BEFORE THE
STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF
NEW JERSEY-AMERICAN WATER COMPANY, INC.
FOR APPROVAL OF INCREASED TARIFF RATES
AND CHARGES FOR WATER AND WASTEWATER SERVICE,
CHANGE IN DEPRECIATION RATES AND
OTHER TARIFF MODIFICATIONS

BPU Docket No. WR1709____

DIRECT TESTIMONY OF

PAUL R. MOUL, MANAGING CONSULTANT
P. MOUL & ASSOCIATES

Exhibit PT-16

New Jersey-American Water Company, Inc.
Direct Testimony of Paul R. Moul
Table of Contents

Page No.

INTRODUCTION AND SUMMARY OF RECOMMENDATION 1
WATER UTILITY RISK FACTORS 7
FUNDAMENTAL RISK ANALYSIS 16
COST OF EQUITY – GENERAL APPROACH 23
DISCOUNTED CASH FLOW ANALYSIS 24
RISK PREMIUM ANALYSIS 39
CAPITAL ASSET PRICING MODEL 44
COMPARABLE EARNINGS APPROACH 50
CONCLUSION ON COST OF EQUITY 54
Appendix A - Educational Background, Business Experience and Qualifications

GLOSSARY OF ABBREVIATIONS AND DEFINED TERMS	
ABBREVIATION	**DEFINED TERM**
AFUDC	Allowance for Funds Used During Construction
AWCC	American Water Capital Corporation
AWW	American Water Works Company, Inc.
b	Represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
β	Beta
b x r	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
CTA	Consolidated Tax Adjustment
DCF	Discounted Cash Flow
DDBP	Disinfectants/Disinfection By-Products
DSIC	Distribution System Improvement Charge
EPA	Environmental Protection Agency
ESWTR	Enhanced Surface Water Treatment Rule
FOMC	Federal Open Market Committee
g	Growth rate
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
IGF	Internally generated funds
Lev	Leverage modification
MTBE	Methyl Tertiary Butyl Ether
NJAWC	New Jersey-American Water Company, Inc.
r	Represents the expected rate of return on common equity
Rf	Risk-free rate of return

GLOSSARY OF ABBREVIATIONS AND DEFINED TERMS	
ABBREVIATION	**DEFINED TERM**
Rm	Market risk premium
RP	Risk Premium
RSM	Revenue Stabilization Mechanism
s	Represents the new common shares expected to be issued by a Firm
s x v	Represents external growth
S&P	Standard & Poor's
SDWA	Safe Drinking Water Act Amendments of 1996
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value.

1

NEW JERSEY-AMERICAN WATER COMPANY, INC.

INTRODUCTION AND SUMMARY OF RECOMMENDATION

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

A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road, Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm P. Moul & Associates, an independent financial and regulatory consulting firm. My educational background, business experience, and qualifications are provided in Appendix A that follows my direct testimony.

2. Q. What is the purpose of your testimony?

A. My testimony presents evidence, analysis and a recommendation concerning the appropriate cost of common equity, support for the Company's proposed capital structure and overall rate of return that the New Jersey Board of Public Utilities ("BPU" or the "Board") should recognize in the determination of the revenues that New Jersey-American Water Company, Inc. (hereinafter referred to as "NJAWC" or the "Company") should realize as a result of this proceeding. My analysis and recommendation are supported by the detailed financial data set forth in my thirteen (13) schedules, appended hereto. My testimony is based upon my firsthand knowledge of NJAWC, consisting of information obtained from meetings with the Company's management and Company-specific data, which is widely disseminated within the financial community.

3. Q. Based upon your analysis, what is your conclusion concerning the cost of common equity and overall rate of return for the Company in this case?

A. Based upon my independent analysis, my conclusion is that the Company should be afforded an opportunity to earn a rate of return on common equity of at least 10.80%. To obtain new capital and retain existing capital, the rate of return on common equity must be high enough to satisfy investors' requirements. As described in the testimony of Company Witness Kirwan, the Company has undertaken many initiatives that have produced high quality service. In recognition of its outstanding performance, the Company should be granted an opportunity to earn at least a 10.80% rate of return on common equity. As shown on page 1 of Schedule 1, I have provided the weighted average cost of capital, which includes my recommended cost of equity. The Company's capital structure ratios and embedded cost of debt are taken from the direct testimony of Company Witness Simpson, the Company's Senior Director of Rates and Regulation. The Company expects that the capital structure will include a 54% common equity ratio at the end of the test year. The capital structure that Mr. Simpson has proposed is reasonable for this case because it conforms with ratios expected by investors for a water utility. Hence, I support Mr. Simpson's proposed capital structure ratios for this case. The calculation of the weighted average cost of capital requires the selection of appropriate capital structure ratios and a determination of the cost rate for each capital component. In the case of the capital structure ratios, the components are calculated at September 30, 2018. The resulting 8.07% (rounded) overall rate of return, when applied to the Company's rate base, will provide a compensatory level of return for the use of capital and, if achieved, will provide the Company with the ability to attract capital on reasonable terms.

4. Q. In your opinion, what factors should the Board consider when setting the Company's cost of capital in this proceeding?

A. The rate of return utilized by the Board to set rates must be sufficient to cover the Company's interest and dividend payments, provide a reasonable level of earnings retention, produce an adequate level of internally generated funds to meet capital requirements, be commensurate with the risk to which the Company's capital is exposed, assure confidence in the financial integrity of the Company, support reasonable credit quality, and allow the Company to raise capital on reasonable terms. The return that I propose fulfills these established standards of a fair rate of return set forth by the landmark Bluefield and Hope cases.[1] That is to say, my proposed rate of return is commensurate with returns available on investments having corresponding risks.

5. Q. Please briefly describe the Company.

A. NJAWC is a wholly owned subsidiary of American Water Works Company, Inc. (hereinafter referred to as "AWW"), and the nation's largest water utility holding company. AWW has regulated water utility subsidiaries that operate in 14 states.

As of year-end 2016, NJAWC provided service to approximately 631,000 water customers and approximately 41,000 wastewater customers in 191 communities in

[1] Bluefield Water Works & Improvement Co. v. P.S.C. of West Virginia, 262 U.S. 679 (1923) and F.P.C. v. Hope Natural Gas Co., 320 U.S. 591 (1944).

eighteen counties throughout New Jersey. The Company meets its customers' needs from surface and ground water supplies and from purchases.

6. Q. How have you determined the cost of common equity in this case?

A. The cost of common equity is established using capital market and financial data relied upon by investors to assess the relative risk, and hence the cost of equity, for a water utility such as NJAWC. In this regard, I employed four (4) well-recognized measures of the cost of equity: the Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") analysis, the Capital Asset Pricing Model ("CAPM"), and the Comparable Earnings ("CE") approach.

7. Q. How have you applied those models to measure the cost of equity for NJAWC?

A. The models that I used to measure the cost of common equity for the Company were applied with market and financial data developed from my proxy group of nine (9) water companies. The proxy group consists of water companies that: (i) are contained in The Value Line Investment Survey, (ii) have stock that is publicly-traded, and (iii) are not currently the target of an announced merger or acquisition. From the Value Line report, I have excluded one company that has its principal operations outside the U.S. In assembling my Water Group, I included companies from the expanded edition of Value Line. The companies in the proxy group are identified on page 2 of Schedule 3. I will refer to these companies as the "Water Group" throughout my testimony.

8. Q. How have you performed your cost of equity analysis with the market data for the Water Group?

A. I have applied the models/methods for estimating the cost of equity using the average data for the Water Group. By employing group average data, I have helped to minimize the effect of extraneous influences on the market data for an individual company.

9. Q. Please summarize your cost of equity analysis.

A. My cost of equity determination was derived from the results of the methods/models identified above. In general, the use of more than one method provides a superior foundation to arrive at the cost of equity. At any time, any single method can provide an incomplete measure of the cost of equity. The specific application of these methods/models will be described later in my testimony. The following table provides a summary of the indicated costs of equity using each of these approaches, as shown on page 2 of Schedule 1.

	Excluding Flotation Costs	Including Flotation Costs [2]
DCF	10.27%	10.53%
RP	11.25%	11.51%
CAPM	11.41%	11.67%
CE	12.05%	12.05%

The average of all methods is 11.25%, excluding flotation costs, and 11.44%, including flotation costs. Focusing upon the market models of the cost of equity (i.e., DCF, RP and CAPM), the equity return is 10.98%, excluding flotation cost, and 11.24%, including flotation costs. The midpoint of the market model is 10.84% excluding flotation costs, and 11.10% including flotation costs. From these results, a reasonable, albeit conservative, return for the Company would be at least 10.80%, recognizing that all model results are above my proposed return with the exception of DCF. This recommendation does not include an upward adjustment to reflect the Company's management effectiveness. In selecting a cost of equity for NJAWC, the Board should recognize the Company's management effectiveness that is described in the testimony of Company Witness Kirwan, Vice President of Operations, Exhibit PT-2. As Company Witness Kirwan has shown, the management effectiveness of the Company justifies recognition by the Board, so as to encourage the Company to continue its commitment to best practices and other innovations that provide high quality service for customers.

The Company has undertaken many initiatives that have produced high quality service. The testimony of Mr. Kirwan discusses these initiatives by the Company. Company Witness Kirwan' testimony shows that the Company ranks high in customer service, management efficiency, and service reliability. Indeed, Company Witnesses Kirwan and Simpson have shown that the Company's operation and maintenance expenses are today relatively flat when compared to the level that existed at the time of the Company's last rate case in 2015, at which time

the Company proposed expense reductions of approximately $19 million. While I have not quantified an upward adjustment for management effectiveness in this case, I believe one is justified; in recognition of these factors, the Board should consider the Company's management performance in the rate of return on common equity that is granted in this proceeding.

WATER UTILITY RISK FACTORS

10. Q. Please identify some of the risk factors that impact the water utility industry.

A. The business risk of the water utilities has been strongly influenced by water quality concerns. The Safe Drinking Water Act ("SDWA") Amendments of 1996, which re-authorized the SDWA for the second time since its original passage in 1974, instituted policies and procedures governing water quality. Significant aspects of the 1996 Amendments provide that the federal Environmental Protection Agency ("EPA"), in conjunction with other interested parties, will develop a list of contaminants for possible regulation. From that list, EPA must select at least five contaminants and determine whether to regulate them. This updating process must be repeated every five years. The EPA may bypass this process and adopt interim regulations for contaminants that pose an urgent health threat.

The current priorities of the EPA include regulations directed at the following: (i) microbials, disinfectants and disinfection byproducts, (ii) radon, (iii) radionuclides, and (iv) arsenic. The regulations promulgated by the EPA concerning certain potentially hazardous substances noted above, together with the Federal Clean Water Act and the Resource Conservation and Recovery Act, are risk factors that

affect all water utilities. Most of these regulations affect the entire water industry, in contrast with certain regulations issued pursuant to the Clean Air Act, which may impact only selected electric utilities. This business risk factor, together with the important role that water service facilities play within the infrastructure, underscores the public policy concerns that are focused on the water utilities. Moreover, since September 11, 2001, water utilities are operating on heightened alert to protect drinking water supplies. Water utilities have taken additional security safeguards including (i) limiting access to treatment and storage facilities, (ii) conducting additional testing and monitoring, (iii) reassessing security procedures and systems, and (iv) providing additional training to their personnel.

11. Q. How do these issues impact the water utility industry?

A. Managers of water utilities have in the past and will in the future focus increased attention on environmental and related regulatory issues. Drinking water quality has also received heightened attention out of concern over the integrity of the source of supply, which is often threatened by changing land use and the permissible level of discharged contaminants established by state and federal agencies, and now potential threats from terrorists. Moreover, water companies have experienced increased water treatment and monitoring requirements and escalating costs in order to comply with the increasingly stringent regulatory requirements noted above. Water utilities may also be required to expend resources to undertake research and employ technological innovations to comply with potential regulatory

requirements. These factors are symptomatic of the changing business risk faced by water utilities.

12. Q. Are there other factors that influence the business risk of water utilities?

A. Yes. Being the sole purveyor of potable water from an established infrastructure does not insulate a water utility's operations from general business conditions, regulatory policy, the influence of weather, and customers' usage habits. It is also important to recognize that water companies face higher degrees of capital intensity than other utilities, more costly waste disposal requirements, and threats to their sources of supply. Issues surrounding Methyl Tertiary Butyl Ether ("MTBE") contamination and the regulation of arsenic are cases-in-point.

13. Q. Are there other structural issues which affect the business risk of water utilities?

A. Yes. Conservation efforts can take the form of low water usage clothes washers, toilets and showerheads, and other reductions due to changes in usage. As a consequence, the Company has been faced with a sustained decline in the average use per customer. This trend has prevented the Company from realizing the sales levels used to set rates. This phenomenon has contributed to the Company's inability to earn its authorized return historically.

While the wise use of water is always the objective, the business risk of the water utility industry can be affected by increased customer awareness of conservation. Moreover, current building standards have mandated the use of fixtures that must

comply with more stringent water use requirements. These issues, along with other changes in customer usage patterns, have resulted in declining use per customer. This situation has made it more difficult for a water utility to actually achieve the return established in rate cases.

14. Q. Are there specific infrastructure issues that the Company is currently addressing?

A. Yes. Lead in service lines has reached national prominence after it was identified as a source of contamination in Flint, Michigan. Investors are aware of the consequences of lead contamination on public health and steps that need to be taken to deal with this issue. After all, water utilities deliver a product that is ingested by the public, and are the only type of utility that faces public health issues related thereto. The Company has been addressing the issue of lead in service lines that it owns between the distribution main and curb stop. This represents an on-going issue that will require attention.

15. Q. Please identify some of the specific water utility risk factors which impact the Company.

A. The Company must conform its operations to the requirements of the SDWA and Enhanced Surface Water Treatment Rule ("ESWTR"), which include monitoring and testing, compliance with the lead and copper rule, regulation of Disinfectants/Disinfection By-Products ("DDBP"), and other contaminants. Moreover, high capital intensity is a characteristic typically found in the water utility business. In this regard, the Company's investment in net plant is 4.60 times

its revenue. This is to say, NJAWC must invest $4.60 in new or replacement plant to produce $1.00 of additional revenue. This is a substantially higher ratio than that of the Water Group, whose investment in net plant is 3.87 times its revenue. Thus, the Company is more capital intensive than the Water Group because its investment in net plant per dollar of revenue exceeds that of the Water Group. Again, due to the higher risk trait of NJAWC, my proposed return on equity should be viewed as conservative.

16. Q. How is the Company's risk profile affected by its construction program?

A. The Company is engaged in a continuing capital expenditure program necessary to meet the needs of its customers and to comply with various regulations. For the future, the Company expects its capital expenditures, net of customer contributions and advances, and including cost of removal, will be $1.784 billion over the next five years. These capital expenditures will represent approximately 53.6% ($1,783.965 million ÷ $3,330.591 million) of the net utility plant in service (net of contributions) as of December 31, 2016. The Company expects that a meaningful portion of its capital expenditures will require external financing. For example, the Company's internally generated funds are forecast to provide approximately 13% of its construction expenditures over the years 2018 through 2022. Hence, the remainder will require external funding.

17. Q. How do these projected capital expenditures compare to the Company's historical average and those of the Water Group?

A. The Company's future capital expenditures are expected to be considerably higher than the historical amounts. In a recent RRA Financial Focus, accelerated capital expenditures are expected to continue in the water utility industry. Over the sixteen-year period 2001 through 2016, the Company's historical annual average capital expenditures were $174.115 million. For the future, the capital expenditures are expected to average $356.793 million ($1,783,965 million ÷ 5). Hence, the Company's future capital expenditures over the next five years are expected to be twice the amount of its previous historical expenditures. It is also noteworthy, that each annual future capital expenditure increment will represent over 10% of the Company's net utility plant in service as of December 31, 2016 ($356.793 million ÷ $3,330.591 million = 10.71%). At this level, NJAWC is projected to spend at a level comparable to the investor-owned water industry generally.

A fair rate of return for the Company represents a key to a financial profile that will provide the Company with the ability to raise the capital necessary to meet its capital needs on reasonable terms.

18. Q. How has the Company responded to some of the business risks it faces?

A. The Company has proposed a revenue stabilization mechanism ("RSM"). As a preliminary matter, the RSM is symmetrical in that it operates to provide credits to customers if usage is higher than established in the rate case and to provide charges if usage is lower. The RSM is intended to provide a means to remove the disincentive to sell additional water and to remove the impact of factors that affect water sales over which the Company has no control.

19. Q. How do investors view the risk associated with revenue variability that the RSM is designed to address?

A. Investors in a water utility can only formulate reasonable expectations based upon normal usage, although achieved results may vary significantly from those expectations from year to year. That is to say, a rational investor in a water utility can only anticipate, and base his or her analyses on normal conditions, regardless of the weather. The financial theory upon which the cost of equity is based recognizes that investors value their investments on a long-term basis covering a number of years, not just one year. Variations in usage caused by weather are a short-term phenomenon. For example, the DCF formula explicitly assumes a growth rate "approaching infinity." Additionally, as I will discuss later, analysts' forecasts of water utilities' earnings growth, which investors take into account in making investment decisions, typically are provided on a five-year basis. Normal usage patterns over the long-term or multi-year period will be assumed by investors, although they may vary significantly from year to year. Moreover, one of the standard models of the cost of equity (i.e., CAPM) suggests that there is no measurable effect on the cost of equity from this variance because revenue related to usage represents a company-specific risk, which does not receive compensation in the CAPM, i.e., revenue variability is an unsystematic risk that receives no recognition in the CAPM. Therefore, the theories and models underlying my cost of capital analysis obviate the need for adjustments based upon short-term phenomena such as usage variations which have no long-term effect. Accordingly, over the long term, the investor required cost of capital or discount rate assumed

for an investment in a water utility would be the same either with or without a RSM. That is not to say there are no benefits to the proposed RSM. Variations in usage can significantly affect customers' bills and the Company's cash flow. Fluctuations in bad debt expense from year to year, which may also be driven in part by variations in weather, also affects the Company's cash flow.

20. Q. Should there be an adjustment if the Board adopts the RSM?

A. No. There are many items that affect earnings variability in addition to the variability of revenues. So, while the RSM is intended to add stability to revenues, the Company continues to face variability in operating and capital costs that will contribute to earnings variability. This is not to say that there are no financial benefits from the RSM, which does reduce the volatility in utility revenues, which in turn can support utility credit ratings. The mechanism will be viewed favorably by the credit rating agencies and help the utility sustain its credit ratings. While the RSM proposed in this case will mitigate some of the risks, it will not fully eliminate the lag in the recovery of its revenue requirements associated with new capital investment, which the Company is actively undertaking. Regulatory lag and earnings attrition will undoubtedly delay cash flows at a time when the Company's capital needs are intensifying. Therefore, it is critical that the Company is seen as an attractive investment in order to provide it with the ability to attract capital at reasonable costs.

21. Q. How does this occur?

A. My cost of equity recommendation is based on analyses of the Water Group, and companies within the Water Group operate under revenue stabilization and other rate-setting mechanisms that facilitate recovery of certain costs, such as infrastructure investments, purchased water costs, chemical costs, and pension expenses. The market prices of the Water Group's common equity and estimates of their future growth potential already reflect the value that investors place on revenue stabilization. Since I utilized market-based models to determine the Company's cost of equity, my recommendation already reflects any impacts that RSM may have on its cost of equity and, thus, no separate adjustment is warranted. Of my Water Group companies, American States Water, American Water Works Company, California Water Service Group, Connecticut Water Services, and SJW Corporation have revenue stabilization for their operations in California, Connecticut, Illinois, and New York so the effect of revenue stabilization is already contained in their respective costs of equity and any adjustment to reflect an RSM would be double-counting. If the RSM is not approved by the Board, the Company's risk profile would be higher than the companies that comprise the Water Group and its cost of equity would likewise be higher. Conversely, approval of RSM would better position NJAWC to obtain the cash flow that is equivalent to other water companies in my proxy group.

22. Q. How should the Board respond to the evolving business risk facing the Company?

A. The Company is faced with the requirement to invest in new facilities and to maintain and upgrade existing facilities in its service territory. Where a substantial ongoing capital investment is required to meet the high quality of product and service that customers demand, supportive regulation is absolutely essential.

FUNDAMENTAL RISK ANALYSIS

23. Q. Is it necessary to conduct a fundamental risk analysis to provide a framework for determining a utility's cost of equity?

A. Yes. It is necessary to establish a company's relative risk position within its industry through a fundamental analysis of various quantitative and qualitative factors that bear upon investors' assessment of overall risk. The qualitative factors that bear upon the Company's risk have already been discussed. The quantitative risk analysis follows. For this purpose, I have compared the Company to the Standard & Poor's ("S&P") Public Utilities, an industry-wide proxy consisting of various public utility endeavors, and to the Water Group.

24. Q. What are the components of the S&P Public Utilities?

A. The S&P Public Utilities is a widely recognized index that is composed of electric power companies and natural gas companies. These companies are identified on page 3 of Schedule 4. I have used this group as a broad-based measure of public utility endeavors.

25. Q. What criteria have you employed to assemble your Water Group?

A. The Water Group companies have the following common characteristics: (i) they are listed in the "Water Utility Industry" section of The Value Line Investment Survey; (ii) their stock is traded; and (iii) they are not currently the target of a publicly-announced merger or acquisition. It would be inappropriate to include a company that is a target of a takeover in a proxy group because the stock price of that company usually disconnects from its underlying fundamentals. The members of the Water Group are: American States Water, American Water Works Co., Aqua America, Inc., Artesian Resources Corp., California Water Service Group, Connecticut Water Services, Middlesex Water Company, SJW Corporation, and The York Water Company.

26. Q. Is knowledge of a utility's bond rating an important factor in assessing its risk and cost of capital?

A. Yes. Knowledge of a company's credit quality rating is important because the cost of each type of capital is directly related to the associated risk of the firm. So, while a company's credit quality risk is shown directly by the rating and yield on its bonds, these relative risk assessments also bear upon the cost of equity. This is because a company's cost of equity is represented by its borrowing cost plus compensation to recognize the higher risk of an equity investment compared to debt.

27. Q. How do the credit quality ratings compare for NJAWC, the Water Group, and the S&P Public Utilities?

A. NJAWC has an A3 credit quality rating from Moody's and an A credit quality rating from S&P. The credit quality rating for AWW and American Water Capital Corporation ("AWCC"), which is the financing entity for the subsidiaries of AWW, is A3 from Moody's and A from S&P. For the Water Group, the average credit quality rating is A3 from Moody's and A from S&P. For the S&P Public Utilities, the average composite rating is A3/BBB+ by Moody's and S&P, respectively. Many of the financial indicators that I will subsequently discuss are considered during the rating process. On balance, the credit quality ratings of NJAWC are fairly similar to the Water Group.

28. Q. How do the financial data compare for the Company, Water Group and the S&P Public Utilities?

A. The broad categories of financial data that I will discuss are shown on Schedules 2, 3, and 4. This analysis covers the years 2012 through 2016. The important categories of relative risk may be summarized as follows:

Size. In terms of capitalization, the Company is slightly larger than the average size of the Water Group. The average size of the S&P Public Utilities is many times larger than the Company and the members of the Water Group. All other things being equal, a smaller company is riskier than a larger company because a given change in revenue and expense has a proportionately greater impact on a small firm. As I will demonstrate later, the size of a firm can impact its cost of equity.

Market Ratios. Market-based financial ratios, such as dividend yields, provide a partial measure of the investor-required cost of equity. If all other factors are equal, investors will require a higher return on equity for companies that exhibit greater risk as compensation for that risk. That is to say, a firm that investors perceive to have higher risks will experience a lower price per share in relation to expected earnings and hence; a lower price-earnings ratio.[2]

The average price-earnings multiple was higher for the Water Group as compared to the S&P Public Utilities. The average dividend yield was lower for the Water Group than for the S&P Public Utilities. On average, the historical market-to-book ratios were higher for the Water Group than for the S&P Public Utilities.

Common Equity Ratio. The level of financial risk is measured by the proportion of long-term debt and other senior capital that is contained in a company's capitalization. Financial risk is also analyzed by comparing common equity ratios (the complement of the ratio of debt and other senior capital). That is to say, a firm with a high common equity ratio has a lower financial risk, while a firm with a low common equity ratio has a higher financial risk. The five-year average common equity ratios, based on permanent capital, were 51.5% for the Company and 53.3% for the Water Group. As revealed by the common equity ratios for the water utility industry (see Schedule 3), the trend has been toward

[2] For example, two otherwise similarly situated firms each reporting $1.00 earnings per share would have different market prices at varying levels of risk, i.e., the firm with a higher level of risk will have a lower share value, while the firm with a lower risk profile will have a higher share value.

higher common equity ratios. For example, by year-end 2016, the Company had a 51.7% common equity ratio as compared to the Water Group that had a 54.2% common equity ratio. NJAWC has been moving toward a slightly higher proportion of common equity in its capital structure, consistent with the industry trend. For this case, the Company is proposing to include a 54% common equity ratio to set rates. This common equity ratio is entirely consistent with the common equity ratio of the Water Group. As such, the Company's proposed common equity ratio is reasonable and conforms with the common equity ratio that investors consider when pricing the common stocks of the Water Group.

Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's earned returns signifies relative levels of risk, as shown by the coefficient of variation (standard deviation ÷ mean) of the rate of return on book common equity. The higher the coefficient of variation, the greater degree of variability. For the five-year period, the coefficients of variation were 0.049 (0.5% ÷ 10.2%) for the Company, 0.049 (0.5% ÷ 10.2%) for the Water Group and 0.022 (0.2% ÷ 9.2%) for the S&P Public Utilities. The Company has experienced the same variability of its earned returns as the Water Group.

Operating Ratios. I have also compared operating ratios (the percentage of revenues consumed by operating expense, depreciation, and taxes other than income)[3]. The five-year average operating ratios were 65.6% for the Company,

[3] The complement of the operating ratio is the operating margin which provides a measure of profitability. The higher the operating ratio, the lower the operating margin.

69.0% for the Water Group, and 80.4% for the S&P Public Utilities. The Company's lower operating ratio can be traced to its higher capital intensity because a larger operating margin (i.e., the complement of the operating ratio) derives from the income taxes and return associated with a larger capital investment per dollar of revenue.

Coverage. The level of fixed charge coverage (i.e., the multiple by which available earnings cover fixed charges, such as interest expense and preferred stock dividends) provides an indication of the earnings protection for creditors. Higher levels of coverage, and hence earnings protection for fixed charges, are usually associated with superior grades of creditworthiness. The five-year average pre-tax interest coverage (excluding AFUDC) was 4.03 times for the Company, 4.13 times for the Water Group, and 3.15 times for the S&P Public Utilities. The coverages have been fairly similar for NJAWC and the Water Group.

Quality of Earnings. Measures of earnings quality are usually revealed by the percentage of Allowance for Funds Used During Construction ("AFUDC") related to income available for common equity, the effective income tax rate, and other cost deferrals. These measures of earnings quality usually influence a firm's internally generated funds because poor quality of earnings would not generate high levels of cash flow. Quality of earnings has not been a significant concern for NJAWC, the Water Group and the S&P Utilities in recent years.

Internally Generated Funds. Internally generated funds ("IGF") provide an important source of new investment capital for a utility and represent a key measure of credit strength. Historically, the five-year average percentage of IGF to capital expenditures was 76.1% for the Company, 81.9% for the Water Group, and 79.5% for the S&P Public Utilities. Although the Company's IGF to construction has been historically stronger than the Water Group, cash flow has been less than construction expenditures for the Company and the Water Group as compared to the S&P Public Utilities thus indicating higher risk for the water companies. As revealed by its forecasts, IGF to construction is projected to be approximately 64% on average for 2015-2019.

Betas. The financial data I have been discussing relate primarily to company-specific risks. Market risk for firms with traded stock is measured by beta coefficients. Beta coefficients attempt to identify systematic risk, i.e., the risk associated with changes in the overall market for common equities.[4] Value Line publishes such a statistical measure of a stock's relative historical volatility to the rest of the market. A comparison of market risk is shown by the average betas of .70 for the Water Group (see page 2 of Schedule 3), and .75 for the S&P Public Utilities (see page 3 of Schedule 4).

[4] The procedure used to calculate the beta coefficient published by Value Line is described in Appendix I. A common stock that has a beta less than 1.0 is considered to have less systematic risk than the market as a whole and would be expected to rise and fall more slowly than the rest of the market. A stock with a beta above 1.0 would have more systematic risk.

29. Q. Please summarize your risk evaluation of the Company and the Water Group.

A. NJAWC displays many of the same risk characteristics as the Water Group. Its credit quality ratings, its common equity ratio, its variability of earned returns, and its interest coverage, are fairly similar to the Water Group. The size of the Company is slightly larger than the Water Group. As to the Company's IGF percentage, this metric shows that IGF will fund just 13% of its construction expenditures over the next several years. On balance, the risk factors average out, indicating that the cost of equity for the Water Group would provide a reasonable basis for measuring the Company's cost of equity for this case. For the future, the risk of the water industry will be strongly influenced by the regulatory requirements associated with the SDWA, the need to maintain adequate supply, the need to rehabilitate infrastructure, high capital intensity, a low rate of capital recovery, and relatively low percentages of IGF to construction. For this case, the Water Group provides a reasonable basis for measuring the Company's cost of equity.

COST OF EQUITY – GENERAL APPROACH

30. Q. Please describe the process you employed to determine the cost of equity for NJAWC.

A. Although my fundamental financial analysis provides the required framework to establish the risk relationships among NJAWC, the Water Group, and the S&P Public Utilities, the cost of equity must be measured by standard financial models identified above. Differences in risk traits, such as size, business diversification,

geographical diversity, regulatory policy, financial leverage, and bond ratings must be considered when analyzing the cost of equity.

It is also important to reiterate that no one method or model of the cost of equity can be effectively applied in an isolated manner. Rather, informed judgment must be used in considering the relative risk traits of the company. It is for this reason that I have used more than one method to measure the Company's cost of equity. As I describe below, each of the methods used to measure the cost of equity is based on suboptimal, incomplete and/or overly restrictive assumptions and constraints. Therefore, I favor considering the results from a variety of methods. In this regard, I applied each of the methods with data taken from the Water Group and arrived at a cost of equity of 10.80% for the Company. Each measure of the cost of equity provides key elements to my recommendation, but the process of establishing a fair return does not lend itself to a simple averaging approach.

DISCOUNTED CASH FLOW ANALYSIS

31. Q. Please describe the discounted cash flow ("DCF") model.

A. The DCF model determines the value of an asset based on the present value of future expected cash flows, discounted at the appropriate risk-adjusted rate of return. In its simplest form, the DCF return on common stock consists of a current cash (dividend) yield and future price appreciation (growth) of the investment. The dividend discount equation is the familiar DCF valuation model and assumes future dividends are systematically related to one another by a constant growth rate. The DCF formula is derived from the standard valuation model: $P = D/(k-g)$, where P

= price, D = dividend, k = the cost of equity, and g = growth in cash flows. By rearranging the terms, we obtain the familiar DCF equation: k= D/P + g. All of the terms in the DCF equation represent investors' assessment of expected future cash flows that they will receive in relation to the value that they set for a share of stock (P). The DCF equation is sometimes referred to as the "Gordon" model. My DCF results are provided on page 2 of Schedule 1 for the Water Group. The DCF return is 10.53% including flotation costs.

Among other limitations of the model, there is a certain element of circularity in the DCF method when applied in rate cases. This is because investors' expectations for the future depend upon regulatory decisions. In turn, when regulators depend upon the DCF model to set the cost of equity, they rely upon investor expectations that include an assessment of how regulators will decide rate cases. Due to this circularity, the DCF model may not fully reflect the true risk of a utility.

32. Q. What is the dividend yield component of a DCF analysis?

A. The dividend yield reveals the portion of investors' cash flow that is generated by the return provided by dividend receipts. It is measured by the dividends per share relative to the price per share. The DCF methodology requires the use of an expected dividend yield to establish the investor-required cost of equity. For the twelve months ended July 2017, the monthly dividend yields are shown on Schedule 5 and reflect an adjustment to the month-end prices to reflect the buildup of the dividend in the price that has occurred since the last ex-dividend date (i.e.,

the date by which a shareholder must own the shares to be entitled to the dividend payment – usually about two to three weeks prior to the actual payment).

For the twelve months ended July 2017, the average dividend yield was 2.17% for the Water Group, calculated using annualized dividend payments and adjusted month-end stock prices. The dividend yields for the more recent six- and three-month periods were 2.12% and 2.11%, respectively. I have used, for the purpose of the DCF model, the six-month average dividend yield of 2.12% for the Water Group. The use of this dividend yield will reflect current capital costs, while avoiding the variability inherent in spot yields. For the purpose of a DCF calculation, the average dividend yield must be adjusted to reflect the prospective nature of the dividend payments, i.e., the higher expected dividends for the future. Recall that the DCF is an expectational model that must reflect investor anticipated cash flows for the Water Group. I have adjusted the six-month average dividend yield in three different, but generally accepted, manners and used the average of the three adjusted values as calculated in the lower panel of data presented on Schedule 5. This adjustment adds seven basis points to the six-month average historical yield, thus producing the 2.19% adjusted dividend yield for the Water Group.

33. Q. What are the most significant factors that influence investors' growth expectations?

A. As noted previously, investors are interested principally in the dividend yield and future growth of their investment (i.e., the price per share of the stock). Future earnings per share growth represents the DCF model's primary focus because under

the constant price-earnings multiple assumption of the model, the price per share of stock will grow at the same rate as earnings per share. In conducting a growth rate analysis, a wide variety of variables can be considered when reaching a prospective growth rate, including: earnings, dividends, book value, and cash flow stated on a per share basis. Historical values for these variables can be considered, as well as analysts' forecasts, which are widely available to investors. A fundamental growth rate analysis is sometimes represented by the internal growth ("b x r"), where "r" represents the expected rate of return on common equity and "b" is the retention rate that consists of the fraction of earnings that are not paid out as dividends. To be complete, the internal growth rate should be modified to account for sales of new common stock -- this is called external growth ("s x v"), where "s" represents the new common shares expected to be issued by a firm and "v" represents the value that accrues to existing shareholders from selling stock at a price different from book value. Fundamental growth, which combines internal and external growth, provides an explanation of the factors that cause book value per share to grow over time.

Growth also can be expressed in multiple stages. This expression of growth consists of an initial "growth" stage where a company enjoys rapidly expanding markets, high profit margins, and abnormally high growth in earnings per share. Thereafter, a company enters a "transition" stage where fewer technological advances and increased product saturation begin to reduce growth rates and profit margins come under pressure. During the "transition" phase, investment

opportunities begin to mature, capital requirements decline, and a company begins to pay out a larger percentage of earnings to shareholders. Finally, the mature or "steady-state" stage is reached when a company's earnings growth, payout ratio, and return on equity stabilizes at levels where they remain for the life of a company. The three stages of growth assume a step-down of high initial growth to lower sustainable growth. Even if these three stages of growth can often be expected, the third "steady-state" growth stage, which is assumed to remain fixed in perpetuity, may not last because the three stages of growth repeated. That is to say, the stages can be repeated where growth for a firm ramps-up and ramps-down in cycles over time.

34. Q. How did you determine an appropriate growth rate?

A. The growth rate used in a DCF calculation should measure investor expectations. Investors consider both company-specific variables and overall market sentiment (i.e., level of inflation rates, interest rates, economic conditions, etc.) when balancing their capital gains expectations with their dividend yield requirements. Investors are not influenced solely by a single set of company-specific variables weighted in a formulaic manner. Therefore, all relevant growth rate indicators using a variety of techniques must be evaluated when formulating a judgment of investor-expected growth.

35. Q. Did you consider company-specific data in your growth rate analysis?

A. Yes. As presented on Schedules 6 and 7, I have considered both historical and projected growth rates in earnings per share, dividends per share, book value per

share, and cash flow per share for the Water Group. While analysts will review all measures of growth as I have done, it is earnings per share growth that influences directly the expectations of investors for utility stocks. Forecasts of earnings growth are required within the context of the DCF because the model is forward-looking, and with a constant price-earnings multiple and payout ratio, all other measures of growth will mirror earnings growth. So, according to assumptions underlying the DCF model, all forward-looking variables should be similar with one another with a constant price-earnings multiple, earned return, and payout ratio.

As to the potential use of historical data, investors cannot purchase past earnings of a utility, rather they are only entitled to future earnings. In addition, assigning significant weight to historical growth rates results in double counting of these measures of growth. Historical data is already factored into the analysts' forecasts of earnings growth. In developing a forecast of future earnings growth, an analyst would first evaluate the historical performance of a company.

Schedule 6 shows the historical growth rates in earnings per share, dividends per share, book value per share, and cash flow per share for the Water Group. The historical growth rates were taken from the Value Line publication that provides these data. As shown on Schedule 6, the historical growth of earnings per share was in the range of 9.67% to 7.00% for the Water Group.

36. Q. Did you also consider analysts' expectations of expected growth?

A. Yes. Schedule 7 provides projected earnings per share growth rates taken from five-year forecasts compiled by IBES/First Call, Zacks and Morningstar, and Value Line. IBES/First Call, Zacks, and Morningstar are reliable authorities of projected growth upon which investors rely. The IBES/First Call and Zacks growth rates are consensus forecasts taken from a survey of analysts that make projections of growth for these companies. The IBES/First Call, Zacks and Morningstar estimates are posted online and easily obtained by investors. First Call is among the sources most frequently quoted by the financial press when reporting on earnings forecasts. The Value Line forecasts also are easily available to investors and can be obtained by subscription or free-of-charge at most public and collegiate libraries. The IBES/First Call, Zacks and Morningstar forecasts are limited to earnings per share growth, while Value Line makes projections of other financial variables. The Value Line forecasts of dividends per share, book value per share, and cash flow per share have also been included on Schedule 7 for the Water Group.

37. Q. Is a five-year investment horizon associated with the analysts' forecasts consistent with the traditional DCF model?

A. Yes. The constant form of the DCF assumes an infinite stream of cash flows, but investors do not expect to hold an investment indefinitely. Rather than viewing the DCF in the context of an endless stream of growing dividends (e.g., a century of cash flows), the growth in the share value (i.e., capital appreciation, or capital gains yield) is most relevant to investors' total return expectations. Hence, the sale price

of a stock can be viewed as a liquidating dividend that can be discounted along with the annual dividend receipts during the investment-holding period to arrive at the investor expected return. The growth in the price per share will equal the growth in earnings per share absent any change in price-earnings ("P-E") multiple -- a necessary assumption of the DCF. As such, my company-specific growth analysis, which focuses principally upon five-year forecasts of earnings per share growth, is the type of analysis that influences the actual total return expectation of investors. Moreover, academic research focuses on five-year growth rates as they influence stock prices. Indeed, if investors really required forecasts which extended beyond five years in order to properly value common stocks, then I am sure that some investment advisory service would begin publishing that information for individual stocks in order to meet the demands of investors. The absence of such publication suggests that there is no market for this information, because investors do not require infinite forecasts in order to purchase and sell stocks in the marketplace.

38. Q. What are the projected growth rates published by the sources you discussed?

A. As to the five-year forecast growth rates, Schedule 7 indicates that the projected earnings per share growth rates for the Water Group are 6.49% by IBES/First Call, 5.86% by Zacks, 9.30% by Morningstar, and 6.75% by Value Line. As noted earlier, with the constant price-earnings multiple assumption of the DCF model, growth for the Water Group companies will occur at the higher earnings per share growth rate, thus producing the capital gains yield expected by investors.

39. Q. What other factors did you consider in developing a growth rate?

A. I considered a variety of factors to reach my conclusion on the DCF growth rate. However, certain growth rate variables were given greater weight than others. From the various alternative measures of growth identified above, earnings per share should and did receive the greatest emphasis. Earnings per share growth is the primary determinant of investors' expectations regarding their total returns in the stock market. This is because the capital gains yield (i.e., price appreciation) will track earnings growth with a constant price earnings multiple (a key assumption of the DCF model). Moreover, earnings per share (derived from net income) are the source of dividend payments and are the primary driver of retention growth and its surrogate, i.e., book value per share growth. As such, under these circumstances, greater emphasis must be placed upon projected earnings per share growth. In this regard, it is worthwhile to note that Professor Myron Gordon, the foremost proponent of the DCF model in rate cases, concluded that the best measure of growth in the DCF model is a forecast of earnings per share growth. Hence, to follow Professor Gordon's findings, projections of earnings per share growth, such as those published by IBES/First Call, Zacks, Morningstar, and Value Line, represent a reasonable assessment of investor expectations.

40. Q. What growth rate do you use in your DCF model?

A. The forecasts of earnings per share growth, as shown on Schedule 7, provide a range of average growth rates of 5.86% to 9.30%. Although the DCF growth rates cannot be established solely with a mathematical formulation, it is my opinion that

an investor-expected growth rate of 6.75% is a reasonable estimate of investor expected growth within the array of earnings per share growth rates shown by the analysts' forecasts. The improved economic growth supports a higher DCF growth rate for the Water Group. Moreover, for water utilities, additional emphasis on infrastructure rehabilitation suggests that growth will be near the higher end of the range.

41. Q. Are the dividend yield and growth components of the DCF adequate to explain the rate of return on common equity when it is used in the calculation of the weighted average cost of capital?

A. Yes, however, this is true only if the capital structure ratios are measured with the market value of debt and equity. In the case of the Water Group, those average capital structure ratios are 25.35% long-term debt, 0.05% preferred stock, and 74.60% common equity, as shown on Schedule 8. These ratios vary from the ones I discussed previously, because they are based on the market value of each company's debt and equity, while the ratios discussed previously were based on book values. If book values are used to compute the capital structure ratios, then a leverage adjustment is required.

42. Q. What is a leverage adjustment?

A. Where a company's capitalization, as measured by its stock price, diverges from its book value capitalization, the potential exists for a financial risk difference, because the capitalization of a utility measured at its market value contains more equity, less debt and therefore, less risk than the capitalization measured at its book value. A

leverage adjustment accounts for this difference between market value and book value capital structures.

43. Q. Why is a leverage adjustment necessary?

A. In order to make the DCF results relevant to the capitalization measured at book value (as is done for rate setting purposes) the market-derived cost rate must be adjusted to account for this difference in financial risk. The only fact that is important to investors is the return that they can realize on the market value of their investment. As I have measured the DCF, the simple yield (D/P) plus growth (g) provides a return applicable strictly to the price (P) that an investor is willing to pay for a share of stock. The need for the leverage adjustment arises when the results of the DCF model (k) are applied to a capital structure that is different than indicated by the market price (P). From the market perspective, the financial risk of the Water Group is accurately measured by the capital structure ratios calculated from the market capitalization of a company. If the rate setting process utilized the market capitalization ratios, then no additional analysis or adjustment would be required, and the simple yield (D/P) plus growth (g) components of the DCF would satisfy the financial risk associated with the market value of the equity capitalization. Because the rate setting process uses a different set of ratios calculated from the book value capitalization, further analysis is required to synchronize the financial risk of the book capitalization with the required return on the book value of the equity. This adjustment is developed through precise mathematical calculations, using widely recognized analytical procedures

consistent with accepted financial theory. To arrive at that return, the rate of return on common equity is the unleveraged cost of capital (or equity return at 100% equity) plus one or more terms reflecting the increase in financial risk resulting from the use of leverage in the capital structure.

44. Q. Are there specific factors that influence market-to-book ratios that determine whether the leverage adjustment should be made?

A. No. The leverage adjustment is not intended, nor was it designed, to address the reasons that stock prices vary from book value. Hence, any observations concerning market prices relative to book are irrelevant. The leverage adjustment deals with the issue of financial risk and does not transform the DCF result to a book value return through a market-to-book adjustment. Again, the leverage adjustment that I propose is based on the fundamental financial precept that the cost of equity is equal to the rate of return for an unleveraged company (i.e., where the overall rate of return equates to the cost of equity with a capital structure that contains 100% equity) plus the additional return required for introducing debt and/or preferred stock leverage into the capital structure.

Further, as noted previously, the relatively high market prices of utility stocks cannot be attributed solely to the expectation that these companies will earn a return on equity that differs from their cost of equity. Stock prices above book value are common for utility stocks, and indeed the stock prices of non-regulated companies exceed book values by even greater margins. In this regard, according to the Barron's issue of August 7, 2017, the major market indices' market-to-book ratios

are well above unity. The Dow Jones Utility index traded at a multiple of 2.12 times book value, which is below the market multiple of other indices. For example, the S&P Industrial index was at 4.22 times book value, and the Dow Jones Industrial index was at 3.81 times book value. It is difficult to accept that the vast majority of all companies operating in our economy are generating returns far in excess of their cost of capital. Certainly, in our free-market economy, competition should contain such "excesses" if they indeed exist.

Finally, the leverage adjustment adds stability to the final DCF cost rate. That is to say, as the market capitalization increases relative to its book value, the leverage adjustment increases while the simple yield (D/P) plus growth (g) result declines. The reverse is also true that when the market capitalization declines, the leverage adjustment also declines as the simple yield (D/P) plus growth (g) result increases.

45. Q. Is the leverage adjustment that you propose designed to transform the market return into one that is designed to produce a particular market-to-book ratio?

A. No, it is not. The adjustment that I label as a "leverage adjustment" is merely a convenient way of showing the amount that must be added to (or subtracted from) the result of the simple DCF model (i.e., D/P + g), in the context of a return that applies to the capital structure used in ratemaking, which is computed with book value weights rather than market value weights, in order to arrive at the utility's total cost of equity. I specify a separate factor, which I call the "leverage adjustment", but there is no reason to do so other than providing identification for this factor. If I expressed my return solely in the context of the book value weights

that we use to calculate the weighted average cost of capital, and ignore the familiar D/P + g expression entirely, then there would be no separate element to reflect the financial leverage change from market value to book value capitalization. As shown in the bottom panel of data on Schedule 8, the equity return applicable to the book value common equity ratio is equal to 8.07%, which is the return for the Water Group applicable to its equity with no debt in its capital structure (i.e., the cost of capital is equal to the cost of equity with a 100% equity ratio) plus 2.20% compensation for having a 45.94% debt ratio, plus 0.00% for having a 0.11% preferred stock ratio. The sum of the parts is 10.27% (8.07% + 2.20% + 0.00%) and there is no need to even address the cost of equity in terms of D/P + g. To express this same return in the context of the familiar DCF model, I summed the 2.19% dividend yield, the 6.75% growth rate, and the 1.33% for the leverage adjustment in order to arrive at the same 10.27% (2.19% + 6.75% + 1.33%) return. I know of no means to mathematically solve for the 1.33% leverage adjustment by expressing it in terms of any particular relationship of market price to book value. The 1.33% adjustment is merely a convenient way to compare the 10.13% return computed directly with the Modigliani & Miller formulas to the 8.94%% return generated by the DCF model (i.e., $D_1/P_0 + g$, or the traditional form of the DCF -- see page 1 of Schedule 5) based on a market value capital structure. An 8.94% return assigned to anything other than the market value of equity cannot equate to a reasonable return on book value that has higher financial risk. My point is that when we use a market-determined cost of equity developed from the DCF model, it reflects a level of financial risk that is different (in this case, lower) than the

capital structure stated at book value. This process has nothing to do with targeting any particular market-to-book ratio.

46. Q. What does your DCF analysis show?

A. As explained previously, I have utilized a six-month average dividend yield ("D1/P0") adjusted in a forward-looking manner for my DCF calculation. This dividend yield is used in conjunction with the growth rate ("g") previously developed. The DCF also includes the leverage modification ("lev.") required when the book value equity ratio is used in determining the weighted average cost of capital in the rate setting process rather than the market value equity ratio related to the price of stock. In addition, flotation costs ("flot.") have also been recognized in the DCF return. The resulting DCF cost rate is:

	D_1/P_0	+	g	+	lev.	=	k	x	flot.	=	K
Water Group	2.19%	+	6.75%	+	1.33%	=	10.27%	x	1.025	=	10.53%

The DCF result shown above represents the simplified (i.e., Gordon) form of the model that contains a constant growth assumption. I should reiterate, however, that the DCF-indicated cost rate provides an explanation of the rate of return on common stock market prices without regard to the prospect of a change in the price-earnings multiple. An assumption that there will be no change in the price-earnings multiple is not supported by the realities of the equity market, because price-earnings multiples do not remain constant. This is one of the constraints of this

model and why I believe it is important to consider other model results when determining the Company's cost of equity.

47. Q. How have you measured the flotation cost allowance for the DCF return?

A. The flotation cost adjustment adds 0.26% (10.53% - 10.27%) to the rate of return on common equity for the Water Group as shown by the calculations provided on page 2 of Schedule 1. This adjustment is supported by the analysis of water utility stock issue shown on Schedule 9. There, I show that the average underwriters' discount and commission and company issuance expenses are 5.0% for the eight issues of common stock shown for the Water Group. Since I apply the flotation cost to the entire DCF result, I have utilized an adjustment factor that is one-half of the 5.0% as measured on Schedule 9. Hence, my flotation cost adjustment factor is 1.025, which is used on page 2 of Schedule 1.

RISK PREMIUM ANALYSIS

48. Q. Please describe your use of the risk premium approach to determine the cost of equity.

A. With the Risk Premium approach, the cost of equity capital is determined by corporate bond yields plus a premium to account for the fact that common equity is exposed to greater investment risk than debt capital. The result of my Risk Premium study is shown on page 2 of Schedule 1. That result is 11.51%, including flotation costs.

49. Q. What long-term public utility debt cost rate did you use in your risk premium analysis?

A. I used a 4.75% yield, which represents a reasonable estimate of the prospective yield on long-term A-rated public utility bonds for reasons described below.

50. Q. What historical data is shown by the Moody's data?

A. I have analyzed the historical yields on the Moody's index of long-term public utility debt as shown on page 1 of Schedule 10. Specifically, for the twelve months ending July 2017, the average monthly yield on Moody's index of A-rated public utility bonds was 4.01%. For the six and three-month periods ended July 2017, the yields were 4.10% and 4.02%, respectively. During the twelve-months ended July 2017, the range of the yields on A-rated public utility bonds was 3.59% to 4.27%. Page 2 of Schedule 10 shows the long-run spread in yields between A-rated public utility bonds and long-term Treasury bonds. As shown on page 3 of Schedule 10, the yields on A-rated public utility bonds have exceeded those on Treasury bonds by 1.19% on a twelve-month average basis, 1.15% on a six-month average basis, and 1.17% on a three-month average basis. From these averages, 1.00% represents a conservative spread for the yield on A-rated public utility bonds over Treasury bonds. This spread is derived from data applicable to the entire public utility industry and is related to very large debt issues by major utilities. As such, the spread that I use is applicable generally for debt issues in the hundreds of millions of dollars.

51. Q. Which forecasts of interest rates have you considered in your analysis?

A. I have determined the prospective yield on A-rated public utility debt by using the Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields

that I describe below. The Blue Chip is a reliable authority and contains consensus forecasts of a variety of interest rates compiled from a panel of banking, brokerage, and investment advisory services. In early 1999, Blue Chip stopped publishing forecasts of yields on A-rated public utility bonds because the Federal Reserve deleted these yields from its Statistical Release H.15. To independently project a forecast of the yields on A-rated public utility bonds, I combined the forecast yields on long-term Treasury bonds published on July 1, 2017, and a yield spread of 1.00%, derived from historical data.

52. Q. How have you used these data to project the yield on a-rated public utility bonds for the purpose of your risk premium analyses?

A. Shown below is my calculation of the prospective yield on A-rated public utility bonds using the building blocks discussed above, i.e., the Blue Chip forecast of Treasury bond yields and the public utility bond yield spread. For comparative purposes, I also have shown the Blue Chip forecasts of Aaa-rated and Baa-rated corporate bonds. These forecasts are:

		Blue Chip Financial Forecasts				
		Corporate		30-Year	A-rated Public Utility	
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2017	Third	3.9%	4.6%	3.0%	1.25%	4.25%
2017	Fourth	4.1%	4.8%	3.1%	1.25%	4.35%
2017	First	4.3%	5.0%	3.3%	1.25%	4.55%
2017	Second	4.5%	5.1%	3.4%	1.25%	4.65%
2018	Third	4.7%	5.4%	3.6%	1.25%	4.85%
2018	Fourth	4.8%	5.5%	3.7%	1.25%	4.95%

53. Q. Are there additional forecasts of interest rates that extend beyond those shown above?

A. Yes. Twice yearly, Blue Chip provides long-term forecasts of interest rates. In its June 1, 2017 publication, Blue Chip published longer-term forecasts of interest rates, which were reported to be:

	Blue Chip Financial Forecasts		
	Corporate		30-Year
Averages	Aaa-rated	Baa-rated	Treasury
2019-2022	5.4%	6.3%	4.3%
2024-2028	5.5%	6.4%	4.5%

The longer-term forecasts by Blue Chip suggest that interest rates will move up from the levels revealed by the near-term forecasts. By focusing more on these forecasts, a 4.75% yield on A-rated public utility bonds represents a conservative benchmark and relates to an average period covering a variety of market conditions likely to exist over the next several years. This public utility bond yield is distinct from interest rates that will likely prevail at specific points in time in the future.

54. Q. What equity risk premium have you determined for public utilities?

A. With forecasts predicting an upward movement of interest rates (described below) from historically low levels, I have utilized a 6.50% equity risk premium. To develop an appropriate equity risk premium, I analyzed the results from 2016 SBBI Yearbook, Stocks, Bonds, Bills and Inflation. My investigation reveals that the equity risk premium varies according to the level of interest rates. That is to say, the equity risk premium increases as interest rates decline and declines as interest

rates increase. This inverse relationship is revealed by the summary data presented below and shown on page 1 of Schedule 11.

Common Equity Risk Premiums		
Low Interest Rates		7.08%
Average Across All Interest Rates		5.64%
High Interest Rates		4.18%

Analysis of the historical data shows that the equity risk premium was 7.08% when the marginal cost of long-term government bonds was low (i.e., 2.96%, which was the average yield during periods of low rates). Conversely, when the yield on long-term government bonds was high (i.e., 7.22% on average during periods of high interest rates) the spread narrowed to 4.18%. Over the entire spectrum of interest rates, the equity risk premium was 5.64% when the average government bond yield was 5.07%. The 6.50% equity risk premium utilized is between the 7.08% premium related to periods of low interest rates and the 5.64% premium related to average interest rates across all levels.

55. Q. What common equity cost rate did you determine based on your risk premium analysis?

A. The cost of equity (i.e., "k") is represented by the sum of the prospective yield for long-term public utility debt (i.e., "i"), the equity risk premium (i.e., "RP"), and flotation costs (i.e., "flot."). As determined through my analysis, the Risk Premium

approach provides a cost of equity of 11.51% (including flotation costs) expressed as follows:

	i	+	*RP*	=	*k*	+	*flot.*	=	*K*
Water Group	4.75%	+	6.50%	=	11.25%	+	0.26%	=	11.51%

CAPITAL ASSET PRICING MODEL

56. Q. Generally speaking, how is the CAPM used to measure the cost of equity?

A. The CAPM uses the yield on a risk-free interest-bearing obligation plus a rate of return premium that is proportional to the systematic risk of an investment. As shown on page 2 of Schedule 1, the result of my CAPM analysis is 11.67%, including flotation costs. To compute the cost of equity with the CAPM, three components are necessary: a risk-free rate of return ("Rf"), the beta measure of systematic risk ("β"), and the market risk premium ("Rm-Rf") derived from the total return on the market of equities reduced by the risk-free rate of return. The CAPM specifically accounts for differences in systematic risk (i.e., market risk as measured by the beta) between an individual firm or group of firms and the entire market of equities.

57. Q. What betas have you considered in the CAPM?

A. For my CAPM analysis, I initially considered the Value Line betas. As shown on page 2 of Schedule 3, the average beta is 0.70 for the Water Group.

59. Q. Did you use the Value Line betas in your CAPM determined cost of equity?

A. I used the Value Line betas as a foundation for the leverage adjusted betas that I used in my CAPM analysis. The betas must be reflective of the financial risk associated with the rate setting capital structure that is measured at book value. Therefore, Value Line betas cannot be used directly in the CAPM, unless the cost rate developed using those betas is applied to a capital structure measured with market values. To develop a CAPM cost rate applicable to a book-value capital structure, the Value Line (market value) betas have been unleveraged and releveraged for the book value common equity ratios using the Hamada formula, as follows:

$$\beta l = \beta u \, [1 + (1 - t) \, D/E + P/E]$$

where ßl = the leveraged beta, ßu = the unleveraged beta, t = income tax rate, D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas published by Value Line have been calculated with the market price of stock and are related to the market value capitalization. With the application of the formula shown above and the capital structure ratios measured at market value, the beta becomes 0.57 for the Water Group if the Group employed no leverage and was 100% equity financed. Those calculations are shown on Schedule 8 under the section labeled "Hamada". With the unleveraged beta as a base, I calculated the leveraged beta of 0.89 for the book value capital structure of the Water Group. The book value leveraged beta that I will employ in the CAPM cost of equity is 0.89 for the Water Group.

60. Q. What risk-free rate have you used in your CAPM analysis and how was it derived?

A. I have used a 3.75% risk-free rate of return for CAPM purposes. As shown on page 1 of Schedule 12, I provided the historical yields on Treasury notes and bonds. For the twelve months ended July 2017, the average yield on 30-year Treasury bonds was 2.82%. For the six- and three-months ended January 2017, the yields on 30-year Treasury bonds were 2.95% and 2.88%, respectively. During the twelve-months ended July 2017, the range of the yields on 30-year Treasury bonds was 2.26% to 3.11%.

61. Q. What are some of the factors that have influenced historical treasury yields?

A. The low yields that existed during recent periods can be traced to the financial crisis and its aftermath commonly referred to as the Great Recession. The resulting decline in the yields on Treasury obligations was attributed to a number of factors, including: the sovereign debt crisis in the euro zone, concern over a possible double dip recession and the potential for deflation, the expansion of the Federal Reserve's large balance sheet through the purchase of Treasury obligations and mortgage-backed securities (referred to as Quantitative Easing; also known as QEI, QEII, and QEIII), and the reinvestment of proceeds from maturing obligations and the lengthening of the maturity of the Fed's bond portfolio through the sale of short-term Treasuries and the purchase of long-term Treasury obligations (also known as "operation twist"). Essentially, low interest rates were the product of the policy of the Federal Open Market Committee ("FOMC") in its attempt to deal with stagnant

job growth, which is part of its dual mandate. The FOMC has ended its bond purchasing program.

62. Q. Are treasury yields now moving to higher levels?

A. Yes. At its December 16, 2015 meeting, the FOMC increased the federal funds rate range by 0.25 percentage points. On December 14, 2016, the FOMC acted again by raising the Fed Funds rate by one-quarter percentage point. Two additional one-quarter percentage point increase in the Fed Funds rate occurred on March 15, 2017 and June 15, 2017. The FOMC also used this occasion to reiterate its more aggressive approach to implement future increases in interest rates. FOMC officials indicated that there could be additional increases in interest rates in 2017. In addition, the Fed has indicated that it will begin to reduce the size of its balance sheet. This buttresses expectation of future increases in the federal funds rate.

As shown on page 2 of Schedule 12, forecasts published by Blue Chip on August 1, 2017 indicate that the yields on long-term Treasury bonds are expected to be in the range of 3.0% to 3.7% during the next six quarters. The longer-term forecasts described previously show that the yields on 30-year Treasury bonds are expected to average 4.2% from 2018 through 2022 and 4.5% from 2023 to 2027. For the reasons explained previously, forecasts of interest rates should be emphasized at this time in selecting the risk-free rate of return in CAPM. Hence, I have used a 3.75% risk-free rate of return for CAPM purposes, which considers the Blue Chip forecasts.

63. Q. What market premium have you used in your CAPM analysis and how was it derived?

A. I used a market premium of 7.46%. As shown in the lower panel of data presented on page 2 of Schedule 12, the market premium is derived from historical data and the Value Line and S&P 500 returns. For the historically based market premium, I have used the arithmetic mean obtained from the data presented on page 1 of Schedule 11. As shown on Schedule 11, the market return was 11.97% on large stocks during periods of low interest rates. During those periods, the yield on long-term government bonds was 2.96%. As previously described, interest rates are forecast to trend upward in the future. To recognize that trend, I have given weight to the average returns and yields across all interest rate levels. As such, I carried over to page 2 of Schedule 12 the average large common stock returns of 11.96% (11.97% + 11.95% = 23.92% ÷ 2) and the average yield on long-term government bonds of 4.02% (2.96% + 5.07% = 8.03% ÷ 2). These financial returns rest between those experienced during periods of low interest rates and those experienced across all levels of interest rates. The resulting market premium is 7.94% (11.96% - 4.02%) based on historical data, as shown on page 2 of Schedule 12. For the forecast returns, I calculated an 9.79% total market return from the Value Line data and a DCF return of 11.65% for the S&P 500. With the average forecast return of 10.72% (9.79% + 11.65% = 21.44% ÷ 2), I calculated a market premium of 6.97% (10.72% - 3.75%) using forecast data. The market premium applicable to the CAPM derived from these sources equals 7.46% (6.97% + 7.94% = 14.91% ÷ 2).

64. Q. Are adjustments to the CAPM necessary to fully reflect the rate of return on common equity?

A. Yes. The technical literature supports an adjustment relating to the size of the company or portfolio for which the calculation is performed. As the size of a company decreases, its risk and required return increases. Moreover, in his discussion of the cost of capital, Professor Brigham indicated that smaller companies have higher capital costs than otherwise similar but larger companies.[5] Also, the Fama/French study (see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June 1992) established that the size of a company helps explain stock returns. In an October 15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock Effect," it was demonstrated that the CAPM could understate the cost of equity significantly according to a company's size. Indeed, it was demonstrated in the SBBI Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) were in excess of those shown by the simple CAPM. In this regard, the Water Group has a market-based average equity capitalization of $2,751 million. The mid-cap adjustment of 1.02% is revealed on page 3 of Schedule 12. This adjustment is reasonable given the smaller size of NJAWC.

65. Q. What does your CAPM analysis show?

A. Using the 3.75% risk-free rate of return, the leverage adjusted beta of 0.89 for the Water Group, the 7.46% market premium, the 1.02% size adjustment, and flotation

[5] See Fundamentals of Financial Management, Fifth Edition, at 623.

cost adjustment, the cost of equity derived is 11.67% (including flotation costs) as indicated below:

	Rf	+	***ß***	***x (Rm-Rf)***	+	***size***	=	***k***	+	***flot.***	=	***K***
Water Group	3.75%	+	0.89	x (7.46%)	+	1.02%	=	11.41%	+	0.26%	=	11.67%

COMPARABLE EARNINGS APPROACH

66. Q. Generally speaking, what is the comparable earnings approach?

A. The Comparable Earnings approach estimates a fair return on equity by comparing returns realized by non-regulated companies to returns that a public utility with similar risk characteristics would need to realize in order to compete for capital. Because regulation is a substitute for competitively determined prices, the returns realized by non-regulated companies with risks that are comparable to a public utility provide useful insight into investor expectations for public utility returns. The companies selected for the Comparable Earnings approach should be companies whose prices are not subject to cost-based price ceilings (i.e., non-regulated companies) so that circularity is avoided.

There are two avenues available to implement the Comparable Earnings approach. One method involves the selection of another industry (or industries) with risks that are comparable to those of the public utility in question, and the use of the results for all companies within that industry as a benchmark. The second approach requires the selection of parameters that represent similar risk traits for the public utility and for companies with comparable risks. Using this approach, the business

lines of the comparable companies become unimportant. The latter approach is preferable with the qualification that the comparable risk companies that are considered exclude regulated companies in order to avoid the circular reasoning implicit in the use of the achieved earnings/book ratios of other regulated firms. The United States Supreme Court has held that:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. Bluefield Water Works vs. Public Service Commission, 262 U.S. 668 (1923).

It is important to assess the returns earned by companies that compete for capital with a public utility. This can be accomplished by analyzing the returns of non-regulated companies that are subject to similar competition and marketplace forces.

67. Q. Did you compare the results of your DCF and CAPM analyses to the results indicated by a comparable earnings approach?

A. Yes. I selected companies from the Value Line Investment Survey for Windows that have six categories of risk that established comparability between the non-regulated companies that I selected and the Water Group. These screening criteria were based upon the range of risks as defined by the rankings of the companies in

the Water Group. The measures of risk that were considered include: Timeliness Rank, Safety Rank, Financial Strength, Price Stability, Value Line betas, and Technical Rank. The parameters for selection are provided on page 3 of Schedule 13. The identities of the companies selected for the Comparable Earnings group and their rankings are shown on page 1 of Schedule 13.

Value Line data was relied upon because it provides a comprehensive basis for evaluating the risks of comparable companies. As to the returns calculated by Value Line for these companies, there is some downward bias in the figures shown on page 2 of Schedule 13, because Value Line computes the returns on year-end rather than average book value. The use of year-end book values creates a downward bias under the situation of increasing book values year over year. If average book values had been employed, the rates of return would have been slightly higher. Nevertheless, these are the returns considered by investors when taking positions in these stocks. Because many of the same comparability factors and published returns are used by investors in selecting stocks, and because investors rely on the Value Line service to gauge returns, it is an appropriate database for measuring comparable return opportunities.

68. Q. What data have you used in your comparable earnings analysis?

A. I used both historical realized returns and forecasted returns for non-utility companies in my comparable earnings analysis. As noted previously, I have not used returns for utility companies in order to avoid the circularity that arises from using regulatory-influenced returns to determine a regulated return. It is appropriate

to consider a relatively long measurement period in the Comparable Earnings approach in order to cover conditions over an entire business cycle. A ten-year period (five historical years and five projected years) is sufficient to cover an average business cycle. Unlike the DCF and CAPM, the results of the Comparable Earnings method can be applied directly to the book value capitalization because the nature of the analysis relates to book value. Hence, Comparable Earnings does not pose the risk of potential misspecification that is posed by market models when the market capitalization and book value capitalization diverge significantly.

The historical rate of return on book common equity was 12.0% using only the returns that were less than 20% and greater than 8% as shown on page 2 of Schedule 13. Points of demarcation were chosen to eliminate the results of highly profitable enterprises, which the Bluefield case stated were not the type of returns that a utility was entitled to earn, and unrepresentatively low returns. For this purpose, I used 20% as the point where those returns could be viewed as highly profitable and should be excluded from the Comparable Earnings approach. And to minimize the effect of a skewed distribution, I removed from the average the returns that were less than 8%. The forecast rate of return, as published by Value Line, is 12.1%, as indicated on page 2 of Schedule 13.

69. Q. What rate of return on common equity have you determined in this case using the comparable earnings approach?

A. The average of the historical and forecast rates of return is:

NEW JERSEY-AMERICAN WATER COMPANY, INC.

	Historical	Forecast	Average
Comparable Earnings Group	12.0%	12.1%	12.05%

CONCLUSION ON COST OF EQUITY

70. Q. What is your conclusion regarding the Company's cost of common equity?

A. Based upon the application of a variety of methods and models described previously, it is my opinion that a reasonable cost of common equity for the Company is 10.80%. As my testimony has demonstrated, the equity return that I propose for NJAWC is conservative given the results shown by several of the models of the cost of equity and the risk traits of the Company. My cost of equity determination is based on a range of results and should be considered in the context of the Company's risk characteristics, as well as the general condition of the capital markets. It is essential that the Board employ a variety of techniques to measure the Company's cost of equity because of the limitations/infirmities that are inherent in each method. When conducting its deliberations, I would highly recommend that the Board acknowledge the specific risks of NJAWC.

71. Q. Does this conclude your direct testimony at this time?

A. Yes. However, I reserve the right to supplement my testimony, if necessary, and to respond to witnesses presented by other parties.

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE AND QUALIFICATIONS

I was awarded a degree of Bachelor of Science in Business Administration by Drexel University in 1971. While at Drexel, I participated in the Cooperative Education Program which included employment, for one year, with American Water Works Service Company, Inc., as an internal auditor, where I was involved in the audits of several operating water companies of the American Water Works System and participated in the preparation of annual reports to regulatory agencies and assisted in other general accounting matters.

Upon graduation from Drexel University, I was employed by American Water Works Service Company, Inc., in the Eastern Regional Treasury Department where my duties included preparation of rate case exhibits for submission to regulatory agencies, as well as responsibility for various treasury functions of the thirteen New England operating subsidiaries.

In 1973, I joined the Municipal Financial Services Department of Betz Environmental Engineers, a consulting engineering firm, where I specialized in financial studies for municipal water and wastewater systems.

In 1974, I joined Associated Utility Services, Inc., now known as AUS Consultants. I held various positions with the Utility Services Group of AUS Consultants, concluding my employment there as a Senior Vice President.

In 1994, I formed P. Moul & Associates, an independent financial and regulatory consulting firm. In my capacity as Managing Consultant and for the past twenty-nine years, I have continuously studied the rate of return requirements for cost of service-regulated firms. In this regard, I have supervised the preparation of rate of return studies, which were employed, in connection with my testimony and in the past for other individuals. I have presented direct

testimony on the subject of fair rate of return, evaluated rate of return testimony of other witnesses, and presented rebuttal testimony.

My studies and prepared direct testimony have been presented before thirty-seven (37) federal, state and municipal regulatory Boards, consisting of: the Federal Energy Regulatory Board; state public utility Boards in Alabama, Alaska, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin, and the Philadelphia Gas Board, and the Texas Board on Environmental Quality. My testimony has been offered in over 200 rate cases involving electric power, natural gas distribution and transmission, resource recovery, solid waste collection and disposal, telephone, wastewater, and water service utility companies. While my testimony has involved principally fair rate of return and financial matters, I have also testified on capital allocations, capital recovery, cash working capital, income taxes, factoring of accounts receivable, and take-or-pay expense recovery. My testimony has been offered on behalf of municipal and investor-owned public utilities and for the staff of a regulatory Board. I have also testified at an Executive Session of the State of New Jersey Board of Investigation concerning the BPU regulation of solid waste collection and disposal.

I was a co-author of a verified statement submitted to the Interstate Commerce Board concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was also co-author of comments submitted to the Federal Energy Regulatory Board regarding the Generic Determination of Rate of Return on Common Equity for Public Utilities in 1985, 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-000 and RM88-25-000). Further,

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

I have been the consultant to the NJAWC Chapter of the National Association of Water Companies, which represented the water utility group in the Proceeding on Motion of the Board to Consider Financial Regulatory Policies for New NJAWC Utilities (Case 91-M-0509). I have also submitted comments to the Federal Energy Regulatory Board in its Notice of Proposed Rulemaking (Docket No. RM99-2-000) concerning Regional Transmission Organizations and on behalf of the Edison Electric Institute in its intervention in the case of Southern California Edison Company (Docket No. ER97-2355-000). Also, I was a member of the panel of participants at the Technical Conference in Docket No. PL07-2 on the Composition of Proxy Groups for Determining Gas and Oil Pipeline Return on Equity.

In late 1978, I arranged for the private placement of bonds on behalf of an investor-owned public utility. I have assisted in the preparation of a report to the Delaware Public Service Board relative to the operations of the Lincoln and Ellendale Electric Company. I was also engaged by the Delaware P.S.C. to review and report on the proposed financing and disposition of certain assets of Sussex Shores Water Company (P.S.C. Docket Nos. 24-79 and 47-79). I was a co-author of a Report on Proposed Mandatory Solid Waste Collection Ordinance prepared for the Board of County Boarders of Collier County, Florida.

I have been a consultant to the Bucks County Water and Sewer Authority concerning rates and charges for wholesale contract service with the City of Philadelphia. My municipal consulting experience also included an assignment for Baltimore County, Maryland, regarding the City/County Water Agreement for Metropolitan District customers (Circuit Court for Baltimore County in Case 34/153/87-CSP-2636).