. I need to calculate a market rate of return. The term within parentheses in the CAPM equation often is called the "market risk premium."

Q. What method do you use to find the market risk premium?

A. I employ forecast data from Value Line *Summary & Index* regarding the dividend yield and growth rates for the broad economy (1,700 stocks in the "Value Line Universe"). In the March 30, 2018 edition of the *Summary and Index*, the forecasts are a median dividend yield (2.0 percent) and a 3- to 5-year appreciation potential (40 percent) for these companies. See Exhibit MFG-14, Schedule 3. The equivalent to the annual earnings per share growth rate for individual companies is calculated by computing the annual growth rate over four years (the midpoint of the 3- to 5-year period) that produces the appreciation potential. This growth rate is 8.78 percent. The forward-looking ROE for the companies is calculated by adding the 2.0 percent dividend yield to this annual growth rate, which produces a market rate of return of 10.78 percent.

Q. What is the next step in finding the CAPM return on equity?

A. The market risk premium is calculated by subtracting the rate of return on the

30-year Treasury from the market rate of return to find the market risk premium. The result of this operation is 7.69 percent. This amount is multiplied by the average beta for the Comparison Group to find the CAPM ROE. See Exhibit MFG-14, Schedule 5.

Q. What is the result of your CAPM analysis?

A. I performed a CAPM analysis for each of the three Comparison Group options that I identified earlier. The following chart shows the ROE for each option.

CAPM ROE Analysis

Group Analyzed	ROE with Flotation
Comparison Group	8.93%
CTWS and SJW excluded	9.10%
AWW excluded	9.03%

Q. Have you performed an additional CAPM analysis?

A. Yes. There is evidence that the simple CAPM underestimates the ROE for companies with betas less than 1 and overestimates the ROE for companies with betas greater than 1. The ECAPM has been developed to address this issue.

Q. How does the ECAPM deal with the under/over-estimation of ROE?

A. There are different versions of the ECAPM, but what they have in common is that by adding an adjustment factor to the elements of the CAPM equation,

they increase its intercept and reduce its slope. This operation has the effect of increasing the ROE produced by decreasing amounts as beta approaches 1.

Q. Have you accepted the use of the ECAPM previously before the BPU?

A. No. I have not.

Q. Why are you including it in your analysis in this docket?

A. Previously, I took the position that the betas typically used in CAPM analysis from such sources as Value Line and Bloomberg already include increases in beta to address the problem of underestimation of ROE. This position is accurate, but the ECAPM is directed at an additional problem. I have conducted analysis that shows the ECAPM does appropriately respond to additional flaws in the CAPM. Therefore, I have adopted its use in this docket.

Q. Please explain the ECAPM that you use in your analysis?

A. The ECAPM that I use includes an adjustment factor "x," as shown in the following modified CAPM equation below.

$$k = r + x\,(k_m - r) + (1-x)\,ß\,(k_m - r)$$

The x-term multiplied by the market risk premium increases the intercept (the risk-free rate), while the term (1 –x) decreases the slope of the equation.

Q. How is the value of x determined?

A. The value of x is determined empirically. The suggested value for x is 0.25.[11] I analyzed scenarios where the intercept value of the equation is more in line with current risk-free rates than it is the approximately 8 percent intercept presented. This analysis confirmed that a value for x of 0.25 is appropriate. Please note that x itself is not a percentage.

Q. What result do you get for your ECAPM analysis?

A. Using the same inputs for the risk-free rate, the MRP, and beta as I did in my CAPM analysis, I obtained a ECAPM ROE of 9.30 percent. Adding the flotation-cost adjustment of 12 basis points yields an ROE of 9.42 percent. See Exhibit MFG-14, Schedule 5.

ECAPM ROE Analysis

Group Analyzed	ROE with Flotation
Comparison Group	9.42%
CTWS and SJW excluded	9.55%
AWW excluded	9.50%

2. Authorized ROEs Comparison

Q. Please explain which authorized ROE you used to check the reasonableness of your DCF ROEs.

A. I collected a set of 2017 authorized ROEs from U.S. water rate cases from SNL's Regulatory Research Associates (RRA) *RRA Water Advisory*. My source was the March 26, 2018 edition of the publication.

[11] Exhibit MFG-14, Schedule 5, Morin, *New Regulatory Finance*, pages 190-191.

Q. How do you use this set of authorized ROEs?

A. I use the recent authorized ROEs as a basis for evaluating the reasonableness of my DCF ROE results. I do not use it as a substitute for that analysis.

Q. Why are authorized ROEs not a good substitute for current, forward-looking DCF analysis?

A. Recently authorized ROEs reflect the results of rate cases conducted in a variety of environments and at different times. Test years, conditions in capital markets, general economic indicators such as inflation rates, and so forth for previous rate cases can be different and become outdated when compared with these factors for a current rate case. Therefore, recently authorized ROEs should serve only to establish whether a current ROE result is reasonably close to what has happened, not be a substitute for forward-looking analysis based on current conditions.

Q. Please describe the set of authorized ROEs you collected.

A. The *RRA Water Advisory* lists eleven water rates for 2017. However, the ROEs for two of these cases are not available. See Exhibit MFG-15.

Q. Please describe the authorized ROEs in the 2017 set.

A. The mean ROE for the nine cases is 9.56 percent. The range is from 9.00 percent to 10.40 percent. However, the effective ROE for the top authorized award of 10.40 is lower. The Florida Public Service Commission awarded Utilities, Inc. of Florida 10.40 percent, but reduced the ROE on several parts

of the utility's system to 9.40 percent and 9.90 percent due to poor service quality. When this award is excluded, the mean ROE for the remaining eight cases is 9.46 percent.

3. Recommended ROE

Q. Please summarize the results of your ROE analyses.

A. My constant-growth DCF analyses range from ROEs of 9.26 percent to 9.63 percent. My multistage DCF analyses ROE results were 8.57 percent and 8.67 percent. My CAPM ROE outcomes ranged from 8.93 percent to 9.10 percent, while my ECAPM ROE outcomes ranged from 9.42 percent to 9. 55 percent. I have explained the reasons for the variations previously.

Q. What is your recommended ROE for the Company?

A. My recommended ROE for NJAWC is 9.50 percent.

Q. Please explain how you determined that this ROE is the appropriate recommendation for NJAWC.

A. My preferred method of ROE analysis is the constant-growth DCF model. I performed three analyses for this DCF model. The median of the three is 9.52 percent, while the average is 9.47 percent. I also performed three ECAPM analyses as part of my reasonableness check. The median of the three is 9.50 percent and the mean is 9.49 percent. My multistage DCF model results and my CAPM results are significantly lower. When taken together, these results support an ROE in the range of 9.40 percent to 9.60

percent. My recommended ROE for NJAWC is 9.50 percent, the center of this range. This ROE also is well within the range of 9.00 percent to 10.40 percent for 2017 water case authorized ROEs.

VIII. RECOMMENDED CAPITAL STRUCTURE AND OVERALL RATE OF RETURN

Q. What capital structure and cost of long-term debt has the Company proposed to use in this general rate case?

A. The Company has submitted a proposed capital structure of 46.00 percent long-term debt and 54.00 percent common equity, and cost of long-term debt of 4.96 percent in the testimony of Mr. Frank X. Simpson. The capital structure and cost of debt are that projected to be in place on September 30, 2018. See Exhibit No. P-2, Schedule 60, page 1 of 1, Tax Update, 1/18/18.

Q. Are NJAWC's proposed capital structure and long-term debt cost reasonable?

A. Yes. The proposed capital structure of 46.00 percent long-term debt and 54.00 percent common equity is reasonable. This proposed capital structure is similar to the average capital structure for the companies in Mr. Moul's Water Group. See PT-16, Schedule 3 [1 of 2]. The 4.96 percent cost of long-term debt is supported by Mr. Simpson's original testimony and the update.

Q. Do you accept the Company's proposed capital-structure ratios and cost of long-term debt?

A. Provisionally. I currently adopt the proposed capital structure and cost of long-term debt of the Company for ratemaking purposes in my Direct Testimony. See Exhibit MFG-16. However, the Company's capital structure and cost of debt depend upon transactions that will not all be in place until September 30, 2018. The BPU should confirm that the projected transactions have occurred before accepting the capital structure and cost of debt.

Q. What is the overall ROR that you recommend for the Company?

A. When my recommended ROE of 9.50 is included in the proposed capital structure, the ROR is 7.41 percent. See Exhibit MFG-16.

IX. REVIEW OF THE COMPANY'S ROE ANALYSIS

Q. What is Mr. Moul's recommended ROE for NJAWC?

A. Mr. Moul recommends an ROE of 10.80 percent.

Q. Please describe Mr. Moul's methods of ROE analysis.

A. Mr. Moul employs the DCF model, CAPM, a risk premium model, and a comparable earnings approach. He applies the DCF model and CAPM to a group of nine water utilities he refers to as the Water Group. The Water Group has the same membership as my Comparison Group, except that it

includes Artesian Resources.[12] Mr. Moul states that companies that are the target of an announces merger or acquisition do not qualify for conclusion in the Water Group. The merger of Connecticut Water Resources and SJW Group was only announced March 14, 2018, so Mr. Moul did not have a chance to exclude them from the Water Group at the time he constructed the group.

Q. Do you have criticisms of Mr. Moul's recommended ROE?

A. Yes. Mr. Moul applies leverage adjustments to both his DCF model and CAPM, which causes the results to be overstated. He also makes a size adjustment to the CAPM, again causing the results to be overstated. He further applies the flotation-cost adjustment incorrectly, causing it to be too high and the ROEs of his DCF, CAPM, and Risk Premium models to be overstated. The risk-free rate he employs in his CAPM is too high and he includes historical information in his calculation of the CAPM market risk premium, again causing his outcome to be overstated. Finally, the risk premium and comparable earnings methods are flawed models and should be excluded from ROE analysis.

Q. Please address Mr. Moul's use of leverage adjustments in his DCF and CAPM analyses.

A. Mr. Moul's adjustments for leverage differences are not appropriate. The

[12] As noted, I excluded Artesian Resources because it does not have a S&P bond rating or an EPS estimate from Value Line.

differences between market-value and book-value capital structures (differences in leverage) that he relies on to justify the adjustments to the DCF and CAPM ROE outcome are already captured by the DCF and CAPM ROE processes.

Q. Please explain how the DCF model captures the market-to-book value differences.

A. Investors are aware of the leverage of a company when they make their decisions to purchase or retain shares of common equity in that company. Thus, leverage, along with differences among other factors, both general and specific to firms, affect the price that investors are willing to pay. If differences in market-value and book-value capital structures arise and persist, it is because investors accept them and the level of return on their investment that the prices imply. They are reflected in the DCF model through the mechanism of share price, which affects the expected dividend-yield component of the model. Making a leverage adjustment in addition to the adjustments made by investors counts the effect of leverage twice.

Q. Please explain how the CAPM captures the market-to-book value differences.

A. Beta reflects volatility of share price for a firm. Thus, leverage's effect on share prices paid by investors influences the value of beta. Again, an adjustment for leverage counts the effect count.

Q. Is the Company's adjustment to the CAPM ROE for differences in firm size appropriate?

A. No. Size adjustments are not appropriate. Size is a factor in risk assessment. However, the effect on size of the risk for companies in the Comparison Group (and by extension to the Company's proxy group) is reflected in the S&P credit ratings of the companies. The credit ratings of the eight companies are not identical, but they do not have to be for the companies to be similar in risk. Further, investors and the experts who make the EPS growth-rate projections are aware of the different sizes of the firms. Thus, their beliefs about the firms as investment vehicles are reflected in common-equity share prices, the movement of which affects the value of beta. Size is already captured in the CAPM analysis.

Q. Please explain how Mr. Moul's misapplication of the flotation-cost adjustment inflates his DCF ROE outcome.

A. Mr. Moul creates a flotation-adjustment factor of 0.025 by taking one-half of the issuance cost percentage (f) of 5 percent. The correct flotation-cost adjustment is found by dividing 1 by $(1 - f)$. This term (1/(1 - 0.05)) is multiplied by the expected dividend yield term.[13] Restated from my previous analysis, the correct complete flotation-cost adjustment equation is:

$$k = \frac{D_1}{P_0}\left(\frac{1}{1-f}\right) + g$$

[13] Exhibit MFG-12.

Mr. Moul multiplies the flotation-cost percentage by the entire DCF ROE equation, including the growth-rate term and the leverage adjustment (l). His form of the equation follows:

$$k = (\frac{D_1}{P_0} + g + l)(1 + f)$$

To illustrate the effect of the Company's incorrect flotation-cost adjustment approach on an ROE, I have applied his incorrect equation to my constant-growth DCF analysis. See Exhibit MFG-11, Schedule 5. Mr. Moul's incorrect flotation adjustment factor of 0.025 actually decreases the flotation-adjusted expected dividend yield compared with my adjustment by 6 basis points, 2.38 percent versus 2.44 percent. However, the effect of improperly multiplying the EPS growth-rate term by the 0.25 factor is an increase and of a much greater magnitude. The ROE is increased by 18 basis points by this operation. Multiplying the leverage adjustment by 0.025 adds an additional 3 basis points for a net total increase over my flotation-cost adjustment of 15 basis points (9.78 percent versus 9.63 percent). Reviewing these changes, the Company's procedure adds 21 basis points by incorrectly multiplying the growth-rate component and the leverage adjustment by the flotation-adjustment factor, while subtracting 6 basis points by using 0.25 rather than 0.5 to adjust the expected dividend-yield component.

Q. What do you conclude concerning Mr. Moul's misapplication of the flotation-cost adjustment?

A. Applying Mr. Moul's flotation-cost adjustment method to my ROE analysis results in a flotation-cost adjustment of 27 basis points. My flotation-cost adjustment is 12 basis points. Thus, the Company's incorrect application of flotation costs would inflate my ROE by 15 basis points. When Mr. Moul applied the flotation-cost adjustment incorrectly to his DCF ROE analysis, the result was a flotation-cost adjustment of 26 basis points. Our respective ROE analyses have different base numbers, but the results of 27 basis points and 26 basis points are similar. The evidence indicates that the Company's overstatement of the DCF ROE is 14-15 basis points. Since the DCF flotation adjustment carries over to the CAPM and risk premium ROE analyses, the ROE outcomes for those two models also are overstated by 14-15 basis points.

Q. Please comment on Mr. Moul's risk-free rate in his CAPM analysis.

A. Mr. Moul includes a risk-free rate of 3.75 percent for his CAPM. Mr. Moul bases his choice of this risk-rate on forecasts by *Blue Chip Financial Forecast* and his assertion that Treasury yields are moving to higher levels. In contrast, my risk-free rate is the 3.09 percent average yield on the 30-year Treasury bond from March 5-29, 2018. The Company's higher risk-free rate increases the CAPM ROE outcome compared with the results of my CAPM, and by extension ECAPM, analyses.

Q. Has *Blue Chip Financial Forecasts* accurately forecast interest-rate changes?

A. No. *Blue Chip Financial Forecasts* consistently has been high with its bond-yield forecasts. The forecasts since 2009 have always been greater than the rates that actually ensued. See Exhibit MFG-17. The range of error for a set of forecasts since January 1, 2015 compared with actual ensuing rates is 63 basis points to 118 basis points. Relying on the *Blue Chip* forecasts as the input for the risk-free rate is a mistake that leads to inflating CAPM/ECAPM outcomes.

Q. Is there evidence that increases in the federal funds target rate by the Federal Reserve Open Market Committee (FOMC) do not result in increases in capital costs?

A. Yes. The 30-year Treasury yield was 3.06 percent on March 1, 2017. See Exhibit MFG-18. Since that date, the FOMC has increased the federal funds target rate range by 25 basis points four times, on March 16, 2017; on June 15, 2017; on December 14, 2017; and on March 22, 2017. The 30-year Treasury yield was 2.97 percent on March 29, 2018. Therefore, despite four federal funds target rate increases totaling 100 basis points since March 1, 2017, the 30-year Treasury's yield was 9 basis points lower on March 29, 2018 than it was 13 months before. Thus, the prospect of additional increases by the FOMC does not mean that the increases will translate into increases in the 30-year Treasury bond yield that I use as my risk-free rate.

Q. Please comment on why the 30-year Treasury yield does not change in step with changes in the federal funds target rate?

A. Many factors other than the federal funds target rate affect investors desire to hold long-term instruments such as 30-year Treasury bonds. The state of the economies in the rest of the world, for example, is a primary influence on long-term U.S. Treasury yields. Investors take into account domestic economic factors, domestic politics, world politics, and other sources of economic uncertainty as they make decisions as to which instruments to buy and sell. They are incorporating views of the future now as they think about what they are willing to pay to hold these instruments. Therefore, current bond yields are the best indicator of what the market believes is the correct price for the risk-free rate going forward.

Q. What information does Mr. Moul use in his calculation of the market risk premium in his CAPM analysis?

A. Mr. Moul uses a combination of sources that are forward-looking and historical. The purpose of this ROE analysis for NJAWC is to reflect investors' views of the return necessary for the Company to attract capital. The 1926-2016 historical market premium that Mr. Moul includes looks backward and does not contribute to this purpose. Therefore, it should be excluded from the analysis.

Q. Do you have any comments about the Company's risk-premium analysis?

A. Yes. The reliability of the Company's risk-premium analysis depends upon the relationship between interest rates and equity returns being constant, even allowing for variation in the magnitude of the risk premium at different interest-rate levels. This historically based model is flawed because these relationships vary.

Q. Do you have any comments about the Company's comparable earnings analysis?

A. Yes. Mr. Moul's methodology involves averaging projected returns on common equity for a proxy group of non-utility companies "comparable" in risk to his proxy group. It is questionable whether these unregulated companies are similar in risk to the regulated water utilities used in the ROE analysis in this docket. Their average historical returns and the projected Value Line returns (not the same as using Value Line data in a DCF ROE analysis) frequently exceed 20 percent and go as high as 64.3 percent. These are unrealistic returns for regulated water companies as the RRA Water Advisory data show. Only three of the companies have average historical ROEs and only one company has a projected ROE that fall in the 9.00-10.40 range of recent authorized water utility ROEs. These are not persuasive data on which to base an ROE in this docket.

X. SUMMARY

Q. What are the criteria the Commission should consider in setting the Company's ROE and ROR?

A. The Commission should only consider whether the ROE and ROR meet the *Bluefield* and *Hope* criteria for a fair return. Recounting, these criteria include returns that are commensurate with returns being earned on other investments with equivalent risks, a rate of return sufficient to enable the utility to attract capital, and returns sufficient to enable the regulated company to maintain its credit rating and financial integrity. The interpretation of the *Hope* and *Bluefield* criteria is that a company should be given the opportunity to earn an ROE and ROR sufficient to meet these standards.

Q. What is your recommended return on equity and overall cost of capital?

A. I recommend an ROE of 9.50 percent and an ROR of 7.41 percent.

Q. Does this conclude your testimony?

A. Yes.