EXHIBIT
6
DW 17-165

STATE OF NEW HAMPSHIRE
PUBLIC UTILITY COMMISSION

DOCKET NO. ________

DIRECT TESTIMONY OF

PAULINE M. AHERN, CRRA

ON BEHALF OF

ABENAKI WATER COMPANY
HAMPSTEAD AREA WATER CO., INC.
LAKES REGION WATER CO., INC.

January xx, 2018

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I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Pauline M. Ahern. I am an Executive Director of ScottMadden, Inc. My business address is 1900 West Park Road, Suite 250, Westborough, MA 01581. My mailing address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities before thirty-two state regulatory commissions in the United States and Canada on rate of return issues including, but not limited to, common equity cost rate, fair rate of return, capital structure issues, relative investment risk and credit quality issues. I am a graduate of Clark University, Worcester, MA, where I received a Bachelor of Arts degree with honors in Economics. I have also received a Master of Business Administration with high honors and a concentration in finance from Rutgers University.

On behalf of the American Gas Association ("A.G.A."), I calculate the A.G.A. Gas Index, which serves as the benchmark against which the monthly performance of the American Gas Index Fund ("AGIF") is measured. The A.G.A. Gas Index and AGIF are a market capitalization weighted index and mutual fund, respectively, comprised of the common stocks of the publicly traded corporate members of the A.G.A.

I am a member of the Society of Utility and Regulatory Financial Analysts ("SURFA") and currently serve as its Vice President, having previously served on its Board of Directors from 2011 – 2017, two terms as President, from 2006 – 2008 and 2008 – 2010, and as its Secretary / Treasurer from 2012 – 2006. In 1992, I was awarded the professional designation "Certified Rate of Return Analyst" ("CRRA") by SURFA, which is based upon education, experience and the successful completion of a comprehensive written examination.

I am also an associate member of the National Association of Water Companies, serving on its Finance / Accounting / Taxation and Rates and Regulation Committees; a member of the Advisory Council of the Financial Research Institute – University of Missouri – Robert J. Trulaske, Sr. College of Business; a member of the American Finance and Financial Management Associations; a member of Edison Electric Institute's Cost of Capital Working Group; and a member of A.G.A.'s State Affairs Committee.

The details of my educational background, expert witness appearances, presentations I have given and articles I have co-authored are shown in Appendix A.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose is to provide testimony on behalf of Abenaki Water Company ("AWC"), Hampstead Water Co., Inc. ("HAWC") and Lakes Region Water Co., Inc. ("LRWC"), collectively the "Companies", as to an appropriate small size premium to reflect the smaller size of the Companies relative to any company or group of companies upon whose authorized or estimated market based common equity cost rate ("ROE") the allowed ROEs of the Companies are to be based.

In addition, this testimony will propose a generic / formula ROE methodology for the consideration of the New Hampshire Public Utility Commission ("NH PUC") to be used to determine authorized ROEs for the Companies. I will also address both the Massachusetts ("MA") and Connecticut ("CT") generic methodologies for determining authorized ROEs for the Companies. Finally, this testimony will provide proposed ROEs for each of the Companies based upon my proposed generic ROE formula as well as the MA and CT generic ROE formulas.

Q. HAVE YOU PREPARED ATTACHMENTS THAT SUPPORT YOUR TESTIMONY?

A. Yes. They have been designated as Attachments PMA-1 through PMA-8. Appendix B contains citations footnoted in this testimony with the exception of the *Hope*[1] and *Bluefield*[2] cases.

III. SUMMARY

Q. PLEASE SUMMARIZE YOUR ANALYSES.

A. My analyses indicate that ranges of size premiums of 2.64% - 5.27% for AWC, 2.30% - 4.59% for HAWC and 2.23% - 4.46% for LRWC based upon an analysis of each Company's market capitalization, book value, average 5-year net income, value of invested capital, total assets and number of employees, relative to the averages of each factor for a group of publicly traded water utilities ("Water Utility Group") using size risk premium studies by Duff & Phelps. The selection of the Water Utility Group will be discussed in detail below.

I also propose that the NH PUC consider using a generic ROE methodology based upon that used by the Florida Public Service Commission ("FLPSC") since the late 1980s for the small water and wastewater utilities under its jurisdiction.

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1 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).
2 *Bluefield Water Works Improvement Co. v. Public Serv. Comm'n*, 262 U.S. 679 (1922).

In addition, this testimony provides comments upon the current generic ROE formulas currently in place in Massachusetts and Connecticut and proposes revisions to these formulas.

Finally, I propose common equity cost rates for AWC, HAWC, and LRWC based upon my proposed generic ROE methodology and current capital market data, the MA generic ROE methodology and the CT generic methodology as shown in Table 1 below.

<u>Table 11</u>

<u>Conclusions of ROE for AWC, HAWC and LRWC</u>

Abenaki Water Company	**Low Size Risk Premium**	**High Size Risk Premium**
Proposed generic ROE formula	13.30%	15.96%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	14.14%	16.77%
Proj. 30-Year US Treas. Bond	12.16%	14.79%
Connecticut's ROE formula	12.24%	14.87%
Hampstead Area Water Co., Inc.	**Low Size Risk Premium**	**High Size Risk Premium**
Proposed generic ROE formula	17.33%	21.06%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	13.80%	16.09%
Proj. 30-Year US Treas. Bond	11.82%	14.11%
Connecticut's ROE formula	11.90%	14.19%
Lakes Region Water Co., Inc.	**Low Size Risk Premium**	**High Size Risk Premium**

Proposed generic ROE formula	12.70%	14.93%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	13.79%	16.07%
Proj. 30-Year US Treas. Bond	11.81%	14.09%
Connecticut's ROE formula	11.83%	14.06%

IV. GENERAL PRINCIPLES OF RATE OF RETURN

Q. WHAT GENERAL PRINCIPLES MUST BE CONSIDERED IN DETERMINING A FAIR AND REASONABLE ROE FOR REGULATED UTILITIES

A. The cost of capital is defined as that return which investors require to make an investment in a given firm. From the firm's perspective, that required return, whether it is provided to debt or equity investors, has a cost. Individually, the "cost of debt" and the "cost of equity" are collectively referred to as the "cost of capital."

The cost of capital (including the costs of both debt and equity) is based upon the economic principle of "opportunity cost," meaning that investing in any asset / security implies a forgone opportunity to invest in alternative assets / securities. Because investments with similar risks should offer similar returns, the opportunity cost of an investment should equal the return available on investments of comparable risk.

Although both debt and equity have required costs, they differ fundamentally. The cost of debt is contractually defined and can be directly observed in the market as the interest rate or yield on debt securities. In contrast, the cost of equity does not have a contractual obligation, nor can it be directly observed in the market. Rather, because common equity investors have a claim on a firm's cash flows *only after* debt holders are paid, it is the uncertainty (or risk) associated with those residual cash flows which determines the cost of equity. Because common equity investors bear this "residual risk," they require higher returns than debt holders. In that sense, common equity and debt investors are distinct: they invest in different securities; face different risks; and, require different returns. That is not to say that the risks facing debt and equity investors are separate and distinct, with the two having much in common, but only to a point. Nonetheless, commentary from both debt and equity analysts is instructive and helps inform the determination of the required return within a range of analytical results.

The cost of capital, specifically the cost of common equity or the investor required return on common equity, is also an economic and financial concept which refers to the *ex-ante,* or the *expected* return on an investment at the market value of the publicly traded common shares of a corporation. According to the basic financial principle of risk and return, the investor required return on investment is a function of the level of investor perceived risk as reflected in the market prices paid by investors. The higher / lower the investor-perceived risk, the higher / lower the investor-required return. The investor required return is also forward-looking, or expectational, as it is the return the investor *expects* to receive in the future for investing capital today and is based upon expected economic and capital market conditions.

In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. A sufficient level of earnings is required to assure that the utility can: 1) fulfill its obligation to provide safe and reliable service at all times; 2) maintain the integrity of presently-invested capital through future reinvestment; and, 3) attract needed new capital at a reasonable cost and on reasonable terms in competition with other firms of comparable risk. This is consistent with the previously noted fair rate of return standards established by the U.S. Supreme Court in the *Hope* and *Bluefield* cases.

In rate base / rate of return regulation, the authorized (allowed) return on common equity means the investor-required return. In turn, the investor-required return is defined as the return required by the investor on the funds invested in the publicly traded common stocks of firms. As stated previously, the cost of common equity is not directly observable in the capital markets, since there is no contractual basis or obligation on the part of a firm to provide a return to its common shareholders, unlike the contractual coupon or interest rate on its debt obligations. Therefore, the cost of common equity must be estimated from market (economic and financial) data, using financial models developed for that purpose, including the Discounted Cash Flow ("DCF") and Capital Asset Pricing Model ("CAPM"). Any generic ROE formula adopted by the NH PUC must be based upon the marketplace data of a proxy group of water utilities that are as similar in risk as possible to the Companies based upon selection criteria discussed below.

Because empirical financial models for determining the cost of common equity are subject to limiting assumptions or other constraints, most finance texts recommend using multiple approaches to estimate the cost of common equity. As a practical matter, no individual model is more reliable than all others under all market conditions. The use of multiple common equity cost rate models adds reliability to the estimation of the investor-required return. This fact is well supported in the academic literature with respect to regulatory finance and utility regulation.

For example, Roger A. Morin ("Morin") states:

> Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. The inability of the DCF model to account for changes in relative market valuation, discussed below, is a vivid example of the potential shortcomings of the DCF model when applied to a given company. Similarly, the inability of the CAPM to account for variables that affect security returns other than beta tarnishes its use.
>
> ***No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment.*** Reliance on any single method or preset formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data.
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> * * *
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> The financial literature supports the use of multiple methods. Professor Eugene Brigham, a widely respected scholar and finance academician, asserts:
>
> Three methods typically are used: (1) the Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) method, and (3) the bond-yield-plus-risk-premium approach. These methods are not mutually exclusive – no method dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand. Another prominent finance scholar, Professor Stewart Myers, in an early pioneering article on regulatory finance, stated:
>
> Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information. That means you should not use any one model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data.
>
> Reliance on multiple tests recognizes that no single methodology produces a precise definitive estimate of the cost of equity. As stated in Bonbright, Danielsen, and Kamerschen (1988), '*no single or group test or technique is conclusive*.' Only a fool discards relevant evidence. (italics in original)

* * *

> While it is certainly appropriate to use the DCF methodology to estimate the cost of equity, there is no proof that the DCF produces a more accurate estimate of the cost of equity than other methodologies. Sole reliance on the DCF model ignores the capital market evidence and financial theory formalized in the CAPM and other risk premium methods. ***The DCF model is one of many tools to be employed in conjunction with other methods to estimate the cost of equity.*** It is not a superior methodology that supplants other financial theory and market evidence. The broad usage of the DCF methodology in regulatory proceedings in contrast to its virtual disappearance in academic textbooks does not make it superior to other methods. The same is true of the Risk Premium and CAPM methodologies.[3]

Both the use of the market data of a proxy group of similar risk, as well as the use of multiple common equity cost rate models, adds reliability to the informed expert judgment used in estimating the common equity cost rate. Therefore, it is both prudent and appropriate to use multiple methodologies to mitigate the effects of the limiting assumptions and inputs associated with any single approach. As such, my proposed generic ROE methodology considers the results of two well-tested market models: the DCF and CAPM in arriving at appropriate ROEs applicable to the Companies.

V. WATER AND WASTEWATER UTILITY RISK

A. General Water and Wastewater Business Risk

Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS IMPORTANT TO THE DETERMINATION OF A FAIR RATE OF RETURN.

A. The investor-required return on common equity reflects investors' assessment of the total investment risk of the subject firm. Total investment risk is often discussed in the context of business and financial risk.

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3 Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006) 428-431 (emphasis added) (footnotes omitted) (*See* Appendix B, Workpaper PMA-1).

Business risk reflects the uncertainty associated with owning a company's common stock without the company's use of debt and / or preferred stock financing. One way to consider the distinction between business and financial risk is to view the former as the uncertainty of the expected earned return on common equity assuming the firm is financed with no debt.

Examples of the business risks *generally* faced by utilities include, but are not limited to, the regulatory environment, mandatory environmental compliance requirements, customer mix and concentration of customers, service territory economic growth, market demand, risks and uncertainties of water supply, operations, capital intensity, size, and the degree of operating leverage, and the like, all of which have a direct bearing on earnings. Although analysts, including rating agencies, may categorize business risks according to individual categories, as a practical matter they are inter-related and are not wholly distinct from one another. Therefore, it is difficult to specifically and numerically quantify the effect of any individual factor on investors' required return, i.e., the cost of capital. For determining an appropriate return on common equity, the relevant issue is where investors see the subject company as falling within a spectrum of risk. To the extent investors view a company as being exposed to additional risk, the required return will increase, and vice versa.

For regulated utilities, business risks are both long- and near-term in nature. Whereas near-term business risks are reflected in the year-to-year variability in earnings and cash flow brought about by economic or regulatory factors, long-term business risks reflect the prospect of an impaired ability of investors to earn a return on and of their capital. Moreover, because utilities accept the obligation to provide safe, adequate and reliable service at all times (in exchange for the opportunity to earn a fair return on their investment), they generally do not have the option to delay, defer, or reject capital investments. Because those investments are capital-intensive, utilities generally do not have the option to avoid raising necessary external funds during periods of capital market distress, if necessary.

Because utilities invest in long-lived assets, long-term business risks are of considerable concern to equity investors. That is, the risk of not recovering the return on and of their investment extends far into the future. But, the timing and nature of events that may lead to losses are also uncertain and consequently, those risks and their implications for the required return on equity tend to be difficult to quantify. That does not mean, however, that the risk is of no consequence to investors. Analysts may apply, for example, simulation-based methods to assess the potential risk, but in the final analysis (like the investors that commit their capital), regulatory commissions must review a variety of quantitative and qualitative data and apply their reasoned judgment to determine how long-term risks weigh in their assessment of the market-required return on equity.

Q. PLEASE DESCRIBE THE BUSINESS RISK CURRENTLY FACED BY THE WATER AND WASTEWATER UTILITY INDUSTRY IN GENERAL.

A. Water is necessary for life as it is the only utility product which is intended for customers to ingest. Consequently, water quality and the proper treatment of wastewater is of paramount importance to the public health and well-being of customers. Therefore water production / distribution and wastewater treatment are subject to additional and increasingly stringent health and safety regulations. Beyond health and safety concerns, customers also have significant aesthetic (e.g. taste and odor) concerns regarding the water delivered to them, with regulators paying close attention to these concerns because of the strong reactions they evoke in customers.

Water utilities serve a production function, treatment function and delivery function. They obtain supply from wells, aquifers, surface water reservoirs or streams and rivers. Throughout the years, well supplies and aquifers have been environmentally threatened, with historically minor purification treatment giving way to major well rehabilitation, extensive treatment or replacement. Simultaneously, the Safe Drinking Water Act's ("SDWA") quality standards have tightened considerably, requiring multiple types of treatment prior to water delivery. Supply availability can often be limited by drought, water source overuse, runoff, threatened species and habitat protection, as well as other operational, political and environmental factors. Increasingly stringent environmental standards necessitate additional capital investment in the distribution and treatment of water, thereby exacerbating the pressure on water utilities' free cash flows through increased capital expenditures for infrastructure, repair and replacement. In addition, the U.S. Environmental Protection Agency, as well as individual state and local environmental agencies, are continually monitoring potential contaminants in the water supply and promulgating or expanding regulations when necessary. In the course of procuring water supplies and treating water so that it complies with SDWA standards, water utilities have an ever-increasing responsibility to be stewards of the environment from which supplies are drawn in order to preserve and protect essential natural resources of the United States.

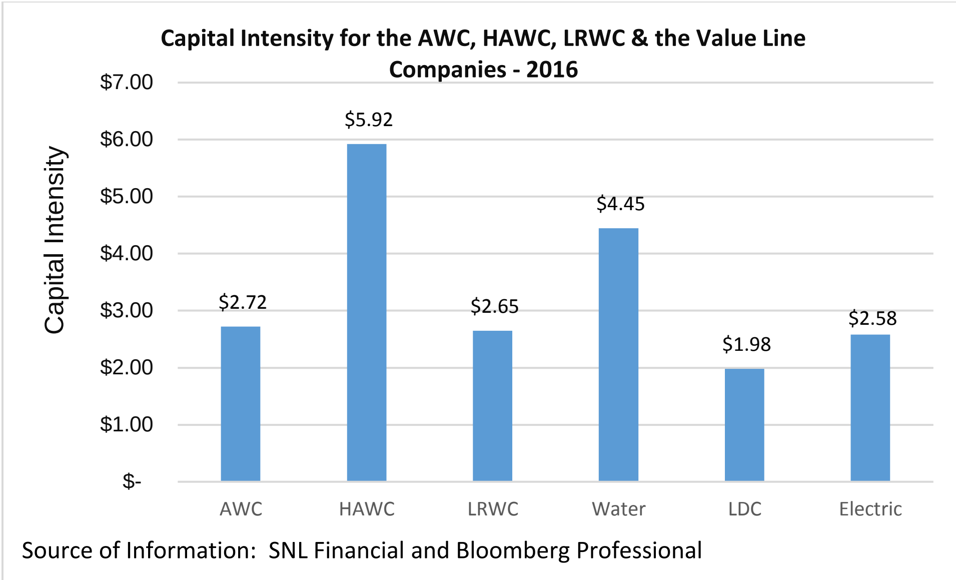
Water and wastewater utilities are typically vertically engaged in the entire process of acquiring supply, producing, treating, and distributing water, serving both a production function in addition to a delivery function. Accordingly, water utilities require significant capital investment, not only in transmission and distribution systems, but also in sources of supply (surface and groundwater), production (wells), and storage as well as the treatment of wastewater. Significant capital investment is necessary both to serve additional customers and to replace aging systems and treatment plants, creating a major risk factor for the water and wastewater utility industry.

B. <u>Comparison of AWC's, HAWC's, LWRC's, as well as the Water, Electric & Natural Gas Utility Industries' Business Risk</u>

Q. PLEASE DISCUSS THE CAPITAL INTENSITY OF THE AWC's, HAWC's, LRWC's AS WELL AS THE WATER AND WASTEWATER UTILITY INDUSTRY RELATIVE TO OTHER UTILITY INDUSTRIES.

A. As a capital-intensive industry, water and wastewater utilities require significantly greater capital investment in the infrastructure required to produce a dollar of revenue than do other industries, including electric and natural gas utilities. For example, as shown in Chart 1 below, it took $4.45 of net utility plant on average to produce $1.00 in operating revenues in 2016 for the water and wastewater utility industry as a whole. For the Companies, specifically, it took, $2.72 (AWC), $5.92 (HAWC) and $2.65 (LRWC), of net utility plant to produce $1.00 in operating revenues in 2016. In contrast, for the natural gas and electric utility industries, on average it took just $1.98 and $2.58, respectively, to produce $1.00 in operating revenues in 2016. As financing needs have increased and continue to increase, the competition for capital from traditional sources has increased and continues to increase, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important.

<u>Chart 1</u>



Q. HOW WILL WATER AND WASTEWATER UTILITIES RAISE THE CAPITAL REQUIRED TO FUND NECESSARY INFRASTRUCTURE REPLACEMENTS?

A. The water and wastewater utility industry's high degree of capital intensity, coupled with the need for substantial infrastructure capital spending, requires regulatory support in the form of adequate and timely rate relief, including a sufficient risk-adjusted rate of return on investment by the regulators. This has become an increasingly important factor for water and wastewater utilities to continue to successfully meet the challenges they face.

Substantial water and wastewater utility investment and expenditures require significant financing, with the three sources typically used for financing being debt, equity (common and preferred) and cash flow from operations. All three are intricately linked to the opportunity to earn a sufficient rate of return on investment, as well as the ability to actually achieve that return. Consistent with *Hope* and *Bluefield*, the return must be sufficient enough to maintain credit quality as well as enable the utility to attract necessary new capital on reasonable terms, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow[4], both of which are directly linked to earning a sufficient rate of return. The level of free cash flow represents the financial flexibility of a firm, i.e., its ability to meet the needs of its debt and equity holders. If either retained earnings or free cash flow are inadequate, it will be nearly impossible for the water and wastewater utility to attract the necessary new capital, at a reasonable cost and on reasonable terms, to invest in necessary new infrastructure. Thus, an insufficient rate of return can be financially devastating for water and wastewater utilities given their obligation to protect the public health by providing safe, adequate and reliable water and wastewater service to their customers at all times.

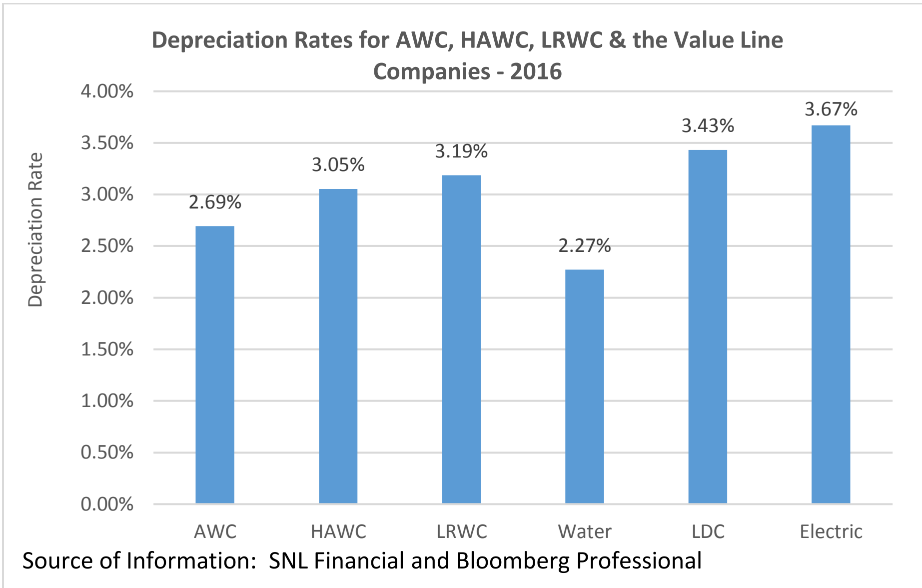
Q. PLEASE CONTINUE YOUR DISCUSSION OF BUSINESS RISK.

A. AWC, HAWC, LRWC, as well as the water and wastewater utility industry in general, also experience lower relative depreciation rates than do other utilities. Lower depreciation rates, as one of the principal sources of internal cash flow for all utilities, mean that water and wastewater utility (including AWC, HAWC and LRWC) depreciation as a source of internally-generated cash is far less than for electric or natural gas utilities. Water and wastewater utilities' assets have longer lives and, hence, longer capital recovery periods than do the assets of electric and natural gas utilities. As such, water and wastewater utilities face greater risk due to inflation which results in a higher replacement cost per dollar of net plant than for other types of utilities. As shown in Chart 2 below, water and wastewater utilities experienced an average depreciation rate of 2.27% for 2016, with the Companies experiencing rates of 2.69% (AWC), 3.05% (HAWC) and 3.19% (LRWC). In contrast, in 2016, the natural gas and electric utilities experienced average depreciation

[4] Operating cash flow (funds from operations) minus capital expenditures.

rates of 3.43% and 3.67%, respectively. Low depreciation rates signify that the pressure on cash flow remains significantly greater for water and wastewater utilities than for other types of utilities.

Chart 2



In view of the foregoing, the water and wastewater utility industry's, including AWC's, HAWC's and LRWC's, high degree of capital intensity and low depreciation rates, coupled with the need for substantial infrastructure capital spending, makes the need to maintain financial integrity and the ability to attract needed new capital, through the allowance of a sufficient rate of return, increasingly important in order for them to successfully meet the challenges they face.

Q. ARE THERE OTHER INDICATIONS THAT DEMONSTRATE THE RELATIVE RISK OF AWC, HAWC, LRWC, THE WATER, ELECTRIC AND NATURAL GAS UTILITY INDUSTRIES?

A. Yes. In addition, not only are water and wastewater utilities historically capital intensive, they are expected to incur significant capital expenditure needs over the next 25 years. In its2017 Infrastructure Report Card,[5] the American Society of Civil Engineers ("ASCE") stated:

> Drinking water is delivered via one million miles of pipes across the country. Many of those pipes were laid in the early to mid-20th century with a lifespan of 75 to 100 years. The quality of drinking water in the United States remains high, but legacy and emerging contaminants continue to require close attention. While water consumption is down, there are still an estimated 240,000 water main breaks per year in the United States, wasting over two trillion gallons of treated drinking water. According to the American Water Works Association, an estimated $1 trillion is necessary to maintain and expand service to meet demands over the next 25 years.[6]

In addition, the ASCE estimates that $270 billion ($10.8 million annually), "is needed for wastewater infrastructure over the next 25 years.[7]

Water utility capital expenditures as large as projected by the ASCE will require significant financing. The three sources typically used for financing are debt, equity (common and preferred) and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to achieve that return. Once again, consistent with the *Bluefield* and *Hope* decisions, the return must be sufficient enough to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow, both of which are directly linked to earning a sufficient rate of return. If either is inadequate, it will be nearly impossible for the utility to invest in

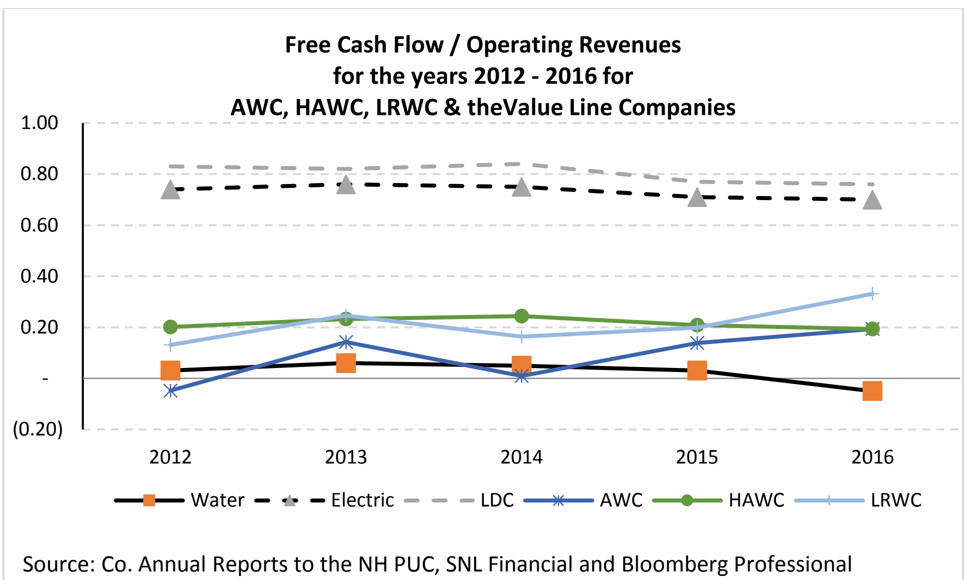
5 2017 Infrastructure Report Card – Drinking Water (American Society of Civil Engineers (2017) 1. (*See* Appendix B, Workpaper PMA-2).

6 $40,000,000 anually.

7 2017 Infrastructure Report Card –Wastewater (American Society of Civil Engineers (2017) 2. (*See* Appendix B, Workpaper PMA-3).

needed infrastructure. Since all utilities typically experience negative free cash flows, it is clear that an insufficient rate of return can be financially devastating for utilities and for its customers, the ratepayers. Chart 3 below demonstrates that the free cash flow (funds from operations minus capital expenditures) of water and wastewater utilities as a percent of total operating revenues has been consistently near zero, while that of electric and natural gas utilities from 2012 through 2016 has been low, but positive. For AWC, HAWC, and LRWC, while free cash flow as a percent of total operating revenues are generally higher than that of the water and wastewater utilities, it is still significantly lower than those of electric and natural gas utilities.

<u>Chart 3</u>

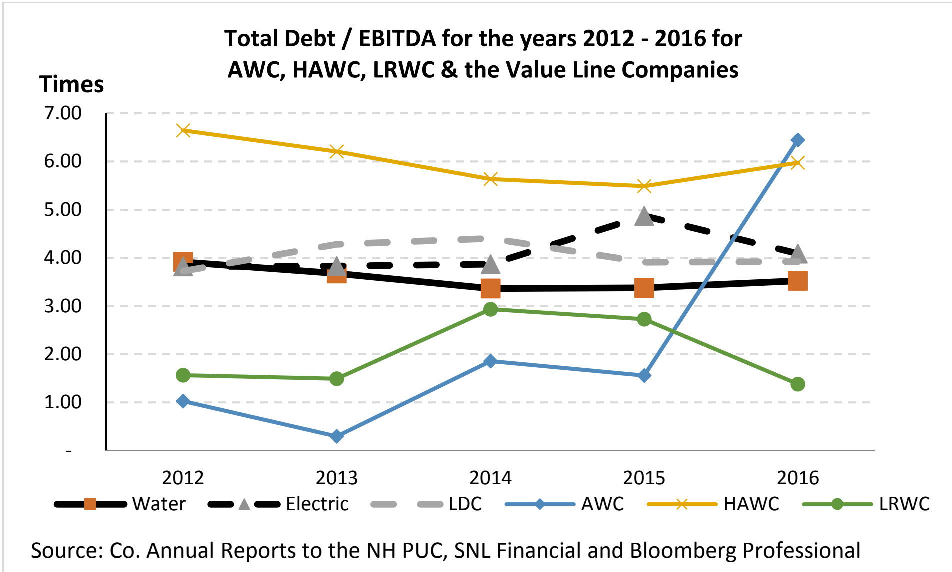


Consequently, as with the previously discussed capital intensity, depreciation rates, significant capital expenditures relative to net plant as well as the consistently and more significantly negative free cash flow relative to operating revenues of water and wastewater utilities indicates greater investment risk for water and wastewater utilities relative to electric and natural gas utilities.

The following charts present several other indications that water and wastewater utilities, including AWC, HAWC and LRWC, exhibit more investment risk than electric and natural gas utilities: total debt / earnings before interest, taxes, depreciation and amortization ("EBITDA"); funds from operations ("FFO") / total debt; funds from operations / interest coverage; and before-income tax / interest coverage each utility industry from 2012 through 2016.

Total debt (including short-term) as a percentage of EBITDA and FFO as a percentage of debt are indications of the financial or credit risk of a company. Chart 4 below, shows that total debt / EBITDA has remained relatively flat during the 2012 through 2016 period for water and wastewater utilities. Total debt / EBITDA for electric and natural gas utilities, while rising and falling during the period is now approaching that of the water and wastewater utilities. In contrast, AWC's total debt as a percentage of EBITDA, while below that of all the utility industries for 2012 – 2015, in 2016 surpassed the utility industries as well as that of HAWC and LRWC, in all likelihood due to the consolidation of systems. HAWC, with a significantly higher debt ratio than AWC, LRWC and the three utility industries, had the highest proportion of total debt to EBITDA from 2012 through 2016. LRWC is the only one of the Companies to have total debt as a percentage of EBITDA below that of the water, electric and natural gas utility industries throughout the period.

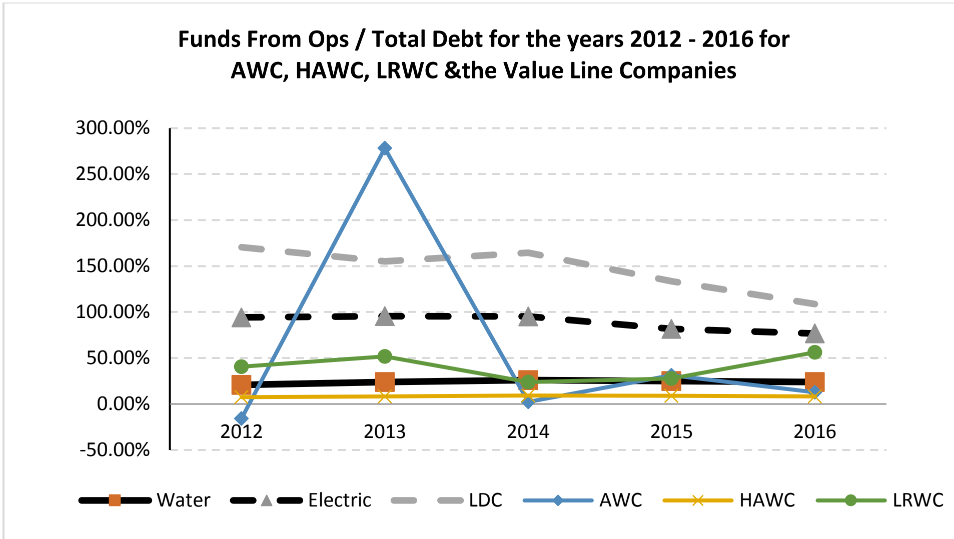
Chart 4



Source: Co. Annual Reports to the NH PUC, SNL Financial and Bloomberg Professional

Chart 5 below shows that from 2012 through 2016, FFO / total debt has declined somewhat, but remaining well above 50.0%, for electric and natural gas utilities. Over the same period, for water and wastewater utilities, it has remained rather flat, although rising somewhat, averaging approximately 24.0%. Likewise, for the Companies, with the exception of 2013, FFO / total debt was below that of the electric and natural gas utilities. The recent low level of FFO / total debt for the Companies and water and wastewater utilities is a further indication of the pressures upon the Companies and water and wastewater utility cash flows and the increased relative investment risk which water and wastewater utilities face.

<u>Chart 5</u>



Source: Co. Annual Reports to the NH PUC, SNL Financial and Bloomberg Professional

Charts 6 and 7 below confirm the pressures upon both cash flow and income faced by water and wastewater utilities. Chart 6 shows that FFO / interest coverage for water and wastewater, electric and natural gas utilities followed a similar pattern to FFO / total debt from 2012 through 2016. FFO interest coverage remained relatively consistent for water and wastewater utilities, hovering around 4.5 times during the period. A similar pattern was exhibited by electric utilities, for which FFO / interest coverage hovering around 20.0 times, FFO / total debt for natural gas utilities hovered around 40.0 times during the period, significantly exceeding that of water and wastewater utilities. With the exception of AWC in 2013, FFO / total debt for AWC, HAWC and LRWC hovered closer to FFO / interest coverage for the water and wastewater utilities, significantly lower than that of the electric and natural gas utilities.

Chart 7 shows that before-income tax / interest coverage for water and wastewater utilities while rising from slightly under 4.0 times in 2012 to over 4.0 times in 2016, was still well below that of the electric and natural gas utilities for the entire period. Before-income tax / interest coverage for HAWC remained stable at roughly 2.0 times, but well below the quite volatile coverage of AWC and LRWC as well as the water, electric and natural gas utilities, with AWC's ranging between 1.0 and 2.0 in 2016 and LWRC's, while close to 6.0 times in 2016, averaging only 3.3 times from 2012 through 2016. Once again, the consistency and relatively low level of interest coverage ratios for water and wastewater utilities as well as the volatile interest coverage ratios for AWC and LRWC are further indications of the pressures upon cash flow which water and wastewater utilities, including AWC, HAWC and LRWC, face, confirming greater investment risk for both the Companies and water and wastewater utilities relative to electric and natural gas utilities.

Chart 6

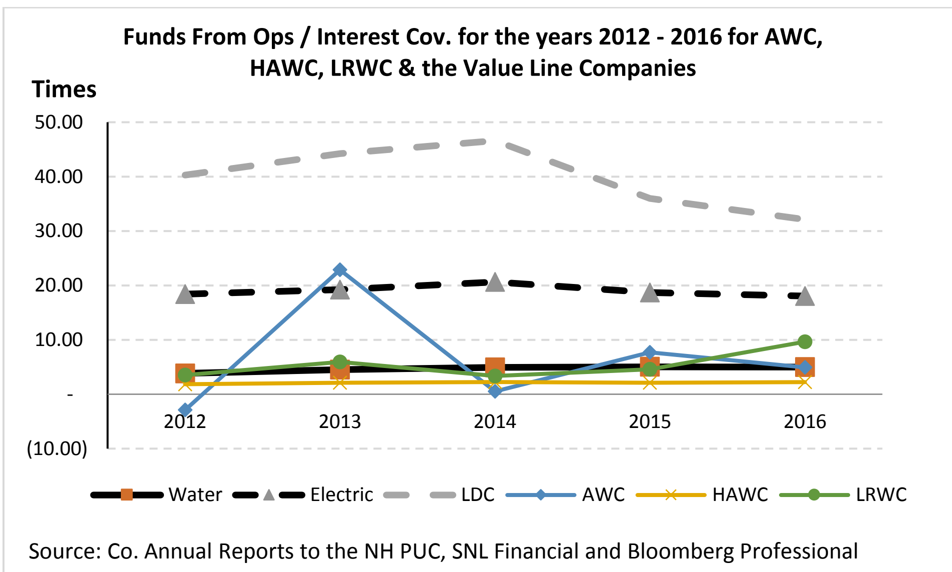
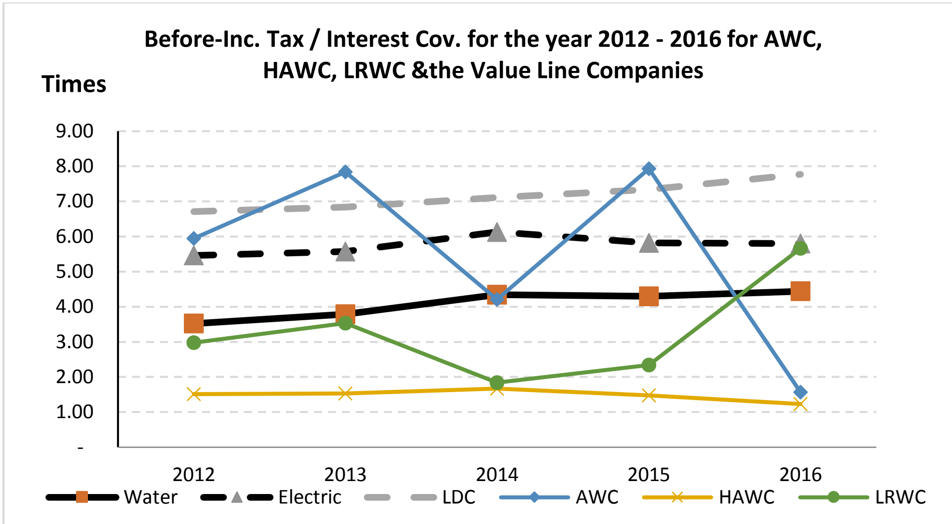


Chart 7



Source: Co. Annual Reports to the NH PUC, SNL Financial and Bloomberg Professional

Exacerbating the greater investment risk demonstrated by the financial metrics discussed above, is the smaller size of water and wastewater utilities relative to electric and natural gas utilities. As shown in Chart 8 and Table 2 below, water and wastewater utilities' market capitalization rose from approximately $1.4B in 2012 to just $2.7B in 2016, remaining consistently below that of electric and natural gas utilities. The market capitalization of electric utilities grew dramatically from just approximately $11.2B in 2012 to nearly $16.0B in 2016, while natural gas utilities grew from approximately $2.4B in 2012 to just nearly $3.8B in 2016. AWC, HAWC and LRWC are so small relative to the water, electric and natural gas utilities, that it is nearly impossible to see their respective estimated market capitalizations[8] in Chart 8. However, as shown in Table 2, AWC's estimated market capitalization rose from $1.4M in 2012 to only $1.7M in 2016, while HAWC's rose from $1.6M in 2012 to $5.1M in 2016 and LRWC' s rose from $2.3M in 2012 to $6.1M in 2016. Since relative size is an indication of the relative investment risk

8 Based upon the 2012 – 2016 market-to-book ratios of the water utilities.

between companies or groups of companies, the significantly smaller size of AWC, HAWC and LRWC greatly exacerbates their already greater relative investment risk.

Later in this testimony, size as a factor of risk will be discussed in more depth, as specifically related to AWC. HAWC and LRWC relative to the Water Utility Group.

Chart 8

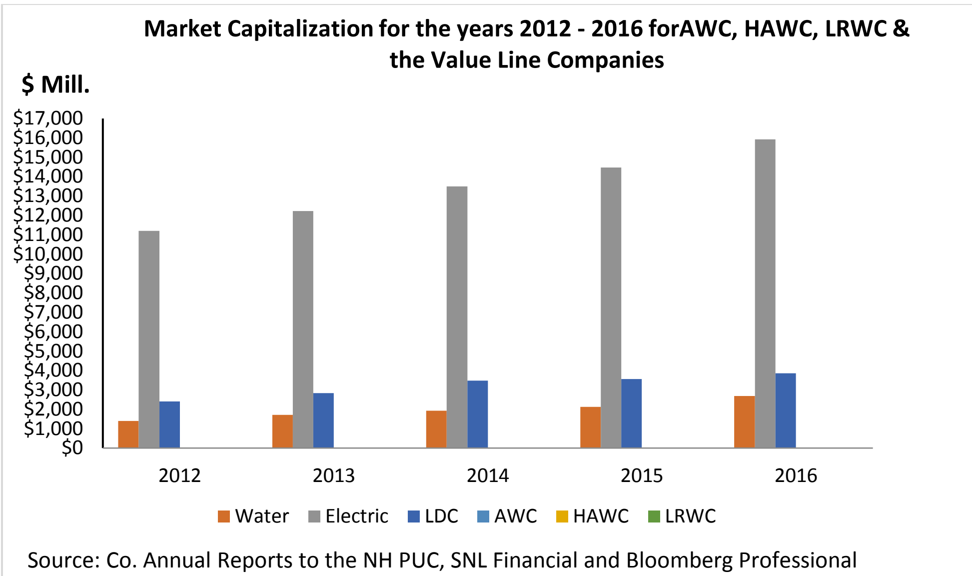


Table 2

Market Capitalization ($Mill)

	2012	2013	2014	2015	2016
Water	$ 1,405.75	$ 1,713.20	$ 1,930.26	$ 2,131.78	$ 2,681.23
Electric	$ 11,207.98	$ 12,222.98	$ 13,492.88	$ 14,478.29	$ 15,917.35
LDC	$ 2,402.89	$ 2,838.21	$ 3,471.80	$ 3,560.26	$ 3,852.87
AWC	$ 1.43	$ 1.70	$ 1.58	$ 1.88	$ 1.69
HAWC	$ 1.64	$ 2.03	$ 2.43	$ 3.13	$ 5.14
LRWC	$ 2.27	$ 2.80	$ 3.67	$ 4.14	$ 6.05

Source: Co. Annual Reports to the NH PUC, SNL Financial and Bloomberg Professional

Q. PLEASE EXPLAIN WHY SIZE HAS A BEARING ON BUSINESS RISK.

A. Smaller companies are less capable of coping with significant events, which affect sales, revenues and earnings.

In general, the loss of revenues from a few larger customers, for example, would have a greater effect on a small company than on a much larger company with a larger customer base. Another factor contributing to the risk effects of size is the fact that investors demand greater returns to compensate for a lack of marketability and liquidity. Because the Companies are regulated utilities to whose respective rate bases the NH PUC's ultimately allowed overall rate of return will be applied, the relevant risk reflected in their costs of capital must be that of AWC, HAWC and LRWC, including the impact of their small size on ROE. Size is an important factor, which affects the common equity cost rate, with each of the Companies being significantly smaller than the average water utility in the Water Utility Group based upon estimated market capitalization as discussed in detail below.

It is conventional wisdom, supported by actual returns over time, that smaller companies tend to be riskier, causing investors to expect greater returns as compensation for that risk. Size affects business risk because smaller companies generally have fewer resources to cope with significant events that affect sales, revenues and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much bigger company with a larger, more diverse, customer base. In addition, the effect of extreme weather conditions, e.g., prolonged drought or extremely wet weather, will have a greater effect upon a small operating water and wastewater utility than upon much larger, more geographically diverse holding companies, such as those in the Water Utility Group.

Further evidence that smaller firms are riskier is the fact that investors demand greater returns to compensate for the lack of marketability and liquidity of the securities of smaller firms is provided by Duff & Phelps in 2017 SBBI Yearbook | Stocks, Bonds, Bills, and Inflation | U.S. Capital Markets Performance by Asset Class 1926 – 2016 ("D&P – 2017") which discuss the nature of the small size phenomenon. D&P – 2017 states:

> One of the most remarkable discoveries of modern finance is the finding of a relationship between company size and return, generally referred to as the "size effect." The size effect is based on the empirical observation that companies of smaller size tend to have higher returns than do larger companies.
>
> In 1981, [a] study by Rolf Banz examined the returns of New York Stock Exchange (NYSE) small-cap companies compared to the returns of NYSE large-cap companies over the period 1926-1975. What Banz found was that the returns of small-cap companies were *greater* than the returns for large-cap companies. Banz's 1981 study is often cited as the first comprehensive study of the size effect. There is a significant (negative) relationship between size and historical equity returns as size decreases, returns tend to increase, and vice versa.
>
> The size effect is not without controversy, nor is this controversy something new. Traditionally, small companies are believed to have greater required rates of return than large companies because small companies are inherently risker. It is not clear, however, whether this is due to size itself, or to other factors closely related to or correlated with size, and thus the qualification that Banz noted in his 1981 article remains pertinent today.
>
> "It is not known whether size [as measured by market capitalization] per se is responsible for the effect or whether size is just a proxy for one or more true unknown factors correlated with size." [9]

[9] Duff & Phelps, 2017 SBBI Yearbook | Stocks, Bonds, Bills, and Inflation | U.S. Capital Markets Performance by Asset Class 1926 – 2016, Wiley 2017 7-1 (footnotes omitted) (*See* Appendix B, Workpaper PMA-4)

Furthermore, in "The Capital Asset Pricing Model: Theory and Evidence," Eugene F. Fama and Kenneth R. French note that size is indeed a risk factor which must be reflected when estimating the cost of common equity:[10]

> . . . the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns not captured in the market return and are priced separately from market betas.

Based upon this evidence, Fama and French proposed their three-factor model which includes a size variable in recognition of the effect of size on the cost of common equity.

A basic financial principle is the fact that it is the use of funds invested, and not the source of those funds, which gives rise to the risk of any investment.[11] For instance, Eugene F. Brigham states in the *Fundamentals of Financial Management*:

> A number of researchers have observed that portfolios of small-firms have earned consistently higher average returns than those of large-firms stocks; this is called "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; what ***the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms***.[12]

VI. SELECTION OF THE WATER UTILITY GROUP

Because the Companies do not have publicly traded common stock, neither market-based common equity cost rates nor their market capitalizations can be directly observed in the marketplace. Consequently, the market-based common equity cost rates and market-

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10 Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Volume 18, Number 3, Summer 2004, 25-43. (*See* Appendix B, Workpaper PMA-5)

11 Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1996) 204-205, 229. (*See* Appendix B, Workpaper PMA-6).

12 Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition (The Dryden Press, 1989) 623 (emphasis added) (*See* Appendix B, Workpaper PMA-7).

to-book ratios of companies of relatively similar, but not necessarily identical, risk, i.e., a proxy group must be assessed for insight into proposed common equity cost rates and estimated market capitalizations applicable to AWC, HAWC, and LRWC. Using companies of relatively similar risk as proxies is consistent with the basic principle of fair rate of return established in the *Hope* and *Bluefield* cases discussed above, adding reliability to the informed expert judgment necessary to arrive at proposed common equity cost rates.

However, no proxy is identical in risk to any single entity. Accordingly, an assessment of relative risk, especially that based upon relative size, between AWC, HAWC, and LRWC and the Water Utility Group, as discussed in further detail later in this testimony, must be made to determine the magnitude of any size adjustments which must be made to any estimated ROE based upon the Water Utility Group's market data.

Q. PLEASE EXPLAIN HOW YOU CHOSE THE WATER UTILITY GROUP.

A. To apply the DCF and CAPM, it is necessary to use widely and readily available market data. Therefore, I chose the Water Utility Group by selecting those publicly traded water utilities which met the following criteria:

1) They are included in the Water Utility Group of *Value Line Investment Survey's ("Value Line")* Standard Edition (October 13, 2017);

2) They have 70% or greater of 2016 total operating income derived from, and 70% or greater of 2016 total assets devoted to, regulated water operations;

3) They had not publicly announced involvement in any major merger or acquisition activity i.e., one publicly-traded utility merging with or acquiring another at the time of the preparation of this testimony;

4) They have not cut or omitted their common dividends during the past five years or through the time of the preparation of this testimony;

5) They have *Value Line* and Bloomberg adjusted betas;

6) They have a positive *Value Line* five-year dividend per share ("DPS") growth rate projection; and,

7) They have *Value Lin* five-year earnings per share ("EPS") growth rate projections.

The following eight companies meet these criteria:

- American States Water Co. (AWR);
- American Water Works Co. Inc. (AWK);
- Aqua America, Inc. (WTR);
- California Water Service Corp. (CWT);
- Connecticut Water Service, Inc. (CTWS);
- Middlesex Water Co. (MSEX);
- SJW Corp. (SJW); and
- York Water Co. (YORW).

Note that these are the same eight water companies whose risk metrics are shown in the Charts discussed above.

VII. ESTIMATION OF SIZE PREMIUMS FOR AWC, HAWC, AND LRWC

Q. WHAT SIZE RISK PREMIUMS ARE INDICATED FOR THE COMPANIES?

A. I estimate the appropriate range of size-related equity risk premiums to be the following:

Table 3

Abenaki Water Company	Premium
D&P Decile Based Size Premium	4.35%
Range of D&P Size Premiums	2.64% - 5.27%
Hampstead Area Water Co., Inc.	Premium
D&P Decile Based Size Premium	4.35%
Range of D&P Size Premiums	2.30% - 4.59%
Lakes Region Water Co., Inc.	Premium

D&P Decile Based Size Premium	4.35%
Range of D&P Size Premiums	2.23% - 4.46

Q. HOW WERE THESE SIZE RISK PREMIUMS DERIVED?

A. The D&P Decile Based Size Premium is based upon a study which constructs decile (10) portfolios of the companies contained in the New York Stock Exchange (NYSE), the NYSE Amex (AMEX) and the Nasdaq National Market (NASDAQ), including publicly traded utilities[13]. Exhibit 7-6 on page 15 of Appendix B, Workpaper PMA-4 presents summary statistics of the realized annual market returns for the 10 deciles from 1926 – 2016. It is clear from Exhibit 7-6 that both the geometric and arithmetic mean market return from 1926 – 2016 as well as total risk as measured by the standard deviation of annual returns have the tendency to increase as decile size decreases. D&P – 2017 then calculates realized arithmetic mean market equity risk premiums ("MERP") for each decile for 1926 - 2016 by subtracting the arithmetic mean income return on long-term U.S. government bonds from the realized annual market returns. D&P – 2017 also calculates an average CAPM return for each decile as described in Exhibit 7-8 on page 16 of Appendix B, Workpaper PMA-4, subtracting the same arithmetic mean income return on long-term U.S. government bonds to arrive at a CAPM MERP. Each decile's CAPM MERP is then subtracted from that decile's realized MERP to determine a "Size Premium (Return in Excess of CAPM)" as shown in Exhibit 7-8. It is clear from Exhibit 7-8, that the size premium increases as the decile size decreases, with D&P - 2017 noting on page 16 of

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13 D&P – 2017 Chapter 7 | Company Size and Return (*See* Appendix B, Workpaper PMA-4).

Appendix B, Workpaper PMA-4 that: "Exhibit 7-8 illustrates that the smaller deciles have had returns that are not fully explained by their higher betas."

The second study, also by D&P, published in D&P Valuation – 2017, is based upon the relationship between size as measured by the following eight measures of size:[14]

1. Market Value of Common Equity (or total capital if no debt / equity);
2. Book Value of Common Equity;
3. Net Income;
4. Market Value of Invested Capital;
5. Total assets (Invested Capital);
6. Earnings before interest, taxes, depreciation & amortization ("EBITDA");
7. Sales / operating revenues; and
8. Number of Employees (not available for each barometer / proxy group).

Relative to the relationship between average annual return and the eight measures of size listed above, D&P state[15]:

> **The size of a company is one of the most important risk elements to consider when developing cost of equity estimates for use in valuing a firm**. Traditionally, researchers have used market value of equity as a measure of size in conducting historical rate of return research. For example, the Center for Research in Security Prices (CRSP) "deciles" are developed by sorting U.S. companies by market capitalization, and the returns of the Fama-French "Small minus Big" (SMB) series is the difference in return of "small" stocks minus "big" (i.e., large) stocks, as defined by market capitalization. [101, 102] (footnote omitted) (emphasis added)

The D&P - 2017 *Size Study* provides "risk premia over CAPM"[16] using the average rate of return for 25 size-based portfolios ranked by the eight measures of size, identified

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[14] D&P Valuation – 2017 Appendix B Exhibits (*See* Appendix B Workpaper PMA-8).
[15] D&P Valuation – 2017 10-1 (*See* Appendix B Workpaper PMA-9).
[16] D&P Valuation – 2017 10-2 (*See* Appendix B Workpaper PMA-9).

in above, calculated over the sample period, e.g., 1963 – 2016, from which the average income return on long-term U.S. Treasury bonds over that same period is subtracted.

Q. HOW DID YOU QUANTIFY BUSINESS RISK ADJUSTMENTS DUE TO EACH COMPANY'S SMALL SIZE RELATIVE TO THE WATER UTILITY GROUP USING THE D&P – 2017 DECILE BASED STUDY?

A. The D&P – 2017 decile based study provides a very broad indication of the magnitude of such an adjustment for the greater relative business risk due to smaller relative size is based upon the size premiums for decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for the 1926-2016 and related data from Duff & Phelps[17].

As shown in Table 4 below, the Companies are significantly smaller than the average water company in the Water Utility Group, upon whose market data my proposed generic ROE formula is based and which reflects the collective risk of those water utilities, including the lower risk inherent in their larger size relative to the Companies, based upon estimated market capitalization:

Table 4

	Market Capitalization ($ Millions)	Applicable SBBI Decile	Decile Size Premium	Size Premium Applicable to the Companies
Water Utility Group	$3,834.700	4-5	1.25%	
Abenaki Water Company	2.316	10	5.59%	4.35%(1)
Hampstead Area Water Co., Inc.	7.047	10	5.59%	4.35%(1)
Lakes Region Water Co., Inc.	8.300	10	5.59%	4.35%(1)

(1) 4.35% = 5.59% - 1.25%.

17 D&P Valuation – 2017 7-9 to 7-11 (*See* Appendix B Workpaper PMA-4).

The average size premium for the 4th and 5th deciles (1.25%) between which the average market capitalization of the Water Utility Group falls has been compared with the average size premium for the 10th decile (5.59%) in which the estimated market capitalizations each of the Companies falls. As shown on Attachment PMA-1 and in Table 4 above, the size premium spread between the 10th and 4th and 5th deciles is 4.35%.

Q. HOW DID YOU QUANTIFY BUSINESS RISK ADJUSTMENTS DUE TO EACH COMPANY'S SMALL SIZE RELATIVE TO THE WATER UTILITY GROUP USING THE D&P VALUATION – 2017 SIZE STUDY?

A. I used the D&P size premium study to determine the approximate magnitude of any necessary company specific risk premiums due to size for AWC, HAWC and LRWC relative to the Water Utility Group. I used the D&P Valuation - 2017 "regression equation method".[18] As D&P note:

> The regression equation method, however, allows the valuation professional to calculated an *interpolated* risk premia "in between" portfolios, and also to calculate *interpolated* risk premia for companies with size characteristics less than the average size in Portfolio 25.

The regression equations thus allow for the calculation of size premiums relative to each risk factor specific to both the Water Utility Group and to AWC, HAWC, and LRWC, individually. As with the D&P – 2017 decile based size study, the size premiums specific to AWC, HAWC, and LRWC must be subtracted from the size premiums relative to the Water Utility Group size premiums upon whose market data my proposed generic ROE

[18] D&P Valuation – 2017 9-8 (*See* Appendix B, Workpaper PMA-10).

formula is based, and which reflects the collective lower risk of those water utilities as discussed above.

Pages 2 through 9 of Attachment PMA-2 present the interpolated risk premiums based upon the regression equations shown in Note 1 on each page for the eight D&P risk factors identified above. Page 1 and Tables 5, 6 and 7 below provides the results for AWC, HAWC, and LRWC, respectively:

Table 5

Factor	AWC-Specific Interpolated Premium
Market Value (2016)	8.80%
Book Value (2016)	4.64%
Net Income (5-yr. avg.)	5.77%
Market Value of Invested Capital (2016)	7.65%
Total Assets (Invested Capital) (2016)	5.88%
EBITDA (5-yr. avg.)	5.02%
Net Sales (2016)	5.57%
Number of Employees (2016)	NMF
Range of D&P Size Study Premiums	4.64% - 8.80%
Average D&P Size Study Premium	6.19%
D&P Decile Size Premium	4.35%
Average	5.27%

Table 6

Factor	HAWC-Specific Interpolated Premium
Market Value (2016)	7.48%
Book Value (2016)	3.95%
Net Income (5-yr. avg.)	5.14%
Market Value of Invested Capital (2016)	4.66%
Total Assets (Invested Capital) (2016)	4.47%
EBITDA (5-yr. avg.)	3.89%
Net Sales (2016)	4.46%
Number of Employees (2016)	4.57%
Range of D&P Size Study Premiums	3.89% - 7.48%
Average D&P Size Study Premium	4.83%
D&P Decile Size Premium	4.35%
Average	4.59%

Table 7

Factor	LRWC-Specific Interpolated Premium
Market Value (2016)	7.29%
Book Value (2016)	3.85%
Net Income (5-yr. avg.)	4.79%
Market Value of Invested Capital (2016)	2.01%
Total Assets (Invested Capital) (2016)	5.25%
EBITDA (5-yr. avg.)	4.37%
Net Sales (2016)	4.65%
Number of Employees (2016)	4.32%
Range of D&P Size Study Premiums	2.01% - 7.29%
Average D&P Size Study Premium	4.57%
D&P Decile Size Premium	4.35%
Average	4.46%

From these results and the previously discussed risk factors, it is clear that the Companies are riskier than the Water Utility Group. Consistent with both the financial principle of risk and return discussed previously, i.e., that investors require a greater return as compensation for bearing greater risk, and the stand-alone nature of the cost of capital and ratemaking, upward adjustments to the ROE findings based upon any proxy group's market data are warranted.

Q. PLEASE DISCUSS THE STAND-ALONE NATURE OF THE COST OF CAPITAL?

A. Because it is the rate base of each of the Companies to which the overall rates of return set in this proceeding will be applied, each Company should be evaluated as a stand-alone entity. To do otherwise would be discriminatory, confiscatory and inaccurate.

As previously discussed, it is a basic financial principle that the use of the funds invested gives rise to the risk of the investment. As Brealey and Myers[19] state:

> The true cost of capital depends on the use to which the capital is put.
>
> * * *
>
> Each project should be evaluated at its own opportunity cost of capital; the true cost of capital depends on the use to which the capital is put. (italics and bold in original)

Morin[20] confirms Brealey and Myers when he states:

> Financial theory clearly establishes that the cost of equity is the risk-adjusted opportunity cost of the investors and not the cost of the specific capital sources employed by the investors. The true cost of capital depends on the use to which the capital is put and not on its source. The Hope and Bluefield doctrines have made clear that the relevant considerations in calculating a company's cost of capital are the alternatives available to investors and the returns and risks associated with those alternatives.

In addition, Levy and Sarnat[21] state:

> The firm's cost of capital is the discount rate employed to discount the firm's average cash flow, hence obtaining the value of the firm. It is also the weighted average cost of capital, as we shall see below. The weighted average cost of capital should be employed for project evaluation . . . only in cases where the risk profile of the new projects is a "carbon copy" of the risk profile of the firm.

Although Levy and Sarnat discuss a project's cost of capital relative to a firm's cost of capital, these principles apply equally to the use of a proxy group-based cost of capital.

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[19] Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1988) 173, 198. (*See* Appendix B, Workpaper PMA-11).

[20] Morin, 523. (*See* Appendix B, Workpaper PMA-12).

[21] Haim Levy & Marshall Sarnat, Capital Investment and Financial Decisions, Prentice/Hall International, 1986, 465. (*See* Appendix B, Workpaper PMA-13).

Thus, each of the Companies must be viewed on its own merits, regardless of the source of its equity capital. As *Bluefield*[22] clearly states:

> 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; . . .

In other words, it is the "risks and uncertainties" surrounding the property employed for the "convenience of the public" which determines the appropriate level of rates. In this proceeding, the properties employed "for the convenience of the public" are the respective rate bases of each of the Companies. It is only the specific risk of investment in each Company's rate base that is relevant to the determination of the cost of common equity to be applied to the common equity-financed portion of that Company's rate base.

In view of the foregoing, and consistent with both the risk and return and stand-alone principles, each Company's greater investment risk due to its small size must be reflected in its authorized ROE. Although average small size premiums 4.35% - 5.27%, 4.35% - 4.59% and 4.35% - 4.46% are indicated by both D&P studies, for AWC, HAWC and LRWC, respectively, I propose a range of small size risk premiums for each Company, with the bottom of the range being one-half (1/2) of each Company's average small size risk premium and the top of the range being the average D&P small size risk premium as shown in Table 7 below:

<u>Table 7</u>

[22] *Bluefield*. 6.

Company	Low Size Risk Premium	High Size Risk Premium
AWC	2.64%	5.27%
HAWC	2.30%	4.59%
LRWC	2.23%	4.46%

VIII. PROPOSED GENERIC RETURN ON COMMON EQUITY FORMULA BASED UPON THE FLORIDA PUBLIC SERVICE COMMISSION'S ("FLPSC") METHODOLOGY

Q. PLEASE DESCRIBE THE FLPSC'S GENERIC RETURN ON COMMON EQUITY FORMULA.

A. The FLPSC's generic ROE formula (also known as the ("Florida Leverage Formula") was established by Florida Statute in 1988 in Section 367.081 (4)(f), to establish, on an annual basis, a formula to calculate a reasonable range of ROEs for the water and wastewater utilities operating under its jurisdiction. Each year, in late Spring, the FLPSC Staff establishes a range of ROEs applicable to small water and wastewater utilities for the following twelve months. However, the water and wastewater utilities are not obligated to use the formula and may file a general rate case instead. Using the formula allows small water and wastewater utilities to avoid the expense of hiring rate of return witnesses as well as attorneys to litigate a general rate case. Currently, the methodology relies on the DCF and CAPM adjusted for differences in risk and debt cost between a proxy group of natural gas utilities whose market data are used in the DCF and CAPM models and the average small Florida water and wastewater utilities. The FLPSC leverage formula also includes a 4% adjustment for flotation costs.

Q. DO YOU PROPOSE THAT THE FLPSC LEVERAGE FORMULA BE APPLIED PRECISELY AS IT IS IN FLORIDA?

A. No. My proposed generic ROE formula incorporates suggested revisions I proposed recently at a FLPSC Staff workshop held on November 8, 2017 for which the Staff requested comments on the formula and suggestions to revise the formula. Since there is sufficient market data for water utilities to which the DCF and CAPM can be applied, I propose that the Water Utility Group, discussed above, be used to estimate the ROE.

As for the DCF, the FLPSC formula relies upon an annual version of the model, which I propose to replace with a constant growth single-stage DCF model for simplicity of application. I also propose to use forecasted growth in earnings per share ("EPS") as the growth rate component, as well as 60-trading days of market prices to develop the dividend yield component. The FLPSC formula also relies upon a CAPM which uses an expected return for the companies followed by *Value Line* as the market return and a projected yield on 30-year U.S. Treasury bonds from *Blue Chip Financial Forecasts ("Blue Chip")* in estimating the market equity risk premium[23]. However, I propose to include four MERPs, one based upon the long-term arithmetic mean historical MERP from 1926 - 2016 using D&P – 2017's Appendix A Tables, with the second, also based upon the Appendix A Tables, reflecting the relationship between equity risk premiums and interest rates. These two MERPs will use the historical income return on long-term U.S. Treasury bonds from 1926 – 2016, also from the Appendix A Tables. The third and fourth MERPS will be based upon *Value Line's* expected median price appreciation potential and dividend yield 3-5 years hence and an expected return on the S&P 500 Composite Index as a proxy for the market, respectively, minus *Blue Chip*'s projected yield on 30-year U.S. Treasury bonds. The FLPSC staff's application of the CAPM also uses adjusted betas as published by *Value Line*, which I also propose be used. Also, while the FLPSC leverage formula relies exclusively upon the traditional CAPM, I propose including an Empirical CAPM ("ECAPM") to reflect the fact that the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML as will be discussed

[23] Previously defined as MERP.

in further detail below.

The FLPSC staff then adjusts the average results of the DCF and CAPM by adding bond yield differential, currently 0.63% (63 basis points), to reflect the difference in yields between A (S&P) / A2 (Moody's), the average bond rating of the Water Utility Group, and BBB- (S+P) / Baa3 (Moody's), the assumed bond rating of the Florida water and wastewater utilities. I propose to retain this adjustment since, in my experience, the bonds of water and wastewater utilities of the size of the Companies are likely to be rated at the bottom of investment grade, if rated at all.

The FLPSC staff also adds a private placement premium of 0.50% (50 basis points) to reflect the yield on publicly traded debt and privately placed debt This premium is compensation for the lack of liquidity of privately placed debt. I will propose to retain this adjustment as well, because neither AWC, HAWC, nor LRWC place debt publicly.

The FLPSC also adds a small utility risk premium of 0.50% (50 basis points) because the average Florida water and wastewater utility is too small to even qualify for privately placed debt. As discussed above, I propose specific ranges of small utility risk premiums for each of the Companies, i.e., 2.64% - 5.27% for AWC, 2.30% - 4.59% for HAWC, and 2.23% - 4.46% for LRWC as discussed above.

Once these three adjustments are added to the average DCF and CAPM results, a range of ROEs applicable to a range of common equity ratios between 40.0% and 100.0% is estimated by the FLPSC Staff based upon the average common equity ratio of the Water Utility Group. This analysis uses the relationship between leverage and financial risk formalized by financial economists, such as Modigliani and Miller,[24] which will be

[24] F. Modigliani and M. Miller, The Cost of Capital, Corporation Finance, and the Theory of Investment, The American Economic Review 48 No. 3, June 1958 261-297; F. Modigliani and M. Miller, Corporate Income

discussed in further detail below. The estimation produces a formula, i.e. "leverage formula", which can be used to determine a specific ROE applicable to the common equity ratios of AWC, HAWC, and LRWC. I also propose the same methodology for estimating a range of ROEs for each Company in this proceeding.

A. <u>Discounted Cash Flow Model ("DCF")</u>

Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?

A. The theory underlying the DCF model is that the present value of an expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory assumes that an investor buys a stock for an expected total return rate which is derived from cash flows received in the form of dividends plus appreciation in market price (the expected growth rate). Mathematically, the dividend yield on market price plus a growth rate equals the capitalization rate i.e., the total common equity return rate expected by investors.

Q. WHICH VERSION OF THE DCF MODEL ARE YOU PROPOSING?

A. I propose using the single-stage constant growth DCF model. The single-stage DCF model is expressed as:

$$K = (D_1 / P_0) + g$$

Where:

K = Cost of Equity Capital
D_1 = Expected Dividend Per Share in one year
P_0 = Current Market Price
g = Expected Dividend Per Share Growth

Taxes and the Cost of Capital: A Correction, <u>The American Economic Review</u> 53 No. 3, June 1963 433 – 443. (*See* Appendix B, Workpaper PMA-14).

In my experience, the single-stage constant growth DCF model is the most widely used in regulation throughout the U.S. Moreover, its application is straightforward and simple.

Q. PLEASE EXPLAIN THE ADJUSTED DIVIDEND YIELD SHOWN ON PAGE 1 OF ATTACHMENT PMA-3, COLUMN [3].

A. Because dividends are paid quarterly, or periodically, as opposed to continuously (daily), an adjustment must be made to the dividend yield. This is often referred to as the discrete, or the "Gordon Periodic", version of the DCF model.

DCF theory calls for the use of the full expectational growth rate, referred to as D_1, in calculating the dividend yield component of the model. However, since the various companies in the Water Utility Group increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, referred to as $D_{1/2}$. This is a conservative approach because it does not overstate the dividend yield, which should be representative of the next twelve-month period. Therefore, the actual average dividend yields in Column [1], page 1 of Attachment PMA-3, have been adjusted upward to reflect one-half the average projected growth rate shown in Column [3].

Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES OF THE WATER UTILITY GROUP WHICH YOU PROPOSE TO USE IN THE APPLICATION OF THE DCF MODEL.

A. Investors with more limited resources than institutional investors are likely to rely upon widely available financial information services, such as *Value Line.* Investors recognize that such analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as an entity's historical and future ability to effectively manage the effects of changing laws and regulations and ever changing economic and market conditions.

Security analysts' earnings expectations have a significant, but not sole, influence upon market prices and are therefore reasonable indicators of investor expectations.[25] As noted by Morin:

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g. [g = growth]

Over the long run, there can be no growth in DPS without growth in EPS. While security analysts' earnings expectations are not the only influence on market prices, they have a more significant influence on market prices than dividend expectations. Thus, the use of projected earnings growth rates in a DCF analysis provides a better matching between investors' market price appreciation expectations and the growth rate component of the DCF because projected earnings growth rates have a significant influence on market prices and the appreciation or "growth" experienced by investors.[26] This should be evident even to relatively unsophisticated investors just by listening to financial news reports on radio, TV or reading the newspapers.

In addition, Myron Gordon, the "father" of the standard regulatory version of the DCF model widely utilized throughout the United States in rate base / rate of return regulation, recognized the significance of analysts' forecasts of growth in EPS in a speech

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25 Morin 298-303 (*See* Appendix B, Workpaper PMA-15).

26 Morin 298 (*See* Appendix B, Workpaper PMA-15).

he gave in March 1990 before the Institute for Quantitative Research and Finance.[27] As Professor Gordon stated:

> We have seen that earnings and growth estimates by security analysts were found by Malkiel and Cragg to be superior to data obtained from financial statements for the explanation of variation in price among common stocks. . .

Professor Gordon recognized that total return is largely affected by the terminal price which is mostly affected by earnings (hence price earnings multiples). However, while EPS is the most significant factor influencing market prices, it is by no means the only factor that affects market prices, as recognized by Bonbright:[28]

> In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently volatile stock* market. In short, market prices are beyond the control, though not beyond the influence of rate regulation. Moreover, even if a commission did possess the power of control, any attempt to exercise it ... would result in harmful, uneconomic shifts in public utility rate levels. (italics added)

As Professor Gordon noted, studies performed by Cragg and Malkiel[29] demonstrate that analysts' forecasts are superior to historical growth rate extrapolations. While some question the accuracy of analysts' forecasts of EPS growth, the level of accuracy of those analysts' forecasts well after the fact does not really matter for our purposes. What is

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27 Myron J. Gordon, "The Pricing of Common Stocks', Presented before the Spring 1990 Seminar, March 27, 1990 of the Institute for Quantitative Research in Finance, Palm Beach Fl. (*See* Appendix B, Workpaper PMA-16).

28 James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc. 1988) 334 (*See* Appendix B, Workpaper PMA-17).

29 John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices (University of Chicago Press 1982) Chapter 4 (*See* Appendix B, Workpaper PMA-18).

important is that the forecasts reflect widely held expectations influencing investors at the time they make their pricing decisions and hence the market prices they pay.

Jeremy J. Siegel[30] also notes the importance of security analysts' EPS growth estimates to investors when he states:

> For the equity holder, the source of future cash flows is the earnings of firms
>
> * * *
>
> Some people argue that shareholders most value stocks' cash dividends. But this is not necessarily true.
>
> * * *
>
> Since the price of a stock depends primarily on the present discounted value of all expected future dividends, it appears that dividend policy is crucial to determining the value of the stock. However, this is not generally true.
>
> * * *
>
> Since stock prices are the present value of future dividends, it would seem natural to assume that economic growth would be an important factor influencing future dividends and hence stock prices. However, this is not necessarily so. The determinants of stock prices are earnings and dividends on a per-share basis. Although economic growth may influence aggregate earnings and dividends favorably, economic growth does not necessarily increase the growth of per-share earnings of dividends. It is earnings per share (EPS) that is important to Wall Street because per-share data, not aggregate earnings or dividends, are the basis of investor returns. (italics in original)

Moreover, there is no empirical evidence that investors would disregard analysts' estimates of growth in earnings per share. "Do Analyst Conflicts Matter? Evidence From Stock Recommendations"[31] by Anup Agrawal and Mark A. Chen examined whether conflicts of interest with investment banking ("IB") and brokerage businesses induced sell-

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[30] Jeremy J. Siegel, Stocks for the Long Run – The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies (McGraw-Hill 2002) 90-94 (*See* Appendix B, Workpaper PMA-19).

[31] Anup Agrawal and Mark A. Chen, "Do Analysts' Conflicts Matter? Evidence from Stock Recommendations", Journal of Law and Economics (August 2008), Vol. 51 503-537 (*See* Appendix B, Workpaper PMA-20).

side analysts to issue optimistic stock recommendations and whether investors were misled by such biases when they state: "our findings do not support the view that conflicted analysts are able to systematically mislead investors with optimistic stock recommendations." (page 503)

Agrawal and Chen explain:[32]

> Overall, our empirical findings suggest that while analysts do respond to IB and brokerage conflicts by inflating their stock recommendations, the market discounts these recommendations after taking analysts' conflicts into account. These findings are reminiscent of the story of the nail soup told by Brealey and Myers (1991), except that here analysts (rather than accountants) are the ones who put the nail in the soup and investors (rather than analysts) are the ones to take it out. Our finding that the market is not fooled by biases stemming from conflicts of interest echoes similar findings in the literature on conflicts of interest in universal banking (for example, Kroszner and Rajan, 1994, 1997; Gompers and Lerner 1999) and on bias in the financial media (for examples, Bhattacharya et al. forthcoming; Reuter and Zitzewitz 2006). Finally, while we cannot rule out the possibility that some investors may have been naïve, our findings do not support the notion that the marginal investor was systematically misled over the last decade by analysts' recommendations.

Therefore, given the overwhelming academic / empirical support regarding the superiority of security analysts' EPS growth rate forecasts, I suggest that such EPS growth rate projections, as published in *Value Line* be used in a single-stage application of the DCF in the Formula.[33]

I propose developing the dividend yield for the DCF model using the currently indicated annual dividend per share and average closing market prices for the 60-trading days ending November 30, 2017 for the Water Utility Group and *Value Line* projected 5-

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32 Agrawal and Chen 531. (*See* Appendix B, Workpaper PMA-20).

33 Although there are other sources of projected EPS growth rates, such as Reuters, Zacks or Yahoo! Finance, for simplicity of the application of a generic ROE formula, I propose the use of *Value Line* projections for simplicity in applying the DCF model.

year EPS growth rates on page 1 of Attachment PMA-3. As shown, the single-stage DCF results are 8.73% for the Water Utility Group.

B. The Capital Asset Pricing Model ("CAPM")

Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.

A. CAPM theory defines risk as the covariability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower variability while a beta greater than 1.0 indicates greater variability than the market. The CAPM assumes that all other risk, i.e., all non-market or unsystematic risk, can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market or systematic risk. In addition, the CAPM presumes that investors require compensation only for those systematic risks that are the result of macroeconomic and other events that affect the returns on all assets. The model is applied by adding a risk-free rate of return to a market risk premium, which is adjusted proportionately to reflect the systematic risk of the individual security relative to the total market, as measured by beta. The traditional CAPM model is expressed as:

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

Where:

R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

β = Adjusted beta (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have measured the extent to which security returns and betas are related, as predicted by the CAPM, confirming the CAPM's validity. However, while the results of these tests support the notion that beta is related to security returns, the ECAPM reflects the reality that, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML. Morin[34] states:

> With few exceptions, the empirical studies agree that … low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + (R_M - R_F) + (1\text{-}x)\ \beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\ \beta(R_M - R_F)$$

In view of theory and practical research, I have applied both the traditional CAPM and the ECAPM to the companies in the Water Utility Group and averaged the results.

Q. PLEASE DESCRIBE YOUR SELECTION OF THE PROPOSED BETA FOR YOUR CAPM ANALYSIS.

A. I propose relying upon the adjusted betas published by the *Value Line*, which adjusts its calculated (or "raw") betas to reflect the tendency of the beta to regress to the market mean of 1.00, *Value Line* calculates its beta over a five-year period. These are readily available to both investors and rate of return analysts / practitioners.

Q. PLEASE DESCRIBE YOUR PROPOSED RISK-FREE RATE OF RETURN FOR YOUR CAPM ANALYSIS.

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[34] Morin 175, 190 (*See* Appendix B, Workpaper PMA-21).

A. I propose a risk-free rate for both applications of the CAPM of 3.53% based upon the average of the consensus forecast for the six quarters ending with the first quarter 2019, from the December 1, 2017 *Blue Chip*[35], averaged with the long-range forecasts for 2019 – 2023, and 2024 – 2028, also from the December 1, 2017, *Blue Chip,* as detailed in Note 2 on page 2 of Attachment PMA-4.

Q. WHY IS THE YIELD ON LONG-TERM U.S. TREASURY BONDS APPROPRIATE FOR USE AS THE RISK-FREE RATE?

A. The yield on long-term U.S. Treasury Bonds is almost risk-free and its term is consistent with: 1) the long-term cost of capital to public utilities measured by the yields on A rated public utility bonds; 2) the long-term investment horizon inherent in utilities' common stock; and 3) the long-term life of the jurisdictional rate base to which the allowed fair rate of return i.e., cost of capital will be applied. In contrast, short-term U.S. Treasury yields are more volatile, and reflect a short-term investment horizon that is not consistent with the long-term investment horizon and life of the rate base to which the allowed rate of return is applied.

Q. PLEASE EXPLAIN YOUR PROPOSED ESTIMATION OF THE EXPECTED EQUITY RISK PREMIUM FOR THE MARKET.

A. The basis of the market risk premium is explained in detail in Note 1 on page of Attachment PMA-4. As discussed previously, the market risk premium is derived from an average of

1) D&P – 2017 historical data-based market risk premiums; and
2) *Value Line* data-based market risk premiums.

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35 *Blue Chip Financial Forecasts*, December 1, 2017 2, 14 (*See* Appendix B, Workpaper PMA-22).

Q. HOW DID YOU DERIVE A MARKET EQUITY RISK PREMIUM BASED UPON D&P - 2017 LONG-TERM HISTORICAL DATA?

A. To derive the D&P – 2107 long-term historical market equity risk premium, I used the most recent holding period returns for large company common stocks from the D&P – 2017[36] less the average income yield on long-term U. S. Treasury bonds for the period 1926 to 2016. The use of holding period returns over a very long period of time is useful because it is consistent with the long-term investment horizon presumed by investing in a going concern, i.e., a company expected to operate in perpetuity.

D&P – 2017's long-term arithmetic mean monthly total return rate on large company common stocks was 11.97% and the long-term arithmetic mean monthly yield on long-term U. S. Treasury bonds was 5.17%. As shown in Note 1 on page 2 of Attachment PMA-4, subtracting the mean monthly long-term U.S. Treasury bond yield from the total return on large company stocks results in a long-term historical market equity risk premium of 6.80%.[37]

I used arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for long-term U.S. Treasury bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in D&P – 2017.[38] The use of the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns needed by investors in estimating future risk when making a current investment. Absent such valuable insight into the potential variance

36 D&P – 2017 Appendix A Tables (*See* Appendix B, Workpaper PMA-23).
37 6.80% = 11.97% - 5.14%.
38 D&P – 2017 10-22 (*See* Appendix B, Workpaper PMA-24).

of returns, investors cannot meaningfully evaluate prospective risk. If investors alternatively relied upon the geometric mean of historical equity risk premiums, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, which is critical to risk analysis.

Q. PLEASE EXPLAIN THE DERIVATION OF THE REGRESSION-BASED MARKET EQUITY RISK PREMIUM.

A. To derive the regression analysis-derived market equity risk premium of 8.65%, shown in Note 1 on page 2 of Attachment PMA-4, I used the same monthly annualized total returns on large company common stocks relative to the monthly annualized yields on long-term U.S. Treasury bonds as discussed above. The relationship between interest rates and the market equity risk premium was modeled using the observed monthly market equity risk premium as the dependent variable and the monthly yield on long-term U.S. Treasury bonds as the independent variable. I used a linear Ordinary Least Squares ("OLS ") regression, in which the market equity risk premium is expressed as a function of the long-term U.S. Treasury bond yield:

$$RP = \alpha + \beta\,(R_{Aaa/Aa})$$

The average D&P - 2017-based equity risk premiums is 7.72%,[39] which is shown in Note 1 on page 2 of Attachment PMA-4.

Q. PLEASE EXPLAIN THE DERIVATION OF A PROJECTED EQUITY RISK PREMIUM BASED UPON *VALUE LINE* DATA.

39 7.72% = (6.80% + 8.65%)/2.

A. Because both ratemaking and the cost of capital, including the cost rate of common equity, are prospective, a prospective market equity risk premium is essential. The derivation of the forecasted or prospective market equity risk premium can also be found in Note 1 on page 2 of Attachment PMA-4. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the thirteen weeks ending December 1, 2017, plus an average of the median estimated dividend yield for the common stocks of the 1,700 firms covered in *Value Line*'s Standard Edition.

The average median expected price appreciation is 32%, which translates to a 7.19% annual appreciation, and, when added to the average of the *Value Line* median expected dividend yield of 2.03%, equates to a forecasted annual total return rate on the market of 9.22%. The forecasted 30-year U.S. Treasury bond yield of 3.53% is deducted from the total market return of 9.22%, resulting in an equity risk premium of 5.69%.[40]

Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM BASED UPON THE S&P 500 COMPANIES.

A. Using data from *Value Line*, I calculate an expected total return on the S&P 500 using expected dividend yields and long-term growth estimates as a proxy for capital appreciation. As shown in Note 1 on page 2 of Attachment PMA-4, the expected total return for the S&P 500 is 14.59%. Subtracting the prospective yield on 30-year U.S. Treasury bonds of 3.53% results in an 11.06%[41] projected equity risk premium.

[40] 5.69% = 9.22% - 3.53%

[41] 11.06% = 14.59% - 3.53%.

The average *Value Line*-based equity risk premiums is 8.38%,[42] which is shown on Line No. 7 on page 8 of Attachment PMA-4.

Q. WHAT IS YOUR CONCLUSION OF MARKET EQUITY RISK PREMIUM FOR USE IN YOUR APPLICATION OF THE CAPM?

A. It is 8.05% as derived in Note 1 on page 2 of Attachment PMA-4. In arriving at this conclusion, I averaged: 1) the average D&P-2017-based equity risk premium of 7.70%; and 2) the average *Value Line*-based equity risk premium of 8.38% also derived in Note 1. These two market equity risk premiums average 8.05%, as shown at the end of Note 1.[43]

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE TRADITIONAL AND EMPIRICAL CAPM TO THE WATER UTILITY GROUP?

A. As shown on page 1 of Attachment PMA-4, the average CAPM / ECAPM equity cost rate is 9.78%.[44]

C. *Average of DCF and CAPM Results*

Q. WHAT ARE THE AVERAGE RESULTS OF YOUR APPLICATION OF THE DCF AND CAPM TO THE WATER UTILITY GROUP?

A. As shown on page 1 of Attachment PMA-5, the average DCF and CAPM common equity cost rate is 9.26% as summarized in Table 8 below:

Table 9

	Water Utility Group
DCF	8.73%
CAPM	9.78%
Average	**9.26%**

42 8.38% = (5.69% + 11.06%)/2.
43 8.05% = (7.72% + 8.38%)/2.
44 9.78% = (9.52% + 10.03%)/2.

D. ***Adjustments to DCF and CAPM Results***

Q. WHAT ARE YOUR PROPOSED ADJUSTMENTS TO THE AVERAGE DCF AND CAPM RESULTS?

A. My proposed adjustments to the average DCF and CAPM results for the Water Utility Group include: 1) a Flotation Cost Adjustment; 2) a Bond Yield Differential; 3) a Private Placement Premium; 4) a Small-Utility Risk Premium; and 5) an Adjustment to Reflect Require Equity Return at a 40% Equity Ratio.

E. ***Flotation Cost Adjustment***

Q. WHAT ARE FLOTATION COSTS?

A. Flotation costs are those costs associated with the sale of new issuances of common stock. They include market pressure and the essential costs of issuance (e.g., underwriting fees and out-of-pocket costs for printing, legal, registration, etc.).

Q. WHY MUST FLOTATION COSTS BE RECOGNIZED IN THE ALLOWED RETURN ON COMMON EQUITY?

A. Flotation costs must be recognized in the allowed return on common equity because there is no other mechanism in the ratemaking paradigm with which such costs can be recovered. Because these costs are real and legitimate, recovery of these costs should be permitted. As noted by Morin[45]:

> The costs of issuing these securities are just as real as operating and maintenance expenses or costs incurred to build utility plants, and fair regulatory treatment must permit recovery of these costs….
>
> The simple fact of the matter is that common equity capital is not free….[Flotation costs] must be recovered through a rate of return adjustment.

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[45] Morin 321 (*See* Appendix B, Workpaper PMA-25).

Q. SHOULD FLOTATION COSTS BE RECOGNIZED ONLY WHEN THERE WAS AN ISSUANCE DURING THE TEST YEAR OR THERE IS AN IMMINENT POST-TEST YEAR ISSUANCE OF ADDITIONAL COMMON STOCK?

A. No. As noted above, there is no mechanism through which such costs can be captured in the ratemaking paradigm other than an adjustment to the allowed common equity cost rate. Flotation costs are charged to capital accounts and are not expensed on a utility's income statement. As such, flotation costs are analogous to capital investments, albeit negative, reflected on the balance sheet. Recovery of capital investments relates to the expected useful lives of the investment. Since common equity has a very long and indefinite life (assumed to be infinity in the standard regulatory DCF model), flotation costs should be recovered through an adjustment to common equity cost rate even when there has not been an issuance during the test year nor in the absence of an expected imminent issuance of additional shares of common stock.

Historical flotation costs are a permanent loss of investment to the utility and should be accounted for when setting the allowed return on common equity. When any company, including a utility, issues common stock, flotation costs are incurred for legal, accounting, printing fees and the like. For each dollar of issuing market price, a small percentage is expensed and is permanently unavailable for investment in utility rate base. For example, since these expenses are charged to capital accounts and not expensed on the income statement, the only way to restore the full value of the issuance price is to earn more than the investor required market return on the issuance price, so that the investor receives a full fair return on his / her investment. In other words, if a company issues stock at $1.00 with 5% in flotation costs, it will net $0.95 in investment. Assuming the investor in that stock requires a 10% return on his or her invested $1.00 i.e., a return of $0.10, the company needs to earn approximately 10.5% on its invested $0.95 to receive a $0.10 return.

Q. DO THE DCF AND CAPM ALREADY REFLECT INVESTORS' ANTICIPATION OF FLOTATION COSTS?

A. No. These models assume no transaction costs and therefore flotation costs are not reflected in the results of the application of these models. The literature is quite clear on this point. For example, Brigham and Daves[46] confirm this, providing the methodology utilized to calculate the flotation adjustment. Morin[47] also confirms the need for such an adjustment even when no new equity issuance is imminent. Consequently, it is proper to include a flotation cost adjustment when using market-based cost of common equity models to estimate the common equity cost rate.

Q. WHAT IS YOUR PROPOSAL FOR FLOTATION COSTS?

A. As noted previously, in my opinion an assumed 0.20% (20 basis points) flotation cost adjustment, as used in the FLPSC leverage formula, is reasonable.

F. ***Bond Yield Differential***

Q. WHAT IS YOUR PROPOSAL FOR A BOND YIELD DIFFERENTIAL?

A. As also noted previously, in my opinion the FLPSC Staff's Bond Yield Differential, which is based upon a 120-month average spread between Baa3 / BBB- and A rated public utility bonds, is reasonable. In my estimation of a generic ROE based upon my proposed methodology, the most recent 120-month spread ending November 30, 2017, is 0.63% (63 basis points).

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46 Eugene F. Brigham and Phillip R. Daves, Intermediate Financial Management, 9th Edition, Thomson/Southwestern 342 (*See* Appendix B, Workpaper PMA-26).

47 Morin 327 – 330 (*See* Appendix B, Workpaper PMA-27)

G. ***Private-Placement Premium***

Q. WHAT IS YOUR PROPOSAL FOR A PRIVATE PLACEMENT PREMIUM?

A. Again, as also noted previously, in my opinion the FLPSC Staff's Private Placement Premium of 0.50% (50 basis points) is reasonable and is my proposal.

H. ***Small Size Risk Premium***

Q. WHAT IS YOUR PROPOSAL A SMALL SIZE RISK PREMIUM?

A. As also discussed previously, the FLPSC Staff's Small-Utility Risk Premium of 0.50% (50 basis points), in my opinion, it is extremely conservative, given how small AWC, HAWC, and LRWC are relative to Water Utility Group based upon the relative risk analysis discussed above and presented in Attachments PMA-1 and PMA-2.

As discussed above, an indication of the magnitude of company-specific adjustments for the greater relative business risk due to smaller relative size is based upon the size premiums for the decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for 1926-2016 as published <u>D&P -1017</u> and <u>D&P Valuation – 2017</u> which range from 4.35% - 8.80% for AWC, 3.89% - 7.48% for HAWC and 2.01% - 7.29% for LRWC. However, I suggest that conservative and reasonable ranges of small size premiums of 2.64% - 5.27% for AWC, 2.30% - 4.59% for HAWC, and 2.23% - 4.46% for LRWC as shown in Table 7 above.

I. ***Adjustment to Reflect a Required Return at 40% Common Equity Ratio***

Q. WHAT IS NEEDED TO ESTIMATE AN ADJUSTMENT TO REFLECT A REQUIRED RETURN AT A 40% COMMON EQUITY RATIO FOR AWC, HAWC, AND LRWC IN YOUR PROPOSED GENERIC ROE FORMULA?

A. The estimation of an adjustment to reflect a required return at a 40% common equity ratio requires an estimated debt cost rate, the capital structure ratios of the Water Utility Group, and the estimated ROEs for AWC, HAWC and LRWC.

Q. HOW DO YOU PROPOSE TO ESTIMATE THE DEBT COST RATE?

A. Because the cost of capital and ratemaking are both prospective in nature, consistent with the use of a projected risk-free rate in the CAPM analysis, I propose that a similarly estimated projected yield on Baa3 / BBB- rated public utility bonds be used in the derivation of the ROE for the Companies at a 40% Equity Ratio.

Page 4 of Attachment PMA-4 presents the derivation of a projected Baa3 bond yield of 5.7977% by:

1) First estimating an average projected Baa corporate bond yield of 5.2125% for the six quarters ending with the first quarter 2019, from the December 1, 2017 *Blue Chip*[48], averaged with the long-range forecasts for 2019 – 2023, and 2024 – 2028, also from the December 1, 2017, *Blue Chip*, of 5.2125%, as derived on page 4 of Attachment PMA-5.
2) Adjusting the 5.2125% projected Baa corporate bond yield by a <u>negative</u> 0.07%, the average spread between Baa corporate and Baa public utility bond yields for the three-months ended November 2017 to derive the projected Baa public utility bond yield of 5.1392%.
3) Finally, as shown on pages 1 through 3 of Attachment PMA-5, the Private Placement Premium of 0.50%; and the Adjustment to Reflect a Baa3 Public Utility Bond Yield of

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48 *Blue Chip Financial Forecasts*, December 1, 2017 2, 14 (*See* Appendix B, Workpaper PMA-22).

0.1586% was added to the 5.1392% projected Baa public utility bond yield, resulting in a projected Baa3 public utility bond yield of 5.7977%.[49]

This 5.7977% was then used to estimate the ROE at a 40% common equity ratio for the Water Utility Group using its average capital structure ratios, because the financial risk inherent in those ratios is reflected in the DCF and CAPM ROE results for the Group, and the company specific small size risk premiums for AWC, HAWC, and LRWC.

Q. WHY DO YOU HOLD THE DEBT COST RATE CONSTANT OVER THE RANGE OF COMMON EQUITY RATIOS IN YOUR PROPOSED GENERIC ROE FORMULA?

A. The current FLPSC leverage formula holds the debt cost rate constant over a common equity ratio range of 40% to 100% as can be gleaned from Attachment 1 of Order No. PSC-17-0429-PAA-WS[50] issued June 2017 in Docket No. 170006-WS. The relationship between leverage and financial risk has been formalized by financial economists, such as Modigliani and Miller[51] who showed that the cost of common equity may be expressed as:

$$k_{e,L} = k_{e,U} + (k_{e,U} - k_d)(1-T)(D/E)$$

Where:

$k_{e,U}$	=	Cost of Equity for an unlevered firm
$k_{e,L}$	=	Cost of Equity for a levered firm
k_d	=	cost of debt (interest rate)

49 5.7977% = (5.1392% + 0.50% + 0.1586%).

50 Order No. PSC-17-0249-PAA-WS in re: Water and wastewater industry annual reestablishment of authorized range of return on common equity for water and wastewater utilities pursuant to Section 367.08194)(f). F.S., Florida Public Service Commission, June 26, 2017. (*See* Workpaper PMA-28).

51 F. Modigliani and M. Miller, The Cost of Capital, Corporation Finance, and the Theory of Investment, The American Economic Review 48 No. 3, June 1958, at 261-297; F. Modigliani and M. Miller, Corporate Income Taxes and the Cost of Capital: A Correction, The American Economic Review 53 No. 3, June 1963 433 – 443. (*See* Appendix B, Workpaper PMA-16)

D = level of debt

E = level of equity

T = tax rate

Thus, the cost of common equity for a levered firm is expressed as the cost of common equity for an unlevered firm, which only reflects business risk, plus a premium for financial risk. Although it is theoretically valid that the debt cost rate will also rise as leverage increases, holding the debt cost rate constant over a range of common equity ratios assumes that all else is equal. In regard to public utility regulation, all else is not equal to the competitive markets.

Therefore, the FLPSC's assumption that the debt cost rate is constant over a common equity range of 40% to100% is reasonable for two reasons. First, the revenue requirement formula under which utilities are regulated provides that the regulated utility will be compensated for prudently incurred operating and maintenance expenses, depreciation, taxes and a return on its investment, comprised of a senior capital (debt and or preferred stock) component and a common equity component. The revenue requirement formula ensures that the regulated utility will receive sufficient earnings to compensate it for both its debt and preferred stock obligations. To that end, it is typical, in the rate base / rate of return paradigm, to utilize the embedded cost of senior capital in the derivation of the allowed Weighted Average Cost of Capital ("WACC"). The embedded cost of senior capital is a function of many factors, including but not limited to the timing of the various issues of senior capital, capital market conditions at the time of issuance, the credit / bond rating (or equivalent in the case of private placements) of the regulated utility at the time of issuance, and the level of issuance costs and any premium / discounts at the time of issuance.

The current Florida Leverage Formula, upon which I based my proposed generic ROE formula, assumes that if the Florida small water and wastewater utilities had bonds which were rated, they would be rated Baa3 by Moody's which is equivalent to a BBB- by S&P. While the bond rating process is qualitatively and quantitatively comprehensive, it does not focus exclusively on the debt ratio. In view of the foregoing, it is therefore reasonable to hold the debt rate constant over the common equity range of 40% to 100% in my proposed leverage formula.

<u>Pre-Tax versus Post-Tax Computation of the FLPSC Leverage Formula</u>

Q. PLEASE ADDRESS THE ISSUE OF A PRE-TAX VERSUS A POST-TAX COMPUTATION OF YOUR PROPOSED GENERIC ROE FORMULA?

A. The current FLPSC leverage formula holds the post-tax rate constant as the common equity ratio changes throughout the range from 40.0% to 100.0%. Although it is true, as Modigliani / Miller demonstrated, if it were not for income taxes and bankruptcy risk, the capital structure selected by any company would not impact the WACC. However, by holding the pre-tax WACC constant, the exact opposite can be demonstrated, namely, differing amounts of debt and equity in the capital structure have absolutely no impact, on the revenue cost of capital. For example, an 8.50% pre-tax WACC when multiplied by rate base represents a revenue cost of capital which equates to $8.50 to be recovered from ratepayers for each $100 of rate base. By keeping the pre-tax income tax WACC constant, no matter what the common equity ratio, 100.00%, 40.00% or something in between, that by holding the WACC of 8.50% constant, the revenue cost of capital will be $8.50 / $100 rate base, at any common equity ratio. In other words, various capital structure ratios have no impact on the revenue cost of capital because no matter what the common equity ratio, 100.00% or 40.00%, ratepayers will be paying $8.50 per $100 of rate base. Hence, holding the pre-tax WACC constant demonstrates that capital structure is irrelevant to the revenue cost of capital, providing no incentive to maintain a reasonable capital structure because there is no change in the revenue cost of capital, i.e., the rates recovered from ratepayers, as the common equity ratio changes as discussed below.

In addition, because regulated water and wastewater companies do have to pay income taxes, the WACC will increase as the percentage of common equity in the capital structure increases, because the amount of income taxes to be collected from ratepayers will increase. It is precisely for this reason that it is necessary to hold the post-income tax rate constant, as is assumed by my proposed generic ROE formula, because then the revenue cost of capital will vary with varying capital structure ratios consistent with the Modigliani / Miller principle upon which my proposed generic ROE formula is based. Therefore, I propose that the computation of the generic ROE formula hold the pre-tax WACC constant.

As shown on pages 1 through 3 of Attachment PMA-5, the range of ROEs at a 40% common equity ratio for the Water Utility Group using AWC's low and high size risk premiums of 2.64% - 5.27% is 13.30% - 15.96%, using HAWC's low and high size risk premiums of .30% - 4.59% is 17.33% - 21.06%, and using LRWC's low and high size risk premiums of 2.23% - 4.46% is 12.64% - 14.82%, as shown in Tables 10a, 10b and 10c below, were then estimated using Staff's formula:

<u>Table 10a</u>
<u>Abenaki Water Company</u>

Debt Cost Rate + X / 40% + ROE

Where:
Debt Cost Rate = 5.7997%
X = 3.893% (low) / 5.274% (high)
ROE (AWC) = 13.30% (low) / 15.96% (high)

ROE using AWC's 2016 Common Equity Ratio of 51.91%[52] =

Low	High
5.7997% + (3.893% / 51.91%) =	5.7997% + (5.274% / 51.91%) =
5.7997% + 7.4995% =	5.7997% + 10.1599% =
<u>13.30%</u>	**<u>15.96%</u>**

<u>Table 10b</u>
<u>Hampstead Area Water Co., Inc.</u>

Debt Cost Rate + X / 40% + ROE

Where:
Debt Cost Rate = 5.7997%
X = 3.714% (low) / 4.917% (high)
ROE (HAWC) = 17.33% (low) / 21.06% (high)

ROE using HAWC's 2016 Common Equity Ratio of 32.22%[53] =

Low	High
5.7997% + (3.714% / 32.22%) =	5.7997% + (4.917% / 32.22%) =
5.7997% + 11.5270% =	5.7997% + 15.2607% =
<u>17.33%</u>	**<u>21.06%</u>**

[52] Derived from Abenaki Water Company's 2016 Annual Report to the NH PUC.
[53] Derived from Hampstead Area Water Co., Inc.'s 2016 Annual Report to the NH PUC.

Table 10b
Lakes Region Water Co., Inc.

Debt Cost Rate + X / 40% + ROE

Where:
Debt Cost Rate = 5.7997%
X = 3.680% (low) / 4.849% (high)
ROE (LRWC) = 12.64% (low) / 14.82% (high)

ROE using HAWC's 2016 Common Equity Ratio of 53.76%[54] =

Low	High
5.7997% + (3.680% / 53.67%) =	5.7997% + (4.849% / 53.76%) =
5.7997% + 6.8452% =	5.7997% + 9.0197% =
12.64%	**14.82%**

IX. MASSACHUSETTS ROE FORMULA FOR SMALL WATER AND WASTEWATER UTILITIES

Q. ARE YOU FAMILIAR WITH THE MASSACHUSETTS ROE FORMULA FOR SMALL WATER AND WASTEWATER UTILITIES?

54 Derived from Hampstead Area Water Co., Inc.'s 2016 Annual Report to the NH PUC.

A. Yes. In 1985, the Massachusetts Department of Public Utilities ("MDPU") established a Generic Cost of Capital Formula for Water Companies in D.P.U. 85-115 intended to facilitate the ratemaking process for establishing an authorized ROE for small water and wastewater utilities as well as to reduce rate case expenses to litigate the ROE. However, use of the formula is not required in Massachusetts and utilities may file traditional ROE testimony at their discretion. The formula established in D.P.U. 85-115 (see Attachment PMA-6 to determine the allowed ROE is based upon an "Index", defined as "the most recent twelve-month average of three-year United States Treasury bond interest rates, as derived from [the] Federal Reserve Statistical Release, H.15 (519), "Selected Interest Rates," or a successor or equivalent publication, including the interest rate published on, or as close as possible after, a date four months following the effective date" [55] plus 3.5% (if the utility has a common equity ratio less than or equal to 25%), plus 3.0% (if the utility has a common equity ratio greater than 25% but less than 75%), and plus 2.5% (if the utility has a common equity ratio greater than or equal to 75%).[56] In addition, the formula was limited to a range of ROE of 13.0% - 16.0% no matter what the formula results were for any given estimation of the formula.

[55] Massachusetts Department of Public Utilities, D.P.U. 85-115, "Investigation by the Department on its own motion concerning proposed rules that would establish an optional method for determining the allowed rate of return on equity for water companies subject to its jurisdiction." Sec. 31.01.

[56] D.P.U. 85-115 Sec. 31.03

In D.P.U. 96-90, in November 1996, the MDPU revised the definition of the based "Index" to be "the most recent twelve-month average of thirty-year United States Treasury bond interest rates, as derived from [the] Federal Reserve Statistical Release, H.15 (519), "Selected Interest Rates," or a successor or equivalent publication, including the interest rate published on, or as close as possible after, a date four months following the effective date" [57] as well as clarifying the definition of Common Equity Ratio to include "common equity, retained earnings, and capital surplus."[58] The same premiums above the Index, 3.5%, 3.0% and 2.5% relative to various common equity ratios as adopted in D.P.U 85-115 were retained. In addition, the D.P.U. determined that the formula would be now limited to a range of ROE of 11.5% - 14.5% no matter what the formula results were for any given estimation of the formula.

[57] Massachusetts Department of Public Utilities, D.P.U. 96-90, "Investigation by the Department on its own motion pursuant to G.L. C. 25, § 5; G.L. c 164 §§ 76C, 94; G.L. c. 165 §§ 1B, 2, 4, and 200 C.M.R. §§ 2.00 et seq,, concerning rulemaking to rescind 220 C.M.R. § 76m and to amend 220 C.M.R. § 31.

[58] D.P.U. 96-90 Sec. 31.01

Using the MDPU generic ROE formula currently in place with a twelve-month average 30-year U.S. Treasury bond yield of 2.92% ending November 30, 2017,[59] results in ROEs of 6.42% for a water company with a common equity less than or equal to 25%, 5.92% for a water company with a common equity ratio between 25% and 75% and 5.42% for a water company with a common equity ratio equal to or greater than 75%. Since these ROEs are below the bottom of the acceptable MDPU range of 11.5% - 14.5%, the ROE applicable to all three Companies would be 11.5%. However, this 11.5% does not reflect the extremely small size of the Companies as discussed above. When my proposed low and high small size premiums are added to the 11.5% generic MDPU ROE for each of the companies, ROEs in the ranges of 14.14% - 16.77% result for AWC, 13.80% - 116.09% result for HAWC and 13.73% - 15.96% result for LRWC as derived on page 1 of Attachment PMA-8.[60]

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59 Source: Bloomberg Professional Service.

60 Currently both Colonial and Plymouth Water Companies, sister subsidiaries of AWC, are authorized ROEs of 10.5% by the MDPU. Colonial's ROE was authorized on December 28, 2011 and Plymouth's on August 31, 2015.

I suggest that should the NH PUC wish to consider using the MA generic ROE formula, that a prospective yield on 30-year U.S. Treasury bonds be used. As discussed previously, both ratemaking and the cost of capital are forward looking, therefore a forecasted yield on 30-year U.S. Treasury bonds is appropriate for cost of capital purposes, such as the forecasted yield of 3.53% in my CAPM analysis and a more appropriate equity risk premium related to that yield is the market equity risk premium of 8.05% also used in my CAPM analysis. Such a premium must then be adjusted by the Water Utility Group's average beta to reflect a water utility specific equity risk premium, before being added to the projected yield on 30-year U.S. Treasury bonds to estimate a generic water utility ROE. Subsequently, the specific low and high size risk premiums of AWC, HAWC and LRWC should be added to this generic water utility ROE so that the resultant ranges of ROE are directly applicable to and reflective of the business risk of AWC, HAWC and LRWC. However, this methodology, like the generic MDPU formula described above, does not result in ROEs for the Companies which reflect the financial risk inherent in their capital structures relative to that of the Water Utility Group. This methodology results in ranges of ROEs of 12.16% - 14.79% for AWC, 11.82% - 14.11% for HAWC and 11.75% - 13.98% for LRWC as also shown on page 1 of Attachment PMA-8 and summarized in Table 11 below.

X. <u>CONNECTICUT ROE FORMULA FOR SMALL WATER AND WASTEWATER UTILITIES</u>

Q. ARE YOU ALSO FAMILIAR WITH THE CONNECTICUT ROE FORMULA FOR SMALL WATER AND WASTEWATER UTILITIES?

A. Yes. In October 2013, the Connecticut Public Utilities Regulatory Authority ("CT PURA") established a generic formula with which to estimate the allowed ROE for the small water and wastewater utilities under its jurisdiction. Like the MDPU, CT PURA's purpose was to streamline the rate case process and to avoid the rate case expense of litigated ROE in a rate case. PURA adopted a settlement between the parties[61] which agreed that the most recently allowed average ROES of Aquarion Water Company ("Aquarion") and the Connecticut Water Company "(Connecticut Water") be used as the base ROE for the small water utilities. To this average ROE, there would be a "fixed adder" of 0 50% (50 basis points) "determined as reasonable by the Settling Parties" plus, a "Variable Performance Adder" of up to 0.50% (50 basis points) .[62] No regard was given to any difference in financial risk between the small water companies and the average financial risk of Aquarion and Connecticut Water. In addition, any change in the authorized ROE for the small water companies is dependent upon rate filings by Aquarion and Connecticut Water, neither of which has filed for a rate increase in a number of years. Aquarion's last rate case was decided in September 2013, while Connecticut Water's was decided in July 2010.

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61 Hazardville Water Co., Torrington Water Co., Avon Water Co., Valley Water Systems, Inc., Heritage Village Water Co., and the Office of Consumer Counsel,

62 Connecticut Public Utilities Regulatory Authority, Decision No. 13-01-29: Investigation for Streamlining the Ratemaking Process for Small Water Companies, October 23, 2013 3.

Again, should the NH PUC wish to consider using the CT generic ROE formula, that it base the generic water utility ROE on the prevailing water ROE for other, larger NH water utilities, which the Companies has informed me is 9.6%. However, as discussed previously relative to the FLPSC Leverage Formula, in my opinion a size risk premium of 0.50% (50 basis points) does not adequately reflect the risk of the extremely small sizes of each of the Company. Therefore, I suggest that the low and high size risk premiums be added to the NH average water utility ROE of 9.6% to estimate ranges of ROE applicable to each Company. However, this methodology, like the generic MDPU formula described above, does not result in ROEs for the Companies which reflect the financial risk inherent in their capital structures relative to that of the Water Utility Group. This methodology results in ranges of ROEs of 12.24% - 14.87% for AWC, 11.90% - 14.19% for HAWC and 11.89% - 14.01% for LRWC as shown on page 2 of Attachment PMA-8 and summarized in Table 11 below.[63]

XI. <u>CONCLUSION</u>

Q. WHAT DO YOU CONCLUDE RELATIVE TO A GENERIC ROE FORMULA TO BE USED BY THE NH PUC?

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63 Currently both Valley Water Systems, a sister subsidiary of AWC, is authorized an ROEs of 10.05% by PURA which was authorized on November 3, 2010.

A. I propose that the NH PUC consider establishing a generic ROE formula based upon the Florida Leverage Formula but with the modifications discussed above. My proposed generic ROE formula uses the market data of a group of publicly traded water utilities in the application of two well-tested, market-based, and theoretically sound cost of common equity models, the DCF and CAPM. The proposed formula reflects the risks inherent in investment in small water and wastewater utilities, such as that related to the increased risk of privately placed debt, a small utility premium on debt, a likely bond rating of Baa3 for small water and wastewater utilities as well as the greater business risk of extremely small water and wastewater utilities such as the Companies. In addition, my proposed generic ROE formula reflects the financial risk, i.e., leverage, inherent in the specific capital structure ratios of each of the Companies. In contrast, the Massachusetts and Connecticut generic roe formulas do not reflect financial risk differences between the Companies or between the Companies and the Water Utility Group whose market data form the bases of the ROE estimation. Nor do the Massachusetts or Connecticut generic ROE formulas as currently applied adequately reflect the risk of each of the Companies based upon their extremely small size relative to the Water Utility Group.

Table 11 below summarized the resultant ROEs based upon my proposed generic ROE formula, as well as the Massachusetts and Connecticut formulas revised to reflect the extremely small size of the Companies and in the case of the Massachusetts formula, to also reflect a forecasted 30-year U.S. Treasury bond yield.

Table 11

Conclusions of ROE for AWC, HAWC and LRWC

Abenaki Water Company	**Low Size Risk Premium**	**High Size Risk Premium**

Proposed generic ROE formula	13.30%	15.96%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	14.14%	16.77%
Proj. 30-Year US Treas. Bond	12.16%	14.79%
Connecticut's ROE formula	12.24%	14.87%
Hampstead Area Water Co., Inc.	**Low Size Risk Premium**	**High Size Risk Premium**
Proposed generic ROE formula	17.33%	21.06%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	13.80%	16.09%
Proj. 30-Year US Treas. Bond	11.82%	14.11%
Connecticut's ROE formula	11.90%	14.19%
Lakes Region Water Co., Inc.	**Low Size Risk Premium**	**High Size Risk Premium**
Proposed generic ROE formula	12.70%	14.93%
Massachusetts' ROE formula		
Avg. 30-Year US Treas. Bond*	13.79%	16.07%
Proj. 30-Year US Treas. Bond	11.81%	14.09%
Connecticut's ROE formula	11.83%	14.06%

* 11.50% plus the low and high size risk premiums for each Company.

[64]Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

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A. Yes.