AQUA EXHIBIT 4

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Aqua Ohio, Inc. and Aqua Ohio Wastewater, Inc. to Increase Its Rates and Charges for its Waterworks Service And Wastewater Service	Case No. 22-1094-WW-AIR Case No. 22-1096-ST-AIR

DIRECT TESTIMONY
OF
DYLAN W. D'ASCENDIS, CRRA, CVA
PARTNER
SCOTTMADDEN, INC.

___ Management policies, practice and organization

___ Operating income

___ Rate base

___ Allocations

_X_ Rate of return

___ Rates and tariffs

___ Other

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I. INTRODUCTION

A. WITNESS IDENTIFICATION

Q. Please state your name and business address.

A. My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite 200, Mount Laurel, NJ 08054.

Q. By whom are you employed and in what capacity?

A. I am a Partner at ScottMadden, Inc.

B. BACKGROUND AND QUALIFICATIONS

Q. Please summarize your professional experience and educational background.

A. I have offered expert testimony on behalf of investor-owned utilities before 35 state regulatory commissions in the United States, the Federal Energy Regulatory Commission, the Alberta Utility Commission, and one American Arbitration Association panel on issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure, class cost of service, and rate design.

On behalf of the American Gas Association ("AGA"), I calculate the AGA Gas Index, which serves as the benchmark against which the performance of the American Gas Index Fund ("AGIF") is measured on a monthly basis. The AGA 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 AGA.

I am a member of the Society of Utility and Regulatory Financial Analysts ("SURFA"). In 2011, I was awarded the professional designation "Certified Rate of Return Analyst" by SURFA, which is based on education, experience, and the successful completion of a comprehensive written examination.

I am also a member of the National Association of Certified Valuation Analysts ("NACVA") and was awarded the professional designation "Certified Valuation Analyst" by the NACVA in 2015.

I am a graduate of the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic History. I have also received a Master of Business Administration with high honors and concentrations in Finance and International Business from Rutgers University.

The details of my educational background and expert witness appearances are included in Appendix A.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to present evidence on behalf of Aqua Ohio, Inc. ("Aqua OH" or the "Company") about the appropriate capital structure and corresponding cost rates the Company should be given the opportunity to earn on its jurisdictional rate base.

Q. Have you prepared an Exhibit in support of your recommendation?

A. Yes. Exhibit No. 4-1, which contains Schedules DWD-1 through DWD-9, and has been prepared by me or under my direct supervision.

Q. What is your recommended cost of capital for Aqua OH?

A. I recommend the Public Utilities Commission of Ohio ("PUC OH" or the "Commission") authorize the Company the opportunity to earn an overall rate of return of 7.37% based on the expected capital structure of Aqua OH as of June 30, 2023. The ratemaking capital structure consists of 47.11% long-term debt at an embedded cost rate of 3.86% and 52.89% common equity at my recommended common equity cost rate of 10.50%. The overall rate of return is summarized on page 1 of Schedule DWD-1 and in Table 1 below:

Table 1: Summary of Overall Rate of Return

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.11%	3.86%	1.82%
Common Equity	52.89%	10.50%	5.55%
Total	100.00%		7.37%

III. SUMMARY

Q. Please summarize your recommended common equity cost rate.

A. My recommended common equity cost rate of 10.50% is summarized on page 2 of Schedule DWD-1. I have assessed the market-based common equity cost rates of companies of relatively similar, but not necessarily identical, risk to Aqua OH. Using companies of relatively comparable risk as proxies is consistent with the principles of fair rate of return established in the *Hope*[1] and *Bluefield*[2] cases. No proxy group can be identical in risk to any single company, so there must be an evaluation of relative risk between the company and the proxy group to see if it is appropriate to make adjustments to the proxy group's indicated rate of return.

My recommendation results from the application of several cost of common equity models, specifically the Discounted Cash Flow ("DCF") model, the Risk Premium Model ("RPM"), and the Capital Asset Pricing Model ("CAPM"), to the market data of a proxy group of eight water companies ("Utility Proxy Group") whose selection criteria will be discussed below. In addition, I also applied the DCF, RPM, and CAPM to a proxy group of domestic, non-price regulated companies comparable in total risk to the Utility Proxy Group ("Non-Price Regulated Proxy Group").

The results derived from each are as follows:

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

Table 2: Summary of Common Equity Cost Rate

Discounted Cash Flow Model	9.67%
Risk Premium Model	11.97%
Capital Asset Pricing Model	12.02%
Market Models Applied to Comparable Risk, Non-Price Regulated Companies	12.06%
Indicated Range of Common Equity Cost Rates Before Adjustments for Company-Specific Risk	10.37% - 11.37%
Size Adjustment	0.00%
Flotation Cost Adjustment	0.05%
Indicated Range of Common Equity Cost Rates after Adjustment	10.42% – 11.42%
Recommended Cost of Common Equity	10.50%

After analyzing the indicated common equity cost rates derived through these models, the indicated range of common equity cost rates applicable to the Utility Proxy Group is between 10.37% and 11.37%[3] .

The indicated range of common equity cost rates applicable to the Utility Proxy Group was then adjusted by 0.05% to reflect flotation costs. This adjustment results in a Company-specific range of common equity cost rates between 10.42% and 11.42%. From this range of results, I recommend the Commission consider a common equity cost rate of 10.50% for use in setting rates for the Company.

[3] My recommended range of ROEs applicable to the Utility Proxy Group is 50 basis points above and below the midpoint of my four model results.

IV. GENERAL PRINCIPLES

Q. What general principles have you considered in arriving at your recommended common equity cost rate of 10.50%?

A. 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. Assuring that the utility can fulfill its obligations to the public, while providing safe and reliable service at all times, requires a level of earnings sufficient to maintain the integrity of presently invested capital. Sufficient earnings also permit the attraction of needed new capital at a reasonable cost, for which the utility must compete with other firms of comparable risk, consistent with the fair rate of return standards established by the U.S. Supreme Court in the *Hope* and *Bluefield* U.S. Supreme Court decisions. The U.S. Supreme Court affirmed the fair rate of return standards in *Hope* when it stated:

> The rate-making process under the Act, i.e., the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' 315 U.S. at page 590, 62 S.Ct. at page 745. But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. Cf. Chicago & Grand Trunk R. Co. v. Wellman, 143 U.S. 339, 345, 346 12 S.Ct. 400,402. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[4]

[4] *Hope*, 320 U.S. 591 (1944), at 603.

In summary, the U.S. Supreme Court has found a return that is adequate to attract capital at reasonable terms enables the utility to provide service while maintaining its financial integrity. As discussed above, and in keeping with established regulatory standards, that return should be commensurate with the returns expected elsewhere for investments of equivalent risk. The Commission's decision in this proceeding, therefore, should provide the Company with the opportunity to earn a return that is: (1) adequate to attract capital at reasonable cost and terms; (2) sufficient to ensure their financial integrity; and (3) commensurate with returns on investments in enterprises having corresponding risks.

Lastly, the required return for a regulated public utility is established on a stand-alone basis, i.e., for the utility operating company at issue in a rate case. Parent entities, like other investors, have capital constraints and must look at the attractiveness of the expected risk-adjusted return of each investment alternative in their capital budgeting process. That is, utility holding companies that own many utility operating companies have choices as to where they will invest their capital within the holding company family. Therefore, the opportunity cost concept applies regardless of the source of the funding, public funding or corporate funding.

When funding is provided by a parent entity, the return still must be sufficient to provide an incentive to allocate equity capital to the subsidiary or business unit rather than other internal or external investment opportunities. That is, the regulated subsidiary must compete for capital with all the parent company's affiliates, and with other, similarly situated utility companies. In that regard, investors value corporate entities on a sum-of-the-parts basis and expect each division within the parent company to provide an appropriate risk-adjusted return.

It therefore is important that the authorized ROE reflects the risks and prospects of the utility's operations and supports the utility's financial integrity from a stand-alone perspective as measured by their combined business and financial risks. Consequently, the ROE authorized in this proceeding should be sufficient to support the operational (i.e., business risk) and financing (i.e., financial risk) of the Company's utility operations on a stand-alone basis.

A. 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.

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 of considering 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 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 supply, operations, capital intensity, size, the degree of operating leverage, emerging technologies including distributed energy resources, the vagaries of weather, and the like, all of which have a direct bearing on earnings.

Although analysts, including rating agencies, may categorize business risks individually, as a practical matter, such risks are interrelated and not wholly distinct from one another. When determining an appropriate return on common equity, the relevant issue is where investors see the subject company in relation to other similarly situated utility companies (i.e., the Utility Proxy Group). To the extent investors view a company as being exposed to higher risk, the required return will increase, and vice versa.

For regulated utilities, business risks are both long-term and near-term in nature. Whereas near-term business risks are reflected in 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 obtain both a fair rate of return on, and return of, their capital. Moreover, because utilities accept the obligation to provide safe, adequate and reliable service at all times (in exchange for a reasonable 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 external funds. The obligation to serve and the corresponding need to access capital is even more acute during periods of capital market distress.

Because utilities invest in long-lived assets, long-term business risks are of paramount concern to equity investors. That is, the risk of not recovering the return on their investment extends far into the future. The timing and nature of events that may lead to losses, however, also are uncertain and, consequently, those risks and their implications for the required return on equity tend to be difficult to quantify. Regulatory commissions (like investors who commit their capital) 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 common equity.

Q. What business risks do the water and wastewater industries face in general?

A. The water and wastewater utilities have an ever-increasing responsibility to be stewards of the environment from which water supplies are drawn in order to preserve and protect essential natural resources of the United States. This increased environmental stewardship is a direct result of compliance with the Safe Drinking Water Act, as well as a response to continuous monitoring by the Environmental Protection Agency ("EPA") and state and local governments, of the water supply for potential contaminants and their resultant regulations. This, plus aging infrastructure, necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures for infrastructure repair and replacement. The significant amount of capital investment and, hence, high capital intensity, is a major risk factor for the water and wastewater utility industry.

Value Line Investment Survey ("*Value Line*") observes the following about the water utility industry:

> Just about every company in the Industry has been busy replacing old pipelines. For decades, most water utilities did not invest the funds required to modernize their systems. Water utilities and regulators were both satisfied in keeping customers' monthly bills low. When compared to other utilities' bills, such as electric, gas, and cable, water was relatively cheap. There was a long-term cost to this lack of capital expenditures. In the earlier part of the 21st century, as water started to become more of a scarcer commodity, water districts became alarmed when they realized how much water was being lost because of old leaky pipes. Since then, the industry has been investing heavily to fix the problem. The replacement process will likely take decades to complete.[5]

[5] *Value Line Investment Survey*, October 7, 2022.

The water and wastewater industry also experiences low depreciation rates. Depreciation rates are one of the principal sources of internal cash flows for all utilities (through a utility's depreciation expense) and are vital for a company to fund ongoing replacements and repairs of water and wastewater systems. Water / wastewater utility assets have long lives, and therefore have long capital recovery periods. As such, they face greater risk due to inflation, which results in a higher replacement cost per dollar of net plant.

Substantial capital expenditures, as noted by *Value Line*, will require significant financing. The three sources of financing typically used 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. Consistent with *Hope* and *Bluefield*, the return must be sufficient 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,[6] both of which are directly linked to earning a sufficient rate of return. The level of free cash flow represents a utility's ability to meet the needs of its debt and equity holders. If either retained earnings or free cash flow is inadequate, it will be nearly impossible for the utility to attract the needed capital for new infrastructure investment necessary to ensure quality service to its customers. An insufficient rate of return can be financially devastating for utilities as well as a public safety issue for their customers.

The water and wastewater utility industry's high degree of capital intensity and low depreciation rates, coupled with the need for substantial infrastructure capital spending, require regulatory support in the form of adequate and timely rate relief, and in particular,

[6] Free Cash Flow = Operating Cash Flow (Funds From Operations) minus Capital Expenditures.

a sufficient authorized return on common equity, so that the industry can successfully meet the challenges it faces.

B. FINANCIAL RISK

Q. Please define financial risk and explain why it is important to the determination of a fair rate of return.

A. Financial risk is the additional risk created by the introduction of debt and preferred stock into the capital structure. The higher the proportion of debt and preferred stock in the capital structure, the higher the financial risk (*i.e.*, likelihood of default). Therefore, consistent with the basic financial principle of risk and return, investors demand a higher common equity return as compensation for bearing higher default risk.

Q. Can bond and credit ratings be a proxy for the combined business and financial risk (*i.e.*, investment risk of an enterprise)?

A. Yes, similar bond ratings/issuer credit ratings reflect, and are representative of, similar combined business and financial risks (*i.e.*, total risk) faced by bond investors.[7] Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are roughly similar from a debtholder perspective. The caveat is that these debtholder risk measures do not translate directly to risks for common equity.

[7] Risk distinctions within S&P's bond rating categories are recognized by a plus or minus, i.e., within the A category, an S&P rating can be at A+, A, or A-. Similarly, risk distinctions for Moody's ratings are distinguished by numerical rating gradations, i.e., within the A category, a Moody's rating can be A1, A2 and A3.

V. AQUA OH AND THE UTILITY PROXY GROUP

Q. Why is it necessary to develop a proxy group when estimating the ROE for the company?

A. Because the Company is not publicly traded and does not have publicly traded equity securities, it is necessary to develop groups of publicly traded, comparable companies to serve as "proxies" for the Company. In addition to the analytical necessity of doing so, the use of proxy companies is consistent with the *Hope* and *Bluefield* comparable risk standards, as discussed above. I have selected two proxy groups that, in my view, are fundamentally risk-comparable to the Company: a Utility Proxy Group and a Non-Price Regulated Proxy Group, which is comparable in total risk to the Utility Proxy Group.[8]

Even when proxy groups are carefully selected, it is common for analytical results to vary from company to company. Despite the care taken to ensure comparability, because no two companies are identical, market expectations regarding future risks and prospects will vary within the proxy group. It therefore is common for analytical results to reflect a seemingly wide range, even for a group of similarly situated companies. At issue is how to estimate the ROE from within that range. That determination will be best informed by employing a variety of sound analyses and necessarily must consider the sort of quantitative and qualitative information discussed throughout my Direct Testimony. Additionally, a relative risk analysis between the Company and the Utility Proxy Group must be made to determine whether or not explicit Company-specific adjustments need to be made to the Utility Proxy Group's indicated results.

My analyses are based on the Utility Proxy Group, containing U.S. water utilities. As discussed earlier, utilities must compete for capital with other companies with

[8] The development of the Non-Price Regulated Proxy Group is explained in more detail in Section VII.

commensurate risk (including non-utilities) and, to do so, must be provided the opportunity to earn a fair and reasonable return. Consequently, it is appropriate to consider the Utility Proxy Group's market data in determining the Company's ROE.

Q. Are you familiar with the operations of Aqua OH?

A. Yes. Aqua OH is a subsidiary of Essential Utilities, Inc. ("Essential"). The Company serves approximately 158,706 customers in Ohio. Aqua OH's common stock is not publicly traded.

Q. Please explain how you chose your Utility Proxy Group.

A. Because the cost of equity is a comparative exercise, my objective in developing a proxy group was to select companies that are comparable to the Company. Because the Company is a 100% rate-regulated water utility, I applied the following criteria to select my Utility Proxy Group:

(i) They are included in the Water Utility Group of *Value Line's* Standard Edition or Small & Midcap Edition (October 7, 2022);

(ii) They have 60% or greater of fiscal year 2021 total operating income derived from, or 60% or greater of fiscal year 2021 total assets attributable to, regulated water utility operations;

(iii) At the time of preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity (*i.e.*, one publicly traded utility merging with or acquiring another);

(iv) They have not cut or omitted their common dividends during the five years ending 2021 or through the time of the preparation of this testimony;

(v) They have *Value Line* and Bloomberg Professional Services ("Bloomberg") adjusted Beta coefficients ("beta");

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

(vii) They have *Value Line*, Zacks, or Yahoo! Finance consensus five-year earnings per share ("EPS") growth rate projections.

The following six companies met these criteria: American States Water Co., American Water Works Co., Inc., California Water Service Group, Essential Utilities, Inc., Middlesex Water Co., and SJW Corp.

Q. Please describe Schedule DWD-2, page 1.

A. Page 1 of Schedule DWD-2 contains comparative capitalization and financial statistics for the Utility Proxy Group identified above for the years 2017 to 2021. During the five-year period ending 2021, the historically achieved earnings rate on book common equity for the group averaged 10.40%. The average common equity ratio based on total permanent capital (excluding short-term debt) was 51.78%, and the average dividend payout ratio was 59.46%.

Total debt to earnings before interest, taxes, depreciation, and amortization for the years 2017 to 2021 ranges between 3.48x and 5.92x, with an average of 4.88x. Funds from operations to total debt range from 11.39% to 23.56%, with an average of 16.75%.

VI. CAPITAL STRUCTURE

Q. What capital structure ratios do you recommend be employed in developing an overall fair rate of return appropriate for the Company?

A. I recommend the use of Aqua OH's expected capital structure for the test year ending June 30, 2023, which consists of 47.11% long-term debt and 52.89% common equity as shown on page 1 of Schedule DWD-1.

Q. How does Aqua OH's requested common equity ratio of 52.89% compare with the equity ratios maintained by the companies in your Utility Proxy Group?

A. Aqua OH's requested common equity ratio of 52.89% is reasonable and consistent with the range of common equity ratios maintained, on average, by the companies in the Utility Proxy Group on which I base my recommended common equity cost rate. As shown on page 2 of Schedule DWD-2, the common equity ratios of the Utility Proxy Group range from 40.31% to 62.44% in 2021.

Q. What long-term debt cost rate is most appropriate for Aqua OH in this proceeding?

A. Aqua OH's expected long-term debt cost rate on June 30, 2023 of 3.86% is reasonable and appropriate as Aqua OH's cost of long-term debt in this proceeding.

VII. COMMON EQUITY COST RATE MODELS

Q. Is it important that cost of common equity models be market based?

A. Yes. As discussed previously, regulated public utilities, like the Company, must compete for equity in capital markets along with all other companies with commensurate risk, including non-utilities. The cost of common equity is thus determined based on equity market expectations for the returns of those companies. If an individual investor is choosing to invest their capital among companies with comparable risk, they will choose the company providing a higher return over a company providing a lower return.

Q. Are your cost of common equity models market-based models?

A. Yes. The DCF model is market-based in that market prices are used in developing the dividend yield component of the model. The RPM and CAPM are also market-based in that the bond/issuer ratings and expected bond yields/risk-free rate used in the application of the RPM and CAPM reflect the market's assessment of bond/credit risk. In addition, the use of the beta to determine the equity risk premium also reflects the market's

assessment of market/systematic risk, as betas are derived from regression analyses of market prices. Moreover, market prices are used in the development of the monthly returns and equity risk premiums used in the Predictive Risk Premium Model ("PRPM"). Selection criteria for the Non-Price Regulated Proxy Group are based on regression analyses of market prices and reflect the market's assessment of total risk.

Q. What analytical approaches did you use to determine the Company's ROE?

A. As discussed earlier, I have relied on the DCF model, the RPM, and the CAPM, which I applied to the Utility Proxy Group described above. I also applied these same models to a Non-Price Regulated Proxy Group described later in this section.

I rely on these models because reasonable investors use a variety of tools and do not rely exclusively on a single source of information or single model. Moreover, the models on which I rely focus on different aspects of return requirements, and provide different insights to investors' views of risk and return. The DCF model, for example, estimates the investor-required return assuming a constant expected dividend yield and growth rate in perpetuity, while Risk Premium-based methods (i.e., the RPM and CAPM approaches) provide the ability to reflect investors' views of risk, future market returns, and the relationship between interest rates and the cost of equity. Just as the use of market data for the Utility Proxy Group adds the reliability necessary to inform expert judgment in arriving at a recommended common equity cost rate, the use of multiple generally accepted common equity cost rate models also adds reliability and accuracy when arriving at a recommended common equity cost rate.

A. DISCOUNTED CASH FLOW MODEL

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 indicates that an investor buys a stock for an expected total return rate, which is derived from cash flows received from dividends and market price appreciation. Mathematically, the expected dividend yield on market price plus a growth rate equals the capitalization rate; i.e., the total common equity return rate expected by investors, as shown in Equation [1] below:

$$K_e = (D_0 (1+g))/P + g$$

where:

K_e = the required Return on Equity;

D_0 = the annualized Dividend Per Share;

P = the current stock price; and

g = the growth rate.

Q. Which version of the DCF model did you use?

A. I used the single-stage constant growth DCF model.

Q. Please describe the dividend yield you used in your application of the DCF model.

A. The unadjusted dividend yields are based on the proxy companies' dividends as of October 14, 2022, divided by the average of closing market prices for the 60 trading days ending October 14, 2022.[9]

[9] *See*, Schedule DWD-3, page 1, Column 1.

Q. Please explain your adjustment to the dividend yield.

A. Because dividends are paid periodically (quarterly), 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 growth rate, or D_1, in calculating the dividend yield component of the model. Since the various companies in the Utility Proxy 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, or $D_{1/2}$. Because the dividend should be representative of the next 12-month period, my adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule DWD-3 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 5.

Q. Please explain the basis of the growth rates you applied to the Utility Proxy Group in your DCF model.

A. Investors with more limited resources than institutional investors are likely to rely on widely available financial information services, such as *Value Line*, Zacks, Yahoo! Finance, and Bloomberg. Investors realize that analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as companies' abilities to effectively manage the effects of changing laws and regulations, and ever-changing economic and market conditions. For these reasons, I used analysts' five-year forecasts of EPS growth in my DCF analysis.

Over the long run, there can be no growth in DPS without growth in EPS. Security analysts' earnings expectations have a more significant influence on market prices than

dividend expectations. Thus, the use of earnings growth rates in a DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF.

Q. Please summarize the DCF model results.

A. As shown on page 1 of Schedule DWD-3, the application of the constant growth DCF model to the Utility Proxy Group results in a wide range of indicated ROEs from 4.94% to 14.28%. The mean result is 9.24%, the median result is 9.22%, and the average of the mean and median results is 9.23% for the Utility Proxy Group.

Q. Do you have any comments regarding your DCF model results?

A. Because Middlesex Water Company's ("MSEX") indicated DCF result of 4.94% is below that of the marginal yield on A-rated utility debt (5.26%),[10] it violates the basic financial principle of risk and return, namely that investors require greater returns for bearing greater risk. It is generally accepted that common equity capital has greater investment risk than debt capital, as common equity shareholders are behind debt holders in any claim on a company's assets and earnings. Because of this, any investor required return on equity below the marginal yield on long-term debt related to that particular stock is non-sensical and should not be considered. Given that MSEX's long-term credit rating from S&P is A, and the current (i.e., marginal) yield on A-rated utility bonds of 5.26%,[11] MSEX's indicated DCF of 4.94% result violates the principle of risk and return stated above and should be eliminated.

[10] Average A-rated utility bond yield for September 2022 as shown on page 4 of Schedule DWD-4.
[11] Average A-rated utility bond yield for September 2022 as shown on page 4 of Schedule DWD-4.

Q. Considering the above, what is your recommended indicated ROE applicable to the DCF model?

A. Eliminating MSEX's indicated DCF cost rate of 4.94% results in mean, median, and average of mean and median ROEs of 10.10%, 10.13%, and 10.11%, respectively. In arriving at a conclusion for the DCF-indicated common equity cost rate for the Utility Proxy Group of 9.67%, I have relied on an average of the mean and the median results of the DCF both including and excluding MSEX's DCF result, which takes into consideration all the proxy companies' results, while mitigating the theoretically incorrect MSEX DCF results. Because my recommended DCF cost rate considers MSEX's illogical DCF result, the 9.67% DCF-indicated common equity cost rate should be viewed as extremely conservative.

B. THE RISK PREMIUM MODEL

Q. Please describe the theoretical basis of the RPM.

A. The RPM is based on the fundamental financial principle of risk and return, namely, that investors require greater returns for bearing greater risk. The RPM recognizes that common equity capital has greater investment risk than debt capital, as common equity shareholders are behind debt holders in any claim on a company's assets and earnings. As a result, investors require higher returns from common stocks than from investment in bonds, to compensate them for bearing the additional risk.

While it is possible to directly observe bond returns and yields, investors' required common equity return cannot be directly determined or observed. According to RPM theory, one can estimate a common equity risk premium over bonds (either historically or prospectively) and use that premium to derive a cost rate of common equity. The cost of common equity equals the expected cost rate for long-term debt capital, plus a risk

premium over that cost rate, to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on the corporation's assets and earnings in the event of a liquidation.

Q. Please explain how you derived your indicated cost of common equity based on the RPM.

A. To derive my indicated cost of common equity under the RPM, I used two risk premium methods. The first method was the PRPM and the second method was a risk premium model using a total market approach. The PRPM estimates the risk-return relationship directly, while the total market approach indirectly derives a risk premium by using known metrics as a proxy for risk.

1. Predictive Risk Premium Model

Q. Please explain the PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics* and *The Electricity Journal*[12], was developed from the work of Robert F. Engle, who shared the Nobel Prize in Economics in 2003 "for methods of analyzing economic time series with time-varying volatility ("ARCH")".[13] Engle found that volatility changes over time and is related from one period to the next, especially in financial markets. Engle discovered that the volatility in prices and returns clusters over time and is therefore highly predictable and can be used to predict future levels of risk and risk premiums.

[12] Autoregressive conditional heteroscedasticity. See "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, *The Journal of Regulatory Economics* (December 2011), 40:261-278 and "Comparative Evaluation of the Predictive Risk Premium Model, the Discounted Cash Flow Model and the Capital Asset Pricing Model for Estimating the Cost of Common Equity", Richard A. Michelfelder, Pauline M. Ahern, Dylan W. D'Ascendis, and Frank J. Hanley, *The Electricity Journal* (May 2013), 84-89.

[13] www.nobelprize.org.

The PRPM estimates the risk / return relationship directly, as the predicted equity risk premium is generated by the prediction of volatility or risk. The PRPM is not based on an estimate of investor behavior, but rather on the evaluation of the results of that behavior (*i.e.*, the variance of historical equity risk premiums).

Q. Please explain the application of the PRPM.

A. The inputs to the model are the historical returns on the common shares of each company in the Utility Proxy Group minus the historical monthly yield on long-term U.S. Treasury securities through September 2022. Using a generalized form of ARCH, known as GARCH, I calculated each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH Model is applied to the historical return data, it produces a predicted GARCH variance series[14] and a GARCH coefficient[15]. Multiplying the predicted monthly variance by the GARCH coefficient, then annualizing it[16], produces the predicted annual equity risk premium. I then added the forecasted 30-year U.S. Treasury Bond yield, 3.86%[17], to each company's PRPM-derived equity risk premium to arrive at an indicated cost of common equity. The 30-year Treasury yield is a consensus forecast derived from the *Blue Chip Financial Forecasts ("Blue Chip")*.[18]

Q. Why did you use the 30-year Treasury bond yield as your risk-free rate?

A. I used the 30-year Treasury bond yield as my proxy for the risk-free rate because the yield on long-term U.S. Treasury bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on Moody's Investor Service's ("Moody's") A2-rated public utility bonds; the long-term investment horizon

[14] Illustrated on Columns 1 and 2 of page 2 of Schedule DWD-4.
[15] Illustrated on Column 4 of page 2 of Schedule DWD-4.
[16] Annualized Return = (1+Monthly Return)^12 – 1.
[17] *See*, Column 6 of page 2 of Schedule DWD-4.
[18] *Blue Chip Financial Forecasts*, June 1, 2022 at p. 14 and September 30, 2022 at p. 2.

inherent in utilities' common stocks; and 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 largely a function of Federal Reserve monetary policy.

More specifically, the term of the risk-free rate used for cost of capital purposes should match the life (or duration) of the underlying investment (i.e., perpetuity). As noted by Morningstar:

> The traditional thinking regarding the time horizon of the chosen Treasury security is that it should match the time horizon of whatever is being valued. When valuing a business that is being treated as a going concern, the appropriate Treasury yield should be that of a long-term Treasury bond. Note that the horizon is a function of the investment, not the investor. If an investor plans to hold stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate since the company will continue to exist beyond those five years.[19]

Morin also confirms this when he states:

> [b]ecause common stock is a long-term investment and because the cash flows to investors in the form of dividends last indefinitely, the yield on very long-term government bonds, namely, the yield on 30-year Treasury bonds, is the best measure of the risk-free rate for use in the CAPM and Risk Premium methods (footnote omitted)… The expected common stock return is based on long-term cash flows, regardless of an individual's holding time period.[20]

Pratt and Grabowski recommend a similar approach to selecting the risk-free rate: "[i]n theory, when determining the risk-free rate and the matching ERP you should be matching the risk-free security and the ERP with the period in which the investment cash flows are expected."[21]

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19 Morningstar, Inc., 2013 Ibbotson Stocks, Bonds, Bills and Inflation Valuation Yearbook, at 44.

20 Roger A. Morin, Modern Regulatory Finance, Public Utilities Reports, Inc., 2021, at 169. ("Morin")

21 Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, 3rd Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008), at 92. "ERP" is the Equity Risk Premium.

Q. What are the results of applying the PRPM to the Utility Proxy Group?

A. The mean PRPM indicated common equity cost rate for the Utility Proxy Group is 12.61%, the median is 11.72%, and the average of the two is 12.17%. Consistent with my reliance on the average of the median and mean results of the DCF, I relied on the average of the mean and median results of the Utility Proxy Group PRPM to calculate a cost of common equity rate of 12.17%.

2. Total Market Approach Risk Premium Model

Q. Please explain the total market approach RPM.

A. The total market approach RPM adds a prospective public utility bond yield to an average of: 1) an equity risk premium that is derived from a beta-adjusted total market equity risk premium; and 2) an equity risk premium based on the S&P Utilities Index.

Q. Please explain the basis of the expected bond yield of 6.00% applicable to the Utility Proxy Group.

A. The first step in the total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including common equity cost rate, are prospective in nature, a prospective yield on similarly-rated long-term debt is essential. I rely on a consensus forecast of about 50 economists of the expected yield on Aaa-rated corporate bonds for the six calendar quarters ending with the first calendar quarter of 2024, and the long-term projections for 2024 to 2028, and 2029 to 2033 from *Blue Chip*. As shown on line 1 of page 3 of Schedule DWD-4, the average expected yield on Moody's Aaa-rated corporate bonds is 5.18%. In order to derive an expected yield on A2-rated public utility bonds, I make an upward adjustment of 0.70%, which represents a recent spread between Aaa-rated corporate bonds and A2-rated public utility bonds, in order to adjust the expected Aaa-rated corporate bond yield to an equivalent Moody's A2-rated

public utility bond.[22] Adding that recent 0.70% spread to the expected Aaa-rated corporate bond yield of 5.18% results in an expected A2-rated public utility bond of 5.88%.

Since the Utility Proxy Group's average Moody's long-term issuer rating is A3, another adjustment to the expected A2-rated public utility bond yield is needed to reflect the difference in bond ratings. An upward adjustment of 0.12%, which represents one-third of a recent spread between A2- and Baa2-rated public utility bond yields, is necessary to make the A2-rated prospective bond yield applicable to an A3-rated public utility bond.[23] Adding the 0.12% to the 5.88% prospective A2-rated public utility bond yield results in a 6.00% expected bond yield for the Utility Proxy Group.

Table 3: Summary of the Calculation of the Utility Proxy Group Projected Bond Yield[24]

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (*Blue Chip)*	5.18%
Adjustment to Reflect Yield Spread Between Moody's Aaa-Rated Corporate Bonds and Moody's A2-Rated Utility Bonds	0.70%
Adjustment to Reflect the Utility Proxy Group's Average Moody's Bond Rating of A2/A3	0.12%
Prospective Bond Yield Applicable to the Utility Proxy Group	6.00%

To develop the indicated ROE using the total market approach RPM, this prospective bond yield is then added to the average of the three different equity risk premiums described below.

a. Beta-Derived Equity Risk Premium

[22] As shown on line 2 and explained in Note 2 of page 3 of Schedule DWD-4.

[23] As shown on line 4 and explained in note 3, page 3 of Schedule DWD-4. Moody's does not provide public utility bond yields for A3-rated bonds. As such, it was necessary to estimate the difference between A2-rated and A3-rated public utility bonds. Because there are three steps between Baa2 and A2 (Baa2 to Baa1, Baa1 to A3, and A3 to A2) I assumed an adjustment of one-third of the difference between the A2-rated and Baa2-rated public utility bond yield was appropriate.

[24] As shown on page 3 of Schedule DWD-4.

Q. Please explain how the beta-derived equity risk premium is determined.

A. The components of the beta-derived risk premium model are: 1) an expected market equity risk premium over corporate bonds, and 2) the beta. The derivation of the beta-derived equity risk premium that I applied to the Utility Proxy Group is shown on Lines 1 through 9 of page 8 of Schedule DWD-4. The total beta-derived equity risk premium I applied was based on an average of three historical market data-based equity risk premiums, two *Value Line*-based equity risk premiums, and a Bloomberg-based equity risk premium. Each of these is described below.

Q. How did you derive a market equity risk premium based on long-term historical data?

A. To derive a historical market equity risk premium, I used the most recent holding period returns for the large company common stocks from the Stocks, Bonds, Bills, and Inflation ("SBBI") 2022 Yearbook ("SBBI – 2022")[25] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2021. The use of holding period returns over a very long period of time is appropriate 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.

SBBI's long-term arithmetic mean monthly total return rate on large company common stocks was 12.11% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 5.98% from 1928 to 2021.[26] As shown on Line 1 of page 8 of Schedule DWD-4, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 6.13%.

[25] *See*, SBBI-2022 Appendix A Tables: Kroll Stocks, Bonds, Bills, & Inflation 1926-2021.
[26] As explained in Note 1 on page 9 of Schedule DWD-4.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa-rated corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2022.[27] The use of the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums provide insight into the variance and standard deviation of returns needed by investors in estimating future risk when making a current investment. If investors relied on 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 to 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 7.09%, shown on Line 2 of page 8 of Schedule DWD-4, I used the same monthly annualized total returns on large company common stocks relative to the monthly annualized yields on Moody's Aaa/Aa-rated corporate bonds as mentioned 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 Moody's Aaa/Aa-rated corporate 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 Moody's Aaa/Aa-rated corporate bonds yield:

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

[27] SBBI – 2022, at 201.

Q. Please explain the derivation of a PRPM equity risk premium.

A. I used the same PRPM approach described previously to develop another equity risk premium estimate. The inputs to the model are the historical monthly returns on large company common stocks minus the monthly yields on Aaa/Aa-rated corporate bonds during the period from January 1928 through September 2022.[28] Using the previously discussed generalized form of ARCH, known as GARCH, the projected equity risk premium is determined using Eviews© statistical software. The resulting PRPM predicted market equity risk premium is 10.12%.[29]

Q. Please explain the derivation of a projected equity risk premium based on *Value Line* data for your RPM analysis.

A. As noted previously, because both ratemaking and the cost of capital are prospective, a prospective market equity risk premium is needed. The derivation of the forecasted or prospective market equity risk premium can be found in note 4 on page 9 of Schedule DWD-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 13 weeks ending October 14, 2022, 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.[30]

The average median expected price appreciation is 68%, which translates to a 13.85% annual appreciation, and when added to the average of *Value Line's* median expected dividend yields of 2.18%, equates to a forecasted annual total return rate on the

[28] Data from January 1928-December 2021 is from SBBI – 2022. Data from January – September 2022 is from Bloomberg Professional Services.
[29] Shown on line 3 on page 8 of Schedule DWD-4.
[30] As explained in detail in page 2, note 1 of Schedule DWD-5.

market of 16.03%. The forecasted Aaa-rated bond yield of 5.18% is deducted from the total market return of 16.03%, resulting in an equity risk premium of 10.85%, shown on page 8, Line 4 of Schedule DWD-4.

Q. Please explain the derivation of an equity risk premium based on the S&P 500 companies.

A. Using data from *Value Line*, I calculated an expected total return on the S&P 500 using expected dividend yields and long-term growth estimates as a proxy for capital appreciation. The expected total return for the S&P 500 is 16.66%. Subtracting the prospective yield on Aaa-rated Corporate bonds of 5.18% results in a 11.48% projected equity risk premium.

Q. Please explain the derivation of an equity risk premium based on Bloomberg data.

A. Using data from Bloomberg, I calculated an expected total return on the S&P 500 using expected dividend yields and long-term growth estimates as a proxy for capital appreciation, identical to the method described above. The expected total return for the S&P 500 is 12.54%. Subtracting the prospective yield on Aaa-rated Corporate bonds of 5.18% results in a 7.36% projected equity risk premium.

Q. What is your conclusion of a beta-derived equity risk premium for use in your RPM analysis?

A. I gave equal weight to the six equity risk premiums in arriving at my conclusion of 8.84%.[31]

[31] *See*, line 7 on page 8 of Schedule DWD-4.

Table 4: Summary of the Calculation of the Equity Risk Premium Using Total Market Returns[32]

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2021)	6.13%
Regression Analysis on Historical Data	7.09%
PRPM Analysis on Historical Data	10.12%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected Aaa Corporate Bond Yields	10.85%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P 500 less Projected Aaa Corporate Bond Yields	11.48%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected Aaa Corporate Bond Yields	7.36%
Average	8.84%

After calculating the average market equity risk premium of 8.84%, I adjusted it by beta to account for the risk of the Utility Proxy Group. As discussed below, the beta is a meaningful measure of prospective relative risk to the market as a whole and is a logical means by which to allocate a company's, or proxy group's, share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-5, the average of the mean and median beta for the Utility Proxy Group is 0.78. Multiplying the beta of the Utility Proxy Group of 0.78 by the market equity risk premium of 8.84% results in a beta-adjusted equity risk premium of 6.90% for the Utility Proxy Group.

[32] As shown on page 8 of Schedule DWD-4.

b. *S&P Utility Index-Derived Equity Risk Premium*

Q. How did you derive the equity risk premium based on the S&P Utility Index and Moody's A-rated public utility bonds?

A. I estimated three equity risk premiums based on S&P Utility Index holding returns, and two equity risk premiums based on the expected returns of the S&P Utilities Index, using *Value Line* and Bloomberg data, respectively. Turning first to the S&P Utility Index holding period returns, I derived a long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.74% and monthly A-rated public utility bond yields of 6.46% from 1928 to 2021, to arrive at an equity risk premium of 4.28%.[33] I then used the same historical data to derive an equity risk premium of 4.80% based on a regression of the monthly equity risk premiums. The final S&P Utility Index holding period equity risk premium involved applying the PRPM using the historical monthly equity risk premiums from January 1928 to September 2022 to arrive at a PRPM-derived equity risk premium of 5.13% for the S&P Utility Index.

I then derived expected total returns on the S&P Utilities Index of 9.53% and 11.24% using data from *Value Line* and Bloomberg, respectively, and subtracted the prospective A2-rated public utility bond yield (5.88%[34]), which results in risk premiums of 3.65% and 5.36%, respectively. As with the market equity risk premiums, I averaged each risk premium to arrive at my utility-specific equity risk premium of 4.64%.

[33] As shown on line 1 on page 12 of Schedule DWD-4.
[34] Derived on line. 3 of page 3 of Schedule DWD-4.

Table 5: Summary of the Calculation of the Equity Risk Premium Using S&P Utility Index Holding Returns[35]

Historical Spread Between Total Returns of the S&P Utilities Index and A2-Rated Utility Bond Yields (1928 – 2021)	4.28%
Regression Analysis on Historical Data	4.80%
PRPM Analysis on Historical Data	5.13%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P Utilities Index less Projected A2 Utility Bond Yields	3.65%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P Utilities Index less Projected A2 Utility Bond Yields	5.36%
Average	4.64%

Q. What is your conclusion of an equity risk premium for use in your total market approach RPM analysis?

A. The equity risk premium I applied to the Utility Proxy Group is 5.77%, which is the average of the beta-derived and the S&P utility equity risk premiums of 6.90% and 4.64%, respectively.[36]

Q. What is the indicated RPM common equity cost rate based on the total market approach?

A. As shown on line 7 of Schedule DWD-4, page 3, I calculated a common equity cost rate of 11.77% for the Utility Proxy Group based on the total market approach of the RPM.

Table 6: Summary of the Total Market Return Risk Premium Model[37]

Prospective Moody's A3-Rated Utility Bond Applicable to the Utility Proxy Group	6.00%
Prospective Equity Risk Premium	5.77%
Indicated Cost of Common Equity	11.77%

35 As shown on page 12 of Schedule DWD-4.
36 As shown on page 7 of Schedule DWD-4.
37 As shown on page 3 of Schedule DWD-4.

Q. What are the results of your application of the PRPM and the total market approach RPM?

A. As shown on page 1 of Schedule DWD-4, the indicated RPM-derived common equity cost rate is 11.97%, which gives equal weight to the PRPM (12.17%) and the adjusted market approach results (11.77%).

C. THE CAPITAL ASSET PRICING MODEL

Q. Please explain the theoretical basis of the CAPM.

A. CAPM theory defines risk as the co-variability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower variability than the market as a whole, 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 systematic risk, which is 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 the 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; and
		β	=	Adjusted Beta coefficient (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 its validity. The empirical CAPM ("ECAPM") reflects the reality that while the results of these tests support the notion that the beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[38] The ECAPM reflects this empirical reality.

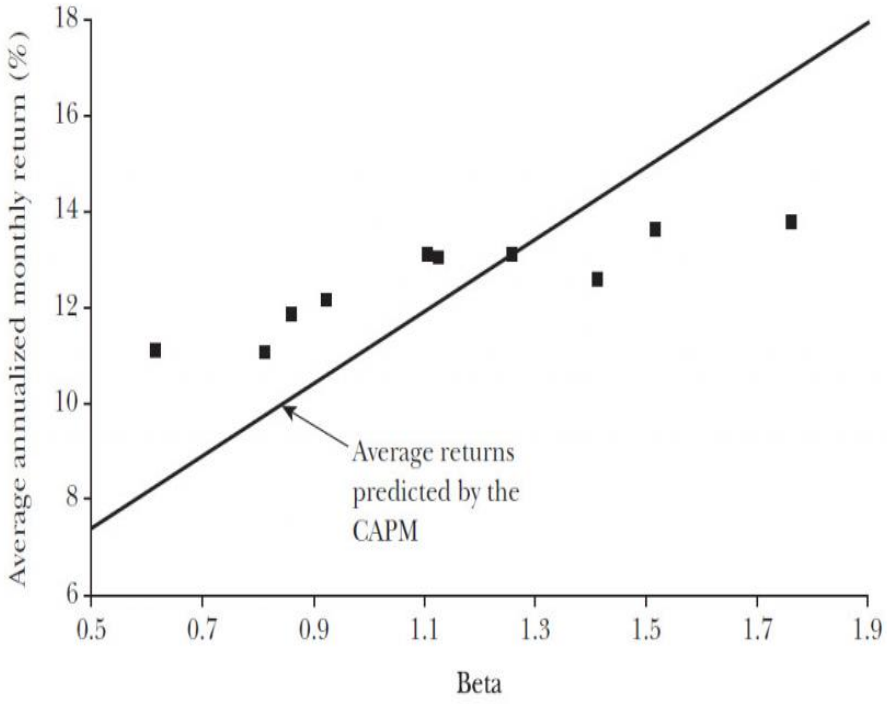
In their work on the CAPM, Fama and French clearly state regarding Figure 2, below, that "[t]he returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low." [39]

[38] Morin at 223-225.

[39] Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence", *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004 at 33 ("Fama & French"). http://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430.

Figure 2 http://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430

Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003



In addition, Morin observes that while the results of these tests support the notion that beta is related to security returns, the empirical SML described by the CAPM formula is not as steeply sloped as the predicted SML. Morin 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.[40]
>
> * * *
>
> These enhanced CAPMs typically produce a risk-return relationship that is flatter than the CAPM prediction in keeping with the actual observed risk-return relationship. The Empirical CAPM…makes use of these empirical findings. The ECAPM estimates the cost of capital with the equation:

$$K = R_F + \alpha + \beta x(MRP - \alpha)$$

[40] Morin, at 207.

> where α is the "alpha" of the risk-return line…For an alpha in the range of 1%-2% and for reasonable values of the MRP and the risk-free rate, Equation…reduces to the following more pragmatic form:

$$K = R_F + 0.25(R_M - R_F) + 0.75\ \beta(R_M - R_F)$$[41]

Fama and French provide similar support for the ECAPM when they state:

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.'… The regressions consistently find that the intercept is greater than the average risk-free rate… and the coefficient on beta is less than the average excess market return… This is true in the early tests… as well as in more recent cross-section regressions tests, like Fama and French (1992).[42]

Finally, Fama and French further note:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Lintner CAPM predicts. The returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return is 11.1 percent. The predicted return on the portfolio with the highest beta is 16.8 percent per year; the actual is 13.7 percent.[43]

Clearly, the justification from Morin, Fama, and French along with their reviews of other academic research on the CAPM, validate the use of the ECAPM. In view of theory and practical research, I have applied both the traditional CAPM and the ECAPM to the companies in the Utility Proxy Group and averaged the results.

Q. What betas did you use in your CAPM analysis?

A. For the beta in my CAPM analysis, I considered two sources: *Value Line* and Bloomberg. While both of those services adjust their calculated (or "raw") betas to reflect the tendency of beta to regress to the market mean of 1.00, *Value Line* calculates beta over a five-year period, while Bloomberg calculates it over a two-year period.

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41 Morin, at 220-221.
42 Fama & French, at 32.
43 Fama & French., at 33.

Q. Please describe your selection of a risk-free rate of return.

A. As shown in Column 5 on page 1 of Schedule DWD-5, the risk-free rate adopted for both applications of the CAPM is 3.86%. This risk-free rate of 3.86% is based on the average of the *Blue Chip* consensus forecast of the expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the first calendar quarter of 2024, and long-term projections for the years 2024 to 2028 and 2029 to 2033.

Q. Please explain the estimation of the expected risk premium for the market used in your CAPM analyses.

A. The basis of the market risk premium is explained in detail in note 1 on page 2 of Schedule DWD-5. As discussed previously, the market risk premium is derived from an average of three historical data-based market risk premiums, two *Value Line* data-based market risk premiums, and one Bloomberg data-based market risk premiums.

The long-term income return on U.S. Government Securities of 5.02% was deducted from the SBBI - 2022 monthly historical total market return of 12.37%, which results in an historical market equity risk premium of 7.35%.[44] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government Securities from SBBI - 2022. That regression analysis yielded a market equity risk premium of 8.76%. The PRPM market equity risk premium is 11.34% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through September 2022.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 3.86%, discussed above, from the *Value Line* projected total annual market return of 16.03%, resulting in a forecasted total market equity

[44] SBBI – 2022, at 256-258, 274-276.

risk premium of 12.17%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 3.86% from the projected total return of the S&P 500 of 16.66%. The resulting market equity risk premium is 12.80%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 3.86% from the projected total return of the S&P 500 of 12.54%. The resulting market equity risk premium is 8.68%.

These six market risk premiums, when averaged, result in an average total market equity risk premium of 10.18%.

Table 7: Summary of the Calculation of the Market Risk Premium for Use in the CAPM[45]

Historical Spread Between Total Returns of Large Stocks and Long-Term Government Bond Yields (1926 – 2021)	7.35%
Regression Analysis on Historical Data	8.76%
PRPM Analysis on Historical Data	11.34%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected 30-Year Treasury Bond Yields	12.17%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P 500 less Projected 30-Year Treasury Bond Yields	12.80%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected 30-Year Treasury Bond Yields	8.68%
Average	10.18%

[45] As shown on page 2 of Schedule DWD-5.

Q. What are the results of your application of the traditional and empirical CAPM to the Utility Proxy Group?

A. As shown on page 1 of Schedule DWD-5, the mean result of my CAPM/ECAPM analysis is 12.17%, the median is 11.86%, and the average of the two is 12.02%. Consistent with my reliance on the average of mean and median DCF results discussed above, the indicated common equity cost rate using the CAPM/ECAPM is 12.02%.

D. COMMON EQUITY COST RATES FOR A PROXY GROUP OF DOMESTIC, NON-PRICE REGULATED COMPANIES BASED ON THE DCF, RPM, AND CAPM

Q. Why did you also consider a proxy group of domestic, non-price regulated companies?

A. Although I am not an attorney, my interpretation of the *Hope* and *Bluefield* cases is that they did not specify that comparable risk companies had to be utilities. Since the purpose of rate regulation is to be a substitute for the competition of the marketplace, non-price regulated firms operating in the competitive marketplace make an excellent proxy if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets.

Q. How did you select non-price regulated companies that are comparable in total risk to the Utility Proxy Group?

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the betas and related statistics derived from *Value Line* regression analyses of weekly market prices over the most recent 260 weeks

(*i.e.*, five years). Using these selection criteria resulted in a proxy group of 27 domestic, non-price regulated firms comparable in total risk to the Utility Proxy Group. Total risk is the sum of non-diversifiable market risk and diversifiable company-specific risks. The criteria used in the selection of the domestic, non-price regulated firms was:

(i) They must be covered by *Value Line Investment Survey* (Standard Edition);

(ii) They must be domestic, non-price regulated companies, *i.e.*, non-utilities;

(iii) Their betas must lie within plus or minus two standard deviations of the average unadjusted beta of the Utility Proxy Group; and

(iv) The residual standard errors of the *Value Line* regressions which gave rise to the unadjusted betas must lie within plus or minus two standard deviations of the average residual standard error of the Utility Proxy Group.

Betas measure market, or systematic risk, which is not diversifiable. The residual standard errors of the regressions were used to measure each firm's company-specific, diversifiable risk. Companies that have similar betas and similar residual standard errors resulting from the same regression analyses have similar total investment risk.

Q. Have you prepared a schedule which shows the data from which you selected the 27 domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group?

A. Yes, the basis of my selection, and both proxy groups' regression statistics, are shown in Schedule DWD-6.

Q. Did you calculate common equity cost rates using the DCF, RPM, and CAPM for the Non-Price Regulated Proxy Group?

A. Yes. Because the DCF, RPM, and CAPM have been applied in an identical manner as described above, I will not repeat the details of the rationale and application of each model.

One exception is in the application of the RPM, where I did not use public utility-specific equity risk premiums, nor did I apply the PRPM to the individual companies.

Page 2 of Schedule DWD-7 contains the derivation of the DCF cost rates. As shown, the indicated common equity cost rate using the DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 11.19%.

Pages 3 through 5 of DWD-7 contain the data and calculations that support the 12.92% RPM cost rate. As shown on line 1 of page 3 of Schedule DWD-7, the consensus prospective yield on Moody's Baa-rated corporate bonds for the six quarters ending in the first quarter of 2024, and for the years 2024 to 2028 and 2029 to 2033, is 6.19%.[46] Because the Non-Price Regulated Proxy Group has an average Moody's bond rating of Baa1, a downward adjustment of 0.17% to the prospective Baa2-rated bond yield is necessary to reflect the difference in bond ratings.[47] Subtracting 0.17% from the prospective Baa2-rated bond yield of 6.19% is 6.02%.

When the beta-adjusted risk premium of 6.90%[48] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa1-rated corporate bond yield of 6.02%, the indicated RPM cost rate is 12.92%.

Page 6 contains the inputs and calculations that support my indicated CAPM/ECAPM cost rate of 12.06%.

Q. What is the cost rate of common equity based on the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group?

A. As shown on page 1 of Schedule DWD-7, the results of the DCF, RPM, and CAPM applied to the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy

[46] *Blue Chip Financial Forecasts*, June 1, 2022, at p. 14 and September 30, 2022, at p. 2.
[47] As demonstrated on Schedule DWD-7, page 3, note 2.
[48] Derived on page 5 of Schedule DWD-7.

Group are 11.19%, 12.92%, and 12.06%, respectively. The average of the mean and median of these models is 12.06%, which I used as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

VIII. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENT

Q. What is the indicated range of common equity cost rates before adjustments?

A. Based on the results of the application of multiple cost of common equity models to the Utility Proxy Group, my recommended range of ROEs attributable to the Utility Proxy Group is between 10.37% and 11.37%.

I used multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate, because no single model is so inherently precise that it can be relied on solely to the exclusion of other theoretically sound models. The use of multiple models adds reliability to the estimation of the common equity cost rate, and the prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent. As discussed previously, after determining the indicated range of ROE attributable to a comparable group, there must be an evaluation of relative risk between that group and the target company to determine whether it is appropriate to apply adjustments to the comparable group's indicated ROE to better reflect the target company's specific risks.

IX. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

A. SIZE ADJUSTMENT

Q. Generally, does the smaller size of a company compared with a comparator group increase its business risk, all else being equal?

A. Yes, it does. Small size indicates greater relative business risk for a company because, all else being equal, size has a material bearing on risk.

Size affects business risk because smaller companies generally are less able 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 bigger company with a larger, more diverse, customer base.

Q. Have you applied a relative risk adjustment due to Aqua OH's small size relative to the Utility Proxy Group?

A. No. While Aqua OH is significantly smaller than the median company in the Utility Proxy Group as measured by its estimated market capitalization of common equity, the difference is not large enough to merit a relative risk adjustment as shown on Table 8, below:

Table 8: Size as Measured by Market Capitalization for the Company and the Utility Proxy Group

	Market Capitalization* ($ Millions)	Times Greater Than the Company
Aqua OH	$752.590	
Utility Proxy Group Median	$3,035.903	4.0
*From page 1 of Schedule DWD-8.		

The Company's estimated market capitalization was at $752.59 million as of October 14, 2022, compared with the median market capitalization of the Utility Proxy Group of $3.0 billion as of October 14, 2022. The Utility Proxy Group's market capitalization is 4.0 times the size of Aqua OH's estimated market capitalization.

The determination of a potential size premium is based on the size premiums for portfolios of New York Stock Exchange, American Stock Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2021 period. The average size premium for the Utility Proxy Group with a market capitalization of $3.0 billion falls in the 6th decile,

while Aqua OH's market capitalization of $7.52 million places the Company in the 8th decile. The size premium spread between the 6th decile and the 8th decile is 0.03%, which in my opinion, is too small to be considered for a size adjustment at this time.

B. 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 is it important to recognize flotation costs in the allowed common equity cost rate?

A. It is important 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:

> 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 the 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[49]

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 to recapture such costs 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

[49] Morin 329.

such, flotation costs are analogous to capital investments 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 or 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 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. Since these expenses are charged to capital accounts and not expensed on the income statement, the only way to restore the full value of that dollar of issuing price with an assumed investor required return of 10% is for the net investment, $0.95, to earn more than 10% to net back to the investor a fair return on that dollar. 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 common equity cost rate models you have used already reflect investors' anticipation of flotation costs?

A. No. All of these models assume no transaction costs. The literature is quite clear that these costs are not reflected in market prices paid for common stocks. For example, Brigham and Daves confirm this and provide the methodology utilized to calculate the flotation

adjustment.[50] In addition, Morin confirms the need for such an adjustment even when no new equity issuance is imminent.[51] Consequently, it is proper to include a flotation cost adjustment when using cost of common equity models to estimate the common equity cost rate.

Q. How did you calculate the flotation cost allowance?

A. I modified the DCF calculation to provide a dividend yield that would reimburse investors for issuance costs in accordance with the method cited in literature by Brigham and Daves as well as Morin. The flotation cost adjustment recognizes the costs of issuing equity that were incurred by Essential since January 2019. Based upon the issuance costs shown on page 1 of Schedule DWD-9, an adjustment of 0.05% is required to reflect the flotation costs applicable to the Utility Proxy Group.

Q. What is the indicated cost of common equity after your flotation cost adjustment?

A. After applying the 0.05% flotation cost adjustment to the indicated range of equity cost rates between 10.37% and 11.37% applicable to the Utility Proxy Group, an adjusted range of common equity cost rates between 10.42% and 11.42% applicable to Aqua OH results. From that range, I recommend the Commission approve an ROE of 10.50%.

X. CONCLUSION

Q. What is your recommended return on investor-supplied capital for Aqua OH?

A. Given the expected capital structure as of June 30, 2023 which consists of 47.11% long-term debt at an embedded debt cost rate of 3.86% and 52.89% common equity at my recommended ROE of 10.50%, I conclude that an appropriate return on investor-supplied capital for the Company is 7.37%. A common equity cost rate of 10.50% is consistent with

[50] Eugene F. Brigham, Phillip R. Daves, Intermediate Financial Management, Ninth Edition, Thomson Southwestern, 2007, at 342.

[51] Morin 337-340.

the *Hope* and *Bluefield* standard of a just and reasonable return which ensures the integrity of presently invested capital and enables the attraction of needed new capital on reasonable terms. It also ensures that Aqua OH will be able to continue providing safe, adequate, and reliable service to the benefit of its customers. Thus, it balances the interests of both customers and the Company.

Q. In your opinion, is your proposed common equity cost rate of 10.50% fair and reasonable to Aqua OH, its shareholders, and its customers?

A. Yes, it is.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

CERTIFICATE OF SERVICE

I hereby certify that a copy of this Direct Testimony of Dylan W. D'Ascendis, CRRA, CVA, was served by electronic mail upon the following parties this 13th day of January, 2023:

John Jones
Chief, Public Utilities Section
Office of Ohio Attorney General
30 East Broad Street, 16th Floor
Columbus, Ohio 43215
John.Jones@OhioAttorneyGeneral.gov

/s Nicole R. Woods
Nicole R. Woods
One of the Attorneys for Aqua Ohio, Inc. and Aqua Ohio Wastewater, Inc.

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). Dylan joined ScottMadden in 2016 and has become a leading expert witness with respect to cost of capital and capital structure. He has served as a consultant for investor-owned and municipal utilities and authorities for 14 years. Dylan has testified as an expert witness on over 125 occasions regarding rate of return, cost of service, rate design, and valuation before more than 35 regulatory jurisdictions in the United States and Canada, an American Arbitration Association panel, and the Superior Court of Rhode Island. He also maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured. Dylan holds a B.A. in economic history from the University of Pennsylvania and an M.B.A. with concentrations in finance and international business from Rutgers University.

Areas of Specialization

- Regulation and Rates
- Rate of Return
- Valuation
- Mutual Fund Benchmarking
- Capital Market Risk
- Regulatory Strategy
- Cost of Service

Recent Expert Testimony Submission/Appearance

- Regulatory Commission of Alaska – Capital Structure
- Federal Energy Regulatory Commission – Rate of Return
- Public Utility Commission of Texas – Return on Equity
- Hawaii Public Utilities Commission – Cost of Service / Rate Design
- Pennsylvania Public Utility Commission - Valuation

Recent Assignments

- Provided expert testimony on the cost of capital for ratemaking purposes before numerous state utility regulatory agencies
- Sponsored valuation testimony for a large municipal water company in front of an American Arbitration Association Board to justify the reasonability of their lease payments to the City
- Co-authored a valuation report on behalf of a large investor-owned utility company in response to a new state regulation which allowed the appraised value of acquired assets into rate base

Recent Articles and Speeches

- Co-Author of: "Decoupling, Risk Impacts and the Cost of Capital", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. The Electricity Journal, March, 2020
- Co-Author of: "Decoupling Impact and Public Utility Conservation Investment", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. Energy Policy Journal, 130 (2019), 311-319
- "Establishing Alternative Proxy Groups", before the Society of Utility and Regulatory Financial Analysts: 51st Financial Forum, April 4, 2019, New Orleans, LA
- "Past is Prologue: Future Test Year", Presentation before the National Association of Water Companies 2017 Southeast Water Infrastructure Summit, May 2, 2017, Savannah, GA.
- Co-author of: "Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Pauline M. Ahern, and Frank J. Hanley, The Electricity Journal, May, 2013
- "Decoupling: Impact on the Risk and Cost of Common Equity of Public Utility Stocks", before the Society of Utility and Regulatory Financial Analysts: 45th Financial Forum, April 17-18, 2013, Indianapolis, IN

Sponsor	Date	Case/Applicant	Docket No.	Subject
Regulatory Commission of Alaska				
ENSTAR Natural Gas Company	08/22	ENSTAR Natural Gas Company	Docket No. TA334-4	Rate of Return
Cook Inlet Natural Gas Storage Alaska, LLC	07/21	Cook Inlet Natural Gas Storage Alaska, LLC	Docket No. TA45-733	Capital Structure
Alaska Power Company	09/20	Alaska Power Company; Goat Lake Hydro, Inc.; BBL Hydro, Inc.	Tariff Nos. TA886-2; TA6-521; TA4-573	Capital Structure
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Alberta Utilities Commission				
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	01/20	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	2021 Generic Cost of Capital, Proceeding ID. 24110	Rate of Return
Arizona Corporation Commission				
EPCOR Water Arizona, Inc.	08/22	EPCOR Water Arizona, Inc.	Docket No. WS-01303A-22-0236	Rate of Return
EPCOR Water Arizona, Inc.	06/20	EPCOR Water Arizona, Inc.	Docket No. WS-01303A-20-0177	Rate of Return
Arizona Water Company	12/19	Arizona Water Company – Western Group	Docket No. W-01445A-19-0278	Rate of Return
Arizona Water Company	08/18	Arizona Water Company – Northern Group	Docket No. W-01445A-18-0164	Rate of Return
Arkansas Public Service Commission				
Southwestern Electric Power Co.	07/21	Southwestern Electric Power Co.	Docket No. 21-070-U	Return on Equity
CenterPoint Energy Resources Corp.	05/21	CenterPoint Arkansas Gas	Docket No. 21-004-U	Return on Equity
Colorado Public Utilities Commission				
Atmos Energy Corporation	08/22	Atmos Energy Corporation	Docket No. 22AL-0348G	Rate of Return
Summit Utilities, Inc.	04/18	Colorado Natural Gas Company	Docket No. 18AL-0305G	Rate of Return
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Rate of Return
Delaware Public Service Commission				
Delmarva Power & Light Co.	01/22	Delmarva Power & Light Co.	Docket No. 22-002 (Gas)	Return on Equity
Delmarva Power & Light Co.	11/20	Delmarva Power & Light Co.	Docket No. 20-0149 (Electric)	Return on Equity
Delmarva Power & Light Co.	10/20	Delmarva Power & Light Co.	Docket No. 20-0150 (Gas)	Return on Equity
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Public Service Commission of the District of Columbia				
Washington Gas Light Company	04/22	Washington Gas Light Company	Formal Case No. 1169	Rate of Return
Washington Gas Light Company	09/20	Washington Gas Light Company	Formal Case No. 1162	Rate of Return
Federal Energy Regulatory Commission				
LS Power Grid California, LLC	10/20	LS Power Grid California, LLC	Docket No. ER21-195-000	Rate of Return
Florida Public Service Commission				
Tampa Electric Company	04/21	Tampa Electric Company	Docket No. 20210034-EI	Return on Equity
Peoples Gas System	09/20	Peoples Gas System	Docket No. 20200051-GU	Rate of Return
Utilities, Inc. of Florida	06/20	Utilities, Inc. of Florida	Docket No. 20200139-WS	Rate of Return
Hawaii Public Utilities Commission				
Launiupoko Irrigation Company, Inc.	12/20	Launiupoko Irrigation Company, Inc.	Docket No. 2020-0217 / Transferred to 2020-0089	Capital Structure
Lanai Water Company, Inc.	12/19	Lanai Water Company, Inc.	Docket No. 2019-0386	Cost of Service / Rate Design

Sponsor	Date	Case/Applicant	Docket No.	Subject
Manele Water Resources, LLC	08/19	Manele Water Resources, LLC	Docket No. 2019-0311	Cost of Service / Rate Design
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. 2016-0363	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	02/21	Utility Services of Illinois, Inc.	Docket No. 21-0198	Rate of Return
Ameren Illinois Company d/b/a Ameren Illinois	07/20	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 20-0308	Return on Equity
Utility Services of Illinois, Inc.	11/17	Utility Services of Illinois, Inc.	Docket No. 17-1106	Cost of Service / Rate Design
Aqua Illinois, Inc.	04/17	Aqua Illinois, Inc.	Docket No. 17-0259	Rate of Return
Utility Services of Illinois, Inc.	04/15	Utility Services of Illinois, Inc.	Docket No. 14-0741	Rate of Return
Indiana Utility Regulatory Commission				
Aqua Indiana, Inc.	03/16	Aqua Indiana, Inc. Aboite Wastewater Division	Docket No. 44752	Rate of Return
Twin Lakes, Utilities, Inc.	08/13	Twin Lakes, Utilities, Inc.	Docket No. 44388	Rate of Return
Kansas Corporation Commission				
Atmos Energy Corporation	07/19	Atmos Energy Corporation	19-ATMG-525-RTS	Rate of Return
Kentucky Public Service Commission				
Water Service Corporation of KY	06/22	Water Service Corporation of KY	2022-00147	Rate of Return
Atmos Energy Corporation	07/21	Atmos Energy Corporation	2021-00304	PRP Rider Rate
Atmos Energy Corporation	06/21	Atmos Energy Corporation	2021-00214	Rate of Return
Duke Energy Kentucky, Inc.	06/21	Duke Energy Kentucky, Inc.	2021-00190	Return on Equity
Bluegrass Water Utility Operating Company	10/20	Bluegrass Water Utility Operating Company	2020-00290	Return on Equity
Louisiana Public Service Commission				
Utilities, Inc. of Louisiana	05/21	Utilities, Inc. of Louisiana	Docket No. U-36003	Rate of Return
Southwestern Electric Power Company	12/20	Southwestern Electric Power Company	Docket No. U-35441	Return on Equity
Atmos Energy	04/20	Atmos Energy	Docket No. U-35535	Rate of Return
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maine Public Utilities Commission				
Summit Natural Gas of Maine, Inc.	03/22	Summit Natural Gas of Maine, Inc.	Docket No. 2022-00025	Rate of Return
The Maine Water Company	09/21	The Maine Water Company	Docket No. 2021-00053	Rate of Return
Maryland Public Service Commission				
Washington Gas Light Company	08/20	Washington Gas Light Company	Case No. 9651	Rate of Return
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts Department of Public Utilities				
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Elec.)	D.P.U. 19-130	Rate of Return
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Gas)	D.P.U. 19-131	Rate of Return
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Minnesota Public Utilities Commission				
Northern States Power Company	11/01	Northern States Power Company	Docket No. G002/GR-21-678	Return on Equity
Northern States Power Company	10/21	Northern States Power Company	Docket No. E002/GR-21-630	Return on Equity

Sponsor	Date	Case/Applicant	Docket No.	Subject
Northern States Power Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Return on Equity
Mississippi Public Service Commission				
Great River Utility Operating Co.	07/22	Great River Utility Operating Co.	Docket No. 2022-UN-86	Rate of Return
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Missouri Public Service Commission				
Spire Missouri, Inc.	12/20	Spire Missouri, Inc.	Case No. GR-2021-0108	Return on Equity
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Case No. SR-2016-0202	Rate of Return
Public Utilities Commission of Nevada				
Southwest Gas Corporation	09/21	Southwest Gas Corporation	Docket No. 21-09001	Return on Equity
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilities Commission				
Aquarion Water Company of New Hampshire, Inc.	12/20	Aquarion Water Company of New Hampshire, Inc.	Docket No. DW 20-184	Rate of Return
New Jersey Board of Public Utilities				
Middlesex Water Company	05/21	Middlesex Water Company	Docket No. WR21050813	Rate of Return
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity
FirstEnergy	02/20	Jersey Central Power & Light Co.	Docket No. ER20020146	Rate of Return
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
New Mexico Public Regulation Commission				
Southwestern Public Service Co.	01/21	Southwestern Public Service Co.	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Commission				
Carolina Water Service, Inc.	07/22	Carolina Water Service, Inc.	Docket No. W-354 Sub 400	Rate of Return
Aqua North Carolina, Inc.	06/22	Aqua North Carolina, Inc.	Docket No. W-218 Sub 573	Rate of Return
Carolina Water Service, Inc.	07/21	Carolina Water Service, Inc.	Docket No. W-354 Sub 384	Rate of Return
Piedmont Natural Gas Co., Inc.	03/21	Piedmont Natural Gas Co., Inc.	Docket No. G-9, Sub 781	Return on Equity
Duke Energy Carolinas, LLC	07/20	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1214	Return on Equity
Duke Energy Progress, LLC	07/20	Duke Energy Progress, LLC	Docket No. E-2, Sub 1219	Return on Equity
Aqua North Carolina, Inc.	12/19	Aqua North Carolina, Inc.	Docket No. W-218 Sub 526	Rate of Return
Carolina Water Service, Inc.	06/19	Carolina Water Service, Inc.	Docket No. W-354 Sub 364	Rate of Return
Carolina Water Service, Inc.	09/18	Carolina Water Service, Inc.	Docket No. W-354 Sub 360	Rate of Return
Aqua North Carolina, Inc.	07/18	Aqua North Carolina, Inc.	Docket No. W-218 Sub 497	Rate of Return
North Dakota Public Service Commission				
Northern States Power Company	09/21	Northern States Power Company	Case No. PU-21-381	Rate of Return
Northern States Power Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of Ohio				
Duke Energy Ohio, Inc.	10/21	Duke Energy Ohio, Inc.	Case No. 21-887-EL-AIR	Return on Equity
Aqua Ohio, Inc.	07/21	Aqua Ohio, Inc.	Case No. 21-0595-WW-AIR	Rate of Return
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Case No. 16-0907-WW-AIR	Rate of Return

Sponsor	Date	Case/Applicant	Docket No.	Subject
Pennsylvania Public Utility Commission				
Borough of Ambler	06/22	Borough of Ambler – Bureau of Water	Docket No. R-2022-3031704	Rate of Return
Citizens' Electric Company of Lewisburg	05/22	C&T Enterprises	Docket No. R-2022-3032369	Rate of Return
Valley Energy Company	05/22	C&T Enterprises	Docket No. R-2022-3032300	Rate of Return
Community Utilities of Pennsylvania, Inc.	04/21	Community Utilities of Pennsylvania, Inc.	Docket No. R-2021-3025207	Rate of Return
Vicinity Energy Philadelphia, Inc.	04/21	Vicinity Energy Philadelphia, Inc.	Docket No. R-2021-3024060	Rate of Return
Delaware County Regional Water Control Authority	02/20	Delaware County Regional Water Control Authority	Docket No. A-2019-3015173	Valuation
Valley Energy, Inc.	07/19	C&T Enterprises	Docket No. R-2019-3008209	Rate of Return
Wellsboro Electric Company	07/19	C&T Enterprises	Docket No. R-2019-3008208	Rate of Return
Citizens' Electric Company of Lewisburg	07/19	C&T Enterprises	Docket No. R-2019-3008212	Rate of Return
Steelton Borough Authority	01/19	Steelton Borough Authority	Docket No. A-2019-3006880	Valuation
Mahoning Township, PA	08/18	Mahoning Township, PA	Docket No. A-2018-3003519	Valuation
SUEZ Water Pennsylvania Inc.	04/18	SUEZ Water Pennsylvania Inc.	Docket No. R-2018-000834	Rate of Return
Columbia Water Company	09/17	Columbia Water Company	Docket No. R-2017-2598203	Rate of Return
Veolia Energy Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	Docket No. R-2017-2593142	Rate of Return
Emporium Water Company	07/14	Emporium Water Company	Docket No. R-2014-2402324	Rate of Return
Columbia Water Company	07/13	Columbia Water Company	Docket No. R-2013-2360798	Rate of Return
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Capital Structure / Long-Term Debt Cost Rate
South Carolina Public Service Commission				
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
South Dakota Public Service Commission				
Northern States Power Company	06/22	Northern States Power Company	Docket No. EL22-017	Rate of Return
Tennessee Public Utility Commission				
Piedmont Natural Gas Company	07/20	Piedmont Natural Gas Company	Docket No. 20-00086	Return on Equity
Public Utility Commission of Texas				
Oncor Electric Delivery Co. LLC	05/22	Oncor Electric Delivery Co. LLC	Docket No. 53601	Return on Equity
Southwestern Public Service Co.	02/21	Southwestern Public Service Co.	Docket No. 51802	Return on Equity
Southwestern Electric Power Co.	10/20	Southwestern Electric Power Co.	Docket No. 51415	Rate of Return
Virginia State Corporation Commission				
Washington Gas Light Company	06/22	Washington Gas Light Company	PUR-2022-00054	Return on Equity
Virginia Natural Gas, Inc.	04/21	Virginia Natural Gas, Inc.	PUR-2020-00095	Return on Equity
Massanutten Public Service Corporation	12/20	Massanutten Public Service Corporation	PUE-2020-00039	Return on Equity
Aqua Virginia, Inc.	07/20	Aqua Virginia, Inc.	PUR-2020-00106	Rate of Return

Sponsor	Date	Case/Applicant	Docket No.	Subject
WGL Holdings, Inc.	07/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	05/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	07/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design
Public Service Commission of West Virginia				
Monongahela Power Company and The Potomac Edison Company	12/21	Monongahela Power Company and The Potomac Edison Company	Case No. 21-0857-E-CN (ELG)	Return on Equity
Monongahela Power Company and The Potomac Edison Company	11/21	Monongahela Power Company and The Potomac Edison Company	Case No. 21-0813-E-P (Solar)	Return on Equity

Aqua Ohio, Inc.
Table of Contents
to Exhibit No. 4-1
of Dylan W. D'Ascendis, CRRA, CVA

Aqua Ohio, Inc.
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes
at June 30, 2023

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	47.11%	3.86%	(1)	1.82%
Common Equity	52.89%	10.50%	(2)	5.55%
Total	100.00%			7.37%

Notes:

(1) Company-provided.
(2) From page 2 of this Schedule.

Aqua Ohio, Inc.
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Six Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	9.67%
2.	Risk Premium Model (RPM) (2)	11.97%
3.	Capital Asset Pricing Model (CAPM) (3)	12.02%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	12.06%
5.	Indicated Common Equity Cost Rate before Adjustment for Unique Risk	10.37% - 11.37%
6.	Business Risk Adjustment (5)	0.00%
7.	Flotation Cost Adjustment (6)	0.05%
8.	Indicated Common Equity Cost Rate after Adjustment	10.42% - 11.42%
9.	Recommended Common Equity Cost Rate	10.50%

Notes:
(1) From page 1 of Schedule DWD-3.
(2) From page 1 of Schedule DWD-4.
(3) From page 1 of Schedule DWD-5.
(4) From page 1 of Schedule DWD-7.
(5) Business risk adjustment not applicable for the Company in this proceeding.
(6) From page 1 of Schedule DWD-9.

Proxy Group of Six Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2017 - 2021, Inclusive

	2021	2020	2019	2018	2017	
			(MILLIONS OF DOLLARS)			
Capitalization Statistics						
Amount of Capital Employed						
Total Permanent Capital	$5,897.865	$5,348.616	$4,493.345	$3,706.817	$3,275.675	
Short-Term Debt	$155.749	$340.249	$220.672	$214.758	$215.958	
Total Capital Employed	$6,053.614	$5,688.865	$4,714.017	$3,921.575	$3,491.633	
Indicated Average Capital Cost Rates (2)						
Total Debt	3.51 %	3.78 %	4.01 %	4.55 %	4.62 %	
Preferred Stock	5.76 %	5.76 %	5.84 %	5.92 %	5.91 %	
Capital Structure Ratios						5 YEAR AVERAGE
Based on Total Permanent Capital:						
Long-Term Debt	50.40 %	50.92 %	47.81 %	45.58 %	46.01 %	48.14 %
Preferred Stock	0.06	0.06	0.07	0.11	0.12	0.08
Common Equity	49.54	49.02	52.13	54.31	53.87	51.78
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Based on Total Capital:						
Total Debt, Including Short-Term Debt	52.56 %	54.67 %	51.78 %	49.31 %	49.87 %	51.64 %
Preferred Stock	0.05	0.06	0.07	0.10	0.11	0.08
Common Equity	47.39	45.28	48.16	50.60	50.02	48.29
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Financial Statistics						
Financial Ratios - Market Based						
Earnings / Price Ratio	3.20 %	3.24 %	2.64 %	3.33 %	3.79 %	3.24 %
Market / Average Book Ratio	352.63	315.40	332.39	304.57	296.61	320.32
Dividend Yield	1.67	1.83	1.77	1.97	2.02	1.85
Dividend Payout Ratio	52.51	56.85	74.00	59.40	54.53	59.46
Rate of Return on Average Book Common Equity	11.22 %	10.24 %	9.22 %	9.99 %	11.34 %	10.40 %
Total Debt / EBITDA (3)	5.05 x	5.57 x	5.92 x	4.37 x	3.48 x	4.88 x
Funds from Operations / Total Debt (4)	11.39 %	12.12 %	14.53 %	22.17 %	23.56 %	16.75 %
Total Debt / Total Capital	52.56 %	54.67 %	51.78 %	49.31 %	49.87 %	51.64 %

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt relative to EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

(4) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges as a percentage of total debt.

Source of Information: Company Annual Forms 10-K

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Six Water Companies
2017 - 2021, Inclusive

	2021	2020	2019	2018	2017	5 YEAR AVERAGE
American States Water Company						
Long-Term Debt	37.56 %	40.72 %	31.87 %	36.54 %	37.75 %	36.89 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	62.44	59.28	68.13	63.46	62.25	63.11
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company, Inc.						
Long-Term Debt	58.75 %	59.93 %	58.59 %	56.55 %	55.81 %	57.91 %
Preferred Stock	0.02	0.02	0.03	0.05	0.07	0.04
Common Equity	41.23	40.05	41.38	43.40	44.12	42.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	47.28 %	46.04 %	50.90 %	52.74 %	43.40 %	48.07 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	52.72	53.96	49.10	47.26	56.60	51.93
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Essential Utilities Inc.						
Long-Term Debt	53.28 %	54.42 %	44.23 %	56.06 %	52.26 %	52.05 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	46.72	45.58	55.77	43.94	47.74	47.95
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Company						
Long-Term Debt	45.86 %	44.61 %	42.20 %	38.94 %	38.65 %	42.05 %
Preferred Stock	0.31	0.33	0.37	0.59	0.63	0.45
Common Equity	53.83	55.06	57.43	60.47	60.72	57.50
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Group						
Long-Term Debt	59.69 %	59.79 %	59.05 %	32.67 %	48.20 %	51.88 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	40.31	40.21	40.95	67.33	51.80	48.12
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Six Water Companies						
Long-Term Debt	50.40 %	50.92 %	47.80 %	45.58 %	46.01 %	48.14 %
Preferred Stock	0.06	0.06	0.07	0.11	0.12	0.08
Common Equity	49.54	49.02	52.13	54.31	53.87	51.78
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
Annual Forms 10-K

Aqua Ohio, Inc.
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Six Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Compan	1.87 %	5.50 %	NA %	4.40 %	4.95 %	1.92 %	6.87 %
American Water Works Company, Inc	1.78	3.00	8.10	8.30	6.47	1.84	8.31
California Water Service Grou	1.71	6.50	NA	11.70	9.10	1.79	10.89
Essential Utilities Inc.	2.41	10.00	6.10	6.80	7.63	2.50	10.13
Middlesex Water Company	1.32	4.50	NA	2.70	3.60	1.34	4.94
SJW Group	2.25	14.00	NA	9.80	11.90	2.38	14.28
						Average	9.24 %
						Median	9.22 %
						Average of Mean and Median	9.23 %
						Average of Mean and Median Excluding Middlesex Water (6)	10.11 %
						Indicated DCF Result	9.67 %

NA= Not Available

Notes:

(1) Indicated dividend at 10/14/2022 divided by the average closing price of the last 60 trading days ending 10/14/2022 for each company.
(2) From pages 2 through 7 of this Schedule
(3) Average of columns 2 through 4 excluding negative growth rate
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Company, 1.87% x (1+(1/2 x 4.95%)) = 1.92%.
(5) Column 5 + column 6.
(6) The indicated DCF cost rate of Middlesex Water Company is excluded as it is below the yield of A-rated public utility bonds.

Source of Information:

Value Line Investment Survey
www.zacks.com Downloaded on 10/14/2022
www.yahoo.com Downloaded on 10/14/2022
Bloomberg Professional Services

AMER. STATES WATER NYSE-AWR

RECENT PRICE **82.11** | P/E RATIO **31.9** (Trailing: 36.8 Median: 27.0) | RELATIVE P/E RATIO **2.22** | DIV'D YLD **2.0%** | **VALUE LINE**

TIMELINESS 4 Lowered 6/10/22
SAFETY 2 Raised 7/20/12
TECHNICAL 3 Raised 8/19/22
BETA .65 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$71-$134	$103 (25%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+15%)	*6%*
Low	70	(-15%)	*-1%*

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	157	153	128
to Sell	117	121	150
Hld's(000)	27394	27827	26629

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
High:	18.2	24.1	33.1	38.7	44.1	47.2	58.4	69.6	96.0	96.6	103.8	103.4								
Low:	15.3	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3	65.1	70.1	71.2								
Revenues per sh	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.86	13.24	13.51	*13.70*	*14.00*	Revenues per sh	*18.15*
"Cash Flow" per sh	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.26	3.34	3.64	*3.60*	*3.90*	"Cash Flow" per sh	*4.75*
Earnings per sh A	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.28	2.33	2.55	*2.45*	*2.60*	Earnings per sh A	*3.25*
Div'd Decl'd per sh B■	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.28	1.40	*1.53*	*1.62*	Div'd Decl'd per sh B■	*2.15*
Cap'l Spending per sh	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	4.12	3.54	3.91	*4.10*	*4.00*	Cap'l Spending per sh	*4.25*
Book Value per sh D	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.33	17.39	18.57	*20.15*	*21.35*	Book Value per sh D	*23.75*
Common Shs Outst'g C	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.85	36.89	36.94	*37.25*	*37.50*	Common Shs Outst'g C	*37.50*
Avg Ann'l P/E Ratio	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	34.4	34.3	33.2	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*25.0*
Relative P/E Ratio	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.84	1.83	1.76	1.82			Relative P/E Ratio	*1.40*
Avg Ann'l Div'd Yield	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	1.5%	1.6%	1.7%			Avg Ann'l Div'd Yield	*2.6%*
Revenues ($mill)							466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	488.2	498.9	*510*	*525*	Revenues ($mill)	*680*
Net Profit ($mill)							54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	86.4	94.3	*91.0*	*98.0*	Net Profit ($mill)	*120*
Income Tax Rate							39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	24.6%	24.4%	*24.0%*	*24.0%*	Income Tax Rate	*24.0%*
AFUDC % to Net Profit							2.5%	- -	- -	- -	- -	- -	- -	- -	2.5%	- -	*1.0%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
Long-Term Debt Ratio							42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	47.2%	46.1%	*46.5%*	*45.5%*	Long-Term Debt Ratio	*52.0%*
Common Equity Ratio							57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	52.8%	53.9%	*53.5%*	*54.5%*	Common Equity Ratio	*48.0%*
Total Capital ($mill)							787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1216.2	1272.6	*1400*	*1450*	Total Capital ($mill)	*1710*
Net Plant ($mill)							917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	1512.0	1626.0	*1720*	*1800*	Net Plant ($mill)	*2025*
Return on Total Cap'l							8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.3%	*7.5%*	*8.0%*	Return on Total Cap'l	*8.0%*
Return on Shr. Equity							11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	*12.5%*	*12.5%*	Return on Shr. Equity	*13.5%*
Return on Com Equity							11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	*12.5%*	*12.5%*	Return on Com Equity	*13.5%*
Retained to Com Eq							6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.1%	6.2%	*4.5%*	*4.5%*	Retained to Com Eq	*4.5%*
All Div'ds to Net Prof							45%	47%	53%	54%	56%	52%	61%	51%	55%	55%	*62%*	*62%*	All Div'ds to Net Prof	*66%*

LEGENDS
18.00 x "Cash Flow" p sh
Relative Price Strength
2-for-1 split 9/13
Options: Yes
Shaded area indicates recession

Target Price Range 2025 2026 2027

% TOT. RETURN 8/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-8.4	-12.0
3 yr.	-6.1	43.2
5 yr.	82.4	54.9

CAPITAL STRUCTURE as of 6/30/22
Total Debt $670.8 mill. **Due in 5 Yrs** $33.5 mill.
LT Debt $446.9 mill. **LT Interest** $24.0 mill. (39% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.6 mill.
Pension Assets-12/21 $233.5 mill. **Oblig.** $259.8 mill.
Pfd Stock None

Common Stock 36,956,824 shs.
as of 7/29/22

MARKET CAP: $3.0 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	36.7	5.0	10.8
Accts Receivable	29.2	34.4	27.1
Other	91.2	98.7	101.1
Current Assets	157.1	138.1	139.0
Accts Payable	63.8	65.9	71.9
Debt Due	.4	31.4	223.9
Other	54.4	58.3	52.9
Current Liab.	118.6	155.6	348.7

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	2.5%	1.5%	*5.5%*
"Cash Flow"	5.5%	4.5%	*5.5%*
Earnings	9.0%	8.5%	*5.5%*
Dividends	9.5%	8.0%	*9.0%*
Book Value	5.5%	6.0%	*5.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	101.7	124.7	134.5	113.0	473.9
2020	109.1	121.3	133.6	124.2	488.2
2021	117.1	128.4	136.8	116.6	498.9
2022	108.6	122.6	*143.8*	*135*	*510*
2023	*112*	*130*	*145*	*138*	*525*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.35	.72	.76	.45	2.28
2020	.38	.69	.72	.54	2.33
2021	.52	.72	.76	.55	2.55
2022	.38	.54	*.65*	*.88*	*2.45*
2023	*.50*	*.75*	*.75*	*.60*	*2.60*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020	.305	.305	.335	.335	1.28
2021	.335	.335	.365	.365	1.40
2022	.365	.365	.3975		

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 262,770 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,656 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS subsidiary. Sold Chaparral City Wtr. of AZ. (6/11). Employs 808. BlackRock, Inc. owns 17.7% of out. shares; State St., 13.7%; off. & dir., 0.9% (4/22 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc: CA. Address: 630 East Foothill Blvd., San Dimas, CA 91773. Tel.: 909-394-3600. Internet: www.aswater.com.

American States Water had another difficult quarter. In the June interim, the company's share net came in at $0.54, versus last year's $0.72 showing. About $0.10 a share of the shortfall was the result of old rates still being in effect. Recall that the company's Golden States Water utility has already reached a settlement regarding higher rates with the state's Office of Public Advocate. The California Public Utility Commission (CPUC) has yet to approve the deal. Typically, the CPUC goes along with the Public Advocate's recommendation. (Indeed, as a body, it can be tougher on utilities than the CPUC.) Also, with the rate increase not in effect yet, third-quarter income will be hurt as well. It is important to note, however, that once the agreement is finalized, the utility will be able to collect these funds retroactive to the beginning of 2022.

We have lowered our earnings estimates for both 2022 and 2023. Assuming the CPUC makes a final ruling by the end of the year, we have still reduced our share-net estimate by a dime for this year and next. The main reason being that American States has to adjust the valuation of its portfolio of assets set aside for the pension program each quarter. Losses were incurred that impacted the June period by $0.10 a share. Moreover, we think the third quarter will cause another asset writedown, as both the bond and equity markets slumped.

Nonutility operations could be a growth catalyst out to 2025 to 2027. Through its ASUS subsidiary, American States provides water and waste treatment services to U.S. military bases. As the armed forces continue to privatize their water systems, we believe that ASUS will keep winning a fair amount of the 50-year contracts that are being put out for competitive bidding. This business is not regulated, so earnings here can exceed those in its other operations.

These shares do not hold much appeal at the recent quotation. In the near term, the equity is ranked to underperform the broader market averages in the coming year. Furthermore, over the three- to five-year pull, AWR's total return potential is well below that of the *Value Line* median.

James A. Flood *October 7, 2022*

(A) Primary earnings. Excludes nonrecurring gains/(losses):; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due early Nov.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.
(D) Includes intangibles. As of 12/31/21; $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	95

AMERICAN WATER NYSE-AWK

RECENT PRICE 137.33 | P/E RATIO 31.0 (Trailing: 19.2 Median: 25.0) | RELATIVE P/E RATIO 2.15 | DIV'D YLD 2.0% | VALUE LINE

TIMELINESS 2 Raised 9/16/22
SAFETY 3 New 7/25/08
TECHNICAL 3 Raised 10/7/22
BETA .90 (1.00 = Market)

18-Month Target Price Range

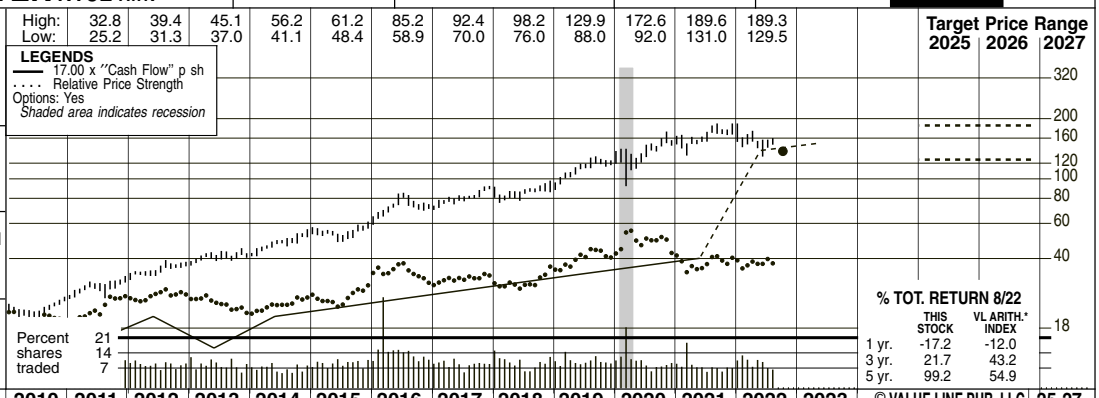
Low-High	Midpoint (% to Mid)
$132-$255	$194 (40%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	185	(+35%)	*10%*
Low	125	(-10%)	*Nil*

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	526	450	469
to Sell	369	473	415
Hld's(000)	156569	156704	151931



2006[E]	2007[E]	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	19.97	20.83	21.58	*20.90*	*22.25*	Revenues per sh	*27.10*
.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.65	7.24	10.46	*8.15*	*8.90*	"Cash Flow" per sh	*10.10*
d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.43	3.91	6.95	*4.45*	*4.85*	Earnings per sh [A]	*5.75*
- -	- -	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	2.15	2.36	*2.57*	*2.80*	Div'd Decl'd per sh [B■]	*3.55*
4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	9.15	10.05	9.71	*13.75*	*11.75*	Cap'l Spending per sh	*11.50*
23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	33.83	35.58	40.18	*41.00*	*43.85*	Book Value per sh [D]	*57.80*
160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	180.81	181.30	181.61	*182.00*	*182.50*	Common Shs Outst'g [C]	*190.00*
- -	- -	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	32.9	35.3	23.6	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*27.0*
- -	- -	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	1.75	1.81	1.28			Relative P/E Ratio	*1.50*
- -	- -	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	1.7%	1.6%	1.4%			Avg Ann'l Div'd Yield	*2.3%*
						2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	3777.0	3920.0	*3800*	*4060*	Revenues ($mill)	*5150*
						374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	709.0	1263.0	*810*	*885*	Net Profit ($mill)	*1095*
						40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	23.3%	23.0%	*21.0%*	*22.0%*	Income Tax Rate	*24.0%*
						6.2%	5.1%	- -	- -	- -	- -	- -	- -	5.1%	2.9%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
						53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	59.1%	58.6%	*60.0%*	*61.0%*	Long-Term Debt Ratio	*60.0%*
						46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	40.9%	41.4%	*40.0%*	*39.0%*	Common Equity Ratio	*40.0%*
						9635.5	9940.7	10364	10911	10967	11875	13433	14760	15787	17639	*19260*	*20500*	Total Capital ($mill)	*22000*
						11739	12391	12900	13933	14992	16246	17409	18232	19710	21084	*22900*	*24400*	Net Plant ($mill)	*26000*
						5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	5.7%	8.2%	*5.5%*	*5.5%*	Return on Total Cap'l	*6.0%*
						8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	*10.5%*	*10.5%*	Return on Shr. Equity	*10.5%*
						8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	*10.5%*	*10.5%*	Return on Com Equity	*10.5%*
						3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	5.0%	11.4%	*4.5%*	*4.5%*	Retained to Com Eq	*4.0%*
						57%	40%	50%	50%	56%	68%	56%	57%	55%	34%	*58%*	*58%*	All Div'ds to Net Prof	*62%*

CAPITAL STRUCTURE as of 6/30/22
Total Debt $11621 mil. **Due in 5 Yrs** $1849 mil.
LT Debt $11023 mil. **LT Interest** $414 mil. (59% of Cap'l)

Leases, Uncapitalized: Annual rentals $12.0 mill.
Pension Assets 12/21 $2294.0 mill
Oblig. $1991.0 mill.
Pfd Stock $3.0 mill. **Pfd Div'd** $.2 mill

Common Stock 181,786,473 shares
as of 7/21/22

MARKET CAP: $25.0 billion (Large Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	576	136	97
Accts Receivable	321	271	383
Other	1009	1147	538
Current Assets	1906	1554	1018
Accts Payable	189	235	196
Debt Due	1611	641	598
Other	1081	1265	934
Current Liab.	2881	2141	1728

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.5%	3.5%	*4.5%*
"Cash Flow"	9.0%	10.0%	*3.5%*
Earnings	12.0%	13.5%	*3.0%*
Dividends	9.5%	10.0%	*8.5%*
Book Value	4.5%	5.0%	*8.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	813	882	1013	902	3610
2020	844	931	1079	923	3777
2021	888	999	1082	951	3920
2022	842	937	*1081*	*940*	*3800*
2023	*895*	*1000*	*1165*	*1000*	*4060*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.62	.94	1.33	.54	3.43
2020	.68	.97	1.46	.80	3.91
2021	.73	1.14	1.53	3.55	6.95
2022	.87	1.20	*1.55*	*.83*	*4.45*
2023	*.85*	*1.25*	*1.80*	*.95*	*4.85*

Calendar	QUARTERLY DIVIDENDS PAID [B■] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020	.50	.55	.55	.55	2.15
2021	.55	.6025	.6025	.6025	2.36
2022	.6025	.655	.655		

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 14 million people in 24 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2021 revenues. Pennsylvania is its largest market accounting for 21.5% of regulated revenues; New Jersey, 20.3%; Missouri, 13.9%. Has 6,400 employees. Vanguard owns 11.8% of outstanding shares; BlackRock, 8.9%; State St., 5.4%; officers & directors, less than 1.0% (4/22 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

Profits from American Water Works' operations ought to be flattish for the second half of this year. After deducting a $2.70-a-share one-time gain in 2021's final period, the company's share net was $2.38 over the third and fourth quarters. That is the same amount we expect the utility to make in the remainder of 2022.

The bottom line ought to get back on track in 2023. Assuming reasonable treatment from regulators, American Water's share net could well rise 9% to $4.85. A healthy percentage of the profit increase will come from the utility's acquisition strategy (more below).

The regulatory climate could change. American Water has enjoyed a good relationship with the authorities that determine the rates it's allowed to charge customers. State regulators have been cognizant that large capital expenditures are required to upgrade the existing infrastructure. The potential problem ahead is inflation. When prices were rising just 2% annually, it was easier to pass along higher rates to residents. When inflation is high, though, it makes it more difficult politically to approve hikes of 6%-8%, even if the costs are justified.

The construction program is massive. Management has been pursuing an aggressive building policy aimed mostly at replacing antiquated pipelines and wastewater systems. In 2022, the company is on pace to spend $2.5 billion. Since most of its pipelines and other assets are not in great shape, the spending should be ongoing.

Acquisitions ought to be a driver of income growth. There are thousands of small municipally run water district in the U.S. A good portion do not have the finances to fund the necessary repairs and upgrades needed to be in compliance with EPA guidelines. American Water has been absorbing many smaller entities over the decade. This has enabled it to expand its rate base, on which it earns a return. Also, there are redundancies in the industry that can be eliminated from the districts it purchases, which should increase operating margins.

These timely shares are not suitable for long-term accounts. The price of the equity is already trading within our projected 2025-2027 Target Price Range.

James A. Flood *October 7, 2022*

(A) Diluted earnings. Excludes nonrecur. losses: '08, $4.62; '09, $2.63; '11, $0.07. Disc. oper.: '06, ($0.04); '11, $0.03; '12, ($0.10); '13,($0.01). GAAP used as of 2014. Includes $2.70 sh. gain from sale of HOS sub.in Q4,'21. Next earnings report due late Oct.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. **(D)** Includes intangibles. On 12/31/21: $1.231 billion, $6.67/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	100
Earnings Predictability	80

CALIFORNIA WATER NYSE-CWT

RECENT PRICE **55.60** | P/E RATIO **31.2** (Trailing: 33.7 Median: 27.0) | RELATIVE P/E RATIO **2.17** | DIV'D YLD **1.8%** | **VALUE LINE**

TIMELINESS 4 Lowered 8/12/22
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Raised 9/16/22
BETA .70 (1.00 = Market)

18-Month Target Price Range

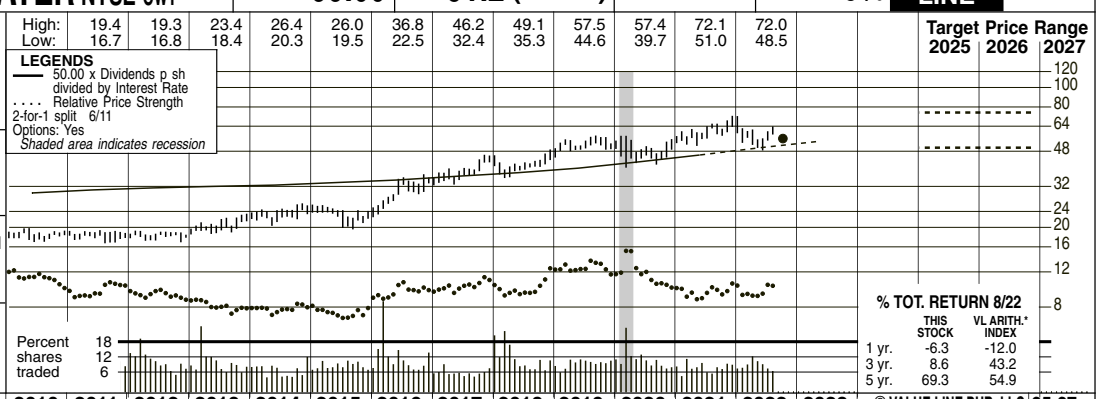
Low-High	Midpoint (% to Mid)
$47-$89	$68 (20%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(+35%)	*9%*
Low	50	(-10%)	*Nil*

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	155	152	121
to Sell	109	127	141
Hld's(000)	42143	43279	43653



2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	14.72	15.78	14.72	*15.45*	*16.55*	Revenues per sh	*17.90*
1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	3.14	3.88	3.91	*3.20*	*3.70*	"Cash Flow" per sh	*4.15*
.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	1.97	1.96	*1.70*	*2.15*	Earnings per sh [A]	*2.55*
.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.85	.92	*1.00*	*1.08*	Div'd Decl'd per sh [B] ■	*1.25*
2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	5.64	5.93	5.46	*5.85*	*6.00*	Cap'l Spending per sh	*6.45*
9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	16.07	18.30	21.92	*22.35*	*23.55*	Book Value per sh [C]	*25.50*
41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	48.53	50.33	53.72	*53.75*	*52.00*	Common Shs Outst'g [D]	*50.00*
29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	39.3	24.9	30.5	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*24.0*
1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64	2.09	1.28	1.67			Relative P/E Ratio	*1.30*
2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	1.5%	1.7%	1.5%			Avg Ann'l Div'd Yield	*2.0%*
						560.0	584.1	597.5	588.4	609.4	666.9	698.2	714.6	794.3	790.9	*830*	*860*	Revenues ($mill) [E]	*895*
						42.6	47.3	56.7	45.0	48.7	67.2	65.6	63.1	96.8	101.1	*92.0*	*112*	Net Profit ($mill)	*128*
						37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	11.1%	20.1%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
						8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	3.3%	1.7%	*4.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
						47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	45.9%	47.3%	*44.0%*	*42.5%*	Long-Term Debt Ratio	*39.5%*
						52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	54.1%	52.7%	*56.0%*	*57.5%*	Common Equity Ratio	*60.5%*
						908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	1702.4	2233.4	*2150*	*2125*	Total Capital ($mill)	*2100*
						1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	2650.6	2846.9	*2950*	*2975*	Net Plant ($mill)	*3050*
						6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	7.0%	5.5%	*5.0%*	*6.0%*	Return on Total Cap'l	*6.5%*
						9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	*7.5%*	*9.0%*	Return on Shr. Equity	*10.0%*
						9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	*7.5%*	*9.0%*	Return on Com Equity	*10.0%*
						3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	6.0%	4.6%	*3.0%*	*4.5%*	Retained to Com Eq	*5.0%*
						62%	56%	55%	71%	68%	51%	55%	60%	43%	47%	*59%*	*50%*	All Div'ds to Net Prof	*49%*

CAPITAL STRUCTURE as of 6/30/22
Total Debt $1130.0 mill. **Due in 5 Yrs** $357.0 mill.
LT Debt $1054.2 mill. **LT Interest** $40.0 mill.
(Total interest coverage: 4.9x) (47% of Cap'l)

Pension Assets-12/21 $810.5 mill.
Oblig. $887.5 mill.

Pfd Stock None

Common Stock 54,356,000 shs.

MARKET CAP: $3.0 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	44.6	78.4	61.7
Other	221.4	222.1	215.0
Current Assets	266.0	300.5	276.7
Accts Payable	131.7	144.4	139.7
Debt Due	375.1	40.2	75.8
Other	81.9	72.0	70.6
Current Liab.	588.7	256.6	286.1

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 494,500 customers in 100 communities in the state of California. Accounts for about 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '21: residential, 69%; business, 19%; industrial, 3%; public authorities, 5%; other 4%. Off. and dir. own 1% of common stock (4/22 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.0%	4.0%	*3.0%*
"Cash Flow"	6.5%	9.0%	*2.0%*
Earnings	6.5%	11.0%	*6.5%*
Dividends	3.5%	5.0%	*6.5%*
Book Value	6.0%	7.0%	*5.0%*

Calendar	QUARTERLY REVENUES ($ mill.) [E] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	126.1	179.0	232.6	176.9	714.6
2020	125.6	175.5	304.1	189.1	794.3
2021	147.7	213.1	256.7	173.4	790.9
2022	173.0	206.2	*255*	*195.8*	*830*
2023	*175*	*220*	*265*	*200*	*860*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	d.16	.35	.88	.24	1.31
2020	d.42	.11	1.94	.31	1.97
2021	d.06	.75	1.20	.07	1.96
2022	.02	.36	*1.07*	*.25*	*1.70*
2023	*.10*	*.55*	*1.15*	*.35*	*2.15*

Calendar	QUARTERLY DIVIDENDS PAID [B] ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020	.2125	.2125	.2125	.2125	.85
2021	.230	.230	.230	.230	.92
2022	.250	.250	.250		

California Water Service Group has made some moves since our early-July review. First, the company's California- and Washington-based subsidiaries both inked deal's to acquire water system assets of two adjacent utilities. The acquisitions, which are still pending customary closing conditions and regulatory approval, ought to bolster California Water's residential operating footprint in these areas. Meanwhile, in Texas, the company recently entered into a long-term water supply agreement with the Guadalupe Blanco River Authority. The deal is imperative to meeting residential water demand in the growing region, and is likely to require substantial pipeline infrastructure development. Lastly, management continues to make progress on its 2021 cost of capital review and general rate case filing.

Earnings are apt to take a step back this year. California Water posted net income of $0.36 per share in the June period, roughly half that of the prior-year tally. The softer-than-expected showing can be attributed to costs associated with a change in deferred revenue, weaker customer water consumption, and an uptick in general and administrative expenses. That said, bottom-line comparisons are poised to improve over the back half of 2022, largely owing to prospects for customer rate increases. Even so, we are shaving $0.30 from our current-year earnings estimate, to $1.70 per share.

Significant infrastructure investment is on the docket over the pull to late decade. In addition to upgrading aging water delivery systems and treatment plants, California Water is allocating funds to shore up its preparation for unexpected wildfires and climate-related challenges. Meanwhile, the company's recently announced $350-million stock buyback program is imminent.

California Water shares lack investment appeal at this juncture. The stock has slipped one notch on our Timeliness ranking scale, to 4 (Below Average). Moreover, much of the growth we envision three to five years hence appears to already be factored into the recent quotation. All told, subscribers would do well to remain on the sidelines, for now.

Nicholas Patrikis *October 7, 2022*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early Nov.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '21 : $36.8 mill., $0.69/sh.
(D) In millions, adjusted for split.
(E) Excludes non-regulated revenues.

Company's Financial Strength	B++
Stock's Price Stability	95
Price Growth Persistence	85
Earnings Predictability	55

ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE 43.46 | P/E RATIO 23.9 (Trailing: 25.6 Median: 25.0) | RELATIVE P/E RATIO 1.66 | DIV'D YLD 2.7% | VALUE LINE

TIMELINESS 3 Raised 9/16/22
SAFETY 3 Lowered 1/8/21
TECHNICAL 1 Raised 9/16/22
BETA .95 (1.00 = Market)

18-Month Target Price Range

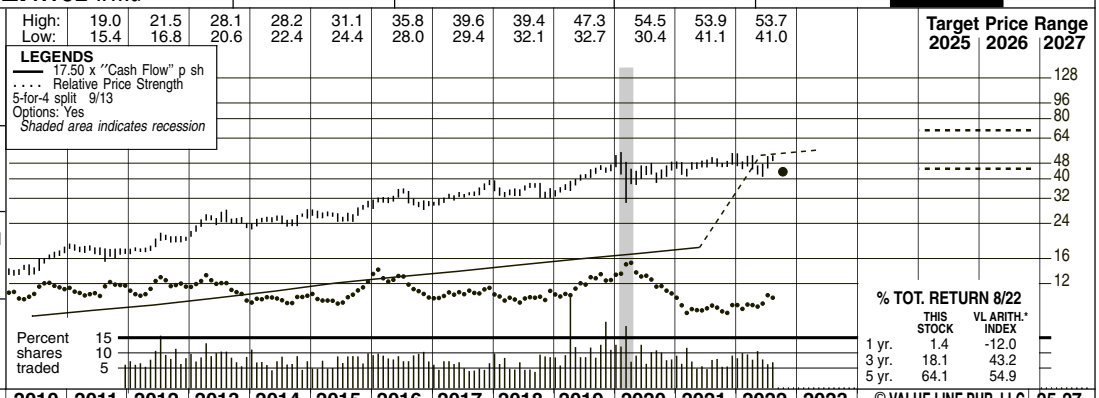
Low-High	Midpoint (% to Mid)
$38-$72	$55 (25%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	70	(+60%)	*15%*
Low	45	(+5%)	*4%*

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	313	292	277
to Sell	208	248	249
Hld's(000)	178560	181504	183099



% TOT. RETURN 8/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	1.4	-12.0
3 yr.	18.1	43.2
5 yr.	64.1	54.9

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	4.03	5.96	7.43	*8.25*	*8.25*	Revenues per sh	*8.95*
1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	1.73	2.21	2.89	*3.00*	*3.20*	"Cash Flow" per sh	*4.00*
.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	1.12	1.67	*1.80*	*1.95*	Earnings per sh	*2.25*
.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	.97	1.04	*1.11*	*1.20*	Div'd Decl'd per sh	*1.55*
1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	2.49	3.41	4.04	*3.95*	*3.85*	Cap'l Spending per sh	*3.80*
5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	17.58	19.09	20.50	*21.45*	*22.30*	Book Value per sh	*26.90*
165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	220.76	245.39	252.87	*255.00*	*260.00*	Common Shs Outst'g	*280.00*
34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	39.1	39.6	28.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*26.0*
1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76	2.08	2.03	1.55			Relative P/E Ratio	*1.45*
1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%	2.2%	2.2%	2.2%			Avg Ann'l Div'd Yield	*2.7%*
						757.8	768.6	779.9	814.2	819.9	809.5	838.1	889.7	1462.7	1878.1	*2110*	*2150*	Revenues ($mill)	*2500*
						153.1	205.0	213.9	201.8	234.2	239.7	192.0	224.5	284.8	431.6	*460*	*505*	Net Profit ($mill)	*630*
						39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	--	--	--	--	*4.0%*	*10.0%*	Income Tax Rate	*15.0%*
						--	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	4.5%	4.8%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*6.0%*
						52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	54.0%	52.7%	*54.0%*	*54.5%*	Long-Term Debt Ratio	*53.0%*
						47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	46.0%	47.3%	*46.0%*	*45.5%*	Common Equity Ratio	*47.0%*
						2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	10192	10964	*11975*	*12800*	Total Capital ($mill)	*16000*
						3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	9512.9	10252	*10900*	*11600*	Net Plant ($mill)	*13500*
						6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	3.7%	4.8%	*5.5%*	*5.5%*	Return on Total Cap'l	*5.5%*
						11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	*8.5%*	*8.5%*	Return on Shr. Equity	*8.5%*
						11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	*8.5%*	*8.5%*	Return on Com Equity	*8.5%*
						4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	1.1%	3.3%	*3.0%*	*3.0%*	Retained to Com Eq	*2.5%*
						61%	50%	52%	60%	56%	59%	79%	84%	82%	60%	*62%*	*62%*	All Div'ds to Net Prof	*69%*

CAPITAL STRUCTURE as of 6/30/22
Total Debt $6213.3 mill. **Due in 5 Yrs** $882.1 mill.
LT Debt $6087.7 mill. **LT Interest** $216.0 mill.
(53% of Cap'l)

Pension Assets-12/21 $433.1 mill.
Oblig. $452.9 mill.

Pfd Stock None
Common Stock 262,170,763 shares
as of 7/22/22

MARKET CAP: $11.4 billion (Large Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	4.8	10.6	13.0
Receivables	154.8	141.0	143.4
Inventory (AvgCst)	58.4	109.6	128.6
Other	162.2	176.6	128.3
Current Assets	380.2	437.8	413.3
Accts Payable	177.5	192.9	194.1
Debt Due	162.6	197.1	125.6
Other	263.8	285.1	224.4
Current Liab.	603.9	675.1	544.1

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.5%	5.0%	*7.5%*
"Cash Flow"	5.0%	3.0%	*10.0%*
Earnings	6.0%	1.0%	*10.0%*
Dividends	7.5%	7.0%	*8.0%*
Book Value	11.0%	14.0%	*6.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	201.1	218.9	243.6	226.1	889.7
2020	255.6	384.5	348.6	474.0	1462.7
2021	583.5	397.0	361.9	535.7	1878.1
2022	699.3	448.8	*391.9*	*570*	*2110*
2023	*660*	*475*	*420*	*595*	*2150*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.09	.25	.38	.28	1.04
2020	.21	.29	.22	.40	1.12
2021	.72	.32	.19	.44	1.67
2022	.76	.31	*.22*	*.51*	*1.80*
2023	*.78*	*.37*	*.33*	*.47*	*1.95*

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020	.2343	.2343	.2507	.2507	.97
2021	.2507	.2507	.2682	.2682	1.04
2022	.2682	.2682	.287		

BUSINESS: Essential Utilities, Inc. became the new name for Aqua America on Feb. 3, 2020, to reflect the acquisition of Peoples, a natural gas utility, which occurred in 3/20. In 2021, Aqua Amer. provided water and wastewater services to about 5 million people in PA, OH, TX, IL, NC, NJ, IN, VA NS WS. Employs 3,211. Acquired AquaSource, 7/13; N. Maine Util., 7/15; and others. Water respn. for 52% of revenues in 2021; residential, 30%; commercial, 8.0%; industrial, wastewater & other, 14%. Gas 46%; other, 2.0%. Off. & dir. own less than 1% of the common stock; BlackRock, 10.6%; Vanguard, 9.7%; Can. Pen. Plan 8.6% (3/22 proxy). Pres. & CEO: Christopher Franklin. Inc.: PA Addr.: 762 W Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Int.: www.essential.co.

Essential Utilities' second-quarter earnings were in line with our expectations. The water and gas utility posted share net of $0.31, versus our $0.32 estimate. Management reaffirmed the same guidance as before, so we are sticking with our previous bottom-line estimates of $1.80 and 1.95 for 2022 and 2023, respectively. These figures represent a solid 8% increase for both this year and next.

A potential acquisition of a large wastewater project has been shelved, for now. Last summer, Essential's Aqua America water subsidiary signed an exclusivity agreement with the Bucks County Water and Sewer Authority to discuss purchasing the asset for about $1.1 billion. In early September, the negotiations were suddenly halted. Aqua continues to express interest in completing the transaction, however. In any case, it has already closed two acquisitions this year and agreed to buy parts, or all of the assets of seven different water systems. The price tag will total approximately $365 million.

The policy of aggressively buying other water entities ought to help fuel long-term growth. America's water industry is incredibly fragmented with most water districts being run by small, undercapitalized municipal entities. Not only do they not have the funds required to replace old pipelines and treatment centers, but they are inefficient. When a bigger company, such as Aqua, takes over a smaller water authority, it can create significant efficiencies by eliminating many redundancies.

The dividend was hiked by a healthy percentage. The board increased the quarterly payout by 7%, to $0.287 a share in the latest quarter.

Shares of Essential do not look particularly attractive at this time. In the year ahead, the equity is just ranked to perform in line with the broader market averages. Also, the stock's total return potential is well below that of the average equity under *Value Line* review. Similar to others in this industry, Essential has many appealing features, including well-defined earnings and dividend growth, but they all appear to be more than reflected in the recent quotation.

James A. Flood *October 7, 2022*

(A) Diluted egs. Excl. nonrec. gains: '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. Quarterly EPS do not add in '19 due to a large change in the number of shares outstanding in the Dec. period. Next earnings report early November.
(B) Dividends historically paid in early March, June, Sept., & Dec. ■ Div'd. reinvestment plan available (5% discount).
(C) In millions, adjusted for stock split.
(D) Includes intangibles: 12/31/21, $1.231 bill./$4.87 a share.

Company's Financial Strength	B++
Stock's Price Stability	90
Price Growth Persistence	90
Earnings Predictability	60

MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 81.76 | P/E RATIO 35.5 (Trailing: 36.5 Median: 24.0) | RELATIVE P/E RATIO 2.47 | DIV'D YLD 1.4% | VALUE LINE

TIMELINESS 3 Raised 9/9/22
SAFETY 2 New 10/21/11
TECHNICAL 3 Raised 10/7/22
BETA .70 (1.00 = Market)

18-Month Target Price Range

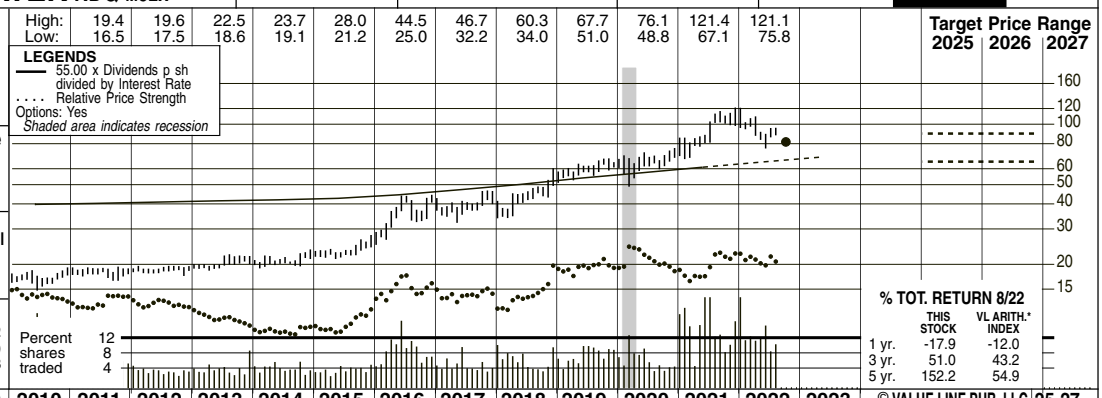
Low-High	Midpoint (% to Mid)
$77-$160	$119 (45%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	90	(+10%)	4%
Low	65	(-20%)	-4%

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	93	82	90
to Sell	84	90	93
Hld's(000)	12685	13008	11842



2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.72	8.10	8.17	*8.75*	*8.95*	Revenues per sh	*9.15*
1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.90	3.25	3.28	*3.40*	*3.50*	"Cash Flow" per sh	*3.85*
.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	2.18	2.07	*2.45*	*2.50*	Earnings per sh A	*2.75*
.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.11	*1.18*	*1.25*	Div'd Decl'd per sh B■	*1.40*
2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	5.11	6.04	4.53	*5.00*	*5.25*	Cap'l Spending per sh	*6.00*
9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	18.57	19.81	20.99	*21.70*	*22.40*	Book Value per sh	*22.80*
13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.43	17.47	17.52	*17.75*	*17.85*	Common Shs Outst'g C	*18.00*
22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	29.7	30.1	44.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*28.0*
1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.58	1.55	2.43			Relative P/E Ratio	*1.30*
3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	1.6%	1.6%	1.2%			Avg Ann'l Div'd Yield	*1.8%*
110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	141.6	143.1	*155*	*160*	Revenues ($mill)	*165*
14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	38.4	36.5	*44.0*	*45.0*	Net Profit ($mill)	*50.0*
33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	- -	2.8%	2.8%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	3.9%	3.9%	*2.5%*	*2.5%*	AFUDC % to Net Profit	*2.5%*
41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	44.0%	45.3%	*44.0%*	*43.5%*	Long-Term Debt Ratio	*42.0%*
57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	55.7%	54.4%	*55.5%*	*56.0%*	Common Equity Ratio	*57.5%*
316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	621.5	676.3	*690*	*710*	Total Capital ($mill)	*715*
435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	796.6	865.4	*875*	*885*	Net Plant ($mill)	*915*
5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	6.8%	6.0%	*6.5%*	*6.5%*	Return on Total Cap'l	*7.5%*
7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	11.0%	9.9%	*11.0%*	*11.0%*	Return on Shr. Equity	*12.0%*
7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	11.1%	9.9%	*11.5%*	*11.0%*	Return on Com Equity	*12.0%*
1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	5.8%	4.6%	*6.0%*	*5.5%*	Retained to Com Eq	*6.0%*
83%	73%	67%	63%	58%	62%	46%	48%	48%	53%	*48%*	*50%*	All Div'ds to Net Prof	*51%*

CAPITAL STRUCTURE as of 6/30/22
Total Debt $313.2 mill. **Due in 5 Yrs** $43.7 mill.
LT Debt $305.4 mill. **LT Interest** $7.5 mill.
(Total interest coverage: 5.0x)
(45% of Cap'l)

Pension Assets-12/21 $100.8 mill.
Oblig. $113.7 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 17,610,000 shs.
as of 7/29/22

MARKET CAP: $1.4 billion (Small Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	4.5	3.5	4.3
Other	29.6	30.9	34.7
Current Assets	34.1	34.4	39.0
Accts Payable	30.4	21.1	24.2
Debt Due	9.3	6.7	7.8
Other	17.1	28.8	46.8
Current Liab.	56.8	56.6	78.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	2.0%	.5%	*2.5%*
"Cash Flow"	8.0%	9.5%	*3.5%*
Earnings	9.5%	11.0%	*4.5%*
Dividends	3.5%	6.0%	*5.0%*
Book Value	6.0%	9.0%	*2.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	30.7	33.4	37.8	32.7	134.6
2020	31.8	35.3	39.9	34.6	141.6
2021	32.5	36.7	39.9	34.0	143.1
2022	36.2	39.7	*41.0*	*38.1*	*155*
2023	*38.0*	*41.0*	*42.0*	*39.0*	*160*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.39	.49	.66	.46	2.01
2020	.44	.55	.72	.47	2.18
2021	.39	.62	.65	.41	2.07
2022	.68	.50	*.75*	*.52*	*2.45*
2023	*.53*	*.60*	*.77*	*.60*	*2.50*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020	.2562	.2562	.2562	.2725	1.04
2021	.2725	.2725	.2725	.29	1.11
2022	.29	.29	.29		

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 61,000 retail customers, primarily in Middlesex County, New Jersey. In 2021, the Middlesex System accounted for 59% of operating revenues. At 12/31/21, the company had 347 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 2.0% of the com. stock; BlackRock Inst. Trust Co., 7.8% (4/22 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Telephone: 732-634-1500. Int.: www.middlesexwater.com.

Middlesex Water recently inked a deal to manage the Borough of Avalon, New Jersey's water and sewer utility operations. The new 10-year contract, which went into effect on September 1, 2022, replaces the previous decade-long agreement, and includes provisions for maintenance and customer services.

Periodic rate hikes have more than offset the company's regulated Delaware wastewater divestment from earlier this year. The latter resulted in approximately $0.7 million in reduced revenues for the June period. However, the top line is benefiting notably from the latest round of customer rate increases. To wit, the New Jersey Board of Public Utilities recently approved another rate hike, largely due to aggressive infrastructure and distribution system investments. In sum, we now look for revenues of $155 million this year (up from our previous call of $153 million) and $160 million in the next (up from $158 million).

Strong bottom-line expansion is likely on tap for 2022, despite a modest reduction to our current-year profit forecast. Earnings contracted about 20% year over year in the second quarter, to $0.50 per share. Expiring income tax benefits and higher operating expenses weighed on the figure. Consequently, we are shaving a dime from our full-year 2022 bottom-line estimate, to $2.45 per share.

Over the pull to late decade, leadership is poised to invest heavily on infrastructure-related upgrades. Indeed, aging water delivery systems and pipelines are long overdue for replacement. Management is apt to focus on facility treatment enhancements as well. Overall, aggressive spending on public infrastructure projects suggests that additional rate hikes are probably in the cards further down the road.

Middlesex stock is ranked to mirror the broader market averages over the coming six to 12 months. What's more, at the recent quotation, the equity lacks appeal over the 18-month and 3- to 5-year windows. Although the company is noncyclical and pays a stable quarterly dividend that is well-covered by earnings, we think waiting for a better entry point is the prudent move here at this juncture.

Nicholas Patrikis *October 7, 2022*

(A) Diluted earnings. Next earnings report due early November.

(B) Dividends historically paid in mid-Feb., May, Aug., and November.■ Div'd reinvestment plan available.

(C) In millions.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	90
Earnings Predictability	90

SJW GROUP NYSE-SJW

RECENT PRICE 59.57 | P/E RATIO 28.9 (Trailing: 34.2 Median: 23.0) | RELATIVE P/E RATIO 2.01 | DIV'D YLD 2.4% | VALUE LINE

TIMELINESS 4 Lowered 8/12/22
SAFETY 3 New 4/22/11
TECHNICAL 3 Raised 10/7/22
BETA .80 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$57-$96	$77 (30%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	90	(+50%)	*13%*
Low	60	(Nil)	*3%*

Institutional Decisions

	4Q2021	1Q2022	2Q2022
to Buy	98	93	78
to Sell	68	80	104
Hld's(000)	21890	21360	21790

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
High:	26.8	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0	73.7	73.4								
Low:	20.9	22.6	24.5	25.5	27.5	28.6	45.4	51.3	53.9	45.6	58.0	55.7								
	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	18.97	14.00	14.78	19.77	19.01	*20.00*	*20.85*	Revenues per sh	*22.15*
	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	5.24	3.29	3.13	5.28	5.13	*3.60*	*4.15*	"Cash Flow" per sh	*4.90*
	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	.82	2.14	2.03	*1.95*	*2.50*	Earnings per sh [A]	*3.25*
	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	1.28	1.36	*1.44*	*1.52*	Div'd Decl'd per sh [B]■	*1.76*
	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	7.26	5.08	6.25	7.44	8.32	*7.50*	*8.00*	Cap'l Spending per sh	*7.75*
	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	22.57	31.31	31.27	32.12	34.28	*36.65*	*39.15*	Book Value per sh	*40.85*
	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	20.52	28.40	28.46	28.56	30.18	*30.00*	*30.00*	Common Shs Outst'g [C]	*30.00*
	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	NMF	30.0	32.9	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.0*
	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	NMF	1.54	1.80			Relative P/E Ratio	*1.30*
	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	1.9%	1.9%	1.9%	2.0%	2.0%			Avg Ann'l Div'd Yield	*2.3%*
	261.5	276.9	319.7	305.1	339.7	389.2	397.7	420.7	564.5	573.7	*600*	*625*	Revenues ($mill)	*665*
	22.3	23.5	51.8	37.9	52.8	59.2	38.8	23.4	61.5	60.5	*59.0*	*75.0*	Net Profit ($mill)	*98.0*
	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	26.4%	12.0%	12.2%	*21.5%*	*21.0%*	Income Tax Rate	*21.0%*
	--	--	--	--	--	--	--	--	2.0%	1.5%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.1%	58.4%	59.1%	*57.5%*	*54.0%*	Long-Term Debt Ratio	*45.0%*
	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	40.9%	41.6%	40.9%	*42.5%*	*46.0%*	Common Equity Ratio	*55.0%*
	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	2173.6	2204.7	2527.5	*2575*	*2550*	Total Capital ($mill)	*2225*
	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	2334.9	2497.5	*2565*	*2650*	Net Plant ($mill)	*2825*
	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	1.8%	4.0%	3.5%	*3.0%*	*3.5%*	Return on Total Cap'l	*5.0%*
	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	*5.5%*	*6.5%*	Return on Shr. Equity	*8.0%*
	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	*5.5%*	*6.5%*	Return on Com Equity	*8.0%*
	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	NMF	2.7%	2.0%	*1.5%*	*2.5%*	Retained to Com Eq	*3.5%*
	59%	62%	29%	42%	31%	36%	60%	NMF	59%	66%	*74%*	*61%*	All Div'ds to Net Prof	*54%*

% TOT. RETURN 8/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-5.2	-12.0
3 yr.	-0.4	43.2
5 yr.	27.2	54.9

CAPITAL STRUCTURE as of 6/30/22
Total Debt $1494.7 mill. **Due in 5 Yrs** $39.0 mill.
LT Debt $1455.7 mill. **LT Interest** $50.0 mill.
(LT Interest Coverage: 3.6x)
(59% of Cap'l)

Pension Assets-12/21 $310.2 mill.
Oblig. $383.8 mill.
Pfd Stock None.
Common Stock 30,248,000 shs.

MARKET CAP: $1.8 billion (Small Cap)

CURRENT POSITION ($MILL.)	2020	2021	6/30/22
Cash Assets	9.3	10.9	12.0
Accts Receivable	58.1	53.7	58.8
Other	59.9	69.5	68.0
Current Assets	127.3	134.1	138.8
Accts Payable	34.2	30.4	26.6
Debt Due	76.2	39.1	39.0
Other	240.4	133.8	212.2
Current Liab.	350.8	203.3	277.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	4.0%	2.5%	*3.5%*
"Cash Flow"	6.0%	.5%	*2.5%*
Earnings	6.0%	-6.5%	*14.0%*
Dividends	6.5%	10.5%	*5.5%*
Book Value	9.0%	11.5%	*4.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	77.7	103.0	114.0	125.8	420.5
2020	115.8	147.2	165.9	135.6	564.5
2021	114.8	152.2	166.9	139.8	573.7
2022	124.3	149.0	*175*	*151.7*	*600*
2023	*130*	*160*	*180*	*155*	*625*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.21	.47	.33	d.19	.82
2020	.08	.69	.91	.46	2.14
2021	.09	.69	.64	.60	2.03
2022	.12	.38	*.75*	*.70*	*1.95*
2023	*.23*	*.57*	*.95*	*.75*	*2.50*

Calendar	QUARTERLY DIVIDENDS PAID [BD]■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020	.32	.32	.32	.32	1.28
2021	.34	.34	.34	.34	1.36
2022	.36	.36	.36		

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with a total population of 450,000 people. Has 751 employees. Officers and directors own about 8.0% of outstanding shares (3/22 proxy). Chairman & CEO: Eric Thornburg. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

SJW Group reported weaker-than-anticipated second-quarter bottom-line results. The East and West coast water utility operator earned $0.38 per share in the June period. Indeed, the figure, which was well short of consensus estimates, contracted about 45% year over year. On top of a softer revenue performance during the period (on an annual basis), higher administrative expenses, depreciation, and interest on long-term obligations weighed on the result. All told, despite management reaffirming an upbeat outlook for the remainder of the year, we are lowering our 2022 earnings estimate by $0.55, to $1.95 per share, which would mark the company's second-consecutive year of share profit declines.

We think 2023 holds more promise. To start, modest revenue growth ought to be underpinned by further customer rate hikes and a wider base. Regarding the former, SJW Group expects the currently pending 2021 California General Rate Case decision to be reached by the end of this year, which would allow the company to not only boost rates, but recoup revenues retroactively. Rate increases in Connecticut, Maine, and Texas were also recently approved by regulators. Moreover, prospects for a healthier economic backdrop should support increased water consumption. Elsewhere, we envision a notable earnings recovery in 2023. Leadership is likely to focus on curtailing operating expenses and lowering debt obligations.

Aggressive infrastructure investment remains on tap over the 3- to 5-year stretch. For this year, top brass has utilized roughly half of its $223 million capital investment budget. Funds are allocated across all operating regions, and support aging pipeline replacement, facility and treatment plant upgrades, as well as the company's advanced metering initiative. By late decade, SJW Group intends to spend approximately $1.3 billion on infrastructure upgrades.

Investors should turn the page, for now. SJW stock is unfavorably ranked (4) for relative year-ahead price performance. What's more, at the recent quotation, total return potential over the pull to 2025-2027 leaves much to be desired.

Nicholas Patrikis *October 7, 2022*

(A) Diluted earnings. Excludes nonrecurring losses: '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due early November. Quarterly egs. may not add due to rounding.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions.
(D) Paid special dividend of $0.17 per share on 11/17.

Company's Financial Strength	B+
Stock's Price Stability	85
Price Growth Persistence	85
Earnings Predictability	45

Aqua Ohio, Inc.
Summary of Risk Premium Models for the
Proxy Group of Six Water Companies

	Proxy Group of Six Water Companies
Predictive Risk Premium Model (PRPM) (1)	12.17 %
Risk Premium Using an Adjusted Total Market Approach (2)	11.77 %
Average	11.97 %

Notes:
(1) From page 2 of this Schedule.
(2) From page 3 of this Schedule.

Aqua Ohio, Inc.
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

Proxy Group of Six Water Companies	[1] LT Average Predicted Variance	[2] Spot Predicted Variance	[3] Recommended Variance (2)	[4] GARCH Coefficient	[5] Predicted Risk Premium (3)	[6] Risk-Free Rate (4)	[7] Indicated ROE (5)
American States Water Company	0.38%	0.40%	0.38%	1.8175	8.62%	3.86%	12.48%
American Water Works Company, Inc.	0.28%	0.33%	0.28%	4.1911	15.02%	3.86%	NMF
California Water Service Group	0.33%	0.42%	0.33%	1.8595	7.53%	3.86%	11.39%
Essential Utilities Inc.	0.45%	0.54%	0.45%	2.1551	12.22%	3.86%	16.08%
Middlesex Water Company	0.33%	0.68%	0.33%	1.9058	7.86%	3.86%	11.72%
SJW Group	0.41%	0.40%	0.41%	1.4632	7.50%	3.86%	11.36%
						Average	12.61%
						Median	11.72%
					Average of Mean and Median		12.17%

NMF = Not Meaningful Figure

Notes:

(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Services.

(2) Based on the long-term average predicted variance.

(3) (1+(Column [3] * Column [4])^12) - 1.

(4) From note 2 on page 2 of Schedule DWD-5.

(5) Column [5] + Column [6].

Exhibit No. 4-1
Schedule DWD-4
Page 2 of 12

Aqua Ohio, Inc.
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Six Water Companies
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	5.18 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds	0.70 (2)
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds	5.88 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.12 (3)
5.	Adjusted Prospective Bond Yield	6.00 %
6.	Equity Risk Premium (4)	5.77
7.	Risk Premium Derived Common Equity Cost Rate	11.77 %

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10 and 11 of this Schedule).
(2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.70% from page 4 of this Schedule.
(3) Adjustment to reflect the A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.12% upward adjustment is derived by taking 1/3 of the spread between A2 and Baa2 Public Utility Bonds (1/3 * 0.35% = 0.12%) as derived from page 4 of this Schedule.
(4) From page 7 of this Schedule.

Aqua Ohio, Inc.
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1] Aaa Rated Corporate Bond	[2] A2 Rated Public Utility Bond	[3] Baa2 Rated Public Utility Bond
Sep-2022	4.57 %	5.26 %	5.60 %
Aug-2022	4.07	4.76	5.09
Jul-2022	4.06	4.78	5.15
Average	4.23 %	4.93 %	5.28 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds: 0.70 % (1)

Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds: 0.35 % (2)

Notes:
(1) Column [2] - Column [1].
(2) Column [3] - Column [2].

Source of Information:
Bloomberg Professional Services

Aqua Ohio, Inc.
Comparison of Long-Term Issuer Ratings for
Proxy Group of Six Water Companies

	Moody's		Standard & Poor's	
	Long-Term Issuer Rating October 2022		Long-Term Issuer Rating October 2022	
Proxy Group of Six Water Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
American States Water Company (2)	A2	6.0	A+	5.0
American Water Works Company, Inc. (3)	A3	7.0	A	6.0
California Water Service Group	NR	- -	A+	5.0
Essential Utilities Inc. (4)	Baa1	8.0	A	6.0
Middlesex Water Company	NR	- -	A	6.0
SJW Group (5)	NR	- -	A-	7.0
Average	A3	7.0	A	5.8

Notes:
(1) From page 6 of this Schedule.
(2) Ratings are that of Golden State Water Company.
(3) Ratings are that of New Jersey American Water Co., and Pennsylvania American Water Co.
(4) Ratings are that of PNG Companies and Aqua Pennsylvania, Inc. (S&P).
(5) Ratings are that of San Jose Water Company, Connecticut Water Inc. and Connecticut Water Service Inc.

Source Information: Moody's Investors Service
Standard & Poor's Global Utilities Rating Service

Numerical Assignment for Moody's and Standard & Poor's Bond Ratings

Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond Rating
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-
B1	14	B+
B2	15	B
B3	16	B-

Aqua Ohio, Inc.
Judgment of Equity Risk Premium for the
Proxy Group of Six Water Companies

Line No.		Proxy Group of Six Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	6.90 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A2 rated bonds (2)	4.64
3.	Average equity risk premium	5.77 %

Notes: (1) From page 8 of this Schedule.
(2) From page 12 of this Schedule.

Aqua Ohio, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Six Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Six Water Companies
1.	Ibbotson Equity Risk Premium (1)	6.13 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.09
3.	Ibbotson Equity Risk Premium based on PRPM (3)	10.12
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	10.85
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.48
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	7.36
7.	Conclusion of Equity Risk Premium	8.84 %
8.	Adjusted Beta (7)	0.78
9.	Forecasted Equity Risk Premium	6.90 %

Notes provided on page 9 of this Schedule.

Aqua Ohio, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Six Water Companies

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Kroll 2022 SBBI Yearbook minus the arithmetic mean monthly yield of Moody's average Aaa and Aa2 corporate bonds from 1928-2021.

(2) This equity risk premium is based on a regression of the monthly equity risk premiums of large company common stocks relative to Moody's average Aaa and Aa2 rated corporate bond yields from 1928-2021 referenced in note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the average consensus forecast of Aaa corporate bonds of 5.18% (from page 3 of this

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between large company common stock monthly returns and average Aaa and Aa2 corporate monthly bond yields, from January 1928 through September 2022.

(4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 5.18% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 16.03% (described fully in note 1 on page 2 of Schedule DWD-5).

(5) Using data from Value Line for the S&P 500, an expected total return of 16.66% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 5.18% results in an expected equity risk premium of 11.48%.

(6) Using data from the Bloomberg Professional Services for the S&P 500, an expected total return of 12.54% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 5.18% results in an expected equity risk premium of 7.36%.

(7) Average of mean and median beta from Schedule DWD-5.

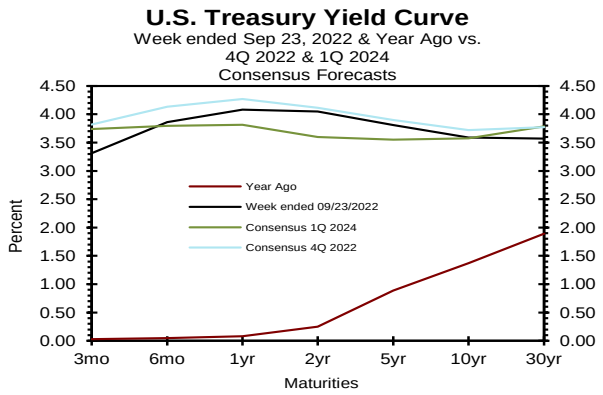
Sources of Information:

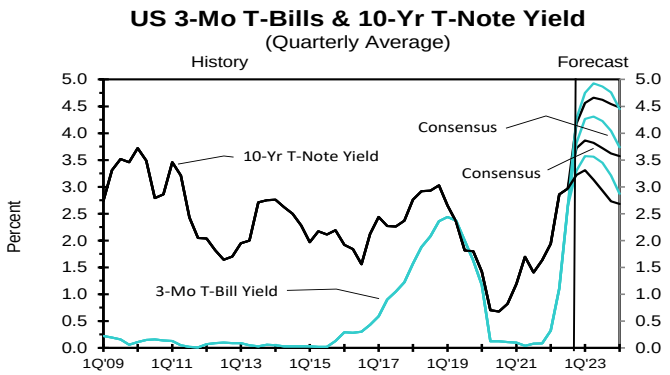
Stocks, Bonds, Bills, and Inflation - 2022 SBBI Yearbook, Kroll, Inc.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, June 1, 2022 and September 30, 2022
Bloomberg Professional Services

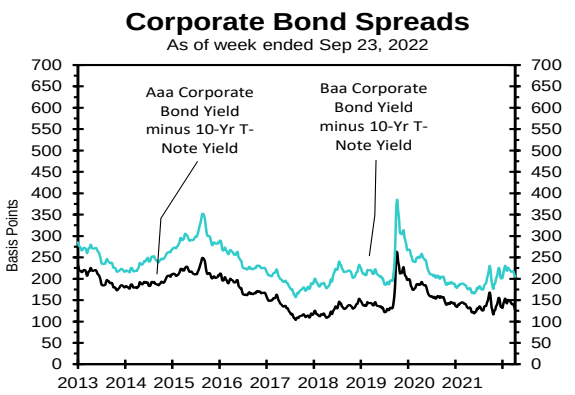
Consensus Forecasts of U.S. Interest Rates and Key Assumptions

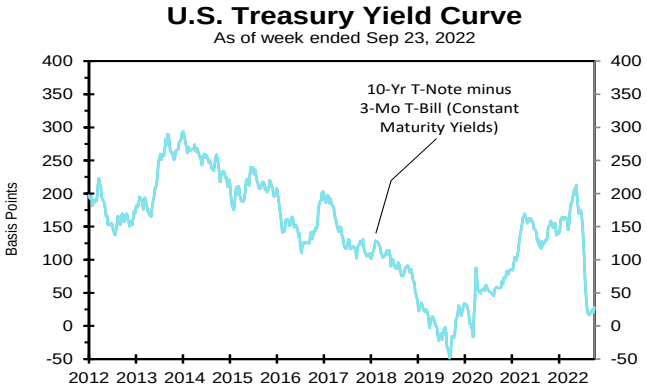
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Qtr*	4Q	1Q	2Q	3Q	4Q	1Q
Interest Rates	Sep 23	Sep 16	Sep 9	Sep 2	Aug	Jul	Jun	3Q 2022*	2022	2023	2023	2023	2023	2024
Federal Funds Rate	2.33	2.33	2.33	2.33	2.33	1.68	1.21	2.12	**3.8**	**4.3**	**4.4**	**4.3**	**4.2**	**3.9**
Prime Rate	5.50	5.50	5.50	5.50	5.50	4.85	4.38	5.29	**6.9**	**7.4**	**7.5**	**7.4**	**7.3**	**6.9**
SOFR	2.55	2.28	2.28	2.29	2.28	1.60	1.11	2.09	**3.6**	**4.2**	**4.3**	**4.3**	**4.1**	**3.7**
Commercial Paper, 1-mo.	3.04	2.64	2.54	2.39	2.33	1.90	1.35	2.26	**3.8**	**4.4**	**4.5**	**4.4**	**4.3**	**3.9**
Treasury bill, 3-mo.	3.31	3.22	3.06	2.96	2.72	2.30	1.54	2.71	**3.8**	**4.3**	**4.3**	**4.2**	**4.0**	**3.7**
Treasury bill, 6-mo.	3.86	3.72	3.45	3.32	3.15	2.87	2.17	3.20	**4.1**	**4.5**	**4.5**	**4.3**	**4.1**	**3.8**
Treasury bill, 1 yr.	4.08	3.91	3.62	3.48	3.28	3.02	2.65	3.35	**4.3**	**4.5**	**4.5**	**4.3**	**4.1**	**3.8**
Treasury note, 2 yr.	4.05	3.77	3.50	3.45	3.25	3.04	3.00	3.33	**4.1**	**4.3**	**4.2**	**4.0**	**3.8**	**3.6**
Treasury note, 5 yr.	3.81	3.59	3.41	3.31	3.03	2.96	3.19	3.17	**3.9**	**4.1**	**4.0**	**3.8**	**3.7**	**3.6**
Treasury note, 10 yr.	3.59	3.42	3.31	3.17	2.90	2.90	3.14	3.05	**3.7**	**3.9**	**3.8**	**3.7**	**3.6**	**3.6**
Treasury note, 30 yr.	3.57	3.50	3.46	3.29	3.13	3.10	3.25	3.23	**3.8**	**3.9**	**4.0**	**3.9**	**3.8**	**3.8**
Corporate Aaa bond	4.86	4.77	4.73	4.57	4.35	4.39	4.52	4.49	**5.0**	**5.4**	**5.4**	**5.4**	**5.2**	**5.1**
Corporate Baa bond	5.64	5.53	5.48	5.33	5.08	5.15	5.22	5.24	**6.0**	**6.4**	**6.5**	**6.4**	**6.3**	**6.1**
State & Local bonds	4.35	4.21	4.16	4.08	3.84	3.82	3.94	3.95	**4.4**	**4.6**	**4.7**	**4.6**	**4.5**	**4.4**
Home mortgage rate	6.29	6.02	5.89	5.66	5.22	5.41	5.52	5.53	**6.3**	**6.4**	**6.3**	**6.2**	**6.1**	**5.9**
	History								Consensus Forecasts-Quarterly					
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q
Key Assumptions	2020	2021	2021	2021	2021	2022	2022	2022**	2022	2023	2023	2023	2023	2024
Fed's AFE $ Index	105.1	103.4	102.9	105.0	107.0	108.4	113.7	118.5	**121.4**	**121.5**	**120.4**	**118.8**	**117.6**	**117.0**
Real GDP	3.9	6.3	7.0	2.7	7.0	-1.6	-0.6	1.4	**0.7**	**0.1**	**0.1**	**0.9**	**1.3**	**1.6**
GDP Price Index	2.5	5.2	6.3	6.2	6.8	8.3	9.0	4.9	**4.3**	**3.5**	**3.0**	**2.8**	**2.7**	**2.5**
Consumer Price Index	2.2	4.1	8.2	6.7	7.9	9.2	10.5	5.3	**3.9**	**3.4**	**3.0**	**2.6**	**2.5**	**2.4**
PCE Price Index	1.6	4.5	6.4	5.6	6.2	7.5	7.3	4.5	**3.7**	**3.2**	**2.7**	**2.5**	**2.4**	**2.3**

Forecasts for interest rates and the Federal Reserve's Advanced Foreign Economies Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index, CPI and PCE Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; SOFR from the New York Fed. *Interest rate data for 3Q 2022 based on historical data through the week ended Sep 23. **Data for 3Q 2022 for the Fed's AFE $ Index based on data through the week ended September 23. Figures for 3Q 2022 Real GDP, GDP Chained Price Index, Consumer Price Index, and PCE Price Index are consensus forecasts from the September 2022 survey.









Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2023 through 2028 and averages for the five-year periods 2024-2028 and 2029-2033. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

		Average For The Year						Five-Year Averages	
		2023	2024	2025	2026	2027	2028	2024-2028	2029-2033
1. Federal Funds Rate	**CONSENSUS**	**3.0**	**2.7**	**2.5**	**2.5**	**2.5**	**2.5**	**2.6**	**2.5**
	Top 10 Average	3.5	3.3	3.0	2.8	2.8	2.8	3.0	2.8
	Bottom 10 Average	2.6	2.1	2.0	2.2	2.2	2.2	2.2	2.1
2. Prime Rate	**CONSENSUS**	**6.1**	**5.9**	**5.7**	**5.6**	**5.6**	**5.6**	**5.7**	**5.6**
	Top 10 Average	6.6	6.4	6.1	6.0	6.0	6.0	6.1	5.9
	Bottom 10 Average	5.6	5.3	5.2	5.3	5.3	5.3	5.3	5.2
3. SOFR	**CONSENSUS**	**3.0**	**2.8**	**2.5**	**2.5**	**2.5**	**2.5**	**2.6**	**2.5**
	Top 10 Average	3.4	3.3	3.0	2.9	2.8	2.8	3.0	2.8
	Bottom 10 Average	2.7	2.2	2.0	2.2	2.2	2.2	2.2	2.1
4. Commercial Paper, 1-Mo	**CONSENSUS**	**3.2**	**2.9**	**2.6**	**2.6**	**2.6**	**2.6**	**2.7**	**2.6**
	Top 10 Average	3.5	3.4	3.1	2.9	2.9	2.9	3.0	2.9
	Bottom 10 Average	2.8	2.5	2.3	2.4	2.4	2.3	2.3	2.3
5. Treasury Bill Yield, 3-Mo	**CONSENSUS**	**3.0**	**2.8**	**2.6**	**2.6**	**2.6**	**2.5**	**2.6**	**2.5**
	Top 10 Average	3.6	3.4	3.1	3.1	3.0	2.9	3.1	2.9
	Bottom 10 Average	2.5	2.2	2.0	2.1	2.2	2.2	2.1	2.2
6. Treasury Bill Yield, 6-Mo	**CONSENSUS**	**3.2**	**2.9**	**2.7**	**2.7**	**2.7**	**2.6**	**2.7**	**2.6**
	Top 10 Average	3.8	3.6	3.2	3.2	3.1	3.0	3.2	3.0
	Bottom 10 Average	2.6	2.2	2.1	2.2	2.3	2.3	2.2	2.3
7. Treasury Bill Yield, 1-Yr	**CONSENSUS**	**3.2**	**3.0**	**2.9**	**2.9**	**2.8**	**2.8**	**2.9**	**2.8**
	Top 10 Average	3.9	3.8	3.5	3.4	3.3	3.2	3.4	3.2
	Bottom 10 Average	2.6	2.4	2.2	2.4	2.4	2.4	2.3	2.4
8. Treasury Note Yield, 2-Yr	**CONSENSUS**	**3.4**	**3.2**	**3.1**	**3.1**	**3.0**	**3.0**	**3.1**	**3.0**
	Top 10 Average	4.3	4.1	3.8	3.6	3.5	3.5	3.7	3.5
	Bottom 10 Average	2.7	2.4	2.3	2.5	2.6	2.5	2.4	2.5
9. Treasury Note Yield, 5-Yr	**CONSENSUS**	**3.5**	**3.4**	**3.3**	**3.3**	**3.3**	**3.2**	**3.3**	**3.3**
	Top 10 Average	4.3	4.2	4.1	3.9	3.8	3.8	3.9	3.8
	Bottom 10 Average	2.8	2.6	2.5	2.7	2.7	2.7	2.6	2.8
10. Treasury Note Yield, 10-Yr	**CONSENSUS**	**3.5**	**3.5**	**3.4**	**3.5**	**3.5**	**3.4**	**3.5**	**3.5**
	Top 10 Average	4.4	4.4	4.2	4.2	4.1	4.1	4.2	4.1
	Bottom 10 Average	2.8	2.5	2.6	2.9	2.9	2.8	2.7	2.8
11. Treasury Bond Yield, 30-Yr	**CONSENSUS**	**3.8**	**3.8**	**3.8**	**3.9**	**3.8**	**3.8**	**3.8**	**3.9**
	Top 10 Average	4.6	4.7	4.5	4.5	4.4	4.5	4.5	4.5
	Bottom 10 Average	3.0	2.9	3.0	3.3	3.2	3.2	3.1	3.2
12. Corporate Aaa Bond Yield	**CONSENSUS**	**5.0**	**5.0**	**4.9**	**5.0**	**5.0**	**4.9**	**4.9**	**5.0**
	Top 10 Average	5.7	5.7	5.6	5.5	5.5	5.5	5.5	5.6
	Bottom 10 Average	4.4	4.2	4.3	4.4	4.4	4.4	4.3	4.4
13. Corporate Baa Bond Yield	**CONSENSUS**	**6.0**	**5.9**	**5.8**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
	Top 10 Average	6.6	6.6	6.4	6.3	6.3	6.3	6.4	6.4
	Bottom 10 Average	5.4	5.3	5.2	5.4	5.4	5.4	5.3	5.4
14. State & Local Bonds Yield	**CONSENSUS**	**4.3**	**4.3**	**4.2**	**4.3**	**4.3**	**4.3**	**4.3**	**4.3**
	Top 10 Average	5.0	5.0	4.8	4.8	4.7	4.7	4.8	4.8
	Bottom 10 Average	3.7	3.7	3.7	3.9	3.9	3.9	3.8	3.9
15. Home Mortgage Rate	**CONSENSUS**	**5.7**	**5.5**	**5.4**	**5.4**	**5.4**	**5.4**	**5.4**	**5.4**
	Top 10 Average	6.4	6.4	6.1	6.0	6.0	6.0	6.1	6.0
	Bottom 10 Average	4.9	4.7	4.6	4.8	4.8	4.8	4.7	4.8
A. Fed's AFE Nominal $ Index	**CONSENSUS**	**113.8**	**112.8**	**111.9**	**111.0**	**110.6**	**110.4**	**111.3**	**109.8**
	Top 10 Average	115.6	114.7	114.0	113.4	113.1	112.8	113.6	112.7
	Bottom 10 Average	112.2	111.0	109.9	108.8	108.2	107.9	109.2	107.4
		Year-Over-Year, % Change						Five-Year Averages	
		2023	2024	2025	2026	2027	2028	2024-2028	2029-2033
B. Real GDP	**CONSENSUS**	**2.0**	**2.0**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.0**
	Top 10 Average	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.3
	Bottom 10 Average	1.5	1.5	1.8	1.8	1.8	1.8	1.7	1.8
C. GDP Chained Price Index	**CONSENSUS**	**3.0**	**2.4**	**2.3**	**2.3**	**2.2**	**2.2**	**2.3**	**2.2**
	Top 10 Average	3.7	2.8	2.7	2.6	2.6	2.6	2.7	2.6
	Bottom 10 Average	2.3	2.0	1.9	1.9	1.9	1.9	1.9	1.9
D. Consumer Price Index	**CONSENSUS**	**3.2**	**2.4**	**2.4**	**2.4**	**2.3**	**2.3**	**2.4**	**2.3**
	Top 10 Average	4.1	3.0	2.9	2.8	2.7	2.7	2.8	2.7
	Bottom 10 Average	2.3	1.8	2.0	2.0	1.9	1.9	1.9	1.9
E. PCE Price Index	**CONSENSUS**	**3.0**	**2.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.3**	**2.3**
	Top 10 Average	3.8	2.8	2.8	2.7	2.7	2.6	2.7	2.7
	Bottom 10 Average	2.2	1.8	1.9	1.9	1.9	1.8	1.9	1.9

Aqua Ohio, Inc.
Derivation of Mean Equity Risk Premium Based Studies
Using Holding Period Returns and
Projected Market Appreciation of the S&P Utility Index

Line No.		Implied Equity Risk Premium
1.	Historical Equity Risk Premium (1)	4.28 %
2.	Regression of Historical Equity Risk Premium (2)	4.80
3.	Forecasted Equity Risk Premium Based on PRPM (3)	5.13
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	3.65
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	5.36
6.	Average Equity Risk Premium (6)	4.64 %

Notes:
(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2021. Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.
(2) This equity risk premium is based on a regression of the monthly equity risk premiums of the S&P Utility Index relative to Moody's A2 rated public utility bond yields from 1928 - 2021 referenced in note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the prospective A2 rated public utility bond yield of 5.88% (from line 3, page 3 of this Schedule).
(3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A2 rated public utility bonds from January 1928 - September 2022.
(4) Using data from Value Line for the S&P Utilities Index, an expected return of 9.53% was derived based on expected dividend yields as a proxy for income returns and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 5.88%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 3.65%. (9.53% - 5.88% = 3.65%)
(5) Using data from Bloomberg Professional Services for the S&P Utilities Index, an expected return of 11.24% was derived based on expected dividend yields as a proxy for income returns and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 5.88%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 5.36%. (11.24% - 5.88% = 5.36%)
(6) Average of lines 1 through 5.

Aqua Ohio, Inc.
Indicated Common Equity Cost Rate Through Use
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

Proxy Group of Six Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
American States Water Company	0.65	0.74	0.70	10.18 %	3.86 %	10.99 %	11.75 %	11.37 %
American Water Works Company, Inc.	0.90	0.89	0.90	10.18	3.86	13.03	13.28	13.15
California Water Service Group	0.70	0.81	0.75	10.18	3.86	11.50	12.13	11.82
Essential Utilities Inc.	0.95	0.86	0.91	10.18	3.86	13.13	13.36	13.24
Middlesex Water Company	0.70	0.75	0.72	10.18	3.86	11.19	11.90	11.55
SJW Group	0.80	0.72	0.76	10.18	3.86	11.60	12.21	11.90
Mean			0.79			11.90 %	12.44 %	12.17 %
Median			0.76			11.55 %	12.17 %	11.86 %
Average of Mean and Median			0.78			11.73	12.31	12.02 %

Notes on page 2 of this Schedule.

Aqua Ohio, Inc.
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

(1) The market risk premium (MRP) is derived by using six different measures from three sources: Ibbotson, Value Line, and Bloomberg as illustrated below:

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2021)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2021:	12.37	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.02	
MRP based on Ibbotson Historical Data:	7.35	%

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data
(1926-2021) 8.76 %

Measure 3: Application of the PRPM to Ibbotson Historical Data:
(January 1926 - September 2022) 11.34 %

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending October 14, 2022)

Total projected return on the market 3-5 years hence*:	16.03	%
Projected Risk-Free Rate (see note 2):	3.86	
MRP based on Value Line Summary & Index:	12.17	%

*Forcasted 3-5 year capital appreciation plus expected dividend yield

Measure 5: Value Line Projected Return on the Market based on the S&P 500

Total return on the Market based on the S&P 500:	16.66	%
Projected Risk-Free Rate (see note 2):	3.86	
MRP based on Value Line data	12.80	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	12.54	%
Projected Risk-Free Rate (see note 2):	3.86	
MRP based on Bloomberg data	8.68	%
Average of Value Line, Ibbotson, and Bloomberg MRP:	10.18	%

(2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 10-11 of Schedule DWD-4.) The projection of the risk-free rate is illustrated below:

Fourth Quarter 2022	3.80	%
First Quarter 2023	3.90	
Second Quarter 2023	4.00	
Third Quarter 2023	3.90	
Fourth Quarter 2023	3.80	
First Quarter 2024	3.80	
2024-2028	3.80	
2029-2033	3.90	
	3.86	%

(3) Average of Column 6 and Column 7.

Sources of Information:
Value Line Summary and Index
Blue Chip Financial Forecasts, June 1, 2022 and September 30, 2022
Stocks, Bonds, Bills, and Inflation - 2022 SBBI Yearbook, Kroll, Inc.
Bloomberg Professional Services

Aqua Ohio, Inc.
Basis of Selection of the Group of Non-Price Regulated Companies
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the proxy group of twenty-seven non-price regulated companies was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group were then selected based on the unadjusted beta range of 0.49 – 0.77 and residual standard error of the regression range of 2.8333 – 3.3793 of the Utility Proxy Group.

These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression. Plus or minus two standard deviations captures 95.50% of the distribution of unadjusted betas and residual standard errors of the regression.

The standard deviation of the Utility Proxy Group's residual standard error of the regression is 0.1365. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1365 = \frac{3.1063}{\sqrt{518}} = \frac{3.1063}{22.7596}$$

Source of Information: Value Line, Inc., September 2022
Value Line Investment Survey (Standard Edition)

Aqua Ohio, Inc.
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

Proxy Group of Six Water Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
American States Water Company	0.65	0.44	2.6059	0.0604
American Water Works Company, Inc.	0.90	0.78	3.3488	0.0776
California Water Service Group	0.70	0.48	3.1091	0.0721
Essential Utilities Inc.	0.95	0.91	2.7564	0.0639
Middlesex Water Company	0.70	0.51	3.4761	0.0806
SJW Group	0.80	0.65	3.3417	0.0775
Average	0.78	0.63	3.1063	0.0720
Beta Range (+/- 2 std. Devs. of Beta)	0.49	0.77		
2 std. Devs. of Beta	0.14			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.8333	3.3793		
Std. dev. of the Res. Std. Err.	0.1365			
2 std. devs. of the Res. Std. Err.	0.2730			

Source of Information: Valueline Proprietary Database, September 2022

Aqua Ohio, Inc.
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Six Water Companies

Proxy Group of Twenty-Seven Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Balchem Corp.	0.75	0.56	3.3474	0.0776
Becton, Dickinson	0.75	0.59	2.9969	0.0695
Black Knight, Inc.	0.75	0.56	3.1415	0.0728
Booz Allen Hamilton	0.85	0.76	3.1644	0.0733
Bristol-Myers Squibb	0.85	0.70	2.9185	0.0676
C.H. Robinson	0.70	0.54	3.3437	0.0775
Chemed Corp.	0.80	0.66	2.8403	0.0658
CSG Systems Int'l	0.75	0.56	2.8967	0.0671
CSW Industrials	0.85	0.76	3.0218	0.0700
Heartland Express	0.70	0.51	3.0304	0.0702
Henry (Jack) & Assoc	0.85	0.70	2.9759	0.0690
Lilly (Eli)	0.80	0.63	3.3732	0.0782
McCormick & Co.	0.75	0.62	3.0694	0.0711
Merck & Co.	0.80	0.63	2.9122	0.0675
Monster Beverage	0.85	0.76	2.9657	0.0687
NewMarket Corp.	0.75	0.59	2.9165	0.0676
Northrop Grumman	0.80	0.67	3.3239	0.0770
Oracle Corp.	0.80	0.67	2.8812	0.0668
Pfizer, Inc.	0.80	0.69	2.9056	0.0673
Progressive Corp.	0.75	0.60	3.0605	0.0709
Quest Diagnostics	0.80	0.62	3.2991	0.0765
RLI Corp.	0.75	0.62	2.9185	0.0676
Rollins, Inc.	0.85	0.71	3.2681	0.0758
Selective Ins. Group	0.85	0.76	3.0002	0.0695
Watsco, Inc.	0.85	0.73	2.8872	0.0669
Werner Enterprises	0.75	0.56	3.3343	0.0773
Western Union	0.80	0.68	3.0050	0.0697
Average	0.79	0.65	3.0666	0.0711
Proxy Group of Six Water Companies	0.78	0.63	3.1063	0.0720

Source of Information: Valueline Proprietary Database, September 2022

Aqua Ohio, Inc.
Summary of Cost of Equity Models Applied to
Proxy Group of Twenty-Seven Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Six Water Companies

Principal Methods	Proxy Group of Twenty-Seven Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	11.19 %
Risk Premium Model (RPM) (2)	12.92
Capital Asset Pricing Model (CAPM) (3)	12.06
Mean	12.06 %
Median	12.06 %
Average of Mean and Median	12.06 %

Notes:
(1) From page 2 of this Schedule.
(2) From page 3 of this Schedule.
(3) From page 6 of this Schedule.

Aqua Ohio, Inc.
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Six Water Companies

Proxy Group of Twenty-Seven Non-Price Regulated Companies	[1] Average Dividend Yield	[2] Value Line Projected Five Year Growth in EPS	[3] Zack's Five Year Projected Growth Rate in EPS	[4] Yahoo! Finance Projected Five Year Growth in EPS	[5] Average Projected Five Year Growth Rate in EPS	[6] Adjusted Dividend Yield	[7] Indicated Common Equity Cost Rate (1)
Balchem Corp.	0.49 %	14.50 %	NA %	24.00 %	19.25 %	0.54 %	19.79 %
Becton, Dickinson	1.41	4.50	7.70	4.80	5.67	1.45	7.12
Black Knight, Inc.	-	10.50	10.20	10.15	10.28	-	NA
Booz Allen Hamilton	1.80	7.00	7.50	7.50	7.33	1.87	9.20
Bristol-Myers Squibb	3.02	NA	6.30	4.44	5.37	3.10	8.47
C.H. Robinson	2.05	8.50	9.00	6.00	7.83	2.13	9.96
Chemed Corp.	0.32	7.00	7.10	7.10	7.07	0.33	7.40
CSG Systems Int'l	1.85	12.00	NA	(5.00)	12.00	1.96	13.96
CSW Industrials	0.54	11.50	NA	12.00	11.75	0.57	12.32
Heartland Express	0.53	8.50	NA	13.30	10.90	0.56	11.46
Henry (Jack) & Assoc	1.00	9.00	9.00	14.00	10.67	1.05	11.72
Lilly (Eli)	1.24	11.50	19.50	18.13	16.38	1.34	17.72
McCormick & Co.	1.79	5.00	5.30	5.10	5.13	1.84	6.97
Merck & Co.	3.12	8.00	10.20	10.80	9.67	3.27	12.94
Monster Beverage	-	10.50	10.30	14.65	11.82	-	NA
NewMarket Corp.	2.80	(1.50)	NA	7.70	7.70	2.91	10.61
Northrop Grumman	1.44	6.50	2.20	3.00	3.90	1.47	5.37
Oracle Corp.	1.77	9.00	8.00	10.13	9.04	1.85	10.89
Pfizer, Inc.	3.41	6.50	12.50	NA	9.50	3.57	13.07
Progressive Corp.	0.33	6.50	18.70	25.80	17.00	0.36	17.36
Quest Diagnostics	2.03	3.50	NA	(14.72)	3.50	2.07	5.57
RLI Corp.	0.94	12.00	NA	9.80	10.90	0.99	11.89
Rollins, Inc.	1.11	10.50	NA	8.20	9.35	1.16	10.51
Selective Ins. Group	1.37	9.50	5.70	13.40	9.53	1.44	10.97
Watsco, Inc.	3.21	11.50	NA	15.00	13.25	3.42	16.67
Werner Enterprises	1.28	9.00	5.80	7.30	7.37	1.33	8.70
Western Union	6.20	8.00	NA	(2.74)	8.00	6.45	14.45
						Mean	11.40 %
						Median	10.97 %
						Average of Mean and Median	11.19 %

NA= Not Available
NMF= Not Meaningful Figure

(1) The application of the DCF model to the domestic, non-price regluated comparable risk companies is identical to the application of the DCF to the utility proxy group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of October 14, 2022. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information:
Value Line Investment Survey
www.zacks.com Downloaded on 10/14/2022
www.yahoo.com Downloaded on 10/14/2022
Bloomberg Professional Services

Aqua Ohio, Inc.
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Twenty-Seven Non-Price Regulated Companies
1.	Prospective Yield on Baa2 Rated Corporate Bonds (1)	6.19 %
2.	Adjustment to Reflect Proxy Group Bond Rating (2)	(0.17)
3.	Prospective Bond Yield Applicable to the Non-Price Regulated Proxy Group	6.02
4.	Equity Risk Premium (3)	6.90
5.	Risk Premium Derived Common Equity Cost Rate	12.92 %

Notes: (1) Average forecast of Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated June 1, 2022 and September 30, 2022 (see pages 10 and 11 of Schedule DWD-4). The estimates are detailed below.

Fourth Quarter 2022	6.00 %
First Quarter 2023	6.40
Second Quarter 2023	6.50
Third Quarter 2023	6.40
Fourth Quarter 2023	6.30
First Quarter 2024	6.10
2024-2028	5.90
2029-2033	5.90
Average	6.19 %

(2) To reflect the Baa1 average rating of the Non-Price Regulated Proxy Group, the prosepctive yield on Baa2 corporate bonds must be adjusted downward by 1/3 of the spread between A2 and Baa2 corporate bond yields as shown below:

	A2 Corp. Bond Yield	Baa2 Corp. Bond Yield	Spread
Sep-2022	5.16 %	5.68 %	0.52 %
Aug-2022	4.65	5.15	0.50
Jul-2022	4.67	5.21	0.54
	Average yield spread		0.52 %
		1/3 of spread	0.17 %

(3) From page 5 of this Schedule.

Aqua Ohio, Inc.
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Twenty-Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Six Water Companies

Proxy Group of Twenty-Seven Non-Price Regulated Companies	Moody's Long-Term Issuer Rating October 2022		Standard & Poor's Long-Term Issuer Rating October 2022	
	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Balchem Corp.	NA	--	NA	--
Becton, Dickinson	Baa2	9.0	BBB	9.0
Black Knight, Inc.	Ba3	13.0	BB	12.0
Booz Allen Hamilton	NA	--	NA	--
Bristol-Myers Squibb	A2	6.0	A+	5.0
C.H. Robinson	Baa2	9.0	BBB+	8.0
Chemed Corp.	WR	--	NR	--
CSG Systems Int'l	NA	--	BB+	11.0
CSW Industrials	NA	--	NA	--
Heartland Express	NA	--	NA	--
Henry (Jack) & Assoc	NA	--	NA	--
Lilly (Eli)	A2	6.0	A+	5.0
McCormick & Co.	Baa2	9.0	BBB	9.0
Merck & Co.	A1	5.0	A+	5.0
Monster Beverage	NA	--	NA	--
NewMarket Corp.	Baa2	9.0	BBB+	8.0
Northrop Grumman	Baa1	8.0	BBB+	8.0
Oracle Corp.	Baa2	9.0	BBB	9.0
Pfizer, Inc.	A2	6.0	A+	5.0
Progressive Corp.	A2	6.0	A	6.0
Quest Diagnostics	Baa2	9.0	BBB+	8.0
RLI Corp.	Baa2	9.0	BBB	9.0
Rollins, Inc.	NA	--	NA	--
Selective Ins. Group	Baa2	9.0	BBB	9.0
Watsco, Inc.	NA	--	NA	--
Werner Enterprises	NA	--	NA	--
Western Union	Baa2	9.0	BBB	9.0
Average	Baa1	8.2	BBB+	7.9

Notes:
(1) From page 6 of Schedule DWD-4.

Source of Information:
Bloomberg Professional Services

Aqua Ohio, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Twenty-Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Six Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Twenty-Seven Non-Price Regulated Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	6.13 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.09
3.	Ibbotson Equity Risk Premium based on PRPM (3)	10.12
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	10.85
5	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.48
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	7.36
7.	Conclusion of Equity Risk Premium	8.84 %
8.	Adjusted Beta (7)	0.78
9.	Forecasted Equity Risk Premium	6.90 %

Notes:
(1) From note 1 of page 9 of Schedule DWD-4.
(2) From note 2 of page 9 of Schedule DWD-4.
(3) From note 3 of page 9 of Schedule DWD-4.
(4) From note 4 of page 9 of Schedule DWD-4.
(5) From note 5 of page 9 of Schedule DWD-4.
(6) From note 6 of page 9 of Schedule DWD-4.
(7) Average of mean and median beta from page 6 of this Schedule.

Sources of Information:
Stocks, Bonds, Bills, and Inflation - 2022 SBBI Yearbook, Kroll, Inc.
Value Line Summary and Index
Blue Chip Financial Forecasts, June 1, 2022 and September 30, 2022
Bloomberg Professional Services

Aqua Ohio, Inc.
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Twenty-Seven Non-Price Regulated Companies	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
Balchem Corp.	0.75	0.88	0.81	10.18 %	3.86 %	12.11 %	12.59 %	12.35 %
Becton, Dickinson	0.75	0.67	0.71	10.18	3.86	11.09	11.83	11.46
Black Knight, Inc.	0.75	0.65	0.70	10.18	3.86	10.99	11.75	11.37
Booz Allen Hamilton	0.85	0.81	0.83	10.18	3.86	12.31	12.75	12.53
Bristol-Myers Squibb	0.85	0.56	0.71	10.18	3.86	11.09	11.83	11.46
C.H. Robinson	0.70	0.87	0.79	10.18	3.86	11.90	12.44	12.17
Chemed Corp.	0.80	0.72	0.76	10.18	3.86	11.60	12.21	11.90
CSG Systems Int'l	0.70	0.80	0.75	10.18	3.86	11.50	12.13	11.82
CSW Industrials	0.85	0.90	0.87	10.18	3.86	12.72	13.05	12.89
Heartland Express	0.70	0.71	0.70	10.18	3.86	10.99	11.75	11.37
Henry (Jack) & Assoc	0.80	0.77	0.79	10.18	3.86	11.90	12.44	12.17
Lilly (Eli)	0.80	0.78	0.79	10.18	3.86	11.90	12.44	12.17
McCormick & Co.	0.75	0.73	0.74	10.18	3.86	11.40	12.06	11.73
Merck & Co.	0.80	0.52	0.66	10.18	3.86	10.58	11.45	11.01
Monster Beverage	0.85	0.82	0.83	10.18	3.86	12.31	12.75	12.53
NewMarket Corp.	0.75	0.62	0.69	10.18	3.86	10.89	11.68	11.28
Northrop Grumman	0.80	0.66	0.73	10.18	3.86	11.29	11.98	11.64
Oracle Corp.	0.80	0.94	0.87	10.18	3.86	12.72	13.05	12.89
Pfizer, Inc.	0.80	0.74	0.77	10.18	3.86	11.70	12.29	11.99
Progressive Corp.	0.75	0.72	0.74	10.18	3.86	11.40	12.06	11.73
Quest Diagnostics	0.80	0.63	0.72	10.18	3.86	11.19	11.91	11.55
RLI Corp.	0.75	0.81	0.78	10.18	3.86	11.80	12.36	12.08
Rollins, Inc.	0.85	0.86	0.86	10.18	3.86	12.62	12.97	12.80
Selective Ins. Group	0.85	0.76	0.80	10.18	3.86	12.01	12.52	12.26
Watsco, Inc.	0.85	0.97	0.91	10.18	3.86	13.13	13.36	13.24
Werner Enterprises	0.75	0.83	0.79	10.18	3.86	11.90	12.44	12.17
Western Union	0.80	0.86	0.83	10.18	3.86	12.31	12.75	12.53
Mean			0.78			11.75 %	12.33 %	12.04 %
Median			0.78			11.80 %	12.36 %	12.08 %
Average of Mean and Median			0.78			11.78 %	12.35 %	12.06 %

Notes:
(1) From Schedule DWD-5, note 1.
(2) From Schedule DWD-5, note 2.
(3) Average of CAPM and ECAPM cost rates.

Aqua Ohio, Inc.
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		[1] Market Capitalization on October 14, 2022 (1) (millions)		[2] Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	[3] Applicable Size Premium (3)	[4] Spread from Applicable Size Premium (4)
1.	Aqua Ohio, Inc.	$ 752.590		8	1.21%	
2.	Proxy Group of Six Water Companies	$ 3,035.903	4.0 x	6	1.18%	0.03%
		[A]		[B]	[C]	[D]

	Decile	Market Capitalization of Smallest Company (millions)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
Largest	1	$ 36,160.584	$ 2,324,390.219	-0.22%
	2	16,759.390	36,099.221	0.43%
	3	8,216.356	16,738.364	0.55%
	4	5,019.883	8,212.638	0.54%
	5	3,281.009	5,003.747	0.89%
	6	2,170.315	3,276.553	1.18%
	7	1,306.402	2,164.524	1.34%
	8	629.118	1,306.038	1.21%
	9	290.002	627.803	2.10%
Smallest	10	10.588	289.007	4.80%

*From 2022 Duff & Phelps Cost of Capital Navigator

Notes:
(1) From page 2 of this Schedule.
(2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].
(3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.
(4) Line No. 1 Column [3] – Line No. 2 Column [3]. For example, the 0.03% in Column [4], Line No. 2 is derived as follows 0.03% = 1.21% - 1.18%.

Aqua Ohio, Inc.
Market Capitalization of Aqua Ohio, Inc. and the
Proxy Group of Six Water Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2021 (millions)	[2] Book Value per Share at Fiscal Year End 2021 (1)	[3] Total Common Equity at Fiscal Year End 2021 (millions)	[4] Closing Stock Market Price on October 14, 2022	[5] Market-to-Book Ratio on October 14, 2022 (2)	[6] Market Capitalization on October 14, 2022 (3) (millions)
Aqua Ohio, Inc.		NA	NA	$ 265.090 (4)	NA		
Based upon Proxy Group of Six Water Companies						283.9 (5)	$ 752.590 (6)
Proxy Group of Six Water Companie							
American States Water Company	NYSE	36.936	$ 18.571	$ 685.947	$ 84.880	457.1 %	$ 3,135.152
American Water Works Company, Inc.	NYSE	181.611	40.185	7,298.000	128.440	319.6	$ 23,326.128
California Water Service Group	NYSE	53.716	22.023	1,182.980	54.670	248.2	$ 2,936.654
Essential Utilities Inc.	NYSE	252.868	20.503	5,184.450	$ 39.910	194.7	$ 10,091.947
Middlesex Water Company	NASDAQ	17.522	20.987	367.726	81.020	386.0	$ 1,419.632
SJW Group	NYSE	30.181	34.277	1,034.519	62.200	181.5	1,877.280
Median		45.326	$ 21.505	$ 1,108.750	$ 71.610	283.9 %	$ 3,035.903

NA= Not Available

Notes: (1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 1 * Column 4.
(4) Requested rate base multiplied by requested common equity ratio.
(5) The market-to-book ratio of Aqua Ohio, Inc. on October 14, 2022 is assumed to be equal to the market-to-book ratio of Proxy Group of Six Water Companies on October 14, 2022 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2021 Annual Forms 10K
Bloomberg Financial Services

Aqua Ohio, Inc.
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

Equity Issuances and Flotation Costs of the Parent Since 2019

Date	Transaction	[Column 1] Shares Issued	[Column 2] Gross Equity Issue before Costs	[Column 3] Total Flotation Costs	[Column 4] Total Net Proceeds (1)	[Column 5] Flotation Cost Percentage (2)
08/09/21	Equity Offering	6,700,000	$ 308,200,000	$ 8,461,000	$ 299,739,000	2.75%
03/16/20	Equity Offering	21,661,095	$ 749,907,000	$ 20,606,000	$ 729,301,000	2.75%
04/23/19	Equity Offering	37,370,017	$ 1,293,750,000	$ 30,651,000	$ 1,263,099,000	2.37%
			$ 2,351,857,000	$ 59,718,000	$ 2,292,139,000	2.54%

Flotation Cost Adjustment

	[Column 6] Average Dividend Yield (3)	[Column 7] Average Projected EPS Growth Rate (3)	[Column 8] Adjusted Dividend Yield	[Column 9] Average DCF Cost Rate Unadjusted for Flotation (3)	[Column 10] DCF Cost Rate Adjusted for Flotation (4)	[Column 11] Flotation Cost Adjustment (5)
Proxy Group of Six Water Companies	1.89 %	7.28 %	1.96 %	9.24 %	9.29 %	0.05 %

Notes:
(1) Column 2 - Column 3.
(2) (Column 2 - Column 4) / Column 2.
(3) From page 1 of Schedule DWD-3.
(4) Adjustment for flotation costs based on adjusting the average constant growth DCF cost rate in accordance with the following:

$$K = \frac{D(1+0.5g)}{P(1-F)} + g$$

Where g is the growth factor and F is the percentage of flotation costs.

(5) Column 10 - Column 9.

Source of Information: Company SEC filed documents