THE YORK WATER COMPANY

Direct Testimony

Of

Paul R. Moul, Managing Consultant
P. Moul & Associates

Concerning
Fair Rate of Return

May 27, 2022

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Appendix A - Educational Background, Business Experience and Qualifications

GLOSSARY OF ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
AFUDC	Allowance for Funds Used During Construction
b	Represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
β	Beta
b x r	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
DCF	Discounted Cash Flow
DDBP	Disinfection/Disinfection By-Products
EPA	Environmental Protection Agency
ESWTR	Enhanced Surface Water Treatment Rule
FOMC	Federal Open Market Committee
g	Growth rate
IGF	Internally generated funds
M&M	Modigliani & Miller
MTBE	Methyl Tertiary Butyl Ether
PEDFA	Pennsylvania Economic Development Financing Authority
PUC	Public Utility Commission
r	Represents the expected rate of return on common equity
Rf	Risk-free rate of return
Rm	Market risk premium
RP	Risk Premium
s	Represents the new common shares expected to be issued by a firm
s x v	Represents external growth
S&P	Standard & Poor's
SBBI	Stocks, Bonds, Bills and Inflation

GLOSSARY OF ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
SDWA	Safe Drinking Water Act Amendments of 1996
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value.

DIRECT TESTIMONY OF PAUL R. MOUL

1 **INTRODUCTION AND SUMMARY OF RECOMMENDATIONS**

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

3 A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road,

4 Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm P. Moul

5 & Associates, an independent financial and regulatory consulting firm. My

6 educational background, business experience and qualifications are provided in

7 Appendix A that follows my direct testimony.

8 **Q. What is the purpose of your testimony?**

9 A. My testimony presents evidence, analysis and recommendation concerning the

10 appropriate cost of common equity and overall rate of return that the Pennsylvania

11 Public Utility Commission ("PUC" or the "Commission") should recognize in the

12 determination of the revenues that The York Water Company ("York Water" or the

13 "Company") should realize as a result of this proceeding. My analysis and

14 recommendation are supported by the detailed financial data set forth in Exhibit No.

15 FVII, which is a multi-page document that is divided into fourteen (14) schedules. The

16 items covered in these appendices deal with the technical aspects of my testimony.

17 **Q. Based upon your analysis, what is your conclusion concerning the appropriate**

18 **rate of return for the Company?**

19 A. Based upon my independent analysis, my conclusion is that the Company should be

20 afforded an opportunity to earn a rate of return on common equity of 11.25%. My cost

21 of equity determination should be viewed in the context of increasing capital costs

22 revealed by rising interest rates and the need for supportive regulation at a time of

23 increased infrastructure improvements now underway for the Company. As shown on

24 Schedule 1, I have provided the weighted average cost of capital of 7.93%, which

25 includes the 11.25% rate of return on common equity. The calculation of the weighted

26 average cost of capital requires the selection of appropriate capital structure ratios

1   and a determination of the cost rate for each capital component. In the case of the

2   capital structure ratios, the components are taken from the fully projected future test

3   year ("FPFTY") ended February 29, 2024. My overall cost of capital recommendation

4   is set forth below and is shown on page 1 of Schedule 1.

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.23%	3.91%	1.77%
Common Equity	54.77%	11.25%	6.16%
Total	100.00%		7.93%

5   The resulting overall rate of return, when applied to the Company's rate base, will

6   provide a compensatory level of return for the use of capital and provide the Company

7   with the ability to attract capital on reasonable terms.

8   **Q.**   **What background information concerning the Company have you considered as**

9   **part of your testimony?**

10   A.   York Water provides water service to 73,144 customers in York County, including the

11   City of York, and in Adams County. The Company's source of supply consists of

12   surface water obtained from the south and east branches of the Codorus Creek and

13   the Susquehanna River. The Company also provides wastewater service to 3,280

14   customers.

15   The Company's water sales were represented by approximately 50% to

16   residential customers, 27% to commercial customers, 16% to industrial customers,

17   and 7% to other customers including sales for resale. While representing 16% of

18   sales, industrial customers comprise less than one-half of one-percent of the

19   Company's customers (i.e., 304 customers). This means that the water demands of a

20   few customers can have a significant impact on the Company's operations.

1   York Water has taken a leadership position in the consolidation of separate

2   water utility systems in York and Adams Counties. Since 1978, the Company has

3   acquired over 40 systems. During the past five years, the Company has experienced

4   approximately 2.0% annual growth in customers, attributed mostly to acquisitions.

5   Acquisitions often require investment of new capital to remedy deficiencies in the

6   systems acquired. The benefits of regionalization accrue to all of the Company's

7   constituencies -- new customers and local municipalities benefit from the Company's

8   management expertise, which enhances service reliability and water quality of the

9   acquired systems; existing customers benefit from the economies of scale derived

10   from adding new customers; the Company's employees benefit from a wider scope of

11   responsibilities and opportunities for professional development; and investors benefit

12   from the additional growth of the Company.

13   **Q. In your opinion, what factors should the Commission consider when**

14   **determining the Company's cost of capital in this proceeding?**

15   A.   The Commission's rate of return allowance must be set to cover the Company's

16   interest and dividend payments, provide a reasonable level of earnings retention,

17   produce an adequate level of internally generated funds to meet capital requirements,

18   be commensurate with the risk to which the Company's capital is exposed, assure

19   confidence in the financial integrity of the Company, support reasonable credit quality,

20   and allow the Company to raise capital on reasonable terms. The return that I

21   propose fulfills these established standards of a fair rate of return set forth by the

22   landmark Bluefield and Hope cases.[1] That is to say, my proposed rate of return is

23   commensurate with returns available on investments having corresponding risks.

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

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

1   A.   The cost of common equity is established using capital market and financial data

2   relied upon by investors to assess the relative risk, and hence the cost of equity, for a

3   water utility, such as York Water. In this regard, I have relied on four well-recognized

4   measures of the cost of equity: the Discounted Cash Flow ("DCF") model, the Risk

5   Premium ("RP") analysis, the Capital Asset Pricing Model ("CAPM"), and the

6   Comparable Earnings ("CE") approach. By considering the results of a variety of

7   approaches, I determined that the cost of equity is 11.25%. I have determined the

8   cost of equity for the Company using data from a group of eight (8) water companies

9   that are identified on page 2 of Schedule 3 of Exhibit No. FVII. I will refer to my group

10   of eight water companies as the "Water Group."

11   **Q.**   **Is the market impact of the COVID-19 pandemic reflected in your analysis of the**

12   **cost of equity for the company?**

13   A.   Yes. My cost of equity analysis reflects the impact of the COVID-19 Pandemic

14   ("Pandemic"). These events had a significant impact on the stock and bond markets

15   beginning in the February-March 2020 time frame. During this period, we saw abrupt

16   reaction to the Pandemic, which ended a record-setting 128-month economic

17   expansion. As we entered a recession in February 2020, extraordinary actions were

18   taken by the Federal Open Market Committee ("FOMC") to address these disruptions.

19   Recently, renewed economic growth has produced inflation levels higher than have

20   been seen in four decades. Indeed, in March 2022, the rate of inflation spiked upward

21   to 8.5%, the highest in forty years, due to pandemic-related supply side issues, strong

22   consumer demand, and tight labor markets. Supply shortages have also significantly

23   impacted the consumer sector of the economy. While short-term interest rates

24   remained at historically low levels through much of the Pandemic, longer term interest

25   rates began to rise in February 2021. At present, short-term interest rates are poised

26   to increase based upon recent FOMC actions. Due to inflationary pressures, the

1   FOMC ended its bond buying program (i.e., quantitative easing) in March 2022, and it

2   now plans to run off its $9 trillion asset portfolio, which will boost interest rates. The

3   FOMC has indicated that several increases in the Fed Funds rate will likely occur in

4   2022 and 2023. The first of these increases occurred on March 16, 2022, when the

5   Fed Funds rate was increased by 0.25%. On May 4, 2022, the Fed Funds rate was

6   increased by an additional 0.50%. The FOMC also ended its quantitative easing at

7   that time. The yield on ten-year Treasury notes has reached 2.00% for the first time

8   since mid-2019. Over the course of the Pandemic, stock prices rebounded and

9   reached a new high in reaction to renewed economic growth. While there has been a

10   pullback in overall market prices in early 2022, commonly known as a market

11   correction, it followed a stellar market performance of 28.71% in 2021. I have

12   considered these events as they impact the inputs that I used in the various models of

13   the cost of equity.

14 **Q.   Why have you performed your cost of equity analysis utilizing the market data**

15   **for the Water Group?**

16 A.   The Company is overwhelmingly a water utility, which makes the selection of a water

17   proxy group an obvious choice. I have also used the same proxy group of water

18   utilities for its wastewater operations. I have followed this approach because there

19   are insufficient data for predominantly wastewater utilities with traded stock that could

20   be used in an analysis such as this. Moreover, of all utility types, the water utilities

21   are probably most similar to the wastewater utilities. In addition, I am aware that

22   several of the companies in my proxy group have wastewater operations. The use of

23   a group average (or portfolio) of utilities will reduce the effect that anomalous results

24   for an individual company may have on the rate of return determination. That is to

25   say, by employing group average data, rather than individual company analyses, I

26   have minimized the effect of extraneous influences on the market data for an

1 individual company.

2 **Q. Please summarize the basis for your cost of equity recommendation in this**

3 **proceeding.**

4 A. My cost of equity determination was derived from the results of the methods/models

5 identified above. In general, the use of more than one method provides a superior

6 foundation to arrive at the cost of equity. At any point in time, reliance on a single

7 method can provide an incomplete measure of the cost of equity depending upon

8 extraneous factors that may influence market sentiment. The specific application of

9 these methods/models will be described later in my testimony. The following table

10 provides a summary of the indicated costs of equity as set forth on page 2 of

11 Schedule 1.

	Water Group
DCF	10.77%
Risk Premium	11.00%
CAPM	14.36%
Comparable Earnings	12.15%

12 Viewing the results of all four measures, there is a range of common equity results

13 from 10.77% to 14.36%. Recognizing the Commission's general approach of giving

14 greater reliance to the DCF method, I have narrowed that range by viewing the results

15 of the market-based models, i.e., DCF, RP and CAPM, producing a range of the cost

16 of equity from 10.77% to 14.36%. The average of those three measures of the cost of

17 equity is 12.04% and the median is 11.00%. As described in the testimony of Mr.

18 Joseph T. Hand, the Company has undertaken many initiatives that have produced

19 high quality service. In recognition of its outstanding performance, the Company

1   should be granted an opportunity to earn a return on equity of at least 11.00%, to

2   which 0.25% should be added in recognition of that performance. This return is

3   11.25% (11.00% + 0.25%) in recognition of the exemplary performance of the

4   Company's management. The rate of return on common equity of 11.25% is well

5   within the range of returns shown above and makes no provision for the prospect that

6   the rate of return may not be achieved due to unforeseen events, such as unexpected

7   spikes in the cost of purchased products and other expenses. To obtain new capital

8   and retain existing capital, the rate of return on common equity must be high enough

9   to satisfy investors' requirements.

10   **WATER UTILITY RISK FACTORS**

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

12   A.   The business risk of the water utilities has been strongly influenced by water quality

13   concerns. The Safe Drinking Water Act Amendments of 1996 ("SDWA"), which re-

14   authorized the SDWA for the second time since its original passage in 1974, instituted

15   policies and procedures governing water quality. Significant aspects of the 1996 Act

16   provide that the federal Environmental Protection Agency ("EPA"), in conjunction with

17   other interested parties, will develop a list of contaminants for possible regulation and

18   must update that list every 5 years. From that list, EPA must select at least five

19   contaminants and determine whether to regulate them. This process must be

20   repeated every five years. The EPA may bypass this process and adopt interim

21   regulations for contaminants that pose an urgent health threat.

22   The current priorities of the EPA include regulations directed to: (i)

23   microbials, disinfectants and disinfection byproducts, (ii) radon, (iii) radionuclides, and

24   (iv) arsenic. The regulations that emanate from the EPA concerning certain

25   potentially hazardous substances noted above, together with the Federal Clean Water

26   Act and the Resource Conservation and Recovery Act, bear upon the risk of all water

1   utilities. Most of these regulations affect the entire water industry in contrast with

2   certain regulations issued pursuant to the Clean Air Act, which may impact only

3   selected electric utilities. This business risk factor, together with the important role

4   that water service facilities play within the infrastructure, underscores the public policy

5   concerns that are focused on the water utilities.

6 **Q.** **Are there specific infrastructure issues that the Company is currently**

7   **addressing?**

8 A. Yes. Lead in service lines has reached national prominence after it was identified as

9   a source of contamination in Flint, Michigan. Investors are aware of the

10   consequences of lead contamination on public health and steps that need to be taken

11   to deal with this issue. After all, water utilities deliver a product that is ingested by the

12   public and are the only type of utility that faces public health issues related thereto.

13   In addition, effective in 2017, the Company was required to file with the PUC

14   a formal Long-Term Infrastructure Improvement Plan ("LTIIP"). It is my understanding

15   that the Company is further accelerating the pace of replacement of water mains in its

16   system.

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

18 A. Managers of water utilities have in the past and will in the future focus increased

19   attention on environmental and related regulatory issues. Drinking water quality has

20   also received heightened attention out of concern over the integrity of the source of

21   supply, which is often threatened by changing land use and the permissible level of

22   discharged contaminants established by state and federal agencies, and now

23   potential threats from terrorists. Drilling activity in the Marcellus shale formation has

24   also raised concerns over the integrity of the aquifers that supply drinking water and

25   the disposal of wastewater from drilling activities in the Marcellus shale formation.

26   Moreover, water companies have experienced increased water treatment and

1   monitoring requirements and escalating costs in order to comply with the increasingly

2   stringent regulatory requirements noted above. Water utilities may also be required to

3   expend resources to undertake research and employ technological innovations to

4   comply with potential regulatory requirements. These factors are symptomatic of the

5   changing business risk faced by water utilities.

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

7 A. Yes. Being the sole purveyor of potable water from an established infrastructure does

8   not insulate a water utility's operations from general business conditions, regulatory

9   policy, the influence of weather, and customers' usage habits. For example, the

10   Company has been faced with a sustained decline in the average use per customer.

11   This trend has prevented the Company from realizing the sales levels used to set

12   rates. It is also important to recognize that water companies face higher degrees of

13   capital intensity than other utilities, more costly waste disposal requirements, and

14   threats to their sources of supply. The headlines surrounding MTBE contamination

15   and the regulation of arsenic are cases-in-point.

16 Q. **Are there other structural issues that affect the business risk of water utilities?**

17 A. Yes. As noted above, the high fixed costs of water utilities make earnings vulnerable

18   to significant variations when usage fluctuates with weather, the economy, and

19   customer conservation efforts. Conservation efforts can take the form of low water

20   usage clothes washers, toilets and shower heads, and other reductions due to

21   changes in usage. While the wise use of water is always the objective, the business

22   risk of the water utility industry can be affected by increased customer awareness of

23   conservation. Moreover, current building standards have mandated the use of

24   fixtures that must comply with more stringent water use requirements.

25 Q. **Please identify some of the specific water utility risk factors that impact the**

26   **Company.**

1   A.   The Company must conform its operations to the requirements of the SDWA and the

2   Enhanced Surface Water Treatment Rule ("ESWTR"), which include monitoring and

3   testing, compliance with the lead and copper rule, regulation of Disinfectants/-

4   Disinfection By-Products ("DDBP"), and other contaminants. Moreover, high capital

5   intensity is a characteristic typically found in the water utility business. In this regard,

6   the Company's investment in net plant is 6.19 times its revenue, as compared to the

7   Water Group's investment in net plant, which is 4.50 times its revenue. This makes

8   York Water the most capital intensive member of the Water Group, and hence more

9   risky.

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

11   A.   The Company is engaged in a continuing capital expenditure program, excluding

12   acquisitions, necessary to meet the needs of its customers and to comply with various

13   regulations. For the future, the Company expects its total capital expenditures, net of

14   customer advances and excluding potential acquisitions, to be:

Year	Capital Expenditures
2022	$ 47,014,000
2023	69,635,500
2024	35,901,800
2025	35,086,800
2026	37,407,800
Total	$ 225,045,900

15   The Company's total capital expenditures over the next five years will represent

16   approximately 59% ($225,045,900 ÷ $382,909,000) of the total depreciated utility

17   plant in service (net of contributions) based upon the amount at December 31, 2021.

18   The Company expects that its capital expenditures will be financed with internally

1   generated funds and issuance of debt and common stock through its dividend

2   reinvestment, direct stock purchase and employee stock purchase plans.

3 **Q.** **How should the Commission respond to the evolving business risk facing the**

4   **Company?**

5 A. The Company is faced with the requirement to invest in new facilities and to maintain

6   and upgrade existing facilities in its service territory. Where a substantial ongoing

7   capital investment is required to meet the high quality of product and service that

8   customers demand, supportive regulation is absolutely essential.

9   **FUNDAMENTAL RISK ANALYSIS**

10 **Q.** **Is it necessary to conduct a fundamental risk analysis to provide a framework**

11   **for a determination of a utility's cost of equity?**

12 A. Yes. It is necessary to establish a company's relative risk position within its industry

13   through a fundamental analysis of various quantitative and qualitative factors that

14   bear upon investors' assessment of overall risk and are detailed in the testimony of

15   Mr. Hand. The qualitative factors that bear upon the Company's risk have already

16   been discussed. The quantitative risk analysis follows. For this purpose, I compared

17   the Company to the S&P Public Utilities, an industry-wide proxy consisting of various

18   regulated businesses, and the Water Group.

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

20 A. The Water Group companies have the following common characteristics: (i) they are

21   listed in the "Water Utility Industry" section (basic and expanded) of <u>The Value Line</u>

22   <u>Investment Survey</u> and (ii) their stock is publicly traded. The members of the Water

23   Group are: American States Water, American Water Works Co., Artesian Resources

24   Corp., California Water Service Group, Essential Utilities, Inc., Middlesex Water

25   Company, SJW Corporation, and York Water.

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

2   A.   The S&P Public Utilities is a widely recognized index that consists of electric power

3   and natural gas companies. These companies are identified on page 3 of Schedule 4

4   of Exhibit No. FVII.

5   **Q.**   **Is knowledge of a utility's bond rating an important factor in assessing its risk**

6   **and cost of capital?**

7   A.   Yes. Knowledge of a company's credit quality rating is important because the cost of

8   each type of capital is directly related to the associated risk of the firm. So, while a

9   company's credit quality risk is shown directly by the rating and yield on its bonds,

10   these relative risk assessments also bear upon the cost of equity. This is because a

11   firm's cost of equity is represented by its borrowing cost plus compensation to

12   recognize the higher risk of an equity investment compared to debt.

13   **Q.**   **How do the bond ratings compare for York Water, the Water Group, and the**

14   **S&P Public Utilities?**

15   A.   York Water has an A- corporate credit rating ("CCR") from Standard & Poor's

16   Corporation ("S&P"). The average ratings for the Water Group are A by S&P and A3

17   by Moody's. The CCR designation by S&P and LT issuer rating by Moody's focus

18   upon the credit quality of the issuer of the debt, rather than upon the debt obligation

19   itself. For the S&P Public Utilities, the average composite rating is BBB+ by S&P and

20   A3 by Moody's. Many of the financial indicators that I will subsequently discuss are

21   considered during the rating process.

22   **Q.**   **How do the financial data compare for York Water, the Water Group, and the**

23   **S&P Public Utilities?**

24   A.   The broad categories of financial data that I will discuss are shown on Schedules 2, 3,

25   and 4 of Exhibit No. FVII. The data cover the five-year period 2017-2021. The

26   important categories of relative risk may be summarized as follows:

1   <u>Size.</u> In terms of capitalization, the Company is very much smaller (less

2   than 10%) than the average size of the Water Group. The average size of the S&P

3   Public Utilities is very much larger than the Water Group and the Company. All other

4   things being equal, a smaller company is riskier than a larger company because a

5   given change in revenue and expense has a proportionately greater impact on a small

6   firm. As I will demonstrate later, the size of a firm can impact its cost of equity. This is

7   the case for the Company and the Water Group.

8   <u>Market Ratios.</u> Market-based financial ratios provide a partial indication of

9   the investor-required cost of equity. If all other factors are equal, investors will require

10   a higher rate of return on equity for companies that exhibit greater risk, in order to

11   compensate for that risk. That is to say, a firm that investors perceive to have higher

12   risks will experience a lower price per share in relation to expected earnings and

13   hence; a lower price-earnings ratio.[2]

14   The five-year average price-earnings multiple was highest for York Water,

15   followed closely by the Water Group and then the S&P Public Utilities, which had the

16   lowest price-earnings multiple. The five-year average dividend yield was lowest for

17   York Water followed closely by the Water Group, while the S&P Public Utilities had

18   the highest dividend yield. The average market-to-book ratio was highest for York

19   Water, followed by the Water Group and finally the S&P Public Utilities.

20   <u>Common Equity Ratio.</u> The level of financial risk is measured by the

21   proportion of long-term debt and other senior capital that is contained in a company's

22   capitalization. Financial risk is also analyzed by comparing common equity ratios (the

23   complement of the ratio of debt and other senior capital). That is to say, a firm with a

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

1   high common equity ratio has lower financial risk, while a firm with a low common

2   equity ratio has higher financial risk. The five-year average common equity ratios,

3   based on permanent capital, were 55.2% for the Company, 51.8% for the Water

4   Group, and 41.0% for the S&P Public Utilities. For reporting purposes, the

5   Company's Form 10-K includes the Committed Line of Credit as part of long-term

6   debt, because its maturity is beyond one-year. But for ratesetting purposes, it is

7   removed from long-term debt because is a revolving credit facility that is periodically

8   repaid with permanent financing. Indeed, the balance of the revolving credit facility is

9   now zero after the Company's recent financing. The Company is proposing a 54.77%

10   common equity ratio for the purpose of calculating its weighted average cost of

11   capital. This common equity ratio contains about the same degree of financial risk

12   than shown historically for the Company. Moreover, the Company's financial risk is

13   not dissimilar to the Water Group.

14   Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's

15   earned returns signifies relatively greater levels of risk, as shown by the coefficient of

16   variation (standard deviation ÷ mean) of the rate of return on book common equity.

17   The higher the coefficients of variation, the greater degree of variability. For the five-

18   year period, the coefficients of variation were 0.035 (0.4% ÷ 11.3%) for the Company,

19   0.067 (0.7% ÷ 10.4%) for the Water Group, and 0.051 (0.5% ÷ 9.9%) for the S&P

20   Public Utilities. The earnings variability for the Company was lower than the Water

21   Group and S&P Public Utilities.

22   Operating Ratios. I have also compared operating ratios (the percentage of

23   revenues consumed by operating expense, depreciation and taxes other than income

24   taxes).[3] The higher the operating ratio, the lower the operating margin. The five-year

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

14

1   average operating ratios were 54.7% for the Company, 70.3% for the Water Group,

2   and 79.8% for the S&P Public Utilities. The Company's lower operating ratio can be

3   traced to its high capital intensity because a larger operating margin (i.e., the

4   complement of the operating ratio) derives from the income taxes and return

5   associated with a larger capital investment per dollar of revenue.

6   Coverage. The level of fixed charge coverage (i.e., the multiple by which

7   available earnings cover fixed charges, such as interest expense) provides an

8   indication of the earnings protection for creditors. Higher levels of coverage, and

9   hence earnings protection for fixed charges, are usually associated with superior

10   grades of creditworthiness. The five-year average interest coverage (excluding

11   Allowance for Funds Used During Construction ("AFUDC")) was 4.28 times for the

12   Company, 3.93 times for the Water Group, and 2.97 times for the S&P Public Utilities.

13   The interest coverages were somewhat above, albeit fairly similar, for York Water and

14   the Water Group.

15   Quality of Earnings. Measures of earnings quality usually are revealed by

16   the percentage of AFUDC related to income available for common equity, the

17   effective income tax rate, and other cost deferrals. These measures of earnings

18   quality usually influence a firm's internally generated funds because poor quality of

19   earnings would not generate high levels of cash flow. Quality of earnings has not

20   been a significant concern for the Company, the Water Group, and the S&P Public

21   Utilities.

22   Internally Generated Funds. Internally generated funds ("IGF") provide an

23   important source of new investment capital for a utility and represent a key measure

24   of credit strength. Historically, the five-year average percentage of IGF to capital

25   expenditures was 60.6% for the Company, 52.2% for the Water Group, and 66.0% for

1   the S&P Public Utilities. The percentage of IGF to construction for the Company was

2   somewhat higher than that of the Water Group.

3   <u>Betas.</u> The financial data that I have been discussing relate primarily to

4   company-specific risks. Market risk for firms with publicly-traded stock is measured

5   by beta coefficients. Beta coefficients attempt to identify systematic risk, i.e., the risk

6   associated with changes in the overall market for common equities. <u>Value Line</u>

7   publishes such a statistical measure of a stock's relative historical volatility to the rest

8   of the market.[4] A comparison of market risk is shown by the <u>Value Line</u> beta of 0.85

9   for York Water, 0.77 as the average for the Water Group (see page 2 of Schedule 3),

10   and 0.90 as the average for the S&P Public Utilities (see page 3 of Schedule 4). The

11   market risk (i.e. systematic risk) for York Water is higher than that of the Water Group,

12   but less than for S&P Public Utilities.

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

14 A. For the future, the risk of the water industry will be strongly influenced by the

15   regulatory requirements associated with the SDWA, the need to maintain adequate

16   supply, the need to rehabilitate infrastructure, high capital intensity, a low rate of

17   capital recovery, and construction expenditures that exceed IGF. The Company's risk

18   is generally equal to that of the Water Group, although York Water is very much

19   smaller in size, it lacks geographic diversity, and it has a much higher degree of

20   capital intensity. As such, the cost of equity for the Water Group will provide a

21   reasonable measure of a fair return for the Company.

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[4] Beta is a relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. The "Beta coefficient" is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. The betas are adjusted for their long-term tendency to converge toward 1.00. A common stock that has a beta less than 1.0 is considered to have less systematic risk than the market as a whole and would be expected to rise and fall more slowly than the rest of the market. A stock with a beta above 1.0 would have more systematic risk.

1   **CAPITAL STRUCTURE RATIOS**

2   **Q.   Please explain the selection of capital structure ratios for York Water.**

3   A.   The capital structure ratios of York Water should be employed for rate of return

4   purposes. In the situation where the operating public utility raises its own debt directly

5   in the capital markets, as is the case for the Company, it is proper to employ the

6   capital structure ratios and senior capital cost rates of the regulated public utility for

7   rate of return purposes. Furthermore, consistency requires that the embedded cost

8   rate of the Company's senior securities should also be employed. This procedure is

9   consistent with the ratesetting procedures used by the Commission in numerous prior

10   rate cases for York Water.

11   **Q.   Does Schedule 5 provide the capitalization and capital structure ratios you have**

12   **considered?**

13   A.   Yes. Schedule 5 presents the Company's capitalization and related capital structure

14   ratios based upon investor-provided capital. The December 31, 2021 capitalization

15   corresponds with the end of the historic test year in this case. The projected February

16   29, 2024 capitalization reflects the end of the FPFTY. The primary changes in the

17   future test year and FPFTY capital structure include a debt maturity of $7.5 million on

18   December 18, 2022, the issuance of two new series of debt ($30 million in 2022 and

19        $32.5 million in 2023), and changes in common equity consisting of proceeds from the

20   issue of common stock that has been completed that provided approximately $43

21   million of new equity and proceeds from the Dividend Reinvestment, Direct Stock

22   Purchase, and Employee Stock Purchase Plans, totaling approximately $5 million,

23   and the build-up of retained earnings. Explanatory notes are provided on Schedule 5

24   noting the changes in the Company's capital structure preceding the end of the

25   FPFTY.

1 **Q. Have you included short-term debt as a component of the Company's capital**

2 **structure in the case?**

3 A. No. I have considered the issue of short-term debt, but I have rejected its use here.

4 The Company uses short-term debt to finance non-rate base items, principally

5 construction work in progress ("CWIP"). In reaching this conclusion, I have compared

6 the historical December 31, 2021 CWIP balance of $25.2 million to the FPFTY

7 balance of $8 million for the revolving credit facility. Indeed, short-term debt is

8 financing all CWIP at December 31, 2021. In order to avoid double-counting the

9 amount of short-term debt that finances CWIP, those amounts must be removed from

10 the short-term debt amounts for rate case purposes. As a consequence, no amount

11 of short-term debt can be assumed to finance the rate base in this case. Hence, all

12 short-term debt is excluded from the capital structure in the FPFTY.

13 **Q. What capital structure ratios do you recommend be adopted for rate of return**

14 **purposes in this proceeding?**

15 A. Since ratesetting is prospective, the rate of return should, at a minimum, reflect known

16 or reasonably foreseeable changes which will occur during the course of the future

17 and FPFTY. As a result, I will adopt the Company's FPFTY capital structure ratios of

18 45.23% long-term debt and 54.77% common equity. It is worth noting that these

19 ratios are within the range of the ratios of the Water Group. These capital structure

20 ratios are the best approximation of the mix of capital the Company will employ to

21 finance its rate base during the period new rates are effective.

22 <u>**COST OF SENIOR CAPITAL**</u>

23 **Q. What cost rate have you assigned to the long-term debt portion of York Water's**

24 **capital structure?**

25 A. The determination of the cost of debt is essentially an arithmetic exercise. This is due

26 to the fact that the Company has contracted for the use of this capital for a specific

1   period of time at a specified cost rate. As shown on page 1 of Schedule 6, the actual

2   embedded cost rate of long-term debt was 4.05% on December 31, 2021. Page 2 of

3   Schedule 6 shows that the embedded debt cost rate is expected to be 3.91% at

4   February 29, 2024. For the two new debt issues of long-term debt, the 2022 issuance

5   has a 4.00% estimated coupon rate and the 2023 issuance has a 4.25% estimated

6   coupon rate. This reflects rising interest rates that I will discuss below. I should note

7   that although the new issuances reflect rising interest rates, the weighted cost rate is

8   declining because the new debt is still substantially lower than the cost rate of the

9   retiring debt. The details leading to the development of the individual effective cost

10 rates for each series of long-term debt, using the cost rate to maturity technique, are

11 shown on page 3 of Schedule 6. The cost rate, or yield to maturity, is the rate of

12 discount that equates the present value of all future interest and principal payments

13 with the net proceeds of the bond.

14   I will adopt the 3.91% embedded cost of long-term debt for the FPFTY. The

15 3.91% long-term debt cost rate is related to the amount of long-term debt shown on

16 Schedule 5, which provides the basis for the 45.23% long-term debt ratio.

17   **COST OF EQUITY – GENERAL APPROACH**

18 **Q. Please describe how you determined the cost of equity for the company.**

19 A. Although my fundamental financial analysis provides the required framework to

20 establish the risk relationships among York Water, the Water Group, and the S&P

21 Public Utilities, the cost of equity must be measured by standard financial models that

22 I identified above. Differences in risk traits, such as size, business diversification,

23 geographical diversity, regulatory policy, financial leverage, and bond ratings must be

24 considered when analyzing the cost of equity.

25   It is also important to reiterate that no one method or model of the cost of

26 equity can be applied in an isolated manner. Rather, informed judgment must be

1   used to take into consideration the relative risk traits of the company. It is for this

2   reason that I have used more than one method to measure the Company's cost of

3   equity. As I describe below, each of the methods used to measure the cost of equity

4   contains certain incomplete and/or overly restrictive assumptions and constraints that

5   are not optimal. Therefore, I favor considering the results from a variety of methods.

6   In this regard, I applied each of the methods with data taken from the Water Group

7   and arrived at a cost of equity of 11.25% for York Water.

8   **DISCOUNTED CASH FLOW**

9   **Q.   Please describe the DCF model.**

10   A.   The DCF model seeks to explain the value of an asset as the present value of future

11   expected cash flows discounted at the appropriate risk-adjusted rate of return. In its

12   simplest form, the DCF-determined return on common stock consists of a current

13   cash (dividend) yield and future price appreciation (growth) of the investment. The

14   dividend discount equation is the familiar DCF valuation model, which assumes that

15   future dividends are systematically related to one another by a constant growth rate.

16   The DCF formula is derived from the standard valuation model: $P = D/(k-g)$, where P =

17   price, D = dividend, k = the cost of equity, and g = growth in cash flows. By

18   rearranging the terms, we obtain the familiar DCF equation: $k = D/P + g$. All of the

19   terms in the DCF equation represent investors' assessment of expected future cash

20   flows that they will receive in relation to the value that they set for a share of stock (P).

21   The DCF equation is sometimes referred to as the "Gordon" model.[5] My DCF results

22   are provided on Schedule 1, page 2, for the Water Group. The DCF return is 10.77%

23   with the leverage adjustment and 9.31% without the leverage adjustment for the

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[5] Although the popular application of the DCF model is often attributed to the work of Myron J. Gordon in the mid-1950s, J.B. Williams exposited the DCF model in its present form nearly two decades earlier.

1   Water Group. The leverage adjustment is discussed more fully below.

2   Among the limitations of the model, there is a certain element of circularity in

3   the DCF method when applied in rate cases. This is because investors' expectations

4   for the future depend upon regulatory decisions. In turn, when regulators depend

5   upon the DCF model to set the cost of equity, they rely upon investor expectations

6   that include an assessment of how regulators will decide rate cases. Due to this

7   circularity, the DCF model may not fully reflect the true risk of a utility. Other

8   limitations of the DCF include the constant P-E multiple assertion that does not

9   conform with actual stock market performance. And, indeed, the FERC has moved to

10   using multiple methods for measuring the cost of equity due to the limitations of the

11   DCF.

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

13   A.   The dividend yield reveals the portion of investors' cash flow that is generated by the

14   return provided by the dividends an investor receives. It is measured by the dividends

15   per share relative to the price per share. The DCF methodology requires the use of an

16   expected dividend yield to establish the investor-required cost of equity. For the

17   twelve months ended March 2022, the monthly dividend yields are shown on

18   Schedule 7. The month-end prices were adjusted to reflect the buildup of the

19   dividend in the price that has occurred since the last ex-dividend date (i.e., the date by

20   which a shareholder must own the shares to be entitled to the dividend payment –

21   usually about two to three weeks prior to the actual payment).

22   For the twelve months ended March 2022, the average dividend yield was

23   1.77% for the Water Group based upon a calculation using annualized dividend

24   payments and adjusted month-end stock prices. The dividend yields for the more

25   recent six-month and three-month periods were 1.75% and 1.79%, respectively. For

26   applying the DCF model, I have used the six-month average dividend yield of 1.75%

1   for the Water Group. The use of this dividend yield will reflect current capital costs

2   while avoiding spot yields. For the purpose of a DCF calculation, the average

3   dividend yield must be adjusted to reflect the prospective nature of the dividend

4   payments, i.e., the higher expected dividends for the future. Recall that the DCF is an

5   expectational model that must reflect investors' anticipated cash flows. I have

6   adjusted the six-month average dividend yield in three different but generally

7   accepted manners and used the average of the three adjusted values as calculated in

8   the lower panel of data presented on Schedule 7.[6] This adjustment adds six basis

9   points to the six-month average historical yield, thus producing the 1.81% adjusted

10   dividend yield for the Water Group.

11   **Q.   What factors influence investors' growth expectations?**

12   A.   As noted previously, investors are interested principally in the dividend yield and

13   future growth of their investment (i.e., the price per share of the stock). Future growth

14   in earnings per share is the DCF model's primary focus because, under the model's

15   assumption that the P-E multiple remains constant, the price per share of stock will

16   grow at the same rate as earnings per share. A growth rate analysis considers a

17   variety of variables to reach a consensus of prospective growth, including historical

18   data and widely available analysts' forecasts of earnings, dividends, book value, and

19   cash flow (all stated on a per-share basis). A fundamental growth rate analysis is

20   frequently based upon internal growth ("b x r"), where "r" is the expected rate of return

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[6] These adjustments are the 1/2 growth approach, the discrete approach, and the quarterly approach. Under the 1/2 approach, the procedure to adjust the average dividend yield for the expectation of a dividend increase during the initial investment period will be at a rate of one-half the growth component, which assumes that half of the dividend payments will be at the expected higher rate during the initial investment period. Under the discrete approach, the "*g*" in the DCF model reflects the discrete growth in the quarterly dividend, which is required for the periodic form of the DCF to properly recognize that dividends are expected to grow on a discrete basis. The quarterly approach takes into account that investors have the opportunity to reinvest quarterly dividend receipts. Recognizing the compounding of the periodic quarterly dividend payments *(D_0)* results in this third DCF formulation. This DCF equation provides no further recognition of growth in the quarterly dividend. A compounding of the quarterly dividend yield recognizes the necessity for an adjusted dividend yield.

1   on common equity and "b" is the retention rate (a fraction representing the proportion

2   of earnings not paid out as dividends). To be complete, the internal growth rate

3   should be modified to account for sales of new common stock (external growth),

4   which is represented by the formula s x v, where "s" is the number of new common

5   shares that the firm expects to issue and "v" is the value that accrues to existing

6   shareholders from selling stock at a price above book value. Fundamental growth,

7   which combines internal and external growth, encompasses the factors that cause

8   book value per share to grow over time.

9   Growth also can be expressed in multiple stages. This expression of growth

10   consists of an initial "growth" stage during which a firm enjoys rapidly expanding

11   markets, high profit margins, and abnormally high growth in earnings per share.

12   Thereafter, a firm enters a "transition" stage during which fewer technological

13   advances and increased product saturation begin to reduce the growth rate and profit

14   margins come under pressure. During the "transition" stage, investment opportunities

15   begin to mature, capital requirements decline, and a firm begins to pay out a larger

16   percentage of earnings to shareholders. Finally, the mature or "steady-state" stage is

17   reached when a firm's earnings growth, payout ratio, and return on equity stabilize at

18   levels where they remain for the life of a firm. The three stages of growth assume a

19   step-down of high initial growth to lower sustainable growth. Even if these three

20   stages of growth can be envisioned for a firm, the third "steady-state" growth stage,

21   which is assumed to remain fixed in perpetuity, represents an unrealistic expectation

22   because the three stages of growth can be repeated. That is to say, the stages can

23   be repeated where growth for a firm ramps up and ramps down in cycles over time.

24   For these reasons, there is no need to analyze growth rates individually for each

25   cycle, but rather to rely upon analysts' growth forecasts that are used by investors

26   when pricing common stocks.

1 **Q. How did you determine an appropriate growth rate?**

2 A. The growth rate used in a DCF calculation should measure investor expectations.

3 Investors consider both company-specific variables and overall market sentiment (i.e.,

4 level of inflation rates, interest rates, economic conditions, etc.) when balancing their

5 capital gains expectations with their dividend yield requirements. Investors are not

6 influenced solely by a single set of company-specific variables weighted in a formulaic

7 manner. Therefore, all relevant growth rate indicators should be evaluated using a

8 variety of techniques when formulating a judgment of investor-expected growth.

9 **Q. What data for the water group have you considered in your growth rate**

10 **analysis?**

11 A. I considered the growth in the financial variables shown on Schedules 8 and 9, which

12 reflect historical (Schedule 8) and projected (Schedule 9) rates of growth in earnings

13 per share, dividends per share, book value per share, and cash flow per share for the

14 Water Group. While analysts will review all measures of growth, as I have done,

15 earnings per share growth directly influences the expectations of investors for the

16 future performance of utility stocks. Forecasts of earnings growth are required

17 because the DCF model is forward-looking, and, with the constant P-E multiple and

18 constant payout ratio that the DCF model assumes, all other measures of growth will

19 mirror earnings growth. The historical growth rates were obtained from the Value Line

20 publication that provides this data. While historical data cannot be ignored, they are

21 much less significant when applying the DCF model than projections of future growth.

22 Investors cannot purchase the past earnings of a utility. To the contrary they are only

23 entitled to future earnings, which are the focus of growth projections. Furthermore, if

24 significant weight is assigned to historical performance, the historical data are double-

25 counted because they are already factored into analysts' forecasts of earnings

26 growth.

1 **Q. Is a five-year investment horizon associated with the analysts' forecasts**

2 **consistent with the traditional DCF model?**

3 A. Yes, it is. Although the constant form of the DCF model assumes an infinite stream of

4 cash flows, investors do not expect to hold an investment indefinitely. Rather than

5 viewing the DCF in the context of an endless stream of growing dividends (e.g., a

6 century of cash flows), the growth in the share value (i.e., capital appreciation, or

7 capital gains yield) is most relevant to investors' total return expectations. Hence, the

8 sale price of a stock can be viewed as a liquidating dividend that can be discounted

9 along with the annual dividend receipts during the investment-holding period to arrive

10 at the investors' expected return. The growth in the price per share will equal the

11 growth in earnings per share if, as the DCF model assumes, there is no change in the

12 P-E multiple. As such, my company-specific growth analysis, which focuses

13 principally upon five-year forecasts of earnings per share growth, conforms with the

14 type of analysis that influences investors' expectations of their actual total return.

15 Moreover, academic research also focuses on five-year growth rates specifically

16 because market outcomes occurring over that investment horizon are what influence

17 stock prices. Indeed, if investors required forecasts beyond five years in order to

18 properly value common stocks, then it would be reasonable to expect that some

19 investment advisory service would begin publishing that information for individual

20 stocks in order to meet the demands of the marketplace. The absence of such a

21 publication suggests that there is no market for this information because investors do

22 not require forecasts for an infinite series of future data points in order to make

23 informed decisions to purchase and sell stocks.

24 **Q. What are the analysts' forecasts of future growth that you considered?**

25 A. Schedule 9 provides projected earnings per share growth rates taken from analysts'

26 five-year forecasts compiled by IBES/First Call, Zacks, and Value Line. These are all

1   reliable authorities of projected growth that investors use to make buy, sell, and hold

2   decisions. The IBES/First Call and Zacks estimates are obtained from the Internet

3   and are widely available to investors. The growth rates reported by IBES/First Call

4   and Zacks are consensus forecasts taken from a survey of analysts that make growth

5   projections for these companies. Notably, First Call's earnings forecasts are

6   frequently quoted in the financial press. The Value Line forecasts also are widely

7   available to investors and can be obtained by subscription or free of charge at most

8   public and collegiate libraries. The IBES/First Call and Zacks forecasts are limited to

9   earnings per share growth, while Value Line makes projections of other financial

10   variables. The Value Line forecasts of dividends per share, book value per share,

11   and cash flow per share for the Water Group are also included on Schedule 7.

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

13 A. Schedule 9 shows the prospective five-year earnings per share growth rates projected

14   for the Water Group by IBES/First Call (6.00%), Zacks (7.10%), and Value Line

15   (7.57%).

16 **Q.** **Are certain growth rate forecasts entitled to greater weight in developing a**

17   **growth rate for use in the DCF model?**

18 A. Yes. While a variety of factors should be examined to reach a reasonable conclusion

19   on the DCF growth rate, growth in earnings per share should receive the greatest

20   emphasis. Growth in earnings per share is the primary determinant of investors'

21   expectations of the total returns they will obtain from stocks because the capital gains

22   yield (i.e., price appreciation) will track earnings growth if the P-E multiple remains

23   constant, as the DCF model assumes. Moreover, earnings per share (derived from

24   net income) are the source of dividend payments and are the primary driver of

25   retention growth and its surrogate, i.e., book value per share growth. As such, under

26   these circumstances, greater emphasis must be placed upon projected earnings per

1   share growth. In fact, Professor Gordon, the foremost proponent of the use of the

2   DCF model in setting utility rates, concluded that the best measure of growth for use

3   in the DCF model is a forecast of earnings per-share growth.[7] Consistent with

4   Professor Gordon's findings, projections of earnings per share growth, such as those

5   published by IBES/First Call, Zacks, and Value Line, provide the best indication of

6   investor expectations.

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

8   A.   The forecasts shown on Schedule 9 for the Water Group exhibit a range of average

9   earnings per share growth rates from 6.08% to 7.57%. DCF growth rates should not

10   be established by mathematical formulation, and I have not done so. In my opinion, a

11   growth rate of 7.50% is a reasonable estimate of investor-expected growth for the

12   Water Group. This value is within the array of analysts' forecasts of five-year earnings

13   per share growth rates. The reasonableness of this growth rate is also supported by

14   the expected continuation of utility infrastructure spending.

15   **Q.   Are the dividend yield and growth components of the DCF adequate to**

16   **accurately depict the rate of return on common equity when it is used to**

17   **calculate a utility's weighted average overall cost of capital?**

18   A.   The components of the DCF model are adequate for that purpose only if the capital

19   structure ratios are measured by the market value of debt and equity. In the case of

20   the Water Group, average market value capital structure ratios are 25.26% long-term

21   debt, 0.01% preferred stock, and 74.72% common equity, as shown on Schedule 10.

22   If book values are used to compute the capital structure ratios, then a leverage

23   adjustment is required.

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[7] Gordon, Gordon & Gould, "Choice Among Methods of Estimating Share Yield," The Journal of Portfolio Management (Spring 1989).

27

1 **Q.** **What is a leverage adjustment?**

2 **A.** If a firm's capitalization, as measured by its stock price, diverges from its

3 capitalization, measured at book value, the potential exists for a financial risk

4 difference. Such a risk difference arises because a market-valued capitalization

5 contains more equity and less debt than a book-value capitalization and, therefore,

6 has less risk than the book-value capitalization. A leverage adjustment properly

7 accounts for the risk differential between market-value and book-value capital

8 structures.

9 **Q.** **Why is a leverage adjustment necessary?**

10 **A.** In order to make the DCF results relevant to the capitalization measured at book

11 value (as is done for rate setting purposes), the market-derived cost rate must be

12 adjusted to account for this difference in financial risk. The only perspective that is

13 important to investors is the return that they can realize on the market value of their

14 investment. As I have measured the DCF, the simple yield (D/P) plus growth (g)

15 provides a return applicable strictly to the price (P) that an investor is willing to pay for

16 a share of stock. The need for the leverage adjustment arises when the results of the

17 DCF model (k) are to be applied to a capital structure that is different from the capital

18 structure indicated by the market price (P). From the market perspective, the financial

19 risk of the Water Group is accurately measured by the capital structure ratios

20 calculated from the market-valued capitalization of a firm. If the ratemaking process

21 utilized the market capitalization ratios, then no additional analysis or adjustment

22 would be required, and the simple yield (D/P) plus growth (g) components of the DCF

23 would satisfy the financial risk associated with the market value of the equity

24 capitalization. Because the ratemaking process uses ratios calculated from a firm's

25 book value capitalization, further analysis is required to synchronize the financial risk

26 of the book capitalization with the required return on the book value of the firm's

1   equity. This adjustment is developed through precise mathematical calculations,

2   using well-recognized analytical procedures that are widely accepted in the financial

3   literature. To arrive at that return, the rate of return on common equity is the

4   unleveraged cost of capital (or equity return at 100% equity) plus one or more terms

5   reflecting the increase in financial risk resulting from the use of leverage in the capital

6   structure. The calculations presented in the lower panel of data shown on Schedule

7   10, under the heading "M&M,"[8] provide a return of 8.06% when applicable to a capital

8   structure with 100% common equity.

9   **Q. Are there specific factors that influence market-to-book ratios that determine**

10   **whether the leverage adjustment should be made?**

11   A.   No. The leverage adjustment is not intended, nor was it designed, to address the

12   reasons that stock prices vary from book value. Hence, any observations concerning

13   market prices relative to book value are not on point. The leverage adjustment deals

14   with the issue of financial risk and does not transform the DCF result to a book value

15   return through a market-to-book adjustment. Again, the leverage adjustment that I

16   propose is based on the fundamental financial precept that the cost of equity is equal

17   to the rate of return for an unleveraged firm (i.e., where the overall rate of return

18   equates to the cost of equity with a capital structure that contains 100% equity) plus

19   the additional return required for introducing debt and/or preferred stock leverage into

20   the capital structure.

21   Further, as noted previously, the relatively high market prices of utility stocks

22   cannot be attributed solely to the notion that these companies are expected to earn a

23   return on the book value of equity that differs from their cost of equity determined from

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[8] Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investments," American Economic Review, June 1958, at 261-97. Franco Modigliani and Merton H. Miller, "Taxes and the Cost of Capital: A Correction," American Economic Review, June 1963, at 433-43.

1   stock market prices. Stock prices above book value are common for utility stocks,

2   and indeed the stock prices of non-regulated companies exceed book values by even

3   greater margins. It is difficult to accept that the vast majority of all firms operating in

4   our economy are generating returns far in excess of their cost of capital. Certainly, in

5   our free-market economy, competition should contain such "excesses" if they actually

6   exist.

7   Finally, the leverage adjustment adds stability to the final DCF cost rate.

8   That is to say, as the market capitalization increases relative to its book value, the

9   leverage adjustment increases while the simple yield (D/P) plus growth (g) result

10   declines. The reverse is also true: when the market capitalization declines, the

11   leverage adjustment also declines as the simple yield (D/P) plus growth (g) result

12   increases.

13 **Q.** **Is the leverage adjustment that you propose designed to transform the market**

14   **return into one that is designed to produce a particular market-to-book ratio?**

15 A. No, it is not. What I label a "leverage adjustment" is merely a convenient way of

16   showing the amount that must be added to (or subtracted from) the result of the

17   simple DCF model (i.e., D/P + g) when the DCF return applies to a capital structure

18   used for ratemaking that is computed with book-value weighting rather than market-

19   value weighting. Although I specify a separate factor, which I call the leverage

20   adjustment, there is no need to do so other than to identify this factor. If I were to

21   express my return solely in the context of the book value weighting that we use to

22   calculate the weighted average cost of capital and ignore the familiar D/P + g

23   expression entirely, then a separate element in the DCF cost of equity determination

24   would not be needed to reflect the differential in financial leverage between a market-

25   value and book-value capitalization. As shown in the bottom panel of data on

26   Schedule 10, the equity return applicable to the book value common equity ratio is

1   equal to 8.06%, which is the return for the Water Group appropriate for a capital

2   structure with no debt (i.e., a 100% equity ratio) plus 2.71% to compensate investors

3   for the risk of a 45.23% debt ratio, which is the debt ratio used for York Water in this

4   case, along with its 3.91% embedded cost of debt. These are the book-value ratios

5   that differ markedly from the market-value based ratios I discussed previously. Under

6   this approach, the parts add up to 10.77% (8.06% + 2.71%), and there is no need to

7   even address the cost of equity in terms of D/P + g. To express this same return in

8   the context of the familiar DCF model, I added the 1.81% dividend yield, the 7.50%

9   growth rate, and 1.46% for the leverage adjustment in order to arrive at the same

10 10.77% (1.81% + 7.50% + 1.46%) return. I know of no means to mathematically

11 solve for the 1.46% leverage adjustment by expressing it in the terms of any particular

12 relationship of market price to book value. The 1.46% adjustment is merely a

13 convenient way to compare the 10.77% return computed using the Modigliani & Miller

14 formulas to the 9.31% return generated by the DCF model (i.e., D_1/P_0 + g, or the

15 traditional form of the DCF shown on Schedule 1, page 2) based on a market-value

16 capital structure. A 9.31% return assigned to anything other than the market value of

17 equity cannot equate to a reasonable return on book value that has higher financial

18 risk. My point is that when we use a market-determined cost of equity developed from

19 the DCF model, it reflects a level of financial risk that is different (in this case, lower)

20 from the capital structure stated at book value. This process has nothing to do with

21 targeting any particular market-to-book ratio.

22 **Q. Please provide the DCF return based upon your preceding discussion of**

23 **dividend yield, growth, and leverage.**

24 A. As explained previously, I have utilized a six-month average dividend yield (D_1/P_0)

25 adjusted in a forward-looking manner for my DCF calculation. This dividend yield is

26 used in conjunction with the growth rate (g) previously developed. The DCF also

1   includes the leverage modification (Lev.) required when the book value equity ratio is

2   used in determining the weighted average cost of capital in the ratemaking process

3   rather than the market value equity ratio related to the price of stock. The resulting

4   DCF cost rate is 10.77%, computed as follows:

$$D_1/P_0 \quad + \quad g \quad + \quad lev. \quad = \quad k$$

Water Group   1.81% + 7.50% + 1.46% = 10.77%

5   The DCF result shown above represents the simplified (i.e., Gordon) form of

6   the model that contains a constant-growth assumption. I should reiterate, however,

7   that the DCF-indicated cost rate provides an explanation of the rate of return on

8   common stock market prices without regard to the prospect of a change in the P-E

9   multiple. An assumption that there will be no change in the P-E multiple is not

10 supported by the realities of the equity market because P-E multiples do not remain

11 constant. This is one of the constraints of this model that makes it important to

12 consider the results of other models when determining a company's cost of equity. In

13 fact, the DCF understates the cost of equity in a time of rapidly increasing capital

14 costs, resulting from inflation and the Fed's actions identified earlier in the testimony.

15 The RP and CAPM reflect projections of interest rates that are more appropriate in a

16 period of rising interest rates.

17   **RISK PREMIUM ANALYSIS**

18 **Q. Please describe your use of the Risk Premium approach to determine the cost**

19 **of equity.**

20 A. With the Risk Premium approach, the cost of equity capital is determined by corporate

21 bond yields plus a premium to account for the fact that common equity is exposed to

22 greater investment risk than debt capital. The result of my Risk Premium study is

23 shown on Schedule 1, page 2. That result is 11.00%.

1 Q. **What long-term public utility debt cost rate did you use in your Risk Premium**

2 **analysis?**

3 A. In my opinion, and as I will explain in more detail further in my testimony, a 4.25%

4 yield represents a reasonable estimate of the prospective yield on long-term, A-rated

5 public utility bonds.

6 Q. **What historical data are shown by the Moody's data?**

7 A. I have analyzed the historical yields on the Moody's index of long-term public utility

8 debt as shown on Schedule 11, page 1. As can be seen across all rating levels, there

9 has been a sharp and consistent rise in interest rates since November of 2021. For

10 the twelve months ended March 2022, the average monthly yield on Moody's index of

11 A-rated public utility bonds was 3.24%. For the six- and three-month periods ended

12 March 2022, the yields were 3.37% and 3.66%, respectively.   During the twelve

13 months ended March 2022, the range of the yields on A-rated public utility bonds was

14 2.95% to 3.98%. Page 2 of Schedule 11 shows the long-run spread in yields between

15 A-rated public utility bonds and long-term Treasury bonds. As shown on page 3 of

16 Schedule 11, the yields on A-rated public utility bonds have exceeded those on

17 Treasury bonds by 1.14% on a twelve-month average basis, 1.27% on a six-month

18 average basis, and 1.41% on a three-month average basis. With these data, 1.25%

19 represents a reasonable spread for the yield on A-rated public utility bonds over

20 Treasury bonds.

21 Q. **What forecasts of interest rates have you considered in your analysis?**

22 A. I have determined the prospective yield on A-rated public utility debt by using the Blue

23 Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that I

24 describe below. Blue Chip is a reliable authority and contains consensus forecasts of

25 a variety of interest rates compiled from a panel of banking, brokerage, and

26 investment advisory services. In early 1999, Blue Chip stopped publishing forecasts

1   of yields on A-rated public utility bonds because the Federal Reserve deleted these

2   yields from its Statistical Release H.15. To independently project a forecast of the

3   yields on A-rated public utility bonds, I have combined the forecast yields on long-term

4   Treasury bonds published on April 1, 2022 and a yield spread of 1.25%, derived from

5   historical data.

6 **Q.** **How have you used these data to project the yield on a-rated public utility**

7   **bonds for the purpose of your Risk Premium analyses?**

8 A. Shown below is my calculation of the prospective yield on A-rated public utility bonds

9   using the building blocks discussed above, i.e., the <u>Blue Chip</u> forecast of Treasury

10   bond yields and the public utility bond yield spread. For comparative purposes, I also

11   have shown the <u>Blue Chip</u> forecasts of Aaa-rated and Baa-rated corporate bonds.

12   These forecasts are:

| | | Blue Chip Financial Forecasts | | | | |
| | | Corporate | | 30-Year | A-rated Public Utility | |
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2022	Second	3.7%	4.6%	2.6%	1.25%	3.85%
2022	Third	4.0%	4.9%	2.8%	1.25%	4.05%
2022	Fourth	4.2%	5.1%	3.0%	1.25%	4.25%
2023	First	4.4%	5.3%	3.2%	1.25%	4.45%
2023	Second	4.5%	5.4%	3.3%	1.25%	4.55%
2023	Third	4.6%	5.5%	3.3%	1.25%	4.55%

13 **Q.** **Are there additional forecasts of interest rates that extend beyond those shown**

14   **above?**

15 A. Yes. Twice yearly, <u>Blue Chip</u> provides long-term forecasts of interest rates. In its

16   December 1, 2021 publication <u>Blue Chip</u> published longer-term forecasts of interest

17   rates, which were reported to be:

| | Blue Chip Financial Forecasts | | |
| | Corporate | | 30-Year |
Averages	Aaa-rated	Baa-rated	Treasury
2022-2026	4.40%	5.20%	3.40%
2027-2031	4.90%	5.70%	3.80%

1   The longer-term forecasts by <u>Blue Chip</u> suggest that interest rates will move

2   up from the levels revealed by the near-term forecasts. A 4.25% yield on A-rated

3   public utility bonds represents a reasonable benchmark for measuring the cost of

4   equity in this case. All the data I used to formulate my conclusion as to a prospective

5   yield on A-rated public utility debt are available to investors, who regularly rely upon

6   such data to make investment decisions.   Recent FOMC pronouncements have

7   moved the forecasts of interest rates to higher levels.

8 **Q.   What equity Risk Premium have you determined for public utilities?**

9 A.   To develop an appropriate equity risk premium, I analyzed the results from 2022 SBBI

10   Yearbook, Stocks, Bonds, Bills and Inflation. My investigation reveals that the equity

11   risk premium varies according to the level of interest rates. That is to say, the equity

12   risk premium increases as interest rates decline, and it declines as interest rates

13   increase. This inverse relationship is revealed by the summary data presented below

14   and shown on Schedule 12, page 1.

Common Equity Risk Premiums

Low Interest Rates	6.81%
Average Across All Interest Rates	5.93%
High Interest Rates	5.05%

15   Based on my analysis of the historical data, the equity risk premium was

16   6.81% when the marginal cost of long-term government bonds was low (i.e., 2.80%,

17   which was the average yield during periods of low rates). Conversely, when the yield

18   on long-term government bonds was high (i.e., 7.03% on average during periods of

1   high interest rates), the spread narrowed to 5.05%. Over the entire spectrum of

2   interest rates, the equity risk premium was 5.93% when the average government

3   bond yield was 4.92%. I have utilized a 6.75% equity risk premium. The equity risk

4   premium of 6.75% that I employed is near the risk premiums (i.e., 6.81%) associated

5   with low interest rates (i.e., 2.80%).

6   **Q.   What common equity cost rate did you determine based on your Risk Premium**

7   **analysis?**

8   A.   The cost of equity (i.e., "k") is represented by the sum of the prospective yield for

9   long-term public utility debt (i.e., "i"), and the equity risk premium (i.e., "RP"). The Risk

10 Premium approach provides a cost of equity of:

$$i \quad + \quad RP \quad = \quad k$$

Water Group   4.25%   +   6.75%   =   11.00%

11 **CAPITAL ASSET PRICING MODEL**

12 **Q.   How is the CAPM used to measure the cost of equity?**

13 A.   The CAPM uses the yield on a risk-free interest-bearing obligation plus a rate of

14 return premium that is proportional to the systematic risk of an investment. As shown

15 on page 2 of Schedule 1, the result of the CAPM is 14.36% for the Water Group with

16 the leverage adjustment. Without the leverage adjustment, the CAPM result is

17 11.90% (14.36% - (0.24 x 10.24%)). To compute the cost of equity with the CAPM,

18 three components are necessary: a risk-free rate of return ("Rf"), the beta measure of

19 systematic risk ("β"), and the market risk premium ("Rm-Rf") derived from the total

20 return on the market of equities reduced by the risk-free rate of return. The CAPM

21 specifically accounts for differences in systematic risk (i.e., market risk as measured

22 by the beta) between an individual firm or group of firms and the entire market of

23 equities.

1   **Q.**   **What betas have you considered in the CAPM?**

2   A.   For my CAPM analysis, I initially considered the <u>Value Line</u> betas. As shown on page

3   2 of Schedule 3, the average beta is 0.77 for the Water Group.

4   **Q.**   **Did you use the <u>Value Line</u> betas in the CAPM determined cost of equity?**

5   A.   I used the <u>Value Line</u> betas as a foundation for the leverage adjusted betas that I

6   used in the CAPM. The betas must be reflective of the financial risk associated with

7   the ratemaking capital structure that is measured at book value. Therefore, <u>Value</u>

8   <u>Line</u> betas cannot be used directly in the CAPM, unless the cost rate developed using

9   those betas is applied to a capital structure measured with market values. To develop

10   a CAPM cost rate applicable to a book-value capital structure, the <u>Value Line</u> (market

11   value) betas have been unleveraged and re-leveraged for the book value common

12   equity ratios using the Hamada formula,[9] as follows:

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

14       $\ss l$ = the leveraged beta, $\ss u$ = the unleveraged beta, t = income tax rate, D =

15   debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas

16   published by <u>Value Line</u> have been calculated with the market price of stock and are

17   related to the market value capitalization. By using the formula shown above and the

18   capital structure ratios measured at market value, the beta would become 0.61 for the

19   Water Group if it employed no leverage and was 100% equity financed. Those

20   calculations are shown on Schedule 10 under the section labeled "Hamada," who is

21   credited with developing those formulas. With the unleveraged beta as a base, I

22   calculated the leveraged beta of 1.01 for the book value capital structure of the Water

23   Group.

---

[9] Robert S. Hamada, "The Effects of the Firm's Capital Structure on the Systematic Risk of Common Stocks;" <u>The Journal of Finance</u>, Vol. 27, No. 2; Papers and Proceedings of the Thirtieth Annual Meeting of the American Finance Association, New Orleans, Louisiana, Dec. 27-29, 1971. (May 1972), pp. 435-52.

1   **Q.   What risk-free rate have you used in the CAPM?**

2   A.   As shown on page 1 of Schedule 13, I provided the historical yields on Treasury notes

3   and bonds. For the twelve months ended March 2022, the average yield on 30-year

4   Treasury bonds was 2.10%. For the six- and three-months ended March 2022, the

5   yields on 30-year Treasury bonds were 2.10% and 2.25%, respectively. During the

6   twelve months ended March 2022, the range of the yields on 30-year Treasury bonds

7   was 1.85% to 2.41%. The low yields that existed during 2020 can be traced to

8   extraordinary events associated with the Pandemic that jolted the capital markets.

9   These events led to the end of the record-setting 128-month economic expansion. As

10   the recession unfolded in February 2020, the FOMC acted to address these

11   disruptions. The FOMC continued to support the money and capital markets during

12   the recovery from the Pandemic. A transition is now taking place that will

13   prospectively produce higher interest rates as the Pandemic nears its end and the

14   FOMC has ended it quantitative easing. That program ended in March 2022 and a

15   Fed Funds rate increase of 0.25% occurred at that time. While interest rates have

16   moved up generally, there had been a "flight" to safety in Treasury obligations due to

17   geopolitical turmoil in Europe. A forward-looking assessment of the capital markets is

18   especially relevant now because the Company's rates will be based on financial

19   conditions in 2024 and beyond. Higher inflation expectations are a contributing factor

20   that points to higher interest rates. Indeed, higher inflation today is revealed by a

21   5.9% increase in Social Security payments announced on October 13, 2021, which is

22   the largest one-year increase in nearly four decades. The Fed Funds rate is expected

23   to continue to increase from very low levels that existed during the Pandemic. Higher

24   interest rates clearly point to higher capital costs prospectively.

25   As shown on page 2 of Schedule 13, forecasts published by Blue Chip on

26   April 1, 2022 indicate that the yields on long-term Treasury bonds are expected to be

1   in the range of 2.6% to 3.3% during the next six quarters. The longer-term forecasts

2   described previously show that the yields on 30-year Treasury bonds will average

3   3.4% from 2023 through 2027 and 3.8% from 2028 to 2032. For the reasons

4   explained previously, forecasts of interest rates should be emphasized at this time in

5   selecting the risk-free rate of return in CAPM. Hence, I have used a 3.00% risk-free

6   rate of return for CAPM purposes, which considers the <u>Blue Chip</u> forecasts.

7   Q.   **What market premium have you used in the CAPM?**

8   A.   As shown in the lower panel of data presented on Schedule 13, page 2, the market

9   premium is derived from historical data and the forecast returns. For the historically

10   based market premium, I have used the arithmetic mean obtained from the data

11   presented on Schedule 12, page 1. On that schedule, the market return was 12.09%

12   on large stocks during periods of low interest rates. During those periods, the yield on

13   long-term government bonds was 2.80% when interest rates were low. As such, I

14   carried over to Schedule 13, page 2, the average large common stock returns of

15   12.09% and the average yield on long-term government bonds of 2.80%. The

16   resulting market premium is 9.29% (12.09% - 2.80%) based on historical data, as

17   shown on Schedule 13, page 2. As also shown on Schedule 13, page 2, I calculated

18   the forecast returns, which show a 14.19% total market return. With this forecast, I

19   calculated a market premium of 11.19% (14.19% - 3.00%) using forecast data. The

20   resulting market premium applicable to the CAPM derived from these sources equals

21   10.24% (11.19% + 9.29% = 20.48% ÷ 2).

22   Q.   **Are there adjustments to the CAPM that are necessary to fully reflect the rate of**

23   **return on common equity?**

24   A.   Yes. The technical literature supports an adjustment relating to the size of the

25   company or portfolio for which the calculation is performed. As the size of a firm

26   decreases, its risk and required return increases. Moreover, in his discussion of the

1 cost of capital, Professor Eugene F. Brigham has indicated that smaller firms have

2 higher capital costs than otherwise similar larger firms. Also, the Fama/French study

3 (see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June

4 1992) established that the size of a firm helps explain stock returns. In an October

5 15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock

6 Effect," it was demonstrated that the CAPM could significantly understate the cost of

7 equity according to a company's size. Indeed, it was demonstrated in the SBBI

8 Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) had returns

9 in excess of those shown by the simple CAPM. To recognize this fact, I used the mid-

10 cap adjustment of 1.02%, as revealed on page 3 of Schedule 13, for the CAPM

11 calculation. The adjustment here is related to the size of the Water Group. As I

12 observed previously, York Water is substantially smaller than the average size of the

13 Water Group.

14 **Q. WHAT DOES YOUR CAPM ANALYSIS SHOW?**

15 A. Using the 3.00% risk-free rate of return, the leverage adjusted beta of 1.01 for the

16 Water Group, the 10.24% market premium, and the 1.02% size adjustment, the

17 following result is indicated.

$$Rf \quad + \quad \text{ß} \quad x \ (\quad Rm\text{-}Rf \ ) + \quad size \quad = \quad k$$

Water Group   3.00% + 1.01 x (10.24%) + 1.02% = 14.36%

18 **COMPARABLE EARNINGS APPROACH**

19 **Q. What is the Comparable Earnings approach?**

20 A. The Comparable Earnings approach estimates a fair return on equity by comparing

21 returns realized by non-regulated companies to returns that a public utility with similar

22 risk characteristics would need to realize in order to compete for capital. Because

23 regulation is a substitute for competitively determined prices, the returns realized by

1   non-regulated firms with comparable risks to a public utility provide useful insight into

2   investor expectations for public utility returns. The firms selected for the Comparable

3   Earnings approach should be companies whose prices are not subject to cost-based

4   price ceilings (i.e., non-regulated firms) so that circularity is avoided.

5   There are two avenues available to implement the Comparable Earnings

6   approach. One method involves the selection of another industry (or industries) with

7   comparable risks to the public utility in question, and the results for all companies

8   within that industry serve as a benchmark.   The second approach requires the

9   selection of parameters that represent similar risk traits for the public utility and the

10   comparable risk companies.   Using this approach, the business lines of the

11   comparable companies become unimportant. The latter approach is preferable with

12   the further qualification that the comparable risk companies exclude regulated firms in

13   order to avoid the circular reasoning implicit in the use of the achieved earnings/book

14   ratios of other regulated firms. The United States Supreme Court has held that:

15   A public utility is entitled to such rates as will permit it
16   to earn a return on the value of the property which it
17   employs for the convenience of the public equal to that
18   generally being made at the same time and in the
19   same general part of the country on investments in
20   other business undertakings which are attended by
21   corresponding risks and uncertainties.   The return
22   should be reasonably sufficient to assure confidence
23   in the financial soundness of the utility and should be
24   adequate,   under   efficient   and   economical
25   management, to maintain and support its credit and
26   enable it to raise the money necessary for the proper
27   discharge of its public duties. <u>Bluefield Water Works</u>
28   <u>v. Public Service Commission, 262 U.S. 668 (1923)</u>.
29
30   It is important to identify the returns earned by firms that compete for capital

31   with a public utility. This can be accomplished by analyzing the returns of non-

32   regulated firms that are subject to the competitive forces of the marketplace.

1 **Q. Did you compare the results of your DCF and CAPM analyses to the results**

2 **indicated by a Comparable Earnings approach?**

3 A. Yes. I selected companies from <u>The Value Line Investment Survey for Windows</u> that

4 have six categories of comparability designed to reflect the risk of the Water Group.

5 These screening criteria were based upon the range as defined by the rankings of the

6 companies in the Water Group. The items considered were Timeliness Rank, Safety

7 Rank, Financial Strength, Price Stability, <u>Value Line</u> betas, and Technical Rank. The

8 definition for these parameters is provided on Schedule 14, page 3. The identities of

9 the companies comprising the Comparable Earnings group and their associated

10 rankings within the ranges are identified on Schedule 14, page 1.

11 I relied upon <u>Value Line</u> data because it provides a comprehensive basis for

12 evaluating the risks of the comparable firms. As to the returns calculated by <u>Value</u>

13 <u>Line</u> for these companies, there is some downward bias in the figures shown on

14 Schedule 14, page 2, because <u>Value Line</u> computes the returns on year-end rather

15 than average book value. If average book values had been employed, the rates of

16 return would have been slightly higher. Nevertheless, these are the returns

17 considered by investors when taking positions in these stocks. Because many of the

18 comparability factors, as well as the published returns, are used by investors in

19 selecting stocks, and the fact that investors rely on the <u>Value Line</u> service to gauge

20 returns, it is an appropriate database for measuring comparable return opportunities.

21 **Q. What data did you consider in your Comparable Earnings analysis?**

22 A. I used both historical realized returns and forecasted returns for non-utility companies.

23 As noted previously, I have not used returns for utility companies in order to avoid the

24 circularity that arises from using regulatory-influenced returns to determine a

25 regulated return. It is appropriate to consider a relatively long measurement period in

26 the Comparable Earnings approach in order to cover conditions over an entire

1   business cycle. A ten-year period (five historical years and five projected years) is

2   sufficient to cover an average business cycle. Unlike the DCF and CAPM, the results

3   of the Comparable Earnings method can be applied directly to the book value

4   capitalization. In other words, the Comparable Earnings approach does not contain

5   the potential misspecification contained in market models when the market

6   capitalization and book value capitalization diverge significantly. A point of

7   demarcation was chosen to eliminate the results of highly profitable enterprises, which

8   the Bluefield case stated were not the type of returns that a utility was entitled to earn.

9   For this purpose, I used 20% as the point where those returns could be viewed as

10   highly profitable and should be excluded from the Comparable Earnings approach.

11   The average historical rate of return on book common equity was 13.1% using only

12   the returns that were less than 20%, as shown on Schedule 14, page 2. The average

13   forecasted rate of return as published by Value Line is 11.2% also using values less

14   than 20%, as provided on Schedule 14, page 2. Using the average of these data, my

15   Comparable Earnings result is 12.15%, as shown on Schedule 1, page 2.

16   <div align="center">**CONCLUSION ON COST OF EQUITY**</div>

17 **Q.** **What is your conclusion regarding the company's cost of common equity?**

18 A. Based upon the application of a variety of methods and models described previously,

19   it is my opinion that a reasonable cost of common equity for York Water is 11.25%.

20   My cost of equity determination is based on a range of results and should be

21   considered in the context of York Water's risk characteristics, as well as the general

22   condition of the capital markets. It is essential that the Commission employ a variety

23   of techniques to measure York Water's cost of equity because of the

24   limitations/infirmities that are inherent in each method. It is also imperative that the

25   Commission acknowledge the exemplary performance of the Company's

26   management.

1 **Q. Does this complete your direct testimony?**

2 A. Yes. However, I reserve the right to supplement my testimony, if necessary, and to

3 respond to witnesses presented by other parties.

1   **EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE**
2   **AND QUALIFICATIONS**

3   I was awarded a degree of Bachelor of Science in Business Administration by

4   Drexel University in 1971. While at Drexel, I participated in the Cooperative Education

5   Program which included employment, for one year, with American Water Works Service

6   Company, Inc., as an internal auditor, where I was involved in the audits of several

7   operating water companies of the American Water Works System and participated in the

8   preparation of annual reports to regulatory agencies and assisted in other general

9   accounting matters.

10   Upon graduation from Drexel University, I was employed by American Water Works

11   Service Company, Inc., in the Eastern Regional Treasury Department where my duties

12   included preparation of rate case exhibits for submission to regulatory agencies, as well as

13   responsibility for various treasury functions of the thirteen New England operating

14   subsidiaries.

15   In 1973, I joined the Municipal Financial Services Department of Betz Environmental

16   Engineers, a consulting engineering firm, where I specialized in financial studies for

17   municipal water and wastewater systems.

18   In 1974, I joined Associated Utility Services, Inc., now known as AUS Consultants. I

19   held various positions with the Utility Services Group of AUS Consultants, concluding my

20   employment there as a Senior Vice President.

21   In 1994, I formed P. Moul & Associates, an independent financial and regulatory

22   consulting firm. In my capacity as Managing Consultant and for the past twenty-nine years,

23   I have continuously studied the rate of return requirements for cost of service-regulated

24   firms. In this regard, I have supervised the preparation of rate of return studies, which were

25   employed, in connection with my testimony and in the past for other individuals. I have

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1 presented direct testimony on the subject of fair rate of return, evaluated rate of return

2 testimony of other witnesses, and presented rebuttal testimony.

3   My studies and prepared direct testimony have been presented before thirty-seven

4 (37) federal, state and municipal regulatory commissions, consisting of: the Federal Energy

5 Regulatory Commission; state public utility commissions in Alabama, Alaska, California,

6 Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa,

7 Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri,

8 New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania,

9 Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin, and

10 the Philadelphia Gas Commission, and the Texas Commission on Environmental Quality.

11 My testimony has been offered in over 200 rate cases involving electric power, natural gas

12 distribution and transmission, resource recovery, solid waste collection and disposal,

13 telephone, wastewater, and water service utility companies. While my testimony has

14 involved principally fair rate of return and financial matters, I have also testified on capital

15 allocations, capital recovery, cash working capital, income taxes, factoring of accounts

16 receivable, and take-or-pay expense recovery. My testimony has been offered on behalf of

17 municipal and investor-owned public utilities and for the staff of a regulatory commission. I

18 have also testified at an Executive Session of the State of New Jersey Commission of

19 Investigation concerning the BPU regulation of solid waste collection and disposal.

20   I was a co-author of a verified statement submitted to the Interstate Commerce

21 Commission concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was also

22 co-author of comments submitted to the Federal Energy Regulatory Commission regarding

23 the Generic Determination of Rate of Return on Common Equity for Public Utilities in 1985,

24 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-000 and RM88-25-

25 000). Further, I have been the consultant to the New York Chapter of the National

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1   Association of Water Companies, which represented the water utility group in the

2   Proceeding on Motion of the Commission to Consider Financial Regulatory Policies for New

3   York Utilities (Case 91-M-0509). I have also submitted comments to the Federal Energy

4   Regulatory Commission in its Notice of Proposed Rulemaking (Docket No. RM99-2-000)

5   concerning Regional Transmission Organizations and on behalf of the Edison Electric

6   Institute in its intervention in the case of Southern California Edison Company (Docket No.

7   ER97-2355-000).   Also, I was a member of the panel of participants at the Technical

8   Conference in Docket No. PL07-2 on the Composition of Proxy Groups for Determining Gas

9   and Oil Pipeline Return on Equity.

10   In late 1978, I arranged for the private placement of bonds on behalf of an investor-

11   owned public utility. I have assisted in the preparation of a report to the Delaware Public

12   Service Commission relative to the operations of the Lincoln and Ellendale Electric

13   Company. I was also engaged by the Delaware P.S.C. to review and report on the

14   proposed financing and disposition of certain assets of Sussex Shores Water Company

15   (P.S.C. Docket Nos. 24-79 and 47-79). I was a co-author of a Report on Proposed

16   Mandatory Solid Waste Collection Ordinance prepared for the Board of County

17   Commissioners of Collier County, Florida.

18   I have been a consultant to the Bucks County Water and Sewer Authority

19   concerning rates and charges for wholesale contract service with the City of Philadelphia.

20   My municipal consulting experience also included an assignment for Baltimore County,

21   Maryland, regarding the City/County Water Agreement for Metropolitan District customers

22   (Circuit Court for Baltimore County in Case 34/153/87-CSP-2636).

THE YORK WATER COMPANY

EXHIBIT

TO ACCOMPANY

THE DIRECT TESTIMONY

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

May 27, 2022

The York Water Company
Index of Schedules

The York Water Company
Summary Cost of Capital
for the Fully Projected Future Test Year Ending February 29, 2024

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.23%	3.91%	1.77%
Common Equity	54.77%	11.25%	6.16%
Total	100.00%		7.93%

Indicated levels of fixed charge coverage assuming that
the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a
 28.8921% composite federal and state income tax rate
         (10.43% ÷   1.77%)   5.89 x

Post-tax coverage of interest expense
         (7.93% ÷   6.16%)   1.29 x

The York Water Company
Cost of Equity
as of March 31, 2022

Discounted Cash Flow (DCF)	D_1/P_0 [1] +	g [2]	+	lev. [3]	=	k
Water Group	1.81% +	7.50%	+	1.46%	=	10.77%

Risk Premium (RP)		I [4]	+	RP [5]	=	k
Water Group		4.25%	+	6.75%	=	11.00%

Capital Asset Pricing Model (CAPM)	Rf [6]	+	ß [7]	x (Rm-Rf [8]) +	size [9]	=	k
Water Group	3.00%	+	1.01	x (10.24%) +	1.02%	=	14.36%

Comparable Earnings (CE) [10]	Historical	Forecast	Average
Comparable Earnings Group	13.1%	11.2%	12.15%

References [1] Schedule 7, page 1

[2] Schedule 9, page 1

[3] Schedule 10, page 1

[4] A-rated public utility bond yield comprised of a 2.75% risk-free rate of return (Schedule 13, page 2) and a yield spread of 1.25% (Schedule 11, page 3)

[5] Schedule 12, page 1

[6] Schedule 13, page 2

[7] Schedule 9, page 1

[8] Schedule 13, page 2

[9] Schedule 13, page 3

[10] Schedule 14, page 2

The York Water Company
Capitalization and Financial Statistics
2017-2021, Inclusive

	2021	2020	2019	2018	2017	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 299.0	$ 266.8	$ 235.2	$ 219.6	$ 209.5	
Short-Term Debt	$ -	$ -	$ -	$ 1.0	$ 1.0	
Total Capital	$ 299.0	$ 266.8	$ 235.2	$ 220.6	$ 210.5	
						Average
Market-Based Financial Ratios						
Price-Earnings Multiple	36 x	34 x	35 x	31 x	35 x	34 x
Market/Book Ratio	417.8%	403.3%	386.7%	333.9%	394.3%	387.2%
Dividend Yield	1.6%	1.7%	1.8%	2.1%	1.8%	1.8%
Dividend Payout Ratio	58.3%	57.2%	63.1%	65.0%	64.1%	61.5%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	49.0%	46.3%	43.0%	42.5%	43.0%	44.8%
Common Equity [1]	51.0%	53.7%	57.0%	57.5%	57.0%	55.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	49.0%	46.3%	43.0%	42.8%	43.3%	44.9%
Common Equity [1]	51.0%	53.7%	57.0%	57.2%	56.7%	55.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [1]	11.5%	12.0%	11.1%	10.9%	11.1%	11.3%
Operating Ratio [2]	57.6%	54.6%	53.9%	53.5%	53.7%	54.7%
Coverage incl. AFUDC [3]						
Pre-tax: All Interest Charges	4.68 x	4.95 x	4.25 x	3.88 x	4.28 x	4.41 x
Post-tax: All Interest Charges	4.45 x	4.53 x	3.81 x	3.43 x	3.43 x	3.93 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	4.43 x	4.84 x	4.18 x	3.84 x	4.11 x	4.28 x
Post-tax: All Interest Charges	4.20 x	4.41 x	3.74 x	3.39 x	3.26 x	3.80 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	7.2%	3.2%	2.5%	1.7%	6.7%	4.3%
Effective Income Tax Rate	6.2%	10.8%	13.5%	15.7%	25.9%	14.4%
Internal Cash Generation/Construction [5]	47.7%	48.8%	76.9%	72.5%	57.3%	60.6%
Gross Cash Flow/ Avg. Total Debt [6]	19.4%	22.3%	23.7%	22.4%	25.4%	22.6%
Gross Cash Flow Interest Coverage [7]	6.15 x	6.21 x	5.46 x	4.73 x	5.04 x	5.52 x
Common Dividend Coverage [8]	2.67 x	2.67 x	2.58 x	2.43 x	2.71 x	2.61 x

See Page 2 for Notes.

The York Water Company
Capitalization and Financial Statistics
2017-2021, Inclusive

Notes:

(1)   Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.
(2)   Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(3)   Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(4)   Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(5)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(6)   Gross Cash Flow plus interest charges divided by interest charges.
(7)   Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: SEC Form 10-K
                         Utility COMPUSTAT

Water Group
Capitalization and Financial Statistics [1]
2017-2021, Inclusive

	2021	2020	2019	2018	2017	Average
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 4,528.6	$ 4,107.0	$ 3,466.3	$ 2,855.0	$ 2,521.4	
Short-Term Debt	$ 102.2	$ 241.8	$ 142.1	$ 151.3	$ 163.3	
Total Capital	$ 4,630.8	$ 4,348.8	$ 3,608.4	$ 3,006.3	$ 2,684.7	
Market-Based Financial Ratios						
Price-Earnings Multiple	32 x	30 x	39 x	30 x	28 x	32 x
Market/Book Ratio	344.7%	311.6%	325.1%	299.2%	301.3%	316.4%
Dividend Yield	1.8%	2.0%	1.9%	2.1%	2.1%	2.0%
Dividend Payout Ratio	54.1%	56.9%	71.4%	60.6%	56.9%	60.0%
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	50.6%	50.5%	48.8%	45.7%	45.1%	48.1%
Preferred Stock	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%
Common Equity [2]	49.4%	49.4%	51.2%	54.3%	54.8%	51.8%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	51.8%	53.1%	50.4%	48.1%	48.3%	50.3%
Preferred Stock	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%
Common Equity [2]	48.1%	46.9%	49.6%	51.8%	51.6%	49.6%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	11.0%	10.5%	9.5%	10.0%	11.0%	10.4%
Operating Ratio [3]	72.1%	71.0%	71.3%	69.0%	68.0%	70.3%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	4.21 x	3.99 x	3.67 x	3.77 x	4.70 x	4.07 x
Post-tax: All Interest Charges	3.86 x	3.65 x	3.31 x	3.35 x	3.50 x	3.53 x
Overall Coverage: All Int. & Pfd. Div.	3.85 x	3.64 x	3.30 x	3.33 x	3.48 x	3.52 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	4.07 x	3.83 x	3.50 x	3.67 x	4.59 x	3.93 x
Post-tax: All Interest Charges	3.72 x	3.49 x	3.15 x	3.24 x	3.39 x	3.40 x
Overall Coverage: All Int. & Pfd. Div.	3.71 x	3.48 x	3.14 x	3.23 x	3.37 x	3.39 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	5.3%	6.1%	8.7%	5.1%	4.8%	6.0%
Effective Income Tax Rate	9.4%	10.9%	14.9%	15.9%	32.4%	16.7%
Internal Cash Generation/Construction [5]	51.8%	50.3%	45.9%	50.8%	62.1%	52.2%
Gross Cash Flow/ Avg. Total Debt [6]	16.7%	17.1%	17.4%	20.3%	24.8%	19.3%
Gross Cash Flow Interest Coverage [7]	5.58 x	5.25 x	4.78 x	5.18 x	6.00 x	5.36 x
Common Dividend Coverage [8]	3.24 x	3.28 x	2.91 x	3.30 x	3.86 x	3.32 x

See Page 2 for Notes.

Water Group
Capitalization and Financial Statistics
2017-2021, Inclusive

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.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(7) Gross Cash Flow plus interest charges divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Basis of Selection:
    The Water Group companies have the following common characteristics: (i) they are listed in the "Water Utility Industry" section (basic and expanded editions) of The Value Line Investment Survey, and (ii) their stock is publicly traded.

Ticker	Company	Corporate Credit Ratings		Stock Traded	Value Line Beta
		Moody's	S&P		
AWR	American States Water	A2	A+	NYSE	0.65
AWK	American Water Works Co.	A3	A	NYSE	0.85
ARTNA	Artesian Resources Corp.	-	-	NASDAQ	0.70
CWT	California Water Serv. Grp.	-	A+	NYSE	0.65
WTRG	Essential Utilities, Inc.	Baa2	A	NASDAQ	0.95
MSEX	Middlesex Water Company	-	A	NASDAQ	0.70
SJW	SJW Corporation	-	A-	NYSE	0.80
YORW	York Water Company	-	A-	NASDAQ	0.85
	Average	A3	A		0.77

Note: Ratings are those of utility subsidiaries

Source of Information: Utility COMPUSTAT
                         Moody's Investors Service
                         Standard & Poor's Corporation

Standard & Poor's Public Utilities
Capitalization and Financial Statistics [1]
2017-2021, Inclusive

	2021	2020	2019	2018	2017	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 40,154.3	$ 38,732.9	$ 36,461.6	$ 32,871.6	$ 30,827.6	
Short-Term Debt	$ 1,397.4	$ 1,154.1	$ 1,221.9	$ 1,420.3	$ 1,076.1	
Total Capital	$ 41,551.7	$ 39,887.0	$ 37,683.5	$ 34,291.9	$ 31,903.7	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	22 x	23 x	20 x	21 x	20 x	21 x
Market/Book Ratio	219.9%	218.2%	220.9%	204.4%	214.4%	215.6%
Dividend Yield	3.5%	3.6%	3.2%	3.5%	3.3%	3.4%
Dividend Payout Ratio	72.9%	78.0%	62.7%	68.7%	65.2%	69.5%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	57.4%	58.1%	56.7%	55.0%	56.8%	56.8%
Preferred Stock	2.3%	2.6%	2.4%	2.5%	1.4%	2.2%
Common Equity [2]	40.4%	39.4%	41.0%	42.5%	41.8%	41.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	58.9%	59.4%	58.1%	57.0%	58.4%	58.3%
Preferred Stock	2.2%	2.5%	2.3%	2.4%	1.4%	2.1%
Common Equity [2]	38.9%	38.1%	39.6%	40.7%	40.3%	39.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	9.4%	10.2%	10.3%	10.3%	9.4%	9.9%
Operating Ratio [3]	83.1%	79.8%	79.3%	79.8%	77.0%	79.8%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.16 x	2.80 x	3.05 x	2.94 x	3.42 x	3.07 x
Post-tax: All Interest Charges	2.87 x	2.60 x	3.10 x	2.59 x	2.86 x	2.80 x
Overall Coverage: All Int. & Pfd. Div.	2.81 x	2.55 x	3.04 x	2.55 x	2.84 x	2.76 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.06 x	2.70 x	2.95 x	2.84 x	3.31 x	2.97 x
Post-tax: All Interest Charges	2.78 x	2.50 x	3.00 x	2.48 x	2.75 x	2.70 x
Overall Coverage: All Int. & Pfd. Div.	2.72 x	2.46 x	2.94 x	2.44 x	2.73 x	2.66 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	7.4%	6.8%	6.0%	7.3%	7.3%	7.0%
Effective Income Tax Rate	10.6%	9.9%	12.2%	19.0%	28.2%	16.0%
Internal Cash Generation/Construction [5]	60.5%	58.6%	65.9%	66.2%	78.7%	66.0%
Gross Cash Flow/ Avg. Total Debt [6]	15.0%	15.9%	17.5%	17.4%	19.9%	17.1%
Gross Cash Flow Interest Coverage [7]	5.17 x	4.90 x	4.97 x	4.98 x	5.57 x	5.12 x
Common Dividend Coverage [8]	3.47 x	3.52 x	5.56 x	4.80 x	4.33 x	4.34 x

See Page 2 for Notes.

Standard & Poor's Public Utilities
Capitalization and Financial Statistics
2017-2021, Inclusive

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.
(2)   Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account
(3)   Total operating expenses, maintenance, depreciation and taxes other than income taxes
        as a percent of operating revenues.
(4)   Coverage calculations represent the number of times available earnings, both including
        and excluding AFUDC (allowance for funds used during construction) as reported in its
        entirety, cover fixed charges.
(5)   Internal cash generation/gross construction is the percentage of gross construction
        expenditures provided by internally-generated funds from operations after payment of all
        cash dividends divided by gross construction expenditures.
(6)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income
        taxes and investment tax credits, less total AFUDC) as a percentage of average total debt.
(7)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income
        taxes and investment tax credits, less total AFUDC) plus interest charges, divided by
        interest charges.
(8)   Common dividend coverage is the relationship of internally-generated funds from
        operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Annual Reports to Shareholders
                        Utility COMPUSTAT

Standard & Poor's Public Utilities
Company Identities

	Ticker	Credit Rating [1]		Common Stock Traded	Value Line Beta
		Moody's	S&P		
Alliant Energy Corporation	LNT	Baa1	A-	NYSE	0.85
Ameren Corporation	AEE	Baa1	BBB+	NYSE	0.80
American Electric Power	AEP	Baa1	A-	NYSE	0.75
American Water Works	AWK	Baa1	A	NYSE	0.85
CenterPoint Energy	CNP	Baa1	BBB+	NYSE	1.15
CMS Energy	CMS	A3	A-	NYSE	0.80
Consolidated Edison	ED	Baa1	A-	NYSE	0.75
Dominion Energy	D	A2	BBB+	NYSE	0.85
DTE Energy Co.	DTE	A2	A-	NYSE	0.95
Duke Energy	DUK	A2	BBB+	NYSE	0.85
Edison Int'l	EIX	Baa2	BBB	NYSE	0.95
Entergy Corp.	ETR	Baa1	BBB+	NYSE	0.95
Evergy, Inc.	EVRG	Baa1	A-	NYSE	0.95
Eversource	ES	A3	A	NYSE	0.90
Exelon Corp.	EXC	A2	BBB+	NYSE	0.95
FirstEnergy Corp.	FE	A3	BBB	NYSE	0.85
NextEra Energy Inc.	NEE	A1	A	NYSE	0.90
NiSource Inc.	NI	Baa2	BBB+	NYSE	0.85
NRG Energy Inc.	NRG	Ba1	BB+	NYSE	1.15
Pinnacle West Capital	PNW	A3	BBB+	NYSE	0.90
PPL Corp.	PPL	A3	A-	NYSE	1.10
Public Serv. Enterprise Inc.	PEG	A3	A-	NYSE	0.90
Sempra Energy	SRE	A3	BBB+	NYSE	0.95
Southern Co.	SO	Baa1	BBB+	NYSE	0.95
WEC Energy Corp.	WEC	A2	A-	NYSE	0.80
Xcel Energy Inc	XEL	A2	A-	NYSE	0.80
Average for S&P Utilities		A3	BBB+		0.90

Note: [1] Ratings are those of utility subsidiaries

Source of Information: Moody's Investors Service, Inc.
S&P Global Inc.
The Value Line Investment Survey

The York Water Company
Capitalization and Related Capital Structure Ratios
Actual at December 31, 2021 and Estimated at February 29, 2024

| | Actual at December 31, 2021 | | | Estimated at February 29, 2024 | | |
| | Amount | Ratios | | Amount | Ratios | |
	Outstanding	Excl. S-T Debt	Incl. S-T Debt	Outstanding	Excl. S-T Debt	Incl. S-T Debt
Long-Term Debt	$ 119,870,000	43.99%	39.72%	$ 174,870,000 (1)	45.23%	44.92%
Common Equity						
Common stock	88,229,701			136,191,323 (2)		
Retained earnings	64,392,117			75,585,783 (3)		
Total Common Equity	152,621,818	56.01%	50.57%	211,777,106	54.77%	54.40%
Total Permanent Capital	272,491,818	100.00%	90.29%	386,647,106	100.00%	99.32%
Short-Term Debt	29,320,000		9.71%	2,653,353		0.68%
Total Capital Employed	$ 301,811,818		100.00%	$ 389,300,459		100.00%

Notes: (1) Reflects changes in long-term debt as follows:

8.43% Senior Note maturity	$ (7,500,000)
Senior Note issue 01/01/2019	30,000,000
Senior Note issue 02/01/2020	32,500,000
	$ 55,000,000

(2) Reflects changes in common stock related to:

Common Stock offering	$ 43,000,000
Dividend Reinvestment, Stock Purchase & Employee Stock Purchase Plans	
2022	2,395,639
2023 and thru 02/29/2024	2,565,983
	$ 47,961,622

(3) Projection of retained earnings reflects:

Net income - 2022	$ 16,156,738
Net income - 2023 and thru 02/29/2024	20,579,284
Common dividends - 2022	(10,792,659)
Common dividends - 2023 and thru 02/29/2024	(14,749,697)
	$ 11,193,666

Source of Information: Company provided data

The York Water Company
Calculation of the Embedded Cost of Long-Term Debt
Actual at December 31, 2021

Series	Date of Maturity	Principal Amount Outstanding (1)	Percent to Total	Effective Cost Rate	Weighted Cost Rate (2)
8.43%	12/18/22	$ 7,500,000	6.26%	8.53%	0.53%
3.18%	10/01/29	12,000,000	10.01%	3.58%	0.36%
3.00%	10/01/36	10,500,000	8.76%	3.35%	0.29%
3.10%	11/01/38	14,870,000	12.41%	3.59%	0.45%
3.23%	10/01/40	15,000,000	12.51%	3.50%	0.44%
4.30%	06/01/45	10,000,000	8.34%	4.70%	0.39%
4.54%	01/31/49	20,000,000	16.69%	4.60%	0.77%
3.24%	09/30/50	30,000,000	25.03%	3.27%	0.82%
4.00%	12/01/52	-	0.00%	4.06%	0.00%
4.25%	12/01/53	-	0.00%	4.32%	0.00%
Total Long -Term Debt		$119,870,000	100.00%		4.05%

Notes: (1) Includes current portion of long-term debt.
(2) As calculated on page 3 of this schedule.

Source of Information: Company provided data

The York Water Company
Calculation of the Embedded Cost of Long-Term Debt
Estimated at February 29, 2024

Series	Date of Maturity	Principal Amount Outstanding [1]	Percent to Total	Effective Cost Rate	Weighted Cost Rate [2]
8.43%	12/18/22	$ -	0.00%	8.53%	0.00%
3.18%	10/01/29	12,000,000	6.86%	3.58%	0.25%
3.00%	10/01/36	10,500,000	6.00%	3.35%	0.20%
3.10%	11/01/38	14,870,000	8.50%	3.59%	0.31%
3.23%	10/01/40	15,000,000	8.58%	3.50%	0.30%
4.30%	06/01/45	10,000,000	5.72%	4.70%	0.27%
4.54%	01/31/49	20,000,000	11.44%	4.60%	0.53%
3.24%	09/30/50	30,000,000	17.16%	3.27%	0.56%
4.00%	12/01/52	30,000,000	17.16%	4.06%	0.70%
4.25%	12/01/53	32,500,000	18.59%	4.32%	0.80%
Total Long-Term Debt		$174,870,000	100.00%		3.91%

Notes: [1] Includes current portion of long-term debt.

[2] As calculated on page 3 of this schedule.

Source of Information: Company provided data

The York Water Company
Calculation of the Effective Cost of Long-Term Debt by Series

Series	Date of Issue	Date of Maturity	Principal Amount Issued	Premium/ Discount and Expense	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate [1]
8.43%	12/15/92	12/18/22	$ 7,500,000	$ 81,274 [2]	$ 7,418,726	98.92%	8.53%
3.18%	05/07/08	10/01/29	12,000,000	712,585 [3]	11,287,415	94.06%	3.58%
3.00%	10/08/19	10/01/36	10,500,000	474,801 [4]	10,025,199	95.48%	3.35%
3.10%	10/08/19	11/01/38	14,870,000	1,004,682 [5]	13,865,318	93.24%	3.59%
3.23%	10/01/19	10/01/40	15,000,000	604,631 [6]	14,395,369	95.97%	3.50%
4.30%	07/23/15	06/01/45	10,000,000	542,646 [7]	9,457,354	94.57%	4.70%
4.54%	01/31/19	01/31/49	20,000,000	177,014	19,822,986	99.11%	4.60%
3.24%	09/30/20	09/30/50	30,000,000	162,709	29,837,291	99.46%	3.27%
4.00% [8]	12/01/22	12/01/52	30,000,000	300,000	29,700,000	99.00%	4.06%
4.25% [8]	12/01/23	12/01/53	32,500,000	325,000	32,175,000	99.00%	4.32%

Notes: [1] The effective cost for each issue is the yield to maturity using as inputs the average term of issue, coupon rate, and net proceeds ratio.

[2] Includes the actual issuance expenses of $18,797, $8,424 premiums paid to redeem the 8.625% Debentures, and unamortized debt issuance expense of $2,970 (8.625% Debentures), $2,417 (7% YCIDA Note), $5,504 (7.125% YCIDA Note), and $43,162 (8.0615% Water Facility Loans) which were all redeemed with the proceeds of the 8.43% Senior Note.

[3] Includes additional issuance expenses of $263,546 and $449,039 remaining amortization associated with the refinancing of 2004 PEDFA Exempt Facilities Revenue Bonds, Series B of 2004, with PEDFA Exempt Facilities Revenue Bonds, Series A of 2008.

[4] Includes additional issuance expenses of $145,997 and $328,804 remaining amortization associated with the refinancing of 2006 YCIDA Revenue Bonds, Series 2006, with 2019 PEDFA Exempt Facilities Revenue Refunding Bonds, Series A of 2019.

[5] Includes additional issuance expenses of $175,495 and $829,187 remaining amortization associated with the refinancing of 2014 PEDFA Exempt Facilities Revenue Refunding Bonds, Series 2014, with 2019 PEDFA Exempt Facilities Revenue Refunding Bonds, Series B of 2019.

[6] Includes additional issuance expenses of $112,356 and $492,275 remaining amortization associated with the refinancing of 2010A Monthly Senior Notes, Series 2010A, with 2019 Senior Notes.

[7] Includes additional issuance expenses of $298,297 and $1,854 remaining amortization associated with the refinancing of 2004 PEDFA A Exempt Facilities Revenue Bonds with 2015 YCIDA Exempt Facilities

[8] Estimated.

Source of Information: Company provided data

Monthly Dividend Yields for
Water Group
for the Twelve Months Ending March 2022

Company	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	12-Month Average	6-Month Average	3-Month Average
American States Water Co (AWR)	1.70%	1.69%	1.69%	1.66%	1.58%	1.71%	1.61%	1.55%	1.41%	1.59%	1.74%	1.64%			
American Water Works Co Inc (AWK)	1.55%	1.56%	1.57%	1.42%	1.32%	1.43%	1.39%	1.43%	1.28%	1.50%	1.60%	1.46%			
Artesian Resource Corp Class A (ARTNA)	2.60%	2.54%	2.85%	2.69%	2.65%	2.75%	2.68%	2.51%	2.32%	2.23%	2.30%	2.21%			
California Water Service Group (CWT)	1.57%	1.62%	1.66%	1.47%	1.45%	1.56%	1.52%	1.46%	1.28%	1.62%	1.76%	1.69%			
Essential Utilities, Inc. (WTRG)	2.14%	2.10%	2.20%	2.19%	2.16%	2.34%	2.29%	2.27%	2.00%	2.21%	2.28%	2.10%			
Middlesex Water Co (MSEX)	1.33%	1.27%	1.34%	1.07%	1.00%	1.06%	1.06%	1.13%	0.97%	1.15%	1.16%	1.10%			
SJW Corp (SJW)	2.08%	2.11%	2.16%	1.98%	1.96%	2.07%	2.07%	2.02%	1.86%	2.10%	2.21%	2.08%			
The York Water Co (YORW)	1.46%	1.50%	1.65%	1.56%	1.46%	1.72%	1.63%	1.67%	1.57%	1.72%	1.74%	1.74%			
Average	**1.80%**	**1.80%**	**1.89%**	**1.76%**	**1.70%**	**1.83%**	**1.78%**	**1.76%**	**1.59%**	**1.77%**	**1.85%**	**1.75%**	**1.77%**	**1.75%**	**1.79%**

Note: Monthly dividend yields are calculated by dividing the annualized quarterly dividend by the month-end closing stock price adjusted by the fraction of the ex-dividend.

Source of Information: https://finance.yahoo.com/quote/
http://www.nasdaq.com

Forward-looking Dividend Yield 1/2 Growth

	D_0/P_0	$(.5g)$	D_1/P_0
	1.75%	1.037500	1.82%

$$K = \frac{D_0(1+g)^0 + D_0(1+g)^0 + D_0(1+g)^1 + D_0(1+g)^1}{P_0} + g$$

Discrete

	D_0/P_0	Adj.	D_1/P_0
	1.75%	1.046451	1.83%

$$K = \frac{D_0(1+g)^{.25} + D_0(1+g)^{.50} + D_0(1+g)^{.75} + D_0(1+g)^{1.00}}{P_0} + g$$

Quarterly

	D_0/P_0	Adj.	D_1/P_0
	0.4375%	1.018245	1.79%

$$K = \left[\left(1 + \frac{D_0(1+g)^{.25}}{P_0}\right)^4 - 1\right] + g$$

Average 1.81%

Growth rate 7.50%

K 9.31%

Historical Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Company	Earnings per Share Value Line		Dividends per Share Value Line		Book Value per Share Value Line		Cash Flow per Share Value Line	
	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year
American States Water	8.50%	9.00%	8.00%	9.50%	6.00%	5.50%	4.50%	5.50%
American Water Works Co., Inc.	8.00%	10.50%	11.50%	11.00%	4.50%	3.50%	7.00%	8.00%
Artesian Res. Corp.	6.50%	-	3.00%	-	4.50%	-	5.50%	-
California Water Serv. Grp.	11.00%	6.50%	5.00%	3.50%	7.00%	6.00%	9.00%	6.50%
Essential Utilities, Inc.	1.00%	6.00%	7.00%	7.50%	14.00%	11.00%	3.00%	5.00%
Middlesex Water Company	11.00%	9.50%	6.00%	3.50%	9.00%	6.00%	9.50%	8.00%
SJW Corporation	-6.50%	6.00%	10.50%	6.50%	11.50%	9.00%	0.50%	6.00%
York Water Company	6.00%	6.00%	4.00%	3.50%	5.00%	4.50%	5.50%	6.00%
Average	5.69%	7.64%	6.88%	6.43%	7.69%	6.50%	5.56%	6.43%

Source of Information: Value Line Investment Survey, April 8, 2022

Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Water Group	I/B/E/S First Call	Zacks	Value Line				
			Earnings Per Share	Dividends Per Share	Book Value Per Share	Cash Flow Per Share	Percent Retained to Common Equity
American States Water	4.90%	NA	5.50%	9.00%	5.50%	5.50%	4.50%
American Water Works	8.30%	8.10%	7.50%	9.00%	8.00%	6.00%	4.00%
Artesian Resources Corp.	4.00%	NA	-	-	-	-	-
California Water Serv. Grp.	11.70%	NA	6.50%	6.50%	4.00%	2.00%	5.50%
Essential Utilities, Inc.	6.40%	6.10%	10.00%	8.00%	6.00%	10.00%	2.50%
Middlesex Water Company	2.70%	NA	4.50%	5.00%	2.00%	3.50%	6.00%
SJW Corporation	5.70%	NA	14.00%	5.50%	4.00%	2.50%	4.50%
York Water Company	4.90%	NA	5.00%	5.50%	2.50%	4.50%	5.00%
Average	6.08%	7.10%	7.57%	6.93%	4.57%	4.86%	4.57%

Source of Information : Yahoo First Call, March 30, 2022
Zacks, March 30, 2022
Value Line, April 8, 2022

Water Group
Financial Risk Adjustment

	American States Water Co (NYSE:AWR)	American Water Works Co. (NYSE:AWK)	Artesian Resources Corp (NDS:ARTNA)	California Water Service Group (NYSE:CWT)	Essential Utilities, Inc. (NYSE:WTRG)	Middlesex Water Co. (NDS:MSEX)	SJW Corp (NYSE:SJW)	The York Water Company (NDS:YORW)	Average
Fiscal Year	12/31/21	12/31/21	12/31/21	12/31/21	12/31/21	12/31/21	12/31/21	12/31/21	
Capitalization at Fair Values									
Debt(D)	$665,352	$11,818,000	$163,182	$1,338,831	$6,482,499	$320,081	$1,651,825	$168,000	2,825,971
Preferred(P)	0	6,000	0	0	0	2,084	0	0	1,011
Equity(E)	3,820,689	34,299,070	437,530	3,860,032	13,576,463	2,107,897	2,209,275	652,763	7,620,465
Total	$4,486,041	$46,123,070	$600,712	$5,198,863	$20,058,962	$2,430,062	$3,861,100	$820,763	10,447,446
Capital Structure Ratios									
Debt(D)	14.83%	25.62%	27.16%	25.75%	32.32%	13.17%	42.78%	20.47%	25.26%
Preferred(P)	0.00%	0.01%	0.00%	0.00%	0.00%	0.09%	0.00%	0.00%	0.01%
Equity(E)	85.17%	74.36%	72.84%	74.25%	67.68%	86.74%	57.22%	79.53%	74.72%
Total	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%
Common Stock									
Issued	36,936.285	186,880.413	9,443.772	53,716.000	256,102.388	17,522.000	30,181.348	13,112.948	
Treasury	0.000	5,269.324	0.000	0.000	3,234.765	0.000	0.000	0.000	
Outstanding	36,936.285	181,611.089	9,443.772	53,716.000	252,867.623	17,522.000	30,181.348	13,112.948	
Market Price`	$103.44	$188.86	$46.33	$71.86	$53.69	$120.30	$73.20	$49.78	
Capitalization at Carrying Amounts									**YORK FPFTY**
Debt(D)	$590,288	$10,396,000	$144,850	$1,060,986	$5,947,357	$311,128	$1,522,955	$149,190	174,870
Preferred(P)	0	4,000	0	0	0	2,084	0	0	0
Equity(E)	685,947	7,298,000	178,010	1,182,980	5,184,450	367,726	1,034,519	152,622	211,777
Total	$1,276,235	$17,698,000	$322,860	$2,243,966	$11,131,807	$680,938	$2,557,474	$301,812	386,647
Capital Structure Ratios									
Debt(D)	46.25%	58.74%	44.86%	47.28%	53.43%	45.69%	59.55%	49.43%	45.23%
Preferred(P)	0.00%	0.02%	0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	0.00%
Equity(E)	53.75%	41.24%	55.14%	52.72%	46.57%	54.00%	40.45%	50.57%	54.77%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Betas Value Line	0.65	0.85	0.70	0.65	0.95	0.70	0.80	0.85	0.77

Hamada:

Bl	=	Bu	[1+	(1 - t)	D/E	+	P/E	]
0.77	=	Bu	[1+	(1-0.21)	0.3381	+	0.0001	]
0.77	=	Bu	[1+	0.79	0.3381	+	0.0001	]
0.77	=	Bu	1.2672					
0.61	=	Bu						

Hamada:

Bl	=	0.61	[1+	(1 - t)	D/E	+	P/E	]
Bl	=	0.61	[1+	0.79	0.8258	+	0.0000	]
Bl	=	0.61	1.6524					
Bl	=	1.01						

M&M:

ku	=	ke	-	(((	ku	-	i	)		1-t	)		D	/	E	)-(	ku	- d	)	P	/ E
8.06%	=	9.31%	-	(((	8.06%	-	3.37%	)		0.79	)		25.26%	/	74.72%	)-(	8.06%	- 5.68%	)	0.01%	/ 74.72%
8.06%	=	9.31%	-	(((	4.69%			)		0.79	)		0.3381			)-(	2.38%		)	0.0001	
8.06%	=	9.31%	-	((	3.71%			)			)		0.3381			)-(	2.38%		)	0.0001	
8.06%	=	9.31%	-		1.25%											-	0.00%				

M&M:

ke	=	ku	+	(((	ku	-	i	)		1-t	)		D	/	E	)+(	ku	- d	)	P	/ E
10.77%	=	8.06%	+	(((	8.06%	-	3.91%	)		0.79	)		45.23%	/	54.77%	)+(	8.06%	- 5.68%	)	0.00%	/ 54.77%
10.77%	=	8.06%	+	(((	4.15%			)		0.79	)		0.8258			)+(	2.38%		)	0.0000	
10.77%	=	8.06%	+	((	3.28%			)			)		0.8258			)+(	2.38%		)	0.0000	
10.77%	=	8.06%	+		2.71%											+	0.00%				

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2017-2021
and the Twelve Months Ended March 2022

Years	Aa Rated	A Rated	Baa Rated	Average
2017	3.82%	4.00%	4.38%	4.07%
2018	4.09%	4.25%	4.67%	4.34%
2019	3.61%	3.77%	4.19%	3.86%
2020	2.79%	3.02%	3.39%	3.07%
2021	2.97%	3.11%	3.36%	3.15%
Five-Year Average	3.46%	3.63%	4.00%	3.70%

Months

	Aa Rated	A Rated	Baa Rated	Average
Apr-21	3.13%	3.30%	3.57%	3.33%
May-21	3.17%	3.33%	3.58%	3.36%
Jun-21	3.01%	3.16%	3.41%	3.19%
Jul-21	2.80%	2.95%	3.20%	2.99%
Aug-21	2.82%	2.95%	3.19%	2.99%
Sep-21	2.84%	2.96%	3.19%	3.00%
Oct-21	2.99%	3.09%	3.32%	3.13%
Nov-21	2.91%	3.02%	3.25%	3.06%
Dec-21	3.01%	3.13%	3.36%	3.17%
Jan-22	3.19%	3.33%	3.57%	3.36%
Feb-22	3.56%	3.68%	3.95%	3.73%
Mar-22	3.81%	3.98%	4.28%	4.02%
Twelve-Month Average	3.10%	3.24%	3.49%	3.28%
Six-Month Average	3.25%	3.37%	3.62%	3.41%
Three-Month Average	3.52%	3.66%	3.93%	3.70%

Yields on
A-rated Public Utility Bonds and
Spreads over 30-Year Treasuries
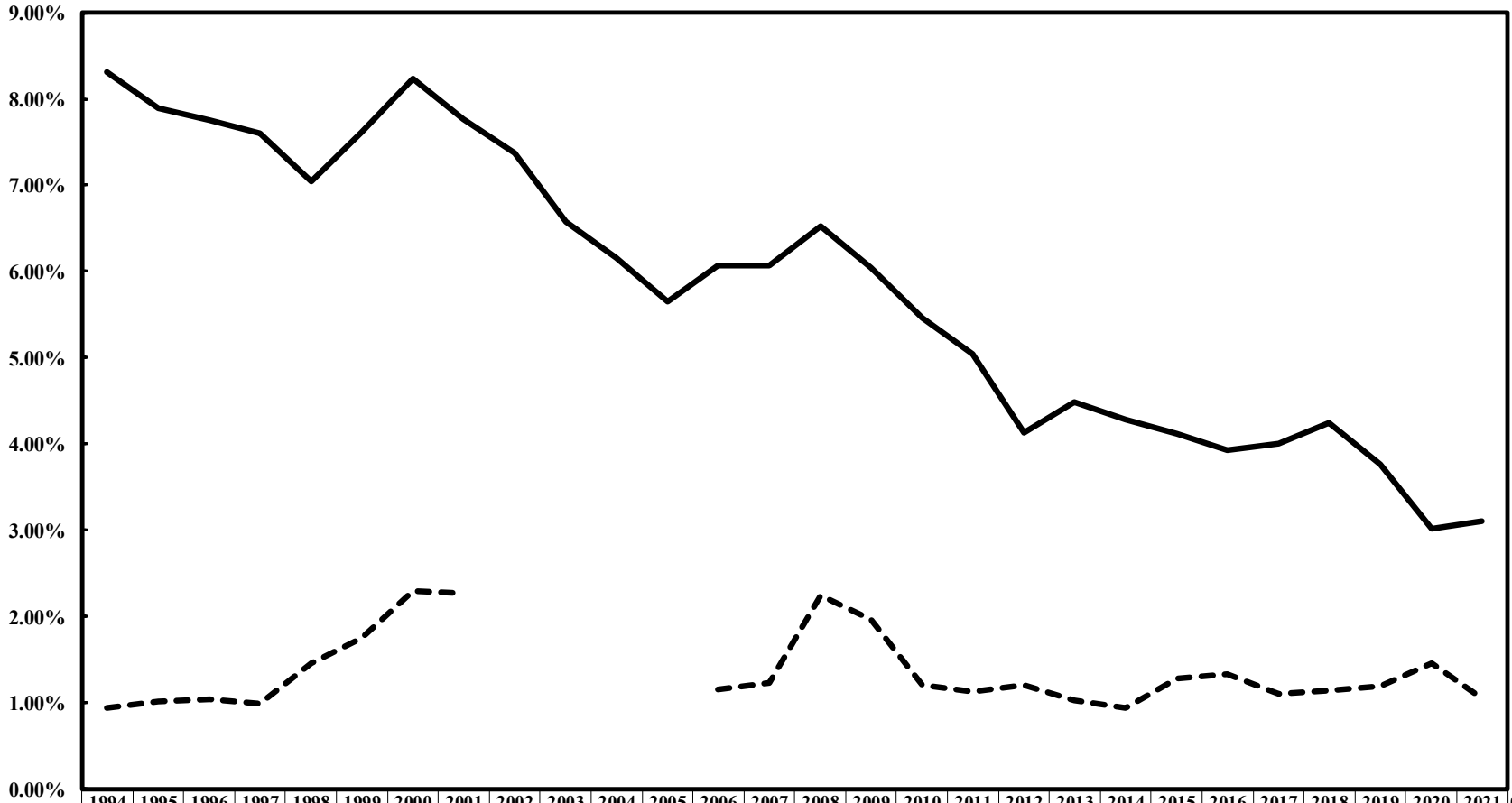
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A-rated Public Utility	8.31	7.89	7.75	7.60	7.04	7.62	8.24	7.76	7.37	6.58	6.16	5.65	6.07	6.07	6.53	6.04	5.46	5.04	4.13	4.48	4.28	4.12	3.93	4.00	4.25	3.77	3.02	3.11
Spread vs. 30-year	0.94	1.01	1.04	0.99	1.46	1.75	2.30	2.27					1.16	1.23	2.25	1.96	1.21	1.13	1.21	1.03	0.94	1.28	1.33	1.10	1.14	1.19	1.46	1.06

A rated Public Utility Bonds over 30-Year Treasuries

Year	A-rated Public Utility	30-Year Treasuries Yield	Spread	Year	A-rated Public Utility	30-Year Treasuries Yield	Spread	Year	A-rated Public Utility	30-Year Treasuries Yield	Spread	Year	A-rated Public Utility	30-Year Treasuries Yield	Spread
Jan-99	6.97%	5.16%	1.81%	Jan-05	5.78%			Jan-11	5.57%	4.52%	1.05%	Jan-17	4.14%	3.02%	1.12%
Feb-99	7.09%	5.37%	1.72%	Feb-05	5.61%			Feb-11	5.68%	4.65%	1.03%	Feb-17	4.18%	3.03%	1.15%
Mar-99	7.26%	5.58%	1.68%	Mar-05	5.83%			Mar-11	5.56%	4.51%	1.05%	Mar-17	4.23%	3.08%	1.15%
Apr-99	7.22%	5.55%	1.67%	Apr-05	5.64%			Apr-11	5.55%	4.50%	1.05%	Apr-17	4.12%	2.94%	1.18%
May-99	7.47%	5.81%	1.66%	May-05	5.53%			May-11	5.32%	4.29%	1.03%	May-17	4.12%	2.96%	1.16%
Jun-99	7.74%	6.04%	1.70%	Jun-05	5.40%			Jun-11	5.26%	4.23%	1.03%	Jun-17	3.94%	2.80%	1.14%
Jul-99	7.71%	5.98%	1.73%	Jul-05	5.51%			Jul-11	5.27%	4.27%	1.00%	Jul-17	3.99%	2.88%	1.11%
Aug-99	7.91%	6.07%	1.84%	Aug-05	5.50%			Aug-11	4.69%	3.65%	1.04%	Aug-17	3.86%	2.80%	1.06%
Sep-99	7.93%	6.07%	1.86%	Sep-05	5.52%			Sep-11	4.48%	3.18%	1.30%	Sep-17	3.87%	2.78%	1.09%
Oct-99	8.06%	6.26%	1.80%	Oct-05	5.79%			Oct-11	4.52%	3.13%	1.39%	Oct-17	3.91%	2.88%	1.03%
Nov-99	7.94%	6.15%	1.79%	Nov-05	5.88%			Nov-11	4.25%	3.02%	1.23%	Nov-17	3.83%	2.80%	1.03%
Dec-99	8.14%	6.35%	1.79%	Dec-05	5.80%			Dec-11	4.33%	2.98%	1.35%	Dec-17	3.79%	2.77%	1.02%
Jan-00	8.35%	6.63%	1.72%	Jan-06	5.75%			Jan-12	4.34%	3.03%	1.31%	Jan-18	3.86%	2.88%	0.98%
Feb-00	8.25%	6.23%	2.02%	Feb-06	5.82%	4.54%	1.28%	Feb-12	4.36%	3.11%	1.25%	Feb-18	4.09%	3.13%	0.96%
Mar-00	8.28%	6.05%	2.23%	Mar-06	5.98%	4.73%	1.25%	Mar-12	4.48%	3.28%	1.20%	Mar-18	4.13%	3.09%	1.04%
Apr-00	8.29%	5.85%	2.44%	Apr-06	6.29%	5.06%	1.23%	Apr-12	4.40%	3.18%	1.22%	Apr-18	4.17%	3.07%	1.10%
May-00	8.70%	6.15%	2.55%	May-06	6.42%	5.20%	1.22%	May-12	4.20%	2.93%	1.27%	May-18	4.28%	3.13%	1.15%
Jun-00	8.36%	5.93%	2.43%	Jun-06	6.40%	5.15%	1.25%	Jun-12	4.08%	2.70%	1.38%	Jun-18	4.27%	3.05%	1.22%
Jul-00	8.25%	5.85%	2.40%	Jul-06	6.37%	5.13%	1.24%	Jul-12	3.93%	2.59%	1.34%	Jul-18	4.27%	3.01%	1.26%
Aug-00	8.13%	5.72%	2.41%	Aug-06	6.20%	5.00%	1.20%	Aug-12	4.00%	2.77%	1.23%	Aug-18	4.26%	3.04%	1.22%
Sep-00	8.23%	5.83%	2.40%	Sep-06	6.00%	4.85%	1.15%	Sep-12	4.02%	2.88%	1.14%	Sep-18	4.32%	3.15%	1.17%
Oct-00	8.14%	5.80%	2.34%	Oct-06	5.98%	4.85%	1.13%	Oct-12	3.91%	2.90%	1.01%	Oct-18	4.45%	3.34%	1.11%
Nov-00	8.11%	5.78%	2.33%	Nov-06	5.80%	4.69%	1.11%	Nov-12	3.84%	2.80%	1.04%	Nov-18	4.52%	3.36%	1.16%
Dec-00	7.84%	5.49%	2.35%	Dec-06	5.81%	4.68%	1.13%	Dec-12	4.00%	2.88%	1.12%	Dec-18	4.37%	3.10%	1.27%
Jan-01	7.80%	5.54%	2.26%	Jan-07	5.96%	4.85%	1.11%	Jan-13	4.15%	3.08%	1.07%	Jan-19	4.35%	3.04%	1.31%
Feb-01	7.74%	5.45%	2.29%	Feb-07	5.90%	4.82%	1.08%	Feb-13	4.18%	3.17%	1.01%	Feb-19	4.25%	3.02%	1.23%
Mar-01	7.68%	5.34%	2.34%	Mar-07	5.85%	4.72%	1.13%	Mar-13	4.20%	3.16%	1.04%	Mar-19	4.16%	2.98%	1.18%
Apr-01	7.94%	5.65%	2.29%	Apr-07	5.97%	4.87%	1.10%	Apr-13	4.00%	2.93%	1.07%	Apr-19	4.08%	2.94%	1.14%
May-01	7.99%	5.78%	2.21%	May-07	5.99%	4.90%	1.09%	May-13	4.17%	3.11%	1.06%	May-19	3.98%	2.82%	1.16%
Jun-01	7.85%	5.67%	2.18%	Jun-07	6.30%	5.20%	1.10%	Jun-13	4.53%	3.40%	1.13%	Jun-19	3.82%	2.57%	1.25%
Jul-01	7.78%	5.61%	2.17%	Jul-07	6.25%	5.11%	1.14%	Jul-13	4.68%	3.61%	1.07%	Jul-19	3.69%	2.57%	1.12%
Aug-01	7.59%	5.48%	2.11%	Aug-07	6.24%	4.93%	1.31%	Aug-13	4.73%	3.76%	0.97%	Aug-19	3.29%	2.12%	1.17%
Sep-01	7.75%	5.48%	2.27%	Sep-07	6.18%	4.79%	1.39%	Sep-13	4.80%	3.79%	1.01%	Sep-19	3.37%	2.16%	1.21%
Oct-01	7.63%	5.32%	2.31%	Oct-07	6.11%	4.77%	1.34%	Oct-13	4.70%	3.68%	1.02%	Oct-19	3.39%	2.19%	1.20%
Nov-01	7.57%	5.12%	2.45%	Nov-07	5.97%	4.52%	1.45%	Nov-13	4.77%	3.80%	0.97%	Nov-19	3.43%	2.28%	1.15%
Dec-01	7.83%	5.48%	2.35%	Dec-07	6.16%	4.53%	1.63%	Dec-13	4.81%	3.89%	0.92%	Dec-19	3.40%	2.30%	1.10%
Jan-02	7.66%	5.45%	2.21%	Jan-08	6.02%	4.33%	1.69%	Jan-14	4.63%	3.77%	0.86%	Jan-20	3.29%	2.22%	1.07%
Feb-02	7.54%	5.40%	2.14%	Feb-08	6.21%	4.52%	1.69%	Feb-14	4.53%	3.66%	0.87%	Feb-20	3.11%	1.97%	1.14%
Mar-02	7.76%			Mar-08	6.21%	4.39%	1.82%	Mar-14	4.51%	3.62%	0.89%	Mar-20	3.50%	1.46%	2.04%
Apr-02	7.57%			Apr-08	6.29%	4.44%	1.85%	Apr-14	4.41%	3.52%	0.89%	Apr-20	3.19%	1.27%	1.92%
May-02	7.52%			May-08	6.28%	4.60%	1.68%	May-14	4.26%	3.39%	0.87%	May-20	3.14%	1.38%	1.76%
Jun-02	7.42%			Jun-08	6.38%	4.69%	1.69%	Jun-14	4.29%	3.42%	0.87%	Jun-20	3.07%	1.49%	1.58%
Jul-02	7.31%			Jul-08	6.40%	4.57%	1.83%	Jul-14	4.23%	3.33%	0.90%	Jul-20	2.74%	1.31%	1.43%
Aug-02	7.17%			Aug-08	6.37%	4.50%	1.87%	Aug-14	4.13%	3.20%	0.93%	Aug-20	2.73%	1.36%	1.37%
Sep-02	7.08%			Sep-08	6.49%	4.27%	2.22%	Sep-14	4.24%	3.26%	0.98%	Sep-20	2.84%	1.42%	1.42%
Oct-02	7.23%			Oct-08	7.56%	4.17%	3.39%	Oct-14	4.06%	3.04%	1.02%	Oct-20	2.95%	1.57%	1.38%
Nov-02	7.14%			Nov-08	7.60%	4.00%	3.60%	Nov-14	4.09%	3.04%	1.05%	Nov-20	2.85%	1.62%	1.23%
Dec-02	7.07%			Dec-08	6.52%	2.87%	3.65%	Dec-14	3.95%	2.83%	1.12%	Dec-20	2.77%	1.67%	1.10%
Jan-03	7.07%			Jan-09	6.39%	3.13%	3.26%	Jan-15	3.58%	2.46%	1.12%	Jan-21	2.91%	1.82%	1.09%
Feb-03	6.93%			Feb-09	6.30%	3.59%	2.71%	Feb-15	3.67%	2.57%	1.10%	Feb-21	3.09%	2.04%	1.05%
Mar-03	6.79%			Mar-09	6.42%	3.64%	2.78%	Mar-15	3.74%	2.63%	1.11%	Mar-21	3.44%	2.34%	1.10%
Apr-03	6.64%			Apr-09	6.48%	3.76%	2.72%	Apr-15	3.75%	2.59%	1.16%	Apr-21	3.30%	2.30%	1.00%
May-03	6.36%			May-09	6.49%	4.23%	2.26%	May-15	4.17%	2.96%	1.21%	May-21	3.33%	2.32%	1.01%
Jun-03	6.21%			Jun-09	6.20%	4.52%	1.68%	Jun-15	4.39%	3.11%	1.28%	Jun-21	3.16%	2.16%	1.00%
Jul-03	6.57%			Jul-09	5.97%	4.41%	1.56%	Jul-15	4.40%	3.07%	1.33%	Jul-21	2.95%	1.94%	1.01%
Aug-03	6.78%			Aug-09	5.71%	4.37%	1.34%	Aug-15	4.25%	2.86%	1.39%	Aug-21	2.95%	1.92%	1.03%
Sep-03	6.56%			Sep-09	5.53%	4.19%	1.34%	Sep-15	4.39%	2.95%	1.44%	Sep-21	2.96%	1.94%	1.02%
Oct-03	6.43%			Oct-09	5.55%	4.19%	1.36%	Oct-15	4.29%	2.89%	1.40%	Oct-21	3.09%	2.06%	1.03%
Nov-03	6.37%			Nov-09	5.64%	4.31%	1.33%	Nov-15	4.40%	3.03%	1.37%	Nov-21	3.02%	1.94%	1.08%
Dec-03	6.27%			Dec-09	5.79%	4.49%	1.30%	Dec-15	4.35%	2.97%	1.38%	Dec-21	3.13%	1.85%	1.28%
Jan-04	6.15%			Jan-10	5.77%	4.60%	1.17%	Jan-16	4.27%	2.86%	1.41%	Jan-22	3.33%	2.10%	1.23%
Feb-04	6.15%			Feb-10	5.87%	4.62%	1.25%	Feb-16	4.11%	2.62%	1.49%	Feb-22	3.68%	2.25%	1.43%
Mar-04	5.97%			Mar-10	5.84%	4.64%	1.20%	Mar-16	4.16%	2.68%	1.48%	Mar-22	3.98%	2.41%	1.57%
Apr-04	6.35%			Apr-10	5.81%	4.69%	1.12%	Apr-16	4.00%	2.62%	1.38%				
May-04	6.62%			May-10	5.50%	4.29%	1.21%	May-16	3.93%	2.63%	1.30%				
Jun-04	6.46%			Jun-10	5.46%	4.13%	1.33%	Jun-16	3.78%	2.45%	1.33%	Average:	12-months		1.14%
Jul-04	6.27%			Jul-10	5.26%	3.99%	1.27%	Jul-16	3.57%	2.23%	1.34%		6-months		1.27%
Aug-04	6.14%			Aug-10	5.01%	3.80%	1.21%	Aug-16	3.59%	2.26%	1.33%		3-months		1.41%
Sep-04	5.98%			Sep-10	5.01%	3.77%	1.24%	Sep-16	3.66%	2.35%	1.31%				
Oct-04	5.94%			Oct-10	5.10%	3.87%	1.23%	Oct-16	3.77%	2.50%	1.27%				
Nov-04	5.97%			Nov-10	5.37%	4.19%	1.18%	Nov-16	4.08%	2.86%	1.22%				
Dec-04	5.92%			Dec-10	5.56%	4.42%	1.14%	Dec-16	4.27%	3.11%	1.16%				

Common Equity Risk Premiums
Years 1926-2021

	Large Common Stocks	Long-Term Corp. Bonds	Equity Risk Premium	Long-Term Govt. Bonds Yields
Low Interest Rates	12.09%	5.28%	6.81%	2.80%
Average Across All Interest Rates	12.33%	6.40%	5.93%	4.92%
High Interest Rates	12.57%	7.52%	5.05%	7.03%

Source of Information: 2022 SBBI Yearbook Stocks, Bonds, Bills, and Inflation

Basic Series
Annual Total Returns (except yields)

Year	Large Common Stocks	Long-Term Corp. Bonds	Long-Term Govt. Bonds Yields
2020	18.40%	15.40%	1.37%
2021	28.71%	-2.66%	1.88%
1940	-9.78%	3.39%	1.94%
1945	36.44%	4.08%	1.99%
1941	-11.59%	2.73%	2.04%
1949	18.79%	3.31%	2.09%
1946	-8.07%	1.72%	2.12%
1950	31.71%	2.12%	2.24%
2019	31.49%	19.95%	2.25%
1939	-0.41%	3.97%	2.26%
1948	5.50%	4.14%	2.37%
1947	5.71%	-2.34%	2.43%
1942	20.34%	2.60%	2.46%
1944	19.75%	4.73%	2.46%
2012	16.00%	10.68%	2.46%
2014	13.69%	17.28%	2.46%
1943	25.90%	2.83%	2.48%
1938	31.12%	6.13%	2.52%
2017	21.83%	12.25%	2.54%
1936	33.92%	6.74%	2.55%
2011	2.11%	17.95%	2.55%
2015	1.38%	-1.02%	2.68%
1951	24.02%	-2.69%	2.69%
1954	52.62%	5.39%	2.72%
2016	11.96%	6.70%	2.72%
1937	-35.03%	2.75%	2.73%
1953	-0.99%	3.41%	2.74%
1935	47.67%	9.61%	2.76%
1952	18.37%	3.52%	2.79%
2018	-4.38%	-4.73%	2.84%
1934	-1.44%	13.84%	2.93%
1955	31.56%	0.48%	2.95%
2008	-37.00%	8.78%	3.03%
1932	-8.19%	10.82%	3.15%
1927	37.49%	7.44%	3.17%
1957	-10.78%	8.71%	3.23%
1930	-24.90%	7.98%	3.30%
1933	53.99%	10.38%	3.36%
1928	43.61%	2.84%	3.40%
1929	-8.42%	3.27%	3.40%
1956	6.56%	-6.81%	3.45%
1926	11.62%	7.37%	3.54%
2013	32.39%	-7.07%	3.78%
1960	0.47%	9.07%	3.80%
1958	43.36%	-2.22%	3.82%
1962	-8.73%	7.95%	3.95%
1931	-43.34%	-1.85%	4.07%
2010	15.06%	12.44%	4.14%
1961	26.89%	4.82%	4.15%
1963	22.80%	2.19%	4.17%
1964	16.48%	4.77%	4.23%
1959	11.96%	-0.97%	4.47%
1965	12.45%	-0.46%	4.50%
2007	5.49%	2.60%	4.50%
1966	-10.06%	0.20%	4.55%
2009	26.46%	3.02%	4.58%
2005	4.91%	5.87%	4.61%
2002	-22.10%	16.33%	4.84%
2004	10.88%	8.72%	4.84%
2006	15.79%	3.24%	4.91%
2003	28.68%	5.27%	5.11%
1998	28.58%	10.76%	5.42%
1967	23.98%	-4.95%	5.56%
2000	-9.10%	12.87%	5.58%
2001	-11.89%	10.65%	5.75%
1971	14.30%	11.01%	5.97%
1968	11.06%	2.57%	5.98%
1972	18.99%	7.26%	5.99%
1997	33.36%	12.95%	6.02%
1995	37.58%	27.20%	6.03%
1970	3.86%	18.37%	6.48%
1993	10.08%	13.19%	6.54%
1996	22.96%	1.40%	6.73%
1999	21.04%	-7.45%	6.82%
1969	-8.50%	-8.09%	6.87%
1976	23.93%	18.65%	7.21%
1973	-14.69%	1.14%	7.26%
1992	7.62%	9.39%	7.26%
1991	30.47%	19.89%	7.30%
1974	-26.47%	-3.06%	7.60%
1986	18.67%	19.85%	7.89%
1994	1.32%	-5.76%	7.99%
1977	-7.16%	1.71%	8.03%
1975	37.23%	14.64%	8.05%
1989	31.69%	16.23%	8.16%
1990	-3.10%	6.78%	8.44%
1978	6.57%	-0.07%	8.98%
1988	16.61%	10.70%	9.19%
1987	5.25%	-0.27%	9.20%
1985	31.73%	30.09%	9.56%
1979	18.61%	-4.18%	10.12%
1982	21.55%	42.56%	10.95%
1984	6.27%	16.86%	11.70%
1983	22.56%	6.26%	11.97%
1980	32.50%	-2.76%	11.99%
1981	-4.92%	-1.24%	13.34%

Yields for Treasury Constant Maturities
Yearly for 2017-2021
and the Twelve Months Ended March 2022

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2017	1.20%	1.40%	1.58%	1.91%	2.16%	2.33%	2.65%	2.90%
2018	2.33%	2.53%	2.63%	2.75%	2.85%	2.91%	3.02%	3.11%
2019	2.05%	1.97%	1.94%	1.96%	2.05%	2.14%	2.40%	2.58%
2020	0.38%	0.40%	0.43%	0.54%	0.73%	0.89%	1.35%	1.56%
2021	0.10%	0.27%	0.46%	0.86%	1.19%	1.44%	1.98%	2.05%
Five-Year Average	1.21%	1.31%	1.41%	1.60%	1.80%	1.94%	2.28%	2.44%

Months	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
Apr-21	0.06%	0.16%	0.35%	0.86%	1.31%	1.64%	2.20%	2.30%
May-21	0.05%	0.16%	0.32%	0.82%	1.28%	1.62%	2.22%	2.32%
Jun-21	0.07%	0.20%	0.39%	0.84%	1.23%	1.52%	2.09%	2.16%
Jul-21	0.08%	0.22%	0.40%	0.76%	1.07%	1.32%	1.87%	1.94%
Aug-21	0.07%	0.22%	0.42%	0.77%	1.06%	1.28%	1.83%	1.92%
Sep-21	0.08%	0.24%	0.47%	0.86%	1.16%	1.37%	1.87%	1.94%
Oct-21	0.11%	0.39%	0.67%	1.11%	1.40%	1.58%	2.03%	2.06%
Nov-21	0.18%	0.51%	0.82%	1.20%	1.45%	1.56%	1.97%	1.94%
Dec-21	0.30%	0.68%	0.95%	1.23%	1.40%	1.47%	1.90%	1.85%
Jan-22	0.55%	0.98%	1.25%	1.54%	1.70%	1.76%	2.15%	2.10%
Feb-22	1.00%	1.44%	1.65%	1.81%	1.91%	1.93%	2.31%	2.25%
Mar-22	1.34%	1.91%	2.09%	2.11%	2.15%	2.13%	2.51%	2.41%
Twelve-Month Average	0.32%	0.59%	0.82%	1.16%	1.43%	1.60%	2.08%	2.10%
Six-Month Average	0.58%	0.99%	1.24%	1.50%	1.67%	1.74%	2.15%	2.10%
Three-Month Average	0.96%	1.44%	1.66%	1.82%	1.92%	1.94%	2.32%	2.25%

Source: Federal Reserve statistical release H.15

Measures of the Risk-Free Rate & Corporate Bond Yields
The forecast of Treasury and Corporate yields
per the consensus of nearly 50 economists
reported in the Blue Chip Financial Forecasts dated December 1, 2021 and April 1, 2022

| | | Treasury | | | | | Corporate | |
| | | 1-Year | 2-Year | 5-Year | 10-Year | 30-Year | Aaa | Baa |
Year	Quarter	Bill	Note	Note	Note	Bond	Bond	Bond
2022	Second	1.6%	2.2%	2.4%	2.4%	2.6%	3.7%	4.6%
2022	Third	1.9%	2.4%	2.6%	2.6%	2.8%	4.0%	4.9%
2022	Fourth	2.2%	2.6%	2.7%	2.8%	3.0%	4.2%	5.1%
2023	First	2.5%	2.8%	2.9%	2.9%	3.2%	4.4%	5.3%
2023	Second	2.7%	2.9%	3.0%	3.0%	3.3%	4.5%	5.4%
2023	Third	2.8%	2.9%	3.1%	3.1%	3.3%	4.6%	5.5%
Long-range CONSENSUS								
2023		1.0%	1.3%	1.9%	2.4%	2.9%	3.7%	4.6%
2024		1.6%	1.9%	2.4%	2.8%	3.3%	4.2%	5.0%
2025		2.1%	2.4%	2.8%	3.1%	3.6%	4.5%	5.3%
2026		2.4%	2.6%	2.9%	3.2%	3.7%	4.6%	5.5%
2027		2.5%	2.6%	2.9%	3.2%	3.7%	4.8%	5.6%
Averages:								
	2023-2027	1.9%	2.2%	2.6%	2.9%	3.4%	4.4%	5.2%
	2028-2032	2.4%	2.6%	3.0%	3.3%	3.8%	4.9%	5.7%

Measures of the Market Premium

	Value Line Return		
		Median	Median
	Dividend	Appreciation	Total
As of:	Yield	Potential	Return
1-Apr-22	1.9% +	10.67% =	12.57%

DCF Result for the S&P 500 Composite

D/P	(	1+.5g	)	+		g	=	k
1.41%	(	1.072	)	+		14.3%	=	15.81%

Summary

Value Line		12.57%
S&P 500		15.81%
Average		14.19%
Risk-free Rate of Return (Rf)		3.00%
Forecast Market Premium		11.19%
Historical Market Premium		
Low Interest Rates	(Rm)	(Rf)	
1926-2021 Arith. mean	12.09%	2.80%	9.29%
Average - Forecast/Historical		10.24%

Exhibit 7.8: Size-Decile Portfolios of the NYSE/NYSE MKT/NASDAQ Long-Term Returns in Excess of CAPM
1926–2016

Size Grouping	OLS Beta	Arithmetic Mean	Return in Excess of Risk-free Rate (actual)	Return in Excess of Risk-free Rate (as predicted by CAPM)	Size Premium
Mid-Cap (3–5)	1.12	13.82%	8.80%	7.79%	1.02%
Low-Cap (6–8)	1.22	15.26%	10.24%	8.49%	1.75%
Micro-Cap (9–10)	1.35	18.04%	13.02%	9.35%	3.67%
Breakdown of Deciles 1–10					
1-Largest	0.92	11.05%	6.04%	6.38%	-0.35%
2	1.04	12.82%	7.81%	7.19%	0.61%
3	1.11	13.57%	8.55%	7.66%	0.89%
4	1.13	13.80%	8.78%	7.80%	0.98%
5	1.17	14.62%	9.60%	8.09%	1.51%
6	1.17	14.81%	9.79%	8.14%	1.66%
7	1.25	15.41%	10.39%	8.67%	1.72%
8	1.30	16.14%	11.12%	9.04%	2.08%
9	1.34	16.97%	11.96%	9.28%	2.68%
10-Smallest	1.39	20.27%	15.25%	9.66%	5.59%

Betas are estimated from monthly returns in excess of the 30-day U.S. Treasury bill total return, January 1926–December 2016. Historical riskless rate measured by the 91-year arithmetic mean income return component of 20-year government bonds (5.02%). Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (11.95%) minus the arithmetic mean income return component of 20-year government bonds (5.02%) from 1926–2016. Source: Morningstar *Direct* and CRSP. Calculated based on data from CRSP US Stock Database and CRSP US Indices Database ©2017 Center for Research. Used with permission. All calculations performed by Duff & Phelps, LLC.

Comparable Earnings Approach
Using Non-Utility Companies with
Timeliness of 3 & 4; Safety Rank of 2 & 3; Financial Strength of B+, B++, & A;
Price Stability of 80 to 100; Betas of .65 to .95; and Technical Rank of 3, 4 & 5

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
Altria Group Inc	Tobacco	4	3	B++	85	0.95	3
AMERCO	Trucking	3	2	B++	90	0.95	3
Assurant Inc	Financial Svcs. (Div.)	4	2	A	90	0.90	4
Ball Corp	Packaging & Container	3	2	B++	85	0.95	3
Bio Rad Laboratories Inc	Med Supp Non-Invasive	3	2	A	80	0.75	3
Broadridge Fin'l	Information Services	3	2	B++	95	0.85	4
Chemed Corporation	Diversified Co.	3	2	A	95	0.85	3
CSG Systems International Inc	IT Services	3	3	B+	90	0.75	3
Exponent Inc.	Information Services	3	3	B+	85	0.90	4
F5 Inc.	Telecom. Equipment	3	2	A	80	0.95	3
FTI Consulting Inc	Industrial Services	3	2	A	80	0.70	3
Gentex Corp	Auto Parts	3	2	B++	90	0.95	3
Hanover Insurance Group Inc	Insurance (Prop/Cas.)	3	2	A	95	0.95	3
Heartland Express Inc	Trucking	4	2	A	95	0.75	3
Lancaster Colony Corporation	Food Processing	4	2	A	95	0.70	4
ManTech International Corporation	IT Services	3	3	B++	85	0.85	4
Motorola Solutions Inc	Telecom. Equipment	3	2	B++	95	0.90	3
Northwest Bancshares Inc	Thrift	4	3	B+	95	0.95	3
Park National Corp	Bank (Midwest)	3	3	B++	80	0.80	3
Quest Diagnostics Inc	Medical Services	3	2	B++	90	0.80	4
Sensient Technologies Corp	Food Processing	3	2	B++	95	0.90	3
Service Corp International Inc	Industrial Services	3	3	B+	90	0.95	3
Stepan Company	Chemical (Specialty)	4	3	B++	80	0.80	3
Verisk Analytics Inc	Information Services	3	2	B++	100	0.85	3
Waters Corp	Precision Instrument	4	2	A	85	0.95	3
West Pharmaceutical Services Inc	Med Supp Non-Invasive	3	2	A	80	0.80	3
Western Union Company	Financial Svcs. (Div.)	4	3	B+	95	0.80	4
Average		3	2	B++	89	0.86	3
Water Group	Average	3	3	B++	89	0.77	4

Source of Information: Value Line Investment Survey for Windows, April 2022

Comparable Earnings Approach
Five -Year Average Historical Earned Returns
for Years 2017-2021 and
Projected 3-5 Year Returns

Company	2017	2018	2019	2020	2021	Average	Projected 2025-27
Altria Group Inc	42.5%	51.0%	NMF	NMF	NMF	46.8%	NMF
AMERCO	9.0%	10.0%	7.0%	12.6%	19.5%	11.6%	10.5%
Assurant Inc	12.2%	4.9%	6.8%	7.4%	9.0%	8.1%	6.5%
Ball Corp	7.7%	13.1%	19.2%	17.9%	24.2%	16.4%	27.5%
Bio Rad Laboratories Inc	2.2%	4.4%	3.7%	3.2%	10.0%	4.7%	6.5%
Broadridge Fin'l	32.6%	46.1%	49.1%	43.7%	36.8%	41.7%	35.5%
Chemed Corporation	26.1%	33.9%	31.7%	32.9%	49.5%	34.8%	32.0%
CSG Systems International Inc	17.9%	18.3%	20.9%	13.9%	16.5%	17.5%	22.0%
Exponent Inc.	14.3%	23.0%	23.5%	22.8%	25.5%	21.8%	29.0%
F5 Inc.	34.2%	35.3%	24.3%	13.8%	14.0%	24.3%	16.0%
FTI Consulting Inc	7.6%	11.4%	14.8%	15.9%	16.0%	13.1%	10.5%
Gentex Corp	18.0%	23.5%	21.9%	17.7%	18.3%	19.9%	27.0%
Hanover Insurance Group Inc	6.8%	9.9%	11.4%	11.1%	11.4%	10.1%	10.5%
Heartland Express Inc	7.4%	11.8%	10.7%	9.8%	11.0%	10.1%	10.0%
Lancaster Colony Corporation	20.0%	20.7%	20.7%	17.5%	16.9%	19.2%	15.5%
ManTech International Corporation	4.7%	5.9%	7.6%	7.6%	8.0%	6.8%	8.5%
Motorola Solutions Inc	-	-	-	-	-	-	NMF
Northwest Bancshares Inc	7.6%	8.4%	8.2%	4.9%	9.7%	7.8%	9.5%
Park National Corp	11.3%	13.3%	10.6%	12.3%	13.9%	12.3%	11.5%
Quest Diagnostics Inc	16.2%	16.8%	15.9%	22.6%	26.3%	19.6%	17.0%
Sensient Technologies Corp	17.7%	18.3%	14.2%	11.7%	13.0%	15.0%	13.0%
Service Corp International Inc	21.2%	20.4%	19.4%	29.8%	315.5%	81.3%	13.5%
Stepan Company	12.4%	14.4%	11.6%	12.9%	14.0%	13.1%	13.0%
Verisk Analytics Inc	28.8%	28.9%	19.9%	26.4%	25.0%	25.8%	24.0%
Waters Corp	27.0%	39.9%	-	NMF	NMF	33.5%	29.0%
West Pharmaceutical Services Inc	11.8%	14.8%	15.4%	18.7%	26.0%	17.3%	18.0%
Western Union Company	-	-	-	NMF	NMF	-	NMF
Average						21.3%	17.3%
Median						17.3%	14.5%
Average (excluding companies with values >20%)						13.1%	11.2%

Comparable Earnings Approach
Screening Parameters

Timeliness Rank

The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies. Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average) will probably advance or decline with the market. Investors should use the Technical and Timeliness Ranks as complements to one another.