

CITY OF LANCASTER
SEWER FUND
LANCASTER, PENNSYLVANIA

RATE OF RETURN

DIRECT TESTIMONY
OF
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TERMS, ABBREVIATIONS AND ACRONYMS

Terms, Abbreviations and Acronyms	Defined
CAPM	Capital Asset Pricing Model
City of Lancaster	The City in its entirety
Commission	Pennsylvania Public Utility Commission
Comparable Companies	Water Group Followed by Analysts
Comparable Group	Water Group Followed by Analysts
Cost of Capital	Investor-required cost rate
DCF	Discounted Cash Flow
EPA	U.S. Environmental Protection Agency
EPS	Earnings per share
Financial Risk	Leverage
GICS	Global Industry Classification Standard
GO	General Obligation Bonds
IOU	Investor Owned Utilities
Leverage	Fixed cost capital
Long-term U.S. Treasury Securities	Base Risk-Free Rate
M/B	Market-to-Book Ratios
Moody's	Moody's Investors Service
NARUC	National Association of Regulatory Utility Commissioners
Non-Systematic Risk	Company-Specific Risk
Outside Customers	Customers who are located outside of the City of Lancaster
ROE	Return on Equity
RP	Risk Premium
S&P	Standard & Poor's
Sewer Fund	City of Lancaster Sewer Enterprise Fund
SIC	Standard Industrial Classification
Systematic Risk	Non-Diversifiable Risk
Water Group	Water Group Followed by Analysts

1 **INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Harold Walker, III. My business mailing address is P. O. Box 80794, Valley
4 Forge, Pennsylvania 19484.

5 **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC as Manager,
7 Financial Studies.

8 **Q. WHAT IS YOUR EDUCATIONAL BACKGROUND AND EMPLOYMENT
9 EXPERIENCE?**

10 A. My educational background, business experience and qualifications are provided in
11 Appendix A.

12 **SCOPE OF TESTIMONY**

13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

14 A. The purpose of my testimony is to recommend an appropriate overall rate of return that the
15 City of Lancaster Sewer Fund (Sewer Fund) should be afforded an opportunity to earn on
16 its sewer utility service rate base. My testimony is supported by Exhibit HW-1, which is
17 composed of 21 Schedules. It should be noted, for the purposes of my testimony, my
18 reference to City of Lancaster refers to the City of Lancaster in its entirety; while my
19 reference to Sewer Fund refers to that portion of the City of Lancaster's services that are
20 accounted for as the Sewer Enterprise Fund.

1 **SUMMARY OF RECOMMENDATION**

2 **Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY?**

3 A. My recommendation is that Sewer Fund be permitted an overall rate of return of 7.92%
4 based upon an imputed capital structure at December 31, 2020, including a 10.85% cost of
5 common equity. My alternative recommended cost of common equity, should the
6 Commission decide to adjust my primary recommendation of 10.85% to reflect the income
7 tax status of the investors of Sewer Fund, is 9.55% and an overall fair rate of return
8 recommendation would be 7.20%. My recommended cost of common equity reflects
9 Sewer Fund's unique risk characteristics.

10 **Q. HOW DID YOU DETERMINE YOUR RECOMMENDED COMMON EQUITY**
11 **COST RATE?**

12 A. I used several models to help me in formulating my recommended common equity cost rate
13 including Discounted Cash Flow ("DCF"), Capital Asset Pricing Model ("CAPM") and
14 Risk Premium ("RP").

15 **Q. IS IT IMPORTANT TO USE MORE THAN ONE MARKET MODEL?**

16 A. Yes. It is necessary to estimate common equity cost rates using a number of different
17 models. At any given time, a particular model may understate or overstate the cost of
18 equity. While any single investor may rely solely upon one model, different investors rely
19 on different models and many investors use multiple models. Therefore, because the price
20 of common stock reflects a number of valuation models, it is appropriate to estimate the
21 market-required common equity cost rate by applying a broad range of analytical models.

1 **Q. PLEASE SUMMARIZE YOUR COMMON EQUITY COST RATE**
2 **RECOMMENDATION.**

3 A. There is no market data concerning Sewer Fund's equity. Accordingly, due to the lack of
4 market data concerning the Sewer Fund's equity, I used a comparable group of publicly
5 traded companies to estimate the common equity cost rate. Based upon the results of my
6 entire analysis, I conclude Sewer Fund's current common equity cost rate is at least
7 10.85%. The current range of common equity cost for Sewer Fund is 10.60% (DCF),
8 10.80% (CAPM), and 11.10% (RP). Value Line Investment Survey ("Value Line") is
9 relied upon by many investors and is the only investment advisory service of which I am
10 aware that projects earned return on equity. As a check on the reasonableness of my
11 common equity cost rate recommendation, I reviewed Value Line's projected returns on
12 common equity for comparable utilities. Value Line's projected earned returns on
13 common equity for my comparable utilities range from 9.7% to 14.4%. The range of the
14 projected returns suggests that my recommendation that Sewer Fund be permitted an
15 opportunity to earn 10.85% is reasonable, if not conservative. If the Commission adjusts
16 for the maximum level of personal income taxes of the Sewer Fund equity investor, the
17 current common equity cost rate is 9.55%.

18 **PRINCIPLES OF RATE REGULATION AND FAIR RATE OF RETURN**

19 **Q. WHAT ARE THE PRINCIPLES GUIDING FAIR RATES OF RETURN IN THE**
20 **CONTEXT OF RATE REGULATION?**

21 A. In a capitalistic or free market system, competition determines the price for all goods and
22 services. Utilities are permitted to operate as monopolies or near monopolies as a tradeoff
23 for a ceiling on the price of service because: (1) the services provided by utilities are

1 considered necessities by society; and (2) capital-intensive and long-lived facilities are
2 necessary to provide utility service. Generally, utilities are required to serve all customers
3 in their service territory at reasonable rates determined by regulators. As a result,
4 regulators act as a substitute for a competitive-free market system when they authorize
5 prices for utility service.

6 Although utilities operate in varying degrees as regulated monopolies, they must
7 compete with governmental bodies, non-regulated industries, and other utilities for labor,
8 materials, and capital. Capital is provided by investors who seek the highest return
9 commensurate with the perceived level of risk; the greater the perceived risk, the higher the
10 required return rate. In order for utilities to attract the capital required to provide service,
11 a fair rate of return should equal an investor-required, market-determined rate of return.

12 **Q. WHAT CONSTITUTES A FAIR RATE OF RETURN?**

13 A. Two noted Supreme Court cases define the benchmarks of a fair rate of return. In
14 *Bluefield*¹, a fair rate of return is defined as: (1) equal to the return on investments in other
15 business undertakings with the same level of risks (the comparable earnings standard);
16 (2) sufficient to assure confidence in the financial soundness of a utility (the financial
17 integrity standard); (3) adequate to permit a public utility to maintain and support its credit,
18 enabling the utility to raise or attract additional capital necessary to provide reliable service
19 (the capital attraction standard). The second case, *Hope*², determined a fair rate of return
20 to be based upon guidelines found in *Bluefield* as well as stating that: (1) allowed revenues
21 must cover capital costs including service on debt and dividends on stock; and (2) the

¹Bluefield Water Works & Improvement Company v. P.S.C. of West Virginia, 262 U.S. 679 (1923).

²Federal Power Commission v. Hope Natural Gas Company, 320 U.S. 591 (1944).

1 Commission was not bound to use any single formula or combination of formulae in
2 determining rates. Utilities are not entitled to a guaranteed return. However, the
3 regulatory-determined price for service must allow the utility a fair opportunity to recover
4 all costs associated with providing the service, including a fair rate of return.

5 **INVESTMENT RISK**

6 **Q. PREVIOUSLY, YOU REFERRED TO RISK. PLEASE DEFINE THE TERM**
7 **RISK.**

8 A. Risk is the uncertainty associated with a particular action; the greater the uncertainty of a
9 particular outcome, the greater the risk. Investors who invest in risky assets expose
10 themselves to investment risk particular to that investment. Investment risk is the sum of
11 business risk and financial risk. Business risk is the risk inherent in the operations of a
12 business. Assuming that a Company is financed with 100% common equity, business risk
13 includes all operating factors that affect the probability of receiving expected future
14 income such as: sales volatility, management actions, availability of product substitutes,
15 technological obsolescence, regulation, raw materials, labor, size and growth of the market
16 served, diversity of the customer base, economic activity of the area served, and other
17 similar factors.

18 **Q. WHAT IS FINANCIAL RISK?**

19 A. Financial risk reflects the manner in which an enterprise is financed. Financial risk arises
20 from the use of fixed cost capital (leverage) such as debt and/or preferred stock, because of
21 the contractual obligations associated with the use of such capital. Because the fixed
22 contractual obligations must be serviced before earnings are available for common

1 stockholders, the introduction of leverage increases the potential volatility of the earnings
2 available for common shareholders and therefore increases common shareholder risks.

3 Although financial risk and business risk are separate and distinct, they are
4 interrelated. In order for a company to maintain a given level of investment risk, business
5 risk and financial risk should complement one another to the extent possible. For
6 example, two firms may have similar investment risks while having different levels of
7 business risk, if the business risk differences are compensated for by using more or less
8 leverage (financial risk) thereby resulting in similar investment risk.

9 **DESCRIPTION OF THE LANCASTER SEWER FUND**

10 **Q. PLEASE GIVE A BRIEF DESCRIPTION OF THE LANCASTER SEWER FUND.**

11 A. The Sewer Fund is essentially a “subsidiary” of the City of Lancaster, although not a
12 separate legal entity. Most government entities such as the City of Lancaster do not have
13 subsidiaries, rather, they have departments. The City of Lancaster uses an enterprise fund,
14 or the Sewer Fund, to account for its sewer utility operations.

15 The Sewer Fund provides sewer services to about 20,204 customers who are
16 primarily located in the City of Lancaster and also located beyond its corporate limits in
17 outlying municipalities in Lancaster County. Lancaster’s sewer service area includes all
18 of the City of Lancaster, and communities that are located outside the City of Lancaster
19 (“Outside Customers”). The price of service of the Outside Customers’ sewer rates is
20 regulated by the Pennsylvania Public Utility Commission (“Commission” or “PUC”).
21 The Outside Customers that are jurisdictional include portions of the townships of East
22 Hempfield, East Lampeter, Manheim, Manor and Lancaster. In total, the entire population
23 of the City of Lancaster that is provided sewer service by Sewer Fund is approximately

1 60,000 people. Only about 17% of Lancaster’s sewer customers, or 3,385 customers,
2 have their sewer rates regulated by the PUC.

3 **THE INDUSTRY**

4 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE INDUSTRY IN WHICH THE**
5 **COMPANY OPERATES.**

6 A. Sewer Fund operates in the wastewater supply industry. The wastewater utility industry
7 has a Standard Industrial Classification (“SIC”) code of 4952 (Sewerage Systems), has
8 sewer utilities, and includes establishments primarily engaged in the collection and
9 disposal of wastes conducted through a sewer system, including such treatment processes
10 as may be provided. There are currently 1,861 U.S. Businesses with a SIC code of 4952.

11 A comparative industry to the wastewater supply industry is the water supply
12 industry. The water supply industry has a SIC code of 4941, has water utilities, and
13 includes establishments primarily engaged in distributing water for sale for residential,
14 commercial, and industrial uses. Government controlled establishments such as
15 municipalities, public service districts and other local governmental entities dominate the
16 industry. Private companies or investor owned utilities (“IOU”) are active in the
17 construction and improvement of water supply facilities and infrastructure. There are
18 currently 9,538 U.S. Businesses with a SIC code of 4941

19 The water supply industry is the most fragmented of the major utility industries
20 with more than 53,000 community water systems in the U.S. (83% of which serve less than
21 3,300 customers). The nation's water systems range in size from large municipally owned
22 systems, such as the New York City water system that serves approximately 9 million
23 people, to small systems, where a few customers share a common well.

1 According to the U.S. Environmental Protection Agency's ("EPA") most recent
2 survey of publicly-owned wastewater treatment facilities in 2008, there are approximately
3 15,000 such facilities in the nation, serving approximately 74% of the U.S. population.
4 Eighty percent of domestic wastewater systems are government owned rather than IOUs.
5 Currently, there are no wastewater utility companies that have actively traded stock.³
6 An estimated 14% of all water supplies are managed or owned by IOUs. IOUs consist of
7 companies with common stock that is either actively traded or inactively traded, as well as
8 companies that are closely held, or not publicly traded. Currently, there are only about 10
9 investor owned water utility companies with publicly traded stock in the U.S.

10 The wastewater utility industry's and water utility industry's increased compliance
11 with state and federal water purity levels and large infrastructure replacements are driving
12 consolidation of the wastewater utility and water utility industries. Because many
13 wastewater utility and water utility operations do not have the means to finance the
14 significant capital expenditures needed to comply with these requirements, many have
15 been selling their operations to larger, financially stronger operations.

16 The larger IOUs have been following an aggressive acquisition program to expand
17 their operations by acquiring smaller wastewater and water systems. Generally, they
18 enter a new market by acquiring one or several wastewater or water utilities. After their
19 initial entry into a new market, the larger investor-owned water utility companies
20 continually seek to expand their market share and services through the acquisition of
21 wastewater and water utility businesses and operations that can be integrated with their
22 existing operations. Such acquisitions may allow a company to expand market share and

3 Many of the publicly traded water utility stocks also own some wastewater utilities but there are no publicly traded utility stocks which are comprised solely of wastewater utilities.

1 increase asset utilization by eliminating duplicate management, administrative, and
2 operational functions. Acquisitions of small, independent utilities can often add earning
3 assets without necessarily incurring the costs associated with the SDWA if such
4 acquisitions are contiguous to the potential purchaser.

5 In summary, the result of increased capital spending, to meet the SDWA
6 requirements⁴ and replace the aging infrastructure of many systems, has moved the
7 wastewater and water industries toward consolidation. Moreover, Federal and State
8 regulations and controls concerning water quality are still in the process of being
9 developed and it is not possible to predict the scope or the enforceability of regulations or
10 standards which may be established in the future, or the cost and effect of existing and
11 potential regulations and legislation upon Sewer Fund. However, as a smaller wastewater
12 system, Sewer Fund faces the cost of compliance with less financial resources when
13 compared to larger IOU water utilities.

14 COMPARABLE GROUP

15 **Q. HOW DO YOU ESTIMATE THE COST OF COMMON EQUITY FOR SEWER**
16 **FUND?**

17 A. The Sewer Fund's fund equity is not traded. Accordingly, I employed a comparable group
18 of utility companies with actively traded stock, to determine a market-required cost rate of
19 common equity capital for Sewer Fund. Since no companies are perfectly identical to
20 Sewer Fund, it is reasonable to determine the market-required cost rate for a comparable

4 The SDWA, or Safe Drinking Water Act, is the principal federal law in the United States intended to ensure safe drinking water for the public. Pursuant to the act, the EPA is required to set standards for drinking water quality and oversee all states, localities, and water suppliers who implement these standards. The CWA, or Clean Water Act, is the primary federal law in the United States governing water pollution. The CWA's objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands.

1 group of utility companies and adjust, to the extent necessary, for investment risk
2 differences between Sewer Fund and the comparable group.

3 **Q. HOW DID YOU SELECT THE COMPARABLE GROUP USED TO DETERMINE**
4 **THE COST OF COMMON EQUITY FOR SEWER FUND?**

5 A. I selected a comparable group of water utilities to determine the cost of common equity for
6 Sewer Fund considering security analysts' coverage. Unlike the other utility industries,
7 only a portion of the IOU water companies with publicly traded stock in the U.S. are
8 followed by security analysts. Coverage by security analysts is important when
9 determining a market required cost of common equity. Accordingly, security analysts'
10 coverage was considered when selecting my comparable group. I selected my water utility
11 comparable group, Water Group Followed by Analysts ("Water Group"), based upon a
12 general criteria that includes: (1) all U.S. water utilities who are covered by several security
13 analysts as measured by the existence of several sources of published projected five-year
14 growth rates in earnings per share ("EPS"); (2) with a Global Industry Classification
15 Standard⁵ ("GICS") of 55104010 (*i.e.*, Water Utility); (3) are not the announced subject of
16 an acquisition; (4) currently pay a common dividend and have not reduced their common
17 dividend within the past four years; and (5) have market capitalization greater than \$75.0
18 million.

5 GICS is an eight-digit code that represents a company's Global Industry Classification Standard that was developed by Standard & Poor's and Morgan Stanley Capital International. The eight-digit code can be broken down according to a hierarchy of economic sectors, industry groups, industries and sub-industries: All Economic Sectors are represented by the leftmost two-digits; Industry Groups are represented by the combination of the leftmost four-digits; Industries are represented by the combination of the leftmost six-digits; and Sub-Industries are represented by the combination of the leftmost eight-digits.

1 It should be noted that the Water Group is also referred to as the Comparable Group
 2 and/or the Comparable Companies.⁶ The names of the utilities that comprise the
 3 Comparable Group and their bond or credit ratings are listed in Table 1.

Bond and Credit Ratings for <u>The Water Group Followed by Analysts</u>	
	S&P Credit <u>Rating</u>
<u>Water Group Followed by Analysts</u>	
American States Water Co	A+
American Water Works Co Inc	A
Aqua America Inc *	A+
California Water Service Gp **	A+
Middlesex Water Co	A
SJW Corp ***	A
York Water Co	A-
Average	<u>A</u>
* - The A+ bond rating is that for Aqua Pennsylvania, Inc. ** - The A+ bond rating is that for California Water Service Co., Inc. *** - The A bond rating is that for San Jose Water Co.	

4 **Table 1**

5 **Q. WHY DID YOU INCLUDE NOT BEING THE SUBJECT OF AN ACQUISITION**
 6 **AS A CRITERIA FOR THE WATER GROUP?**

7 A. To begin with, there are only about 10 investor owned water utility companies with
 8 publicly traded stock in the U.S., and some of these companies are very small. As stated
 9 previously, the IOU water industry receives only limited exposure on Wall Street.
 10 Additionally, the merger activity in the water industry can result in abnormal or "tainted"

6 The majority of the Comparable Companies also provide some wastewater service.

1 stock prices because premiums are typically paid in corporate acquisitions and offered
2 during tender. That is, when a tender offer is made for the purchase of all the outstanding
3 stock of a company, the amount of that offer usually exceeds the price at which the stock
4 was previously traded in the market. These large premiums are sometimes reflected in the
5 prices of other water utilities that are not currently the announced subject of an
6 acquisition.⁷

7 CAPITAL STRUCTURE

8 **Q. WHAT IS REQUIRED TO DEVELOP AN OVERALL RATE OF RETURN?**

9 A. The first step in developing an overall rate of return is the selection of capital structure
10 ratios to be employed. Next, the cost rate for each capital component is determined. The
11 overall rate of return is the product of weighting each capital component by its respective
12 capital cost rate. This procedure results in Sewer Fund's overall rate of return being
13 weighted proportionately to the amount of capital and cost of capital of each type of
14 capital.

15 **Q. DOES SEWER FUND DIRECTLY RAISE OR ISSUE ITS OWN DEBT CAPITAL?**

16 A. No, the Sewer Fund does not raise its own capital; rather it is essentially a “subsidiary” of
17 the City of Lancaster, although not a separate legal entity. Most government entities such
18 as the City of Lancaster do not have subsidiaries, rather, they have departments. The
19 Sewer Fund is a department and a separate accounting entity from the City of Lancaster,
20 accounted for as an Enterprise Fund. As a department of the City of Lancaster, the Sewer

⁷ Multiple publications mention these impacts including Research Magazine – April, 2010, Barron's – March 2001, Utility Business – June 2002, and Value Line Investment Survey – April 2013.

1 Fund has no managerial control over its capital structure and is not able to obtain its equity
2 and debt financing in the open market.

3 **Q. WHAT CAPITAL STRUCTURE RATIOS ARE APPROPRIATE TO BE USED TO**
4 **DEVELOP SEWER FUND'S OVERALL RATE OF RETURN?**

5 A. Consistent with 66 PA. C.S., I believe it is necessary to evaluate the Sewer Fund's current
6 cost of capital based upon an imputed capital structure at December 31, 2020, consisting of
7 45% long term debt and 55% equity, representing the current water industry practice and is
8 consistent with the Comparison Group's capital structure ratios.

9 **Q. HOW DOES YOUR RECOMMENDED CAPITAL STRUCTURE COMPARE**
10 **WITH RATIOS EMPLOYED BY OTHER INVESTOR-OWNED COMPANIES?**

11 A. The capital structure I recommend for Sewer Fund reflects a common equity ratio of 55%
12 which is similar to the ratios employed by other investor-owned water companies as shown
13 on pages 1 and 2 of Schedule 2. A comparison of my recommendation for Sewer Fund's
14 capital structure ratios to those recently employed and forecasted to be employed by the
15 Comparison Group is shown in Table 2.

<u>Comparison of Capital Structure Ratios</u>			
	<u>Sewer Fund</u>	<u>Water Group</u>	
	<u>Projected</u>	<u>At</u>	<u>Projected</u>
	<u>12/31/2020</u>	<u>12/31/2018</u>	<u>2023</u>
Debt	45.0	44.8	43.1
Preferred Stock	0.0	0.1	0.0
Common Equity	<u>55.0</u>	<u>55.1</u>	<u>56.9</u>
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

16

1 **Table 2**

2 The Sewer Fund's rate making capital structure ratios are reasonable based upon the above
3 information and are consistent with 66 PA. C.S.

4 **EMBEDDED COST RATE**

5 **Q. YOU TESTIFIED THAT SEWER FUND DOES NOT DIRECTLY RAISE OR**
6 **ISSUE ITS OWN DEBT CAPITAL. WHAT TYPE OF MUNICIPAL DEBT**
7 **CAPITAL IS ASSUMED OR RAISED FOR SEWER FUND?**

8 A. The City of Lancaster issues general obligation municipal bonds including those financing
9 the Sewer Fund's rate base. The bonds used to fund the construction of the sewer system,
10 are guaranteed by the full faith and credit and taxing authority of the City of Lancaster;
11 hence, they are a general obligation of the City of Lancaster **only**.

12 Municipal bonds are roughly divided into two classes: general obligation ("GO")
13 and revenue bonds. The difference between GO and revenue bonds is the specific security
14 that is pledged to repay the debt. GO bonds are secured by the full faith and credit of the
15 issuer, meaning that the borrower is committing to raise taxes or other revenues sufficient
16 to cover the amount owed. By comparison, revenue bonds are backed or secured solely
17 by the income received by the revenue-producing enterprise (e.g., a water system) being
18 financed by the revenue bonds. Therefore, unlike GO bonds, revenue bonds are not backed
19 by the full faith and credit of the issuing entity. All other things being equal, GO bonds are
20 less risky or a more secure investment than revenue bonds since revenue bonds lack the full
21 faith and credit of the issuing entity.

22 Hence, since the cost of borrowing increases as the risk of nonpayment increases,
23 GO bonds command (i.e., allow the City of Lancaster to borrow at) lower interest rates
24 than revenue bonds. Moreover, the City of Lancaster's GO bonds are tax-exempt to the

1 investor, lowering their cost of borrowing further, including the portion of the City of
2 Lancaster's GO bonds that are allocated to the Sewer Fund. Accordingly, Sewer Fund's
3 Outside Customers benefit from the taxing powers of the City of Lancaster securing lower
4 borrowing costs of GO bonds, and also benefit further from the tax-exemption of the
5 interest paid on the City of Lancaster's GO bonds, lowering their borrowing costs further,
6 despite not being tax payers since they are located beyond its corporate limits.

7 **Q. WHAT EMBEDDED COST RATES DO YOU RECOMMEND BE USED TO**
8 **CALCULATE SEWER FUND'S OVERALL RATE OF RETURN?**

9 A. I recommend using Sewer Fund's embedded debt cost rate of 4.34% at December 31,
10 2020. The determination of the embedded debt cost rate is shown on Schedule 3.

11 **Q. HOW DID YOU DETERMINE SEWER FUND'S EMBEDDED COST RATES?**

12 A. The determination of an embedded cost rate is a relatively simple arithmetic exercise
13 because a company has contracted for this capital for a specific period of time and at a
14 specific cost, including issuance expenses and coupon rate. The embedded cost rate is
15 determined by employing a cost rate to maturity calculation, using as inputs, the coupon
16 rate, net proceeds ratio, and term in years. Once the cost rate to maturity, or effective
17 cost rate, is determined for each issue, it is weighted according to the amount of capital
18 outstanding for each series to determine the weighted composite cost or the embedded
19 cost.

1 **FINANCIAL ANALYSIS**

2 **Q. HAVE YOU REVIEWED HISTORICAL FINANCIAL INFORMATION OF THE**
3 **WATER GROUP AS PART OF YOUR ANALYSIS?**

4 A. Yes. On Schedule 4, I developed a five-year analysis, ending in 2017, detailing various
5 financial ratios for the Water Group. Schedule 5 reveals the results of operations for a
6 large broad-based group of utilities known as the Standard & Poor's ("S&P"), Utilities for
7 the five years ending 2017. This information is useful in determining relative risk
8 differences between different types of utilities.

9 Comparing the Comparable Group and the S&P Utilities' coverage of fixed
10 charges and the various cash flow coverage proves that the Comparable Group has
11 experienced a higher level of coverage than the S&P Utilities.

12 **Q. WHAT DO YOU CONCLUDE FROM THE COMPARISON OF ALL THE**
13 **INFORMATION SHOWN ON SCHEDULES 4 THROUGH 5?**

14 A. Taken together, these comparisons show that Comparable Groups is exposed to risk that is
15 similar in nature but lesser in degree compared with the S&P Utilities. This is evident in
16 particular when one considers the size of the Water Group as compared to the S&P Utilities
17 along with the various financial ratios.

18 **Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 6?**

19 A. Schedule 6 lists the names, issuer credit ratings, common stock rankings, betas and market
20 values of the companies contained in the Comparable Group and the S&P Utilities. As is
21 evident from the information shown on Table 3, the Comparable Group and the S&P
22 Utilities are similar to each other in risk.

	S&P Issuer Credit <u>Rating</u>	S&P Common <u>Stock Ranking</u>	Value Line <u>Beta</u>	Recent Market <u>Value</u> (Mill \$)	Market Quartile <u>Name</u>
Water Group	A	High (A)	0.69	2,425.472	Mid-Cap
S&P Utilities	BBB+	Average (B+)	0.69	28,931.059	Large-Cap

Table 3

The Water Group's average issuer credit ratings and common stock rankings are higher than the S&P Utilities. The average beta of the Comparable Group, 0.69, is similar to the average beta of the S&P Utilities, 0.69. Beta is a measure of volatility or market risk, the higher the beta, the higher the market risk. The market values provide an indication of the relative size of each group. As a generalization, the smaller the average sizes of a group, the greater the risk.

Page 2 of Schedule 7 shows that the Comparable Companies have experienced a higher return on equity ("ROE") when compared to the S&P Utilities. Further, the Comparable Companies' dividend payout ratio is lower than S&P Utilities. S&P, a predominant bond rating agency, considers profit to be a fundamental determinant of credit protection. S&P states that a firm's profit level:

Whether generated by the regulated or deregulated side of the business, profitability is critical for utilities because of the need to fund investment-generating capacity, maintain access to external debt and equity capital, and make acquisitions. Profit potential and stability is a critical determinant of credit protection. A company that generates higher operating margins and returns on capital also has a greater ability to fund growth internally, attract capital externally, and withstand business adversity. Earnings power ultimately attests to the value of the company's assets, as well. In fact, a company's profit performance offers a litmus test of its fundamental health and competitive position.

1 Accordingly, the conclusions about profitability should confirm the
2 assessment of business risk, including the degree of advantage provided by
3 the regulatory environment.⁸
4

5 **Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 7?**

6 A. Schedule 7 reveals the capital intensity and capital recovery for Sewer Fund, the
7 Comparable Companies and the S&P Utilities. Based upon the 2017 capital intensity
8 ratio of plant to revenues, Sewer Fund (\$11.34) is more capital intensive as compared to the
9 Water Group (\$5.82) and more than the S&P Utilities (\$4.17). In other words, Sewer
10 Fund must invest \$11.34 in plant to produce a dollar of revenue or about 194% more than
11 the amount of capital required in the Water Group just to produce the same level of
12 revenue. From a purely financial point of view, based on current accounting practices, the
13 rate of capital recovery or depreciation rate is an indication of risk because it represents
14 cash flow and the return of an investment. Sewer Fund's average rate of capital recovery
15 is lower than the Comparable Group's, suggesting more risk.

16 The return on equity and depreciation expense provides the margin for coverage of
17 construction expenditures. For a utility company, depreciation expense is the single
18 largest generator of cash flow. From a financial analyst's point of view, cash flow is the
19 life blood of a utility company. Without it, a utility cannot access capital markets, it
20 cannot construct plant, and therefore, it cannot provide service to its customers. As shown
21 on Schedule 7, Sewer Fund has an inadequate level of cash flow and is clearly higher risk
22 than the Comparable Companies.

⁸ Standard & Poor's Ratings Services, *Criteria, Utilities: Key Credit Factors: Business And Financial Risks In The Investor-Owned Utilities Industry*, Nov. 26, 2008, pgs. 8-9.

1 **RISK ANALYSIS**

2 **Q. PLEASE EXPLAIN THE INFORMATION SHOWN ON SCHEDULE 8.**

3 A. Schedule 8 details the size difference between Sewer Fund and the Comparable Group.
4 Company size is an indicator of business risk and is summarized in Table 4.

<u>Number of Times Larger Than the Sewer Fund</u>	
	<u>Water Group</u>
Capitalization	54.7x
Revenues	49.9x
Number of Customers	39.7x

5 **Table 4**

6 As shown in Table 4, Sewer Fund is much smaller than the Water Group. The size of a
7 company affects risk. A smaller company requires the employment of proportionately
8 less financial leverage (*i.e.*, debt and preferred capital) than a larger company to balance
9 out investment risk. If investment risk is not balanced out, then a higher cost of capital is
10 required.

11 **Q. WHY IS SIZE SIGNIFICANT TO YOUR ANALYSIS?**

12 A. The size of a company can be likened to ships on the ocean, since a large ship has a much
13 better chance of weathering a storm than a small ship. The loss of a large customer will
14 impact a small company much more than a large company because a large customer of a
15 small company usually accounts for a larger percentage of the small company's sales.

16 Moreover, a larger company is likely to have a more diverse geographic operation
17 than a smaller company, which enables it to sustain earnings fluctuations caused by
18 abnormal weather in one portion of its service territory. A larger company operating in

1 more than one regulatory jurisdiction enjoys "regulatory diversification" which makes it
2 less susceptible to adverse regulatory developments or eminent domain claims in any
3 single jurisdiction. Further, a larger company with a more diverse customer base is less
4 susceptible to downturns associated with regional economic conditions than a small
5 company. For example, on average, the average company in the Water Group provides
6 water/sewer service in multiple states for about 803,000 customers. The average
7 population of the communities served by the average company in the Water Group is about
8 3.1 million people. These wide-ranging operations provide the Water Group substantial
9 geographic, economic, regulatory, weather and customer diversification. Sewer Fund
10 provides regulated sewer service to about 3,385 customers. The concentration of Sewer
11 Fund's business in south central Pennsylvania makes them very susceptible to any adverse
12 development in local regulatory, economic, demographic, competitive and weather
13 conditions.

14 Further, S&P, a major credit rating agency, recognizes the importance that
15 diversification and size play in credit ratings. S&P believes some of the critical factors
16 include: regional and cross-border market diversification (mitigates economic,
17 demographic, and political risk concentration); customer diversification; and regulatory
18 regime diversification.⁹ The size of a company can be a barrier to fluid access to capital
19 markets (*i.e.*, liquidity risk). Investors require compensation for the lack of marketability
20 and liquidity of their investments. If no compensation is provided, then investors, or at
21 least sophisticated investors, shy away.

⁹ Standard & Poor's, Corporate Ratings Criteria, Utilities: Key Credit Factors: Business And Financial Risks In The Investor-Owned Utilities Industry, Nov. 26, 2008.

1 **Q. IS THE IMPACT OF SIZE COMMONLY RECOGNIZED?**

2 A. Yes, the National Association of Regulatory Utility Commissioners ("NARUC"), as well
3 as most good financial texts, recognizes that size affects relative business risk. Liquidity
4 risk and the existence of the small firm effect relating to business risk of small firms are
5 well-documented in financial literature.¹⁰ Investors' expectations reflect the
6 highly-publicized existence of the small firm effect. For example, many mutual funds
7 classify their investment strategy as small capitalization in an attempt to profit from the
8 existence of the small firm effect.

9 As previously discussed, S&P recognizes that size plays a role in credit ratings.

10 Standard & Poor's has no minimum size criterion for any given
11 rating level. However, size turns out to be significantly correlated
12 to ratings. The reason: size often provides a measure of
13 diversification, and/or affects competitive position. . . . Small
14 companies are, almost by definition, more concentrated in terms of
15 product, number of customers, or geography. In effect, they lack
16 some elements of diversification that can benefit larger companies.
17 To the extent that markets and regional economies change, a
18 broader scope of business affords protection. This consideration is
19 balanced against the performance and prospects of a given business.
20 . . . In addition, lack of financial flexibility is usually an important
21 negative factor in the case of very small companies. Adverse
22 developments that would simply be a setback for companies with
23 greater resources could spell the end for companies with limited
24 access to funds.¹¹

25
26 As shown on Schedule 9, size plays a role in the composition of investors, and
27 hence liquidity. In 2017, about 83% of the Water Group's shares traded while the larger
28 companies comprising the S&P Utilities had a much higher trading volume of 156%.

¹⁰ Banz, Rolf, W. "The Relationship Between Return and Market Value of Common Stocks," *Journal of Financial Economics*, 9:3-18 1981. For subsequent studies see Fama and French, etc.

¹¹ *Standard & Poor's, Corporate Ratings Criteria 2006*; pg. 22.

1 Insiders¹² hold more than seven times more, as a percent to total, of the Water Group's
2 shares than the S&P Utilities. Currently, only about 61% of the Water Group shares are
3 held by institutions¹³ while the larger companies comprising the S&P Utilities had much
4 higher institutional holdings of 78%. Due to small size and less interest by financial
5 institutions, fewer security analysts follow the Comparable Group and none follow Sewer
6 Fund.

7 The lack of trading activity may affect the cost of equity estimates for small entities
8 such as Sewer Fund and the Water Group. When stock prices do not change because of
9 inactive trading activity, estimates of dividend yield for use in a dividend cash flow model
10 and beta estimates for use in the capital asset pricing model are affected. In a stock market
11 that is generally up, the beta estimates for the Comparable Companies may be understated
12 due to thin trading.

13 **Q. DOES THE SEWER FUND AND THE COMPARABLE COMPANIES HAVE**
14 **SIMILAR OPERATING RISKS?**

15 A. Yes. From an operations standpoint, Sewer Fund and the Comparable Companies have
16 similar risks and are indistinguishable. Both are required to meet Clean Water Acts and
17 Safe Drinking Water Act requirements and are also required to provide safe and reliable
18 services to their customers and comply with Commission regulations. Further, municipal
19 and non-municipal utilities have similar investment risks as is evident by the fact that their
20 bonds are often rated similarly. However, Sewer Fund is unique when compared with a

¹² An insider is a director or an officer who has a policy-making role or a person who is directly or indirectly the beneficial owner of more than 10% of a certain company's stock.

¹³ Institutional holders are those investment managers having a fair market value of equity assets under management of \$100 million or more. Certain banks, insurance companies, investment advisers, investment companies, foundations and pension funds are included in this category.

1 traditional municipal authority or municipally owned water or sewer utility because Sewer
2 Fund is not able to increase rates for service at the discretion of municipal officials.
3 Rather, rates for Outside City Customers fall under the jurisdiction of the Pennsylvania
4 Public Utility Commission. Accordingly, Sewer Fund must comply with the same
5 regulatory requirements for increasing rates as non-municipals require. Sewer Fund
6 experiences attrition and regulatory lag similar to a non-municipal utility but lacks the
7 benefits that income taxes provide a non-municipal utility, for two reasons.

8 First, deferred income taxes provide non-municipal utilities a cash flow advantage
9 that Sewer Fund does not enjoy. Second, current income taxes included in the revenue
10 requirement provide a margin or cushion against an unanticipated drop in sales or increase
11 in operating expenses. Sewer Fund does not have this margin of protection. Thus, Sewer
12 Fund faces much higher risk than non-municipal utilities.

13 **Q. IS THERE ANY SINGLE MEASURE THAT BEST SHOWS INVESTMENT RISK**
14 **FROM A COMMON STOCKHOLDER'S PERSPECTIVE?**

15 A. No. However, from a creditor's viewpoint, the best measure of investment risk is debt
16 rating. The debt rating process generally provides a good measure of investment risk for
17 common stockholders because the factors considered in the debt rating process are usually
18 relevant factors that a common stock investor would consider in assessing the risk of an
19 investment. Credit rating agencies, such as S&P, assess the risk of an investment into two
20 categories based on: fundamental business analysis; and financial analysis.¹⁴ The
21 business risk analysis includes assessing: Country risk; industry risk; competitive position;

¹⁴ *Standard & Poor's, Corporate Ratings Criteria*, General: Criteria Methodology: Business Risk/Financial Risk Matrix Expanded, May 27, 2009 and *Standard & Poor's, Criteria Corporates General: Corporate Methodology*, November 19, 2013.

1 and profitability/peer group comparisons. The financial risk analysis includes assessing:
2 accounting; financial governance and policies/risk tolerance; cash flow adequacy; capital
3 structure/asset protection; and liquidity/short-term factors.

4 **Q. WHAT IS THE BOND RATING OF SEWER FUND AND THE COMPARABLE**
5 **GROUP?**

6 A. Page 1 of Schedule 10 shows the average bond/credit rating Comparable Group. The
7 Comparable Group has an A credit profile and Sewer Fund does not have bonds rated;
8 however, the City of Lancaster, which provides the debt financing, has received an A3 by
9 Moody's. In 2018 Moody's lowered the City of Lancaster's bond rating from A1 to A3
10 and specifically cited the utilities, both water and sewer, as one of the reasons for the
11 downgrade.

12 This is a satisfactory liquidity position and would not pose a concern in and
13 of itself if the general fund comprised the bulk of the city's operations. But
14 **the city also operates a water fund and a sewer fund, both of which are**
15 **severely cash-strapped** as of 2017-2018 data. The water fund has a
16 negative cash position for eight months of the year, while the sewer fund's
17 cash is negative for five months. At its lowest point, the water fund's cash is
18 -\$2.8 million (10% of water revenue), and the sewer fund's worst cash
19 position is -\$5.499 million (38% of sewer revenue), both in October. The
20 timing is notable here, as the city's largest debt payment is due in
21 November. Given current cash flows, it is apparent that the general fund
22 and some of the city's other ancillary funds are providing for the debt
23 payment. **We no longer consider the water and sewer funds to be**
24 **self-supporting.**

25
26 We believe this worsening cash position in the water and sewer funds has to
27 do in part with the city's limited rate setting ability. More than 60% of
28 water customers are outside of the city's limits. Rates for these customers
29 are set by the Public Utility Commission (PUC), while rates for customers
30 within the city's bounds are set by the city itself. The same is true for the
31 sewer system, though only 15% of sewer customers served are outside of
32 the city. **It is not a new practice for the city to support weak cash**
33 **periods in its utilities with the general fund.** However, the utilities have
34 not had this negative a cash position in the past. Further, the city has
35 routinely been able to apply to the PUC for rate increases and has achieved

1 rate hikes in the past sufficient to provide for structurally balanced utility
2 operations. We expect this will again be the case in 2019, as the city plans to
3 apply for a rate increase next year. **Given the increased debt burden and**
4 **associated debt service costs, it is uncertain that rate increases will be**
5 **sufficient to both bring structural balance and to accumulate**
6 **satisfactory cash reserves.** (bolding added)¹⁵
7

8 The City of Lancaster purchased bond insurance for their 2019 debt offering to get an AA
9 insured rating from S&P at the time the 2019 Series was issued. It should be noted that the
10 market does not equate an AA bond rating to an “AA insured rating” as is evident by the
11 higher yield required on an “AA insured” bond.

12 The major bond rating/credit rating agencies append modifiers, such as +, - for S&P
13 and 1, 2, and 3 for Moody's Investors Service ("Moody's") to each generic rating
14 classification. For example, an "A" credit profile is comprised of three subsets such as
15 A+, A, A- for S&P or A1, A2 or A3 for Moody's. The modifier of either "+" or "1"
16 indicates that the obligation ranks in the higher end of its generic rating category; the
17 modifier "2" indicates a mid-range ranking; and the modifier of "-" or "3" indicates a
18 ranking in the lower end of that generic rating category.

19 S&P and Moody’s publish financial benchmark criteria necessary to obtain a bond
20 rating for different types of utilities. As a generalization, the higher the perceived
21 business risk, the more stringent the financial criteria so the sum of the two, business risk
22 and financial criteria, remains the same.

15 Moody’s Investor Service, Credit Opinion, “Lancaster (City of) PA Update following downgrade to A3“, 7/18/18, pg. 3.

1 **Q. WHAT ARE SOME FINANCIAL BENCHMARKS APPLIED BY CREDIT**
2 **RATING AGENCIES FOR RATING PUBLIC UTILITY DEBT?**

3 A. Page 2 of Schedule 10 summarizes the application of credit rating agencies measures of
4 financial risk for the Comparable Group and the Sewer Fund. S&P describes their range
5 of financial benchmarks as

6 Risk-adjusted ratio guidelines depict the role that financial ratios play in
7 Standard & Poor's rating process, since financial ratios are viewed in the
8 context of a firm's business risk. A company with a stronger competitive
9 position, more favorable business prospects, and more predictable cash
10 flows can afford to undertake added financial risk while maintaining the
11 same credit rating. The guidelines displayed in the matrices make explicit
12 the linkage between financial ratios and levels of business risk.¹⁶
13

14 Credit rating agencies' measures of financial risk are broader than the traditional measure
15 of financial risk, leverage. Besides reviewing amounts of leverage employed, credit
16 rating agencies also focuses on earnings protection and cash flow adequacy. For a
17 municipal bond, the most important measure of financial risk is debt service coverage and
18 other measures of cash flow adequacy.

19 As is evident from the information shown on page 2 of Schedule 10, for the three
20 years ending in 2017, the Sewer Fund's debt service coverage and cash flow adequacy
21 ratios were far below the Comparable Companies. Comparing the Sewer Fund and the
22 Water Group's measures of debt service coverage and cash flow adequacy prove that the
23 Water Group has experienced a much higher level of cash flow adequacy than the Sewer
24 Fund; verifying that the Sewer Fund is a higher investment risk than the Water Group.
25 Prospectively, based upon the Company's construction program, the Company's ratios are

¹⁶ Standard & Poor's Corporate Rating Criteria, 2000.

1 likely to be strained. Based solely upon Sewer Fund's historical ratios, it is my opinion
2 that Sewer Fund's credit profile is lower than the Comparable Companies.

3 Further, based solely upon Sewer Fund's size, it is my opinion that Sewer Fund's
4 credit profile is lower than the Comparable Groups'. Based on Sewer Fund's small size, it
5 is highly likely that Sewer Fund's credit profile is below BBB (i.e., BB). An analysis of
6 corporate credit ratings, shown on page 3 of Schedule 10, indicates that there is an 92%
7 (100%-0%-0%-5%-3%=92%) chance that Sewer Fund's credit profile falls below BBB
8 based on their small size alone.¹⁷ As S&P has stated, size is significantly correlated to
9 credit ratings. An analysis of corporate credit ratings found The York Water Company to
10 be the smallest utility with a credit rating. Their credit rating is only A- despite having a
11 capitalization comprised of more than \$199 million and a common equity ratio in excess of
12 57%.

13 **Q. WHAT DEBT SERVICE COVERAGE HAVE THE COMPARABLE COMPANIES**
14 **EXPERIENCED?**

15 A. As shown on page 4 of Schedule 10, the Comparable Group has an average debt service
16 coverage of 2.9-times and the average has ranged from 2.5-times to 3.4-times. In order to
17 compete with the Comparable Group's for capital, in the future, it will be necessary for the
18 Sewer Fund to achieve higher returns on equity, and increased cash flow just to maintain a
19 similar credit quality.

20 S&P has stated:

17 The information reported by Fitch, shown on page 5 of Schedule 10, also documents the relationship between bond rating and size as both the median population and median number of customers served increased with bond rating. For example, the median number of sewer customers of utilities with a A bond rating was 20,437, the median number of sewer customers of utilities with a AA bond rating was 54,757, and the median number of sewer customers of utilities with a AAA bond rating was 86,744.

1 ... low authorized returns may affect the industry's ability to attract necessary
2 capital to develop new water supplies and upgrade the quality of existing
3 supplies . . . Traditional ratemaking policy has not provided sufficient credit
4 support during the construction cycle of the electric industry over the past 15
5 years. To avoid a repeat in the water industry, regulators must be aware of
6 the increased challenges the industry faces.¹⁸ (Emphasis added)
7

8 Investors will not provide the equity capital necessary for increasing the amount of
9 common equity in a capital structure unless the regulatory authority allows an adequate
10 rate of return on the equity.¹⁹

11 **Q. WHAT INFORMATION IS SHOWN ON PAGE 5 OF SCHEDULE 10?**

12 A. Page 5 of Schedule 10 summarizes the finding of a recent report from Fitch Ratings
13 concerning debt service coverage levels for the typical municipal water and sewer utility.²⁰

14 The recent 2017 Fitch report compiled data for public water and sewer bond issuers and
15 found that the median A rated government utility had a minimum debt service coverage of
16 1.3-times, and an average debt service coverage level of 1.5-times. The 2011 Fitch report
17 compiled data for public water and sewer bond issuers and found that the median A rated
18 government utility had a minimum debt service coverage of 1.5-times, and an average debt
19 service coverage level of 2.0-times.

20 **Q. WHAT INFORMATION IS SHOWN ON PAGE 6 OF SCHEDULE 10?**

21 A. Page 6 of Schedule 10 shows the debt service coverage levels for water and sewer
22 Pennsylvania municipal authorities reported for the years 2013 to 2018. The information
23 shown reflects debt service for over 300 water and sewer Pennsylvania municipal
24 authorities in each year, including about 200 water and about 100 sewer municipal

¹⁸ Standard & Poor's CreditWeek, May 25, 1992.

¹⁹ National Association of Regulatory Utility Commissioners, loc. cit.

²⁰ Fitch, Inc., Fitch Ratings Ltd. "2017 Water and Sewer Medians", Dec. 16, 2016, "2011 Water and Wastewater Medians", Nov. 18, 2011.

1 authorities. Most of the Pennsylvania municipal authorities included in page 6 of
2 Schedule 10 are not regulated by the PUC. The median debt service coverage over the
3 period 2013 to 2017 ranged from: 2.0-times to 2.6-times for all water municipal
4 authorities; and 2.6-times to 4.0-times for all sewer municipal authorities. Based upon the
5 information shown, absent rate regulation, water and sewer Pennsylvania municipal
6 authorities have rates that produced median debt service coverage of 2.4-times to
7 3.3-times, respectively.

8 **Q. WHAT DEBT SERVICE COVERAGE LEVEL HAS SEWER FUND**
9 **EXPERIENCED?**

10 A. For a municipal utility, the revenue requirement should include the potential impact of a
11 revenue bond financing which requires revenue sufficient to achieve debt service coverage.
12 Page 7 of Schedule 10 shows that the Sewer Fund revenues in 2015 through 2017 only
13 provided debt service coverage of 0.6-times to 0.9-times, or far below the 1.5 to 2.0-times
14 average debt service coverage level achieved by A rated government utilities shown in the
15 Fitch reports (page 5 of Schedule 10) and far below the 2.4-times to 3.3-times average
16 median debt service coverage level achieved by water and sewer Pennsylvania municipal
17 authorities (page 6 of Schedule 10).

18 **Q. WHAT DO YOU CONCLUDE FROM THE VARIOUS MEASURES OF**
19 **INVESTMENT RISK INFORMATION YOU HAVE TESTIFIED TO?**

20 A. A summary of my conclusions regarding the risk analyses discussed previously is shown in
21 Table 5. Overall, the information summarized in Table 5 indicates that Sewer Fund is a
22 higher investment risk than the Water Group.

<u>Summary of Risk Analyses</u>		
	Sewer Fund	Water Group Followed by Analysts
1. Business Risk:		
2. Country Risk	Similar Risk Level	
3. Industry Risk	Similar Risk Level	
4. Competitive Position	Similar Risk Level	
5. Profitability/Peer Group Comparisons	Higher Risk Level	
6. Capitalization Ratios & Financial Risk (Leverage)*	Similar Risk Level	
7. Debt Cost Rate*		Higher Risk Level
8. Relative Size:		
9. Regulatory Diversification	Higher Risk Level	
10. Economic Diversification	Higher Risk Level	
11. Demographic Diversification	Higher Risk Level	
12. Diversification of Weather Conditions	Higher Risk Level	
13. Customer Concentration of Revenues	Higher Risk Level	
14. Capital Intensity	Higher Risk Level	
15. Capital Recovery	Higher Risk Level	
16. Lower Liquidity:		
17. Institutional Holdings	Higher Risk Level	
18. Insider Holdings	Higher Risk Level	
19. Percentage of Shares Traded	Higher Risk Level	
20. Required To Meet Clean Water Acts and Safe Drinking Water Act	Similar Risk Level	
21. Same Regulatory Requirements For Increasing Rates As Non-Municipals	Similar Risk Level	
22. Deferred Income Taxes Provide Non-Municipal Utilities A Cash Flow Advantage	Higher Risk Level	
23. Current Income Taxes Included In The Revenue Requirement Provide A Margin Or Cushion Against An Unanticipated Drop In Sales Or Increase In Operating Expenses	Higher Risk Level	
24. Debt Service Coverage	Higher Risk Level	
25. Credit Market Financial Risk Metrics	Higher Risk Level	
26. Cash Flow Adequacy	Higher Risk Level	
27. Credit Rating / Credit Profile	Higher Risk Level	
<p>* - Based on recommended capital structure for rate making purposes. Comment: The terms "Similar Level " indicates same amount of risk and the terms "Higher Level " indicates greater risk.</p>		

1
2
3

Table 5

1 CAPITAL COST RATES

2 **Q. WHAT INFORMATION IS SHOWN ON SCHEDULE 11?**

3 A. Schedule 11 reviews long-term and short-term interest rate trends. Long-term and
4 short-term interest rate trends are reviewed to ascertain the "sub-flooring" or "basement"
5 upon which the Comparable Companies' common equity market capitalization rate is built.
6 Based upon the settled yields implied in the Treasury Bond future contracts and the
7 long-term and recent trends in spreads between long-term government bonds and A-rated
8 public utility bonds available to me at the time Schedule 11 was prepared, I conclude that
9 the market believes that if the Comparable Companies issued new long-term bonds near
10 term, they would be priced to yield about 4.3% based upon a credit profile of "A."
11 Further, it is reasonable to conclude the market anticipates that long-term government
12 bonds will be priced to yield about 3.1%, near term.

13 However, prospectively, over the next couple of years, forecasters believe capital
14 costs rates may increase substantially from their current levels. Recently, former Federal
15 Reserve Chairman Alan Greenspan warned that the bond market is on the edge of a
16 collapse that would bring much higher interest rates and may also impact stock prices.

17 In a CNBC interview, the longtime central bank chief said the prolonged
18 period of low interest rates is about to end and, with it, a bull market in fixed
19 income that has lasted more than three decades.

20 "The current level of interest rates is abnormally low and there's only one
21 direction in which they can go, and when they start they will be rather
22 rapid," Greenspan said on "Squawk Box."

23 That low interest rate environment has been the product of current monetary
24 policy at the institution he helmed from 1987-2006. The Fed took its
25 benchmark rate to near zero during the financial crisis and kept it there for
26 seven years after.

27 Since December 2015, the Fed has approved four rate hikes, but
28 government bond yields remained mired near record lows.

1 Greenspan did not criticize the policies of the current Fed. But he warned
2 that the low rate environment can't last forever and will have severe
3 consequences once it ends.

4 "I have no time frame on the forecast," he said. "I have a chart which goes
5 back to the 1800s and I can tell you that this particular period sticks out. But
6 you have no way of knowing in advance when it will actually trigger."

7 One point he did make about timing is it likely will be quick and take the
8 market by surprise.

9 "It looks stronger just before it isn't stronger," he said. Anyone who thinks
10 they can forecast when the bubble will break is "in for a disastrous"
11 experience."

12 In addition to his general work at the Fed, which also featured an extended
13 period of low rates though nowhere near their current position, Greenspan
14 is widely known for the "irrational exuberance" speech he gave at the
15 American Enterprise Institute in 1996. The speech warned about asset
16 prices and said it is difficult to tell when a bubble is about to burst.

17 Those remarks foreshadowed the popping of the dot-com bubble, and the
18 phrase has found a permanent place in the Wall Street lexicon.

19 "You can never be quite sure when irrational exuberance arises," he told
20 CNBC. "I was doing it as part of a much broader speech and talking about
21 the analysis of the markets and the like, and I wasn't trying to focus short
22 term. But the press loved that term."²¹
23

24 Since October 2008, the Federal Reserve has been monetizing US Treasury debt to
25 artificially suppress interest rates through expansionary money policies. The Federal
26 Reserve, with effectively unlimited money at its disposal, intervenes at any time it wishes,
27 in whatever volume it wishes, to make sure that Treasury bond and bill prices and yields
28 are exactly what the Federal Reserve wants them to be. The US Treasury bond market, and
29 mortgage market, has become an artificial market with no connection to objective risk and
30 interest rates.

31 In August 2011, the Federal Reserve began "Operation Twist." Under "Operation
32 Twist," the Federal Reserve began buying \$400 billion of long-dated or long-term US

21 CNBC, [Greenspan: Bond Bubble About to Break Because of 'Abnormally Low' Interest Rates](https://www.cnbc.com/2017/08/04/greenspan-bond-bubble-about-to-break-because-of-abnormally-low-interest-rates.html), 8/4/17, <https://www.cnbc.com/2017/08/04/greenspan-bond-bubble-about-to-break-because-of-abnormally-low-interest-rates.html> , (8/4/17).

1 Treasury debt, financed by selling short-term US Treasury debt with three years to go or
2 less. The goal of "Operation Twist" was to try to drive long-term rates lower, which the
3 Federal Reserve thought would help the mortgage market. This process has created an
4 artificial demand for the US Treasury debt themselves, and easily drives interest rates
5 artificially lower and deceives investors into believing US Treasury debt are safe with wide
6 demand. This has resulted in the entire capital system being impacted by the Federal
7 Reserve's distortion of the price of risk.

8 In the real world of economics, the borrower pays an interest rate to a
9 lender, who makes money (interest) by taking on the risk of lending and
10 deferring gratification. The lender is willing to not spend his money now.
11 In a free market economy, interest rates are essentially a price put on
12 money, and they reflect the time preference of people. Higher interest rates
13 reflect a high demand for borrowing and lower savings. But the higher
14 rates automatically correct this situation by encouraging savings and
15 discouraging borrowing. Lower interest rates will work the opposite way.
16 When the government/central bank tampers with interest rates, savings and
17 lending are distorted, and resources are misallocated. This is evident in
18 looking back on the housing bubble. The artificially low interest rates
19 signaled that there was a high amount of savings. But it was a false signal.
20 There was also a signal for people to borrow more. Again, it was a false
21 signal. As these false signals were revealed, the housing boom turned into
22 a bust.²²

23
24 When there is a crisis in the markets, such as a financial meltdown, market
25 participants usually sell off and move their money to a safer place; fleeing from illiquid,
26 low quality investments to liquid, high quality investments. This flight to quality reflects a
27 collapse of confidence in the financial system and is most evident in short-term interest
28 rates. Prospectively the capital markets will be affected by the upcoming unprecedented
29 large Treasury financings. Investors provide capital based upon risk and return

22 Pike, Geoffrey "The Threat of Negative Interest Rates," Wealth Daily, May 30, 2014,
<http://www.wealthdaily.com/articles/the-threat-of-negative-interest-rates/5185>, (6/03/2014)

1 opportunities and investors will not provide common equity capital when higher
2 risk-adjusted returns are available.

3 **Q. ARE THERE OTHER INDICATIONS THAT FORECASTERS BELIEVE**
4 **CAPITAL COSTS RATES MAY INCREASE SUBSTANTIALLY FROM THEIR**
5 **CURRENT LEVELS?**

6 A. Yes, consensus forecasts show that interest rates are expected to increase substantially in
7 the next few years. Table 6 shows the forecasted increase in interest rates published in the
8 June 1, 2019 Blue Chip Consensus Forecasts for the period 2021 to 2023. As shown in
9 Table 6, consensus forecasts show interest rates are expected to increase 40 to 90 basis
10 points from current levels. If interest rates were to increase as predicted, investors will not

<u>Blue Chip Financial Forecasts Long-Range Survey (6/1/19)</u>				
	Latest Qtr	Consensus Forecasts		
	(5/1/19)	(6/1/19)		
	<u>1Q 2019</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
<u>Interest Rates</u>				
Prime Rate	5.50	5.40	5.50	5.60
3-mo. Treasury Bills	2.44	2.40	2.40	2.50
10 Year Notes	2.65	3.00	3.10	3.30
30 Year Notes	3.01	3.30	3.50	3.40
Aaa Corporate Bond Yield	4.01	4.40	4.60	4.70
Baa Corporate Bond Yield	4.87	5.30	5.60	5.70

Table 6

11 provide common equity capital when higher risk-adjusted returns are available.

12

13

1 COMMON EQUITY COST RATE ESTIMATE

2 **Q. WHAT IS THE BEST METHOD OF ESTIMATING COMMON EQUITY COST**
3 **RATES?**

4 A. There is no single method (model) suitable for estimating the cost rate for common equity.
5 While a single investor may rely solely upon one model in evaluating investment
6 opportunities, other investors rely on different models. Most sophisticated investors who
7 use an equity valuation model rely on many models in evaluating their common equity
8 investment alternatives. Therefore, the average price of an equity security reflects the
9 results of the application of many equity models used by investors in determining their
10 investment decisions.

11 The application of any single model to estimate common equity cost rates is not
12 appropriate because the security price for which the equity cost rate is being estimated
13 reflects the application of many models used in the valuation of the investment. That is,
14 the price of any security reflects the collective application of many models. Accordingly,
15 if only one model is used to estimate common equity cost rates, that cost rate will most
16 likely be different from the collective market's cost rates because the collective valuation in
17 the market reflects more than one method.

18 Noted financial texts, investor organizations and professional societies all endorse
19 the use of more than one valuation method. "We endorse the dividend discount model,
20 particularly when used for establishing companies with consistent earnings power and
21 when used along with other valuation models. It is our view that, in any case, an investor

1 should employ more than one model."²³ (Emphasis added.) The American Association of
2 Individual Investors state, "No one area of investment is suitable for all investors and no
3 single method of evaluating investment opportunities has been proven successful all of the
4 time."²⁴

5 In their study guide, the National Society of Rate of Return Analysts state, "No cost
6 of equity model or other concept is recommended or emphasized, nor is any procedure for
7 employing any model recommended . . . it remains important to recognize that alternative
8 methods exist and have merit in cost of capital estimation. To this end, analysts should be
9 knowledgeable of a broad spectrum of cost of capital techniques and issues."²⁵

10 Several different models should be employed to measure accurately the market-required
11 cost of equity reflected in the price of stock. Therefore, I used three recognized methods
12 including the DCF shown on Schedule 12, the CAPM shown on Schedule 17, and the RP
13 shown on Schedule 18.

14 **DISCOUNTED CASH FLOW**

15 **Q. PLEASE EXPLAIN THE DISCOUNTED CASH FLOW MODEL.**

16 A. The DCF is based upon the assumption that the price of a share of stock is equal to a future
17 stream of cash flows to which the holder is entitled. The stream of cash flows is
18 discounted at the investor-required cost rate (cost of capital).

19 Although the traditional DCF assumes a stream of cash flow into perpetuity, a
20 termination, or sale price can be calculated at any point in time. Therefore, the return rate

²³Sidney Cottle, Roger F. Murray and Frank E. Block, Graham and Dodd's Securities Analysis 5th Edition, McGraw-Hill, Inc., 1988, p. 568.

²⁴Editorial Policy, AAII Journal, American Association of Individual Investors, Volume 18, No. 1, January 1996, p. 1.

²⁵David C. Parcell, The Cost of Capital - A Practitioners Guide, National Society of Rate of Return Analysts, 1995 Edition.

1 to the stockholder consists of cash flow (earnings or dividends) received and the change in
2 the price of a share of stock. The cost of equity is defined as:

3 ...the minimum rate of return that must be earned on equity finance
4 and investments to keep the value of existing common equity
5 unchanged. This return rate is the rate of return that investors
6 expect to receive on the Company's common stock . . . the dividend
7 yield plus the capital gains yield . . . ²⁶(Emphasis added)
8

9 **Q. PLEASE EXPLAIN HOW YOU CALCULATED YOUR DIVIDEND YIELD IN**
10 **THE DCF SHOWN ON SCHEDULE 12.**

11 A. As shown on page 1 of Schedule 12, I used the average dividend yield of 2.0% for the
12 Water Group. The individual dividend yields are shown on page 2 of Schedule 12 and are
13 based upon the most recent months' yield, April 2019, and the twelve-month average yield,
14 ending April 2019. The second input to a market DCF calculation is the determination of
15 an appropriate share price growth rate.

16 **Q. WHAT SOURCES OF GROWTH RATES DID YOU REVIEW?**

17 A. I reviewed both historical and projected growth rates. Schedule 13 shows the array of
18 projected growth rates for the Comparable Companies that are published. Specific
19 historical growth rates are shown for informational purposes because I believe the
20 meaningful historical growth rates are already considered when analysts arrive at their
21 projected growth rates. Nonetheless, some investors may still rely on historical growth
22 rates.

²⁶J. Fred Weston and Eugene F. Brigham, Essentials of Managerial Finance, 3rd ed. (The Dryden Press), 1974, p. 504.

1 **Q. PLEASE EXPLAIN THE SOURCES OF THE PROJECTED GROWTH RATES**
2 **SHOWN ON SCHEDULE 13.**

3 A. I relied upon four sources for projected growth rates, First Call, Reuters, Zacks Investment
4 Research and Value Line.²⁷

5 **Q. DID YOU REVIEW ANY OTHER GROWTH RATES BESIDES THOSE SHOWN**
6 **ON SCHEDULE 13?**

7 A. Yes. I reviewed EPS growth rates reflecting changes in return rates on book common
8 equity (ROE) over time. I summarized recent ROEs on page 1 of Schedule 14, and
9 compared those to the Water Group's higher levels projected to be achieved by Value Line,
10 as shown on page 2 of Schedule 14. ROEs increase when EPS grows at much
11 higher/faster rates than book value.

12 I also reviewed industry specific average projected growth rates that are published
13 by Zacks for the industries in which the Comparable Companies operate. According to
14 Zacks, the Water Group's industry is projected to have EPS growth rates that average 9.3%
15 over the next five years.

16 **Q. WHAT DO YOU CONCLUDE FROM THE GROWTH RATES YOU HAVE**
17 **REVIEWED?**

18 A. Table 7 summarizes some of the various growth rates reviewed.

²⁷With the exception of Value Line, the earnings growth rate projections are consensus estimates five-year EPS estimates. These consensus estimates are compiled from more than 1,700 financial analysts and brokerage firms nationwide. It should be noted that none of the consensus forecasts provides projected DPS estimates. Value Line publishes projected Cash flow, EPS and DPS five-year growth projections as well.

<u>Summary of Growth Rates</u>	
	<u>Water Group</u>
Projected 5 Year Growth in EPS	7.6
Actual 5 Year Growth in EPS	8.2
Projected 5 Year Growth in DPS	7.5
Projected 5 Year Growth in EPS for the industry	9.3

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Table 7

Academic studies suggest that growth rate conclusions should be tested for reasonableness against long-term interest rate levels. Further, the minimum growth rate must at least exceed expected inflation levels. Otherwise, investors would experience decreases in the purchasing power of their investment. Finally, the combined result of adding the growth rate to the market value dividend yield must provide a sufficient margin over yields of public utility debt.

Q. WHAT METHOD DID YOU USE TO ARRIVE AT YOUR GROWTH RATE CONCLUSION?

A. No single method is necessarily the correct method of estimating share value growth. It is reasonable to assume that investors anticipate that the Water Group's current ROE will expand to higher levels. The published historical earnings growth rates for the Water Group averages 8.2%. Because there is not necessarily any single means of estimating share value growth, I considered all of this information in determining a growth rate conclusion for the Comparable Companies.

Moreover, while some rate of return practitioners would advocate that mathematical precision should be followed when selecting a growth rate, the fact is that

1 investors do not behave in the same manner when establishing the market price for a stock.
2 Rather, investors consider both company-specific variables and overall market sentiment
3 such as inflation rates, interest rates and economic conditions when formulating their
4 capital gains expectations. This is especially true when one considers the relatively
5 meaningless negative growth rates. That is, use of a negative growth rate in a DCF
6 implies that investors invest with the expectation of losing money.

7 The range of growth rates previously summarized supports the reasonableness of
8 an expected 7.6% growth rate for the Water Group based primarily on the projected
9 five-year growth rates and considering the Water Group's industry projected EPS growth
10 rates of 9.3%. Like the projected growth rates, this investor-expected growth rate of 7.6%
11 is based on a survey of projected and historical growth rates published by established
12 entities, including First Call, Reuters, Zacks Investment Research and Value Line. Use of
13 information from these unbiased professional organizations provides an objective
14 estimation of investor's expectations of growth. Based on the aforesaid, all growth rates
15 for the Comparison Companies have been considered and have been given weight in
16 determining a 7.6% growth rate for the Water Group.

17 **Q. WHAT IS YOUR MARKET VALUE DCF ESTIMATE FOR THE COMPARABLE**
18 **COMPANIES?**

19 A. The market value DCF cost rate estimate for the Water Group is 9.7%, as detailed on
20 page 1 of Schedule 12.

1 **Q. ARE THERE OTHER CONSIDERATIONS THAT SHOULD BE TAKEN INTO**
2 **ACCOUNT IN REVIEWING A MARKET VALUE CAPITALIZATION DCF**
3 **COST RATE ESTIMATE?**

4 A. Yes. It should be noted that although I recommend specific dividend yields for the
5 Comparable Group, I recommend that less weight be given to the resultant market value
6 DCF cost rate due to the market's current market capitalization ratios and the impact that
7 the market-to-book ratio has on the DCF results. The Comparable Companies' current
8 market-to-book ratios of 361% (Schedule 14, page 1) and low dividend yields are being
9 affected by the aforementioned policy of the Federal Reserve that has resulted in the
10 mispricing of capital due to artificial interest rates, not DCF fundamentals.

11 Although the DCF cost for common equity appears to be based upon mathematical
12 precision, the derived result does not reflect the reality of the marketplace since the model
13 proceeds from unconnected assumptions. The traditional DCF derived cost rate for
14 common equity will continuously understate or overstate investors' return requirements as
15 long as stock prices continually sell above or below book value. A traditional DCF model
16 implicitly assumes that stock price will be driven to book value over time. However, such
17 a proposition is not rational when viewed in the context of an investor purchasing stock
18 above book value. It is not rational to assume that an investor would expect share price to
19 decrease 72% ($100\% \div 361\% = 28\% - 100\% = 72\%$) in value to equal book value.

20 Utility stocks do not trade in a vacuum. Utility stock prices, whether they are
21 above or below book value, reflect worldwide market sentiment and are not reflective of
22 only one element.

1 **Q. WHAT DO YOU MEAN BY YOUR STATEMENT THAT UTILITY STOCKS ARE**
2 **NOT TRADED IN A VACUUM?**

3 A. Utility stocks cannot be viewed solely by themselves. They must be viewed in the
4 context of the market environment. Table 8 summarizes recent market-to-book ratios
5 ("M/B") for well-known measures of market value reported in the June 3, 2019 issue of
6 Barron's and the Water Group's average M/B as shown on page 1 of Schedule 14.

	<u>M/B Ratios(%)</u>
Dow Jones Industrials	400
Dow Jones Transportation	303
Dow Jones Utilities	218
S&P 500	323
S&P Industrials	419
Vs.	
Water Group	361

7 **Table 8**

8 Utility stock investors view their investment decisions compared with other investment
9 alternatives, including those of the various market measures shown in Table 8.

10 **Q. HOW DOES A TRADITIONAL DCF IMPLICITLY ASSUME THAT MARKET**
11 **PRICE WILL EQUAL BOOK VALUE?**

12 A. Under traditional DCF theory, price will equal book value ($M/B=1.00$) only when a
13 company is earning its cost of capital. Traditional DCF theory maintains that a company
14 is under-earning its cost of capital when the market price is below book value ($M/B<1.00$),
15 while a company over-earning its cost of capital will have a market price above its book
16 value ($M/B>1.00$). If this were true, it would imply that the capitalistic free-market is not
17 efficient because the overwhelming majority of stocks would currently be earning more

1 than their cost of capital. Table 8 shows that most stocks sell at an M/B that is greater than
2 1.0.

3 **Q. PLEASE EXPLAIN WHY SUCH A PHENOMENON WOULD SHOW THAT THE**
4 **CAPITALISTIC FREE-MARKET IS NOT EFFICIENT.**

5 A. Historically, the S&P Industrials, which represented approximately 400 companies, have
6 sold at an M/B as low as 1.0 only one time out of the 53-year period 1947-1999. Based
7 upon the traditional DCF assumption, which suggests that companies with M/Bs greater
8 than 1.0 earn more than their cost of capital, this data would suggest that the S&P Industrial
9 companies have earned more than their cost of capital while competing in a competitive
10 environment over the 53-year period. In a competitive market, new companies would
11 continually enter the market up to the point that the earnings rate was at least equal to their
12 cost of capital.

13 During this period the S&P Industrials sold at an average M/B of 223.7% while
14 experiencing a ROE of 15.7% over a period in which interest rates averaged 7.2%. It is
15 important to note that the average ROE of 15.7% is relative to a common equity ratio of
16 more than 60% for the S&P Industrials over many years.

17 **Q. WHAT IS THE SIGNIFICANCE OF INDUSTRIAL COMPANIES' M/B AND THE**
18 **COST OF CAPITAL FOR A WATER UTILITY?**

19 A. As stated previously, utility stocks do not trade in a vacuum. They must compete for
20 capital with other firms including industrial stocks. Over time, there has been a
21 relationship between M/Bs of industrial stocks and utility stocks. Although industrial
22 stocks have sold at a higher multiple of book value than utility stocks, both have tracked in
23 similar directions. Because utility and industrial stock prices relative to book values move

1 in similar directions, it is irrational to conclude that stock prices that are different from
2 book value, either higher or lower, suggests that a firm is over-or under-earning its cost of
3 capital when competitive free-markets exist.

4 **Q. DOES THE MARKET VALUE DCF PROVIDE A REASONABLE ESTIMATE OF**
5 **THE WATER GROUP'S COMMON EQUITY COST RATE?**

6 A. No, the DCF only provides a reasonable estimate of the Comparable Group's common
7 equity cost rate when their market price and book value are similar (M/B=100%).²⁸ A
8 DCF will overstate a common equity cost rate when M/Bs are below 100% and understate
9 when they are above 100%. Since the Comparable Group's current M/Bs average 361%,
10 the DCF understates their common equity cost rate. Schedule 15 provides a numerical
11 illustration of the impact of M/Bs on investors' market returns and DCF returns. The
12 reason that DCF understates or overstates investors' return requirements depending upon
13 M/B levels is because a DCF-derived equity cost rate is applied to a book value rate base
14 while investors' returns are measured relative to stock price levels. Based upon this, I
15 recommend that less weight be given to the market value DCF cost rate unless the
16 increased financial risk, resulting from applying a market value cost rate to a book value, is
17 accounted for.

²⁸Roger A Morin, Regulatory Finance - Utilities' Cost of Capital, Public Utility Reports, Inc., 1994, pp. 236-237.

1 **Q. HOW DO YOU RESOLVE THE FINANCIAL RISK DIFFERENCE BETWEEN**
2 **MARKET VALUE COST RATES AND BOOK VALUE COST RATES?**

3 A. The basic proposition of financial theory regarding the economic value of a company is
4 based on market value. That is, a company's value is based on its market value weighted
5 average cost of capital.²⁹ Accordingly, the market value derived cost rate reflects the
6 financial risk or leverage associated with capitalization ratios based on market value, not
7 book value. As shown on page 1 of Schedule 16, for the Water Group there is a large
8 difference in leverage as a result of the average \$3,783 million difference in market value
9 common equity and book value common equity. This difference in market values and
10 book values results in debt/equity ratios based on market value of 19.0%/81.0%
11 (debt/equity) verses 45.0%/55.0% (debt/equity) based on book value as shown on page 1 of
12 Schedule 16.

13 Differences in the amount of leverage employed can be quantified based upon the
14 Comparable Group's leveraged beta being "unleveraged" through the application of the
15 "Hamada Formula". The details of the model are shown on page 2 of Schedule 16. For
16 example, the inputs to the formula for the Water Group market value capitalization consist
17 of their leveraged beta of 0.69, debt ratio of 19.3%, preferred stock ratio of 0.0%, common
18 equity ratio of 80.7% and combined tax rate of 29.00%. The group's unleveraged beta is
19 determined to be .55 through the use of the following Hamada formula:

²⁹Shannon P. Pratt, Cost of Capital, John Wiley & Sons, Inc., 1998, pp. 45-46.

1
$$B_l = B_u (1 + (1 - t) D/E + P/E)$$

2 where:

3 B_l = observed, leveraged beta

4 B_u = calculated, unleveraged beta

5 t = income tax rate

6 D = debt ratio

7 P = preferred stock ratio

8 E = common equity ratio

9 Applying the unleveraged beta of 0.59 along with the Water Group's book value
10 capitalization ratios of 44.8% long-term debt, 0.1% preferred stock and 55.1% common
11 equity and combined tax rate of 29.00% results in a leveraged beta of .84 applicable to the
12 group's book value capitalization. Based upon the Water Group's risk premium of 5.9%
13 and the difference between Water Group's market value leveraged beta, their book value
14 leveraged beta of 0.24 (0.93 - 0.69) indicates that the Water Group's common equity cost
15 rate must be increased by 1.42 (0.24 x 5.9 = 1.42) in recognition of their book value's
16 exposure to more financial risk.

17 **Q. IS THERE ANOTHER WAY TO REFLECT THE FINANCIAL RISK**
18 **DIFFERENCE THAT EXISTS AS A RESULT OF MARKET CAPITALIZATION**
19 **RATIOS BEING SIGNIFICANTLY DIFFERENT FROM BOOK VALUE**
20 **CAPITALIZATION RATIOS?**

21 A. Yes, generally speaking. Although it is possible to know the direction of a financial risk
22 adjustment on common equity cost rate, a specific quantification of financial risk
23 differences is very difficult. Although the end result of a financial risk adjustment is very
24 subjective and specific quantification very difficult, the direction of the adjustment is

1 clearly known. However, hypothetically if the Comparable Group's debt were rated based
2 on market value debt ratios they would command an Aaa rating. The Comparison Group
3 currently has bonds rated A based upon their book value debt ratios. The yield spread on a
4 bond rated Aaa versus A rated bonds averages 34 basis points or 0.34% as shown on page 3
5 of Schedule 16.

6 The end result of the application of the Hamada Model and the bond yield spread
7 indicates that the Water Group market value common equity cost rate equity cost rate
8 should be adjusted upward by at least 0.8% (1.4% hamada est. + 0.3% yield spread = 1.7%
9 $\div 2 = 0.8\%$) since it is going to be applied to a book value.

10 Accounting for the increased amount of leverage between market value derived
11 DCF cost rates and book value cost rates indicates a book value DCF cost rate of 10.5% for
12 the Water Group (9.7% + 0.8% = 10.5%).

13 **CAPITAL ASSET PRICING MODEL**

14 **Q. PLEASE BRIEFLY DESCRIBE THE THEORY OF THE CAPITAL ASSET**
15 **PRICING MODEL.**

16 A. The CAPM is based upon the assumption that investors hold diversified portfolios and that
17 the market only recognizes or rewards non-diversifiable (or systematic) risk when
18 determining the price of a security because company-specific risk (or non-systematic) is
19 removed through diversification. Further, investors are assumed to require additional or
20 higher returns for assuming additional or higher risk. This assumption is captured by
21 using a beta that provides an incremental cost of additional risk above the base risk-free
22 rate available to investors. The beta of a security reflects the market risk or systematic
23 risk of the security relative to the market. The beta for the market is always equal to 1.00;

1 therefore, a company whose stock has a beta greater than 1.00 is considered riskier than the
2 market, and a company with a beta less than 1.00 is considered less risky than the market.
3 The base risk-free rate is assumed to be a U.S. Government treasury security because they
4 are assumed to be free of default risk.

5 **Q. WHAT RISK-FREE RATE AND BETA HAVE YOU USED IN YOUR CAPM**
6 **CALCULATION?**

7 A. The risk-free rate used in CAPM should have approximately the same maturity as the life
8 of the asset for which the cost rate is being determined. Because utility assets are
9 long-lived, a long-term Treasury Bond yield serves as an appropriate proxy. Previously, I
10 estimated an appropriate risk-free rate of 3.1% based upon the recent and forward
11 long-term Treasury yields. I used the average beta of 0.69 for the Water Group as shown
12 on page 1 of Schedule 17. However, as stated previously, the Comparable Group's betas
13 are understated due to their small size which affects their stock price changes.

14 **Q. AFTER DEVELOPING AN APPROPRIATE BETA AND RISK-FREE RATE,**
15 **WHAT ELSE IS NECESSARY TO CALCULATE A CAPM DERIVED COST**
16 **RATE?**

17 A. A market premium is necessary to determine a traditional CAPM derived cost rate. The
18 market return rate is the return expected for the entire market. The market premium is
19 then multiplied by the company specific beta to capture the incremental cost of additional
20 risk (market premium) above the base risk-free rate (long-term treasury securities) to
21 develop a risk adjusted market premium. For example, if you conclude that the expected
22 return on the market as a whole is 15% and further assume that the risk-free rate is 8%, then
23 the market premium is calculated to be 7% ($15\% - 8\% = 7\%$).

1 Further, assume there are two companies, one of which is considered less risky than the
2 market, and therefore has a beta of less than 1.00 or 0.80. The second company has a beta
3 that is greater than 1.00 or 1.20, and is therefore considered riskier than the market. By
4 multiplying the hypothetical 7.0% market premium by the respective betas of 0.80 and
5 1.20, risk adjusted market premiums of 5.6% ($7.0\% \times 0.80$) and 8.4% ($7.0\% \times 1.20$) are
6 shown for the company considered less risky than the market and for the company
7 considered more risky than the market, respectively.

8 Adding the assumed risk-free rate of 8% to the risk adjusted market premiums
9 results in the CAPM derived cost rates of 13.6% ($5.6\% + 8.0\%$) for the less risky company
10 and 16.4% ($8.4\% + 8.0\%$) for the company considered of greater risk than the market. In
11 fact, the result of this hypothetical CAPM calculation shows that: (1) the least risky
12 company, with the beta of 0.80, has a cost rate of 13.6%; (2) the market, with the beta of
13 1.00, has a cost rate of 15.0%; and (3) that the higher risk company, with a beta of 1.20, has
14 a cost rate of 16.4%.

15 **Q. HOW DID YOU DEVELOP A MARKET PREMIUM FOR YOUR CAPM?**

16 A. The average projected market premium of 10.4% is developed on page 2 of Schedule 17.
17 It is based upon Value Line's average projected total market return for the next three to five
18 years of 13.5% less the risk-free rate of 3.1%. I also reviewed market premiums derived
19 from Ibbotson Associates' most recent publication concerning asset returns that show a
20 market premium of 6.9%. The Ibbotson Associates' market premium may be on the low
21 side reflective of the higher interest rate environment found during their study (*i.e.*, 5.0%).
22 Equally, the Value Line market premium reflects the Federal Reserve's current artificial

1 interest rate levels while the Ibbotson Associates' market premiums reflect a higher interest
2 rate environment.

3 **Q. HOW DID YOU ADJUST FOR THE IMPACT THAT SIZE HAS ON THE**
4 **COMPARABLE GROUP'S BETA?**

5 A. The adjustment is reflected in the CAPM size premium. The CAPM size premium is
6 developed on page 4 of Schedule 17. The size premium reflects the risks associated with
7 the Comparable Group's small size and its impact on the determination of their beta. This
8 adjustment is necessary because beta (systematic risk) does not capture or reflect the
9 Comparable Group's small size. I reduced the size premium by the ratio of the
10 Comparison Group's beta to their respective market quartile's beta.

11 **Q. WHAT IS THE COMPARISON GROUP'S MARKET COST OF EQUITY BASED**
12 **UPON YOUR CAPM CALCULATION?**

13 A. The CAPM based on Ibbotson Associates' historical market returns shows a market cost
14 rate of 8.7% for the Water Group. The CAPM based on Value Line's projected market
15 returns shows an 11.1% for the Water Group, as shown on page 1 of Schedule 17. The
16 Comparable Group's average market value CAPM of 9.9% is based 50% on the results of
17 the historical market returns and 50% on the projected market returns. Adjusting the
18 market value CAPM based upon the end result of the application of the Hamada Model and
19 the bond yield spread to account for the difference in leverage between market value
20 capitalization ratios and book value ratios discussed previously indicates a cost rate of
21 10.7% for the Water Group applicable to book value ($9.9\% + 0.8\% = 10.7\%$).

1 **RISK PREMIUM**

2 **Q. WHAT IS A RISK PREMIUM?**

3 A. A risk premium is the common equity investors' required premium over the long-term debt
4 cost rate for the same company, in recognition of the added risk to which the common
5 stockholder is exposed versus long-term debtholders. Long-term debtholders have a
6 stated contract concerning the receipt of dividend and principal repayment whereas
7 common stock investors do not. Further, long-term debtholders have the first claim on
8 assets in case of bankruptcy. A risk premium recognizes the higher risk to which a
9 common stock investor is exposed. The risk premium-derived cost rate for common
10 equity is the simplest form of deriving the cost rate for common equity because it is nothing
11 more than a premium above the prospective level of long-term corporate debt.

12 **Q. WHAT IS THE APPROPRIATE ESTIMATED FUTURE LONG-TERM**
13 **BORROWING RATE FOR THE COMPARABLE COMPANIES?**

14 A. The estimated near term long-term borrowing rate for the Comparable Companies is 4.3%
15 based upon their credit profile that supports an A bond rating.

16 **Q. WHAT IS THE APPROPRIATE RISK PREMIUM TO BE ADDED TO THE**
17 **FUTURE LONG-TERM BORROWING RATE?**

18 A. To determine a common equity cost rate, it is necessary to estimate a risk premium to be
19 added to the Comparable Group's prospective long-term debt rate. Investors may rely
20 upon published projected premiums; they also rely upon their experiences of investing in
21 ultimately determining a probabilistic forecasted risk premium.

22 Projections of total market returns are shown on page 2 of Schedule 18. A
23 projected risk premium for the market can be derived by subtracting the debt cost rate from

1 the projected market return as shown on page 2 of Schedule 18. However, the derived risk
2 premium for the market is not directly applicable to the Comparable Companies because
3 they are less risky than the market. The use of 90% of the market's risk is a conservative
4 estimation of their level of risk as compared to the market.

5 The midpoint of the risk premium range is 8.4% and the average for the most recent
6 quarter is 8.5% as shown on page 2 of Schedule 18. Based on this, a reasonable estimate
7 of a longer-term projected risk premium is 8.5%.

8 **Q. HOW DO INVESTORS' EXPERIENCES AFFECT THEIR DETERMINATION**
9 **OF A RISK PREMIUM?**

10 A. Returns on various assets are studied to determine a probabilistic risk premium. The most
11 noted asset return studies and resultant risk premium studies are those performed by
12 Ibbotson Associates. However, Ibbotson Associates has not performed asset return
13 studies concerning public utility common stocks. Based upon Ibbotson Associates'
14 methodology of computing asset returns, I calculated annual returns for the S&P utilities
15 and bonds for the period 1928-2017. The resultant annual returns were then compared to
16 determine a recent risk premium from a recent 20-year period, 1998-2017 and subsequent
17 periods that were each increased by ten years until the entire study period was reviewed
18 (pages 3 and 4 of Schedule 18).

19 A long-term analysis of rates of return is necessary because it assumes that
20 investors' expectations are, on average, equal to realized long-run rates of return and
21 resultant risk premium. Observing a single year's risk premium, either high or low, may not
22 be consistent with investors' requirements. Further, studies show a mean reversion in risk
23 premiums. In other words, over time, risk premiums revert to a longer-term average

1 premium. Moreover, since the expected rate of return is defined as "the rate of return
2 expected to be realized from an investment; the mean value of the probability distribution
3 of possible results,"³⁰ a long-term analysis of annual returns is appropriate.

4 **Q. WHAT DO YOU CONCLUDE FROM THE INFORMATION SHOWN ON**
5 **PAGES 3 AND 4 OF SCHEDULE 18?**

6 A. The average of the absolute range of the S&P Utilities' appropriate average risk premium
7 (i.e., bonds rated AAA to A) was 4.0% during the seven periods studied, as calculated from
8 page 3 of Schedule 18. The credit adjusted longer term risk premiums (i.e., bonds rated
9 A), 1928-2017, and averages 4.2%. The appropriate average (i.e., bonds rated AAA to A)
10 longer term risk premiums, 1928-2017, have an absolute range of 4.2% to 5.1%, and
11 averages 4.6%.

12 The aforementioned premiums are based on total returns for bonds; and reflect their
13 price risk. A bond's price risk is not related to its credit quality and is eliminated when a
14 bond is held to maturity from time of purchase. Using the income returns, page 4 of
15 Schedule 18, for bonds eliminates price risk and better measures an investor's required
16 return based on credit quality. The appropriate average risk premium (i.e., bonds rated
17 AAA to A) based on income returns was 5.1% during the seven periods studied. The
18 credit adjusted longer term risk premiums (i.e., bonds rated A), 1928-2017, and averages
19 4.7%. The appropriate average (i.e., bonds rated AAA to A) longer term risk premiums,
20 1928-2017, have an absolute range of 4.7% to 5.1%, and averages 4.9%.

³⁰Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition, The Dryden Press, 1989, p. 106.

1 **Q. WHAT INFORMATION IS SHOWN ON PAGE 5 OF SCHEDULE 18?**

2 A. Page 5 of Schedule 18 proves and measures the negative relationship between interest rate
3 levels and the resulting risk premium. That is, risk premiums are generally higher when
4 interest rates are low and risk premiums are generally lower when interest rates are high.
5 This was proven by sorting the 90-year period, 1928 to 2017, annual returns based on
6 interest rate level from lowest interest rate to highest interest rate and distributing the
7 results into two equal groups, a 45-year low interest rate environment group and a 45-year
8 high interest rate environment group.

9 During the period 1928-2017, the 45 years with the lowest interest rates had an
10 average interest rate of 3.0% and reflected a range of interest rates from 2.0% to 4.1%.
11 This period resembles the current interest rate environment of 3.1% discussed previously
12 regarding the CAPM's risk free rate. The risk premium based on total returns during this
13 low interest rate environment produced the appropriate average (i.e., bonds rated AAA to
14 A) longer term risk premium of 6.5% and a credit adjusted longer term risk premium (i.e.,
15 bonds rated A) of 5.7%. The annual income return based risk premium during this low
16 interest rate environment produced the appropriate average (i.e., bonds rated AAA to A)
17 longer term risk premium of 7.4% and a credit adjusted longer term risk premium (i.e.,
18 bonds rated A) of 7.1%.

19 However, during the period 1928-2017, the 45 years with the highest interest rates
20 had an average interest rate of 7.3% and reflected a range of interest rates from 4.2% to
21 13.5%. This period is far different from the current interest rate environment of 3.1%.
22 The risk premium based on total returns during the highest interest rate environment
23 produced an average longer-term risk premium of 2.7% over bonds rated AAA to A and a

1 credit adjusted longer term risk premium (i.e., bonds rated A) of only 2.6%. The annual
2 income return based risk premium during the highest interest rate environment produced
3 an average longer-term risk premium of 2.5% over bonds rated AAA to A and a credit
4 adjusted longer term risk premium (i.e., bonds rated A) of only 2.4%.

5 Over time, risk premiums are mean reverting. They constantly move toward a
6 long-term average reflecting a long-term level of interest rates. That is, an above-average
7 risk premium will decrease toward a long-term average while a below-average risk
8 premium will increase toward a long-term average. In any single year, of course,
9 investor-required rates of return may not be realized and in certain instances, a single year's
10 risk premiums may be negative. Negative risk premiums are not indicative of investors'
11 expectations and violate the basic premise of finance concerning risk and return.
12 Negative risk premiums usually occur only in the stock market's down years (*i.e.*, the years
13 in which the stock markets' return was negative).

14 When interest rate levels are not considered the credit adjusted longer term risk
15 premium (i.e., bonds rated A), 1928-2017, averages 4.7%, discussed previously regarding
16 page 4 of Schedule 18. However, the annual income return based risk premium during the
17 low interest rate environment produced a credit adjusted longer term risk premium (i.e.,
18 bonds rated A) of 7.1%. Since this period resembles the current interest rate environment
19 of 3.1%, a reasonable estimate of investors risk premium based on historical returns is
20 based on an average of the results of the entire 1928-2017 historical market returns and the
21 results of the low interest rate environment to produce a 5.9% risk premium.

22 Adding the risk premium of 5.9% for the Comparable Group to the prospective cost
23 of newly-issued long-term debt of 4.3% results in a market value risk premium derived cost

1 rate for common equity of 10.2% as reflected on page 1 of Schedule 18. Adjusting the
2 market value risk premium based upon the end result of the application of the Hamada
3 Model and the bond yield spread to account for the difference in leverage between market
4 value capitalization and book value ratios discussed previously indicates a cost rate of
5 11.0% applicable to book value (10.2% + 0.8% = 11.0%).

6 **SUMMARY OF COMMON EQUITY COST RATE**

7 **Q. WHAT IS YOUR COMPARABLE GROUP'S COMMON EQUITY COST RATE?**

8 A. Based upon the results of the models employed, the Water Group's common equity cost
9 rate is in the range of 10.5% to 11.0% as reflected on Schedule 19. Based upon this data,
10 the common equity cost rate for the Water Group is at least 10.75%. My recommendation
11 is based upon the Water Group's 10.75% common equity cost rate.

12 **Q. DO YOU RECOMMEND A COST OF COMMON EQUITY OF 10.75% FOR**
13 **SEWER FUND?**

14 A. No. Based upon the financial analysis and risk analysis, I conclude that Sewer Fund is
15 exposed to greater investment risk than the Comparable Group. This is evidenced by
16 Sewer Fund's small size, visible lower credit rating and the other factors summarized in
17 Table 5 discussed previously.

18 **Q. HOW DO YOU REFLECT THE INVESTMENT RISK DIFFERENCE BETWEEN**
19 **SEWER FUND AND THE COMPARABLE GROUP?**

20 A. The direction of the investment risk adjustment on common equity cost rates is clearly
21 known. A specific quantification of risk differences is based on Sewer Fund's implied
22 maximum BBB credit profile even though the evidence indicates Sewer Fund's credit
23 rating is below BBB (*i.e.*, BB). A maximum implied bond rating of BBB is a full bond

1 rating below the bond rating of the Comparable Companies. The difference in bond rating
2 between Sewer Fund and the Comparable Companies suggests a minimum 25-basis point
3 difference in long-term debt cost rates based upon the yield spread of A and BBB rated
4 public utility debt.

5 However, as stated previously, the Sewer Fund does not have bonds rated but the
6 City of Lancaster, which provides the debt financing for the Sewer Fund, has bonds rated
7 A3. The difference in bond rating between the City of Lancaster and the Comparable
8 Companies indicates a 10-basis point difference in long-term debt cost rates based upon the
9 yield spread of A and BBB rated public utility debt since a A3 rating falls between the A
10 and BBB ratings. A 10-basis point spread between Sewer Fund and the Water Group
11 is a very conservative estimate of the risk differential. Adding the 0.10% risk adjustment
12 to the various results of the three models employed for the Water Group shows a current
13 range of common equity cost applicable to book value for Sewer Fund of 10.60% (DCF),
14 10.80% (CAPM), and 11.10% (RP) as shown in Table 9.

Summary of the Sewer Fund's Equity Cost Rates	
DCF	10.60
CAPM	10.80
RP	11.10

16 **Table 9**

1 **Q. WHAT IS YOUR COMMON EQUITY COST RATE RECOMMENDATION FOR**
2 **SEWER FUND?**

3 A. As discussed above and as shown in Schedule 19, I recommend a 10.85% common equity
4 cost rate for Sewer Fund. My alternative recommended cost of common equity, should
5 the Commission decide to adjust my primary recommendation of 10.85% to reflect the
6 maximum income tax status of the investors of the Sewer Fund, is 9.55%.

7 **Q. HOW DO YOU IMPUTE PERSONAL INCOME TAXES IN A**
8 **RECOMMENDATION?**

9 A. In past cases the Commission has relied upon bond yield spreads between public utility and
10 GO bonds. The difference in bond yield spreads between public utility and GO bonds
11 produces an estimate of income tax rates of bond investors as shown on Schedule 20. This
12 comparison requires credit quality of each type of bond used be matched (i.e., A vs. A, and
13 Baa vs. Baa) otherwise credit quality differences are measured.

14 As shown on Schedule 20, the credit quality of each type of bond has been matched.
15 The appropriate yield comparison is based on bonds rated A to match the credit rating of the
16 Water Group. As shown on Schedule 20, the yield spreads between public utility and GO
17 bonds shows the maximum income tax adjustment is 12%. Applying the 12% income tax
18 adjustment to my 10.85% recommended cost of common equity produces a 9.55% for the
19 Sewer Fund.

20 **Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR RECOMMENDED**
21 **COMMON EQUITY RATE FOR SEWER FUND?**

22 A. Yes. Page 2 of Schedule 14 reflects the average projected earned return on average book
23 common equity for the companies in the Comparable Group for the period 2022-2024,

1 which is shown to range from 9.7% to 14.4%. Given the large degree to which regulatory
2 lag and attrition impacts utilities earning, the range of the comparable utilities' projected
3 earned returns suggests that my recommendation that Sewer Fund be permitted an
4 opportunity to earn 10.85% is reasonable, if not conservative.

5 **OVERALL RATE OF RETURN RECOMMENDATION**

6 **Q. WHAT IS YOUR OVERALL FAIR RATE OF RETURN RECOMMENDATION**
7 **FOR THE Sewer Fund?**

8 A. Based upon the recommended capital structure and my estimate of the Sewer Fund's
9 common equity cost rate, I recommend an overall fair rate of return of 7.92%. The details
10 of my recommendation are shown on Schedule 1. It should be noted, should the
11 Commission decide to adjust my primary recommendation of 10.85% to reflect the income
12 tax status of the investors of the Sewer Fund, my overall fair rate of return recommendation
13 would be 7.20%, as shown on Schedule 21.

14 **Q. HAVE YOU TESTED THE REASONABLENESS OF YOUR OVERALL FAIR**
15 **RATE OF RETURN RECOMMENDATION?**

16 A. Yes. If my recommended overall rate of return is actually earned, it will give Sewer Fund
17 ratios that will allow Sewer Fund to present a financial profile that will enable it to attract
18 capital necessary to provide safe and reliable water service, at reasonable terms.

19 **Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?**

20 A. Yes, it does.

APPENDIX A

Professional Qualifications
of
Harold Walker, III
Manager, Financial Studies
Gannett Fleming Valuation and Rate Consultants, LLC.

EDUCATION

Mr. Walker graduated from Pennsylvania State University in 1984 with a Bachelor of Science Degree in Finance. His studies concentrated on securities analysis and portfolio management with an emphasis on economics and quantitative business analysis. He has also completed the regulation and the rate-making process courses presented by the College of Business Administration and Economics Center for Public Utilities at New Mexico State University. Additionally, he has attended programs presented by The Institute of Chartered Financial Analysts (CFA).

Mr. Walker was awarded the professional designation "Certified Rate of Return Analyst" (CRRRA) by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. He is also a member of the Society of Utility and Regulatory Financial Analysts (SURFA) and has attended numerous financial forums sponsored by the Society. The SURFA forums are recognized by the Association for Investment Management and Research (AIMR) and the National Association of State Boards of Accountancy for continuing education credits.

Mr. Walker is also a licensed Municipal Advisor Representative (Series 50) by Municipal Securities Rulemaking Board (MSRB) and Financial Industry Regulatory Authority (FINRA).

BUSINESS EXPERIENCE

Prior to joining Gannett Fleming Valuation and Rate Consultants, LLC., Mr. Walker was employed by AUS Consultants - Utility Services. He held various positions during his eleven years with AUS, concluding his employment there as a Vice President. His duties included providing and supervising financial and economic studies on behalf of investor owned and municipally owned water, waste water, electric, natural gas distribution and transmission, oil pipeline and telephone utilities as well as resource recovery companies.

In 1996, Mr. Walker joined Gannett Fleming Valuation and Rate Consultants, LLC. In his capacity as Manager, Financial Studies and for the past twenty years, he has continuously studied rates of return requirements for regulated firms. In this regard, he supervised the preparation of rate of return studies in connection with his testimony and in the past, for other individuals. He also assisted and/or developed dividend policy studies, nuclear prudence studies, calculated fixed charge rates for avoided costs involving cogeneration projects, financial decision studies for capital budgeting purposes and developed financial models for determining future capital requirements and the effect of those requirements on investors and ratepayers, valued utility property and common stock for acquisition and divestiture, and assisted in the private placement of fixed capital securities for public utilities.

Head, Gannett Fleming GASB 34 Task Force responsible for developing Governmental Accounting Standards Board (GASB) 34 services, and educating Gannett Fleming personnel and Gannett Fleming clients on GASB 34 and how it may affect them. The GASB 34 related services include inventory of assets, valuation of assets, salvage estimation, annual depreciation rate determination, estimation of depreciation reserve, asset service life determination, asset condition assessment, condition assessment documentation, maintenance estimate for asset preservation, establishment of condition level index, geographic information system (GIS) and data management services, management discussion and analysis (MD&A) reporting, required supplemental information (RSI) reporting, auditor interface, and GASB 34 compliance review.

Mr. Walker was also the Publisher of C.A. Turner Utility Reports from 1988 to 1996. C.A. Turner Utility Reports is a financial publication which provides financial data and related ratios and forecasts covering the utility industry. From 1993 to 1994, he became a contributing author for the Fortnightly, a utility trade journal. His column was the Financial News column and focused mainly on the natural gas industry.

In 2004, Mr. Walker was elected to serve on the Board of Directors of SURFA. Previously, he served as an ex-officio directors as an advisor to SURFA's existing President. In 2000, Mr. Walker was elected President of SURFA for the 2001-2002 term. Prior to that, he was elected to serve on the Board of Directors of SURFA during the period 1997-1998 and 1999-2000. Currently, he also serves on the Pennsylvania Municipal Authorities Association, Electric Deregulation Committee.

EXPERT TESTIMONY

Mr. Walker has submitted testimony or been deposed on various topics before regulatory commissions and courts in 22 states including: Arizona, California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. His testimonies covered various subjects including: fair market value, the taking of natural resources, appropriate capital structure and fixed capital cost rates, depreciation, fair rate of return, purchased water adjustments, synchronization of interest charges for income tax purposes, valuation, cash working capital, lead-lag studies, financial analyses of investment alternatives, and fair value. The following tabulation provides a listing of

the electric power, natural gas distribution, telephone, wastewater, and water service utility cases in which he has been involved as a witness. Additionally, he has been involved in a number of rate proceedings involving small public utilities which were resolved by Option Orders and therefore, are not listed below.

<u>Client</u>	<u>Docket No.</u>
Alpena Power Company	U-10020
Armstrong Telephone Company - Northern Division	92-0884-T-42T
Armstrong Telephone Company - Northern Division	95-0571-T-42T
Artesian Water Company, Inc.	90 10
Artesian Water Company, Inc.	06 158
Aqua Illinois Consolidated Water Divisions and Consolidated Sewer Divisions	11-0436
Aqua Illinois Hawthorn Woods Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Hawthorn Woods Water Division	07 0620/07 0621/08 0067
Aqua Illinois Kankakee Water Division	10-0194
Aqua Illinois Kankakee Water Division	14-0419
Aqua Illinois Vermilion Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Wastewater Division	07 0620/07 0621/08 0067
Aqua Illinois Willowbrook Water Division	07 0620/07 0621/08 0067
Aqua Pennsylvania Wastewater Inc	A-2016-2580061
Aqua Pennsylvania Wastewater Inc	A-2017-2605434
Aqua Pennsylvania Wastewater Inc	A-2018-3001582
Aqua Virginia - Alpha Water Corporation	Pue-2009-00059
Aqua Virginia - Blue Ridge Utility Company, Inc.	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Wastewater)	Pue-2009-00059
Aqua Virginia - Caroline Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Earlysville Forest Water Company	Pue-2009-00059
Aqua Virginia - Heritage Homes of Virginia	Pue-2009-00059
Aqua Virginia - Indian River Water Company	Pue-2009-00059
Aqua Virginia - James River Service Corp.	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc.	

(Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Holiday Utilities, Inc. (Water)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Wastewater)	Pue-2009-00059
Aqua Virginia - Lake Monticello Services Co. (Water)	Pue-2009-00059
Aqua Virginia - Lake Shawnee	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Wastewater)	Pue-2009-00059
Aqua Virginia - Land'or Utility Company (Water)	Pue-2009-00059
Aqua Virginia - Mountainview Water Company, Inc.	Pue-2009-00059
Aqua Virginia - Powhatan Water Works, Inc.	Pue-2009-00059
Aqua Virginia - Rainbow Forest Water Corporation	Pue-2009-00059
Aqua Virginia - Shawnee Land	Pue-2009-00059
Aqua Virginia - Sydnor Water Corporation	Pue-2009-00059
Aqua Virginia - Water Distributors, Inc.	Pue-2009-00059
Berkshire Gas Company	18-40
Borough of Hanover	R-2009-2106908
Borough of Hanover	R-2012-2311725
Borough of Hanover	R-2014-242830
Chaparral City Water Company	W 02113a 04 0616
California-American Water Company	CIVCV156413
Connecticut-American Water Company	99-08-32
Connecticut Water Company	06 07 08
Citizens Utilities Company Colorado Gas Division	-
Citizens Utilities Company Vermont Electric Division	5426
Citizens Utilities Home Water Company	R 901664
Citizens Utilities Water Company of Pennsylvania	R 901663
City of Bethlehem - Bureau of Water	R-00984375
City of Bethlehem - Bureau of Water	R 00072492
City of Bethlehem - Bureau of Water	R-2013-2390244
City of Dubois – Bureau of Water	R-2013-2350509
City of Dubois – Bureau of Water	R-2016-2554150
City of Lancaster Sewer Fund	R-00005109
City of Lancaster Sewer Fund	R-00049862

City of Lancaster Sewer Fund	R-2012-2310366
City of Lancaster Water Fund	R-00984567
City of Lancaster Water Fund	R-00016114
City of Lancaster Water Fund	R 00051167
City of Lancaster Water Fund	R-2010-2179103
City of Lancaster Water Fund	R-2014-2418872
Coastland Corporation	15-cvs-216
Consumers Pennsylvania Water Company Roaring Creek Division	R-00973869
Consumers Pennsylvania Water Company Shenango Valley Division	R-00973972
Country Knolls Water Works, Inc.	90 W 0458
East Resources, Inc. - West Virginia Utility	06 0445 G 42T
Elizabethtown Water Company	WR06030257
Hampton Water Works Company	DW 99-057
Hidden Valley Utility Services, LP	R-2018-3001306
Hidden Valley Utility Services, LP	R-2018-3001307
Illinois American Water Company	16-0093
Indian Rock Water Company	R-911971
Indiana Natural Gas Corporation	38891
Jamaica Water Supply Company	-
Kentucky American Water Company, Inc.	2007 00134
Middlesex Water Company	WR 89030266J
Millcreek Township Water Authority	55 198 Y 00021 11
Missouri-American Water Company	WR 2000-281
Missouri-American Water Company	SR 2000-282
Mount Holly Water Company	WR06030257
New Jersey American Water Company	WR 89080702J
New Jersey American Water Company	WR 90090950J
New Jersey American Water Company	WR 03070511
New Jersey American Water Company	WR-06030257
New Jersey American Water Company	WR08010020
New Jersey American Water Company	WR10040260
New Jersey American Water Company	WR11070460
New Jersey American Water Company	WR15010035
New Jersey American Water Company	WR17090985
Newtown Artesian Water Company	R-911977

Newtown Artesian Water Company	R-00943157
Newtown Artesian Water Company	R-2009-2117550
Newtown Artesian Water Company	R-2011-2230259
Newtown Artesian Water Company	R-2017-2624240
North Maine Utilities	14-0396
Northern Indiana Fuel & Light Company	38770
Oklahoma Natural Gas Company	PUD-940000477
Pennichuck Water Works, Inc.	DW 04 048
Pennichuck Water Works, Inc.	DW 06 073
Pennichuck Water Works, Inc.	DW 08 073
Pennsylvania Gas & Water Company (Gas)	R-891261
Pennsylvania Gas & Water Co. (Water)	R 901726
Pennsylvania Gas & Water Co. (Water)	R-911966
Pennsylvania Gas & Water Co. (Water)	R-22404
Pennsylvania Gas & Water Co. (Water)	R-00922482
Pennsylvania Gas & Water Co. (Water)	R-00932667
Public Service Company of North Carolina, Inc.	G-5, Sub 565
Public Service Electric and Gas Company	ER181010029
Public Service Electric and Gas Company	GR18010030
Presque Isle Harbor Water Company	U-9702
St. Louis County Water Company	WR-2000-844
Suez Water New Jersey, Inc.	WR18050593
Suez Water Owego-Nichols, Inc.	17-W-0528
Suez Water Pennsylvania, Inc.	R-2018-3000834
Suez Water Pennsylvania, Inc.	A-2018-3003519
Suez Water Pennsylvania, Inc.	A-2018-3003517
Suez Water Rhode Island, Inc.	Docket No. 4800
Town of North East Water Fund	9190
United Water New Rochelle	W-95-W-1168
United Water Toms River	WR-95050219
Valley Water Systems, Inc.	06 10 07
Virginia American Water Company	PUR-2018-00175
West Virginia-American Water Company	15-0676-W-42T
West Virginia-American Water Company	15-0675-S-42T
Wilmington Suburban Water Corporation	94-149
York Water Company	R-901813
York Water Company	R-922168

York Water Company
York Water Company
York Water Company
York Water Company

R-943053
R-963619
R-994605
R-00016236