PECO STATEMENT NO. 5

DIRECT TESTIMONY
OF
PAUL R. MOUL

DOCKET NO. R-2008-2028394

Concerning Rate of Return
Including Capital Structure Ratios,
Embedded Cost of Debt and Preferred Stock,
and the Cost of Equity

Date: March 31, 2008

PECO Energy Company
Direct Testimony of Paul R. Moul

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GLOSSARY OF ACRONYMS AND DEFINED TERMS

ACRONYM	DEFINED TERM
AFUDC	Allowance for Funds Used During Construction
Beta	
b	represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
bxr	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
CTC	Competitive Transition Charge
CWIP	Construction Work in Progress
DCF	Discounted Cash Flow
FERC	Federal Energy Regulatory Commission
FOMC	Federal Open Market Committee
g	Growth rate
IGF	Internally Generated Funds
ITC	Intangible Transition Charge
LDC	Local Distribution Company
Lev	Leverage modification
LT	Long Term
M&A	Merger and Acquisition
MLP	Master Limited Partnerships
PECO	PECO Energy Company
PPUC	Pennsylvania Public Utility Commission
PUC	Public Utility Commission
PUHCA	Public Utility Holding Company Act
	Represents the expected rate of return on common equity
Rf	Risk-free rate of return
Rm	Market risk premium
RP	Risk Premium

GLOSSARY OF ACRONYMS AND DEFINED TERMS

ACRONYM	**DEFINED TERM**
	Represents the new common shares expected to be issued by a firm
SXV	Represents external growth
S&P	Standard & Poor's
V	Represents the value that accrues to existing shareholders from selling stock at a price different from book value
ytm	Yield to maturity

I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

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

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

Q. What is the purpose of your testimony?

A. My testimony presents evidence, analysis, and a recommendation concerning the appropriate cost of common equity and overall rate of return that the Pennsylvania Public Utility Commission ("PPUC" or the "Commission") should recognize in the determination of the revenues that PECO Energy Company ("PECO Energy" or the "Company") should realize as a result of this proceeding. My analysis and recommendation are supported by the detailed financial data contained in Exhibit No. PRM-1, which is a multi-page document divided into fourteen (14) schedules. Additional evidence, in the form of appendices, follows my direct testimony. The items covered in these appendices provide additional detailed information concerning the explanation and application of the various financial models upon which I rely. My testimony is based upon my first hand knowledge of PECO Energy consisting of information obtained from meetings with the Company's management and Company-specific data, which is widely disseminated within the financial

community.

Q. Based upon your analysis, what is your conclusion concerning the appropriate rate of return on common equity for the Company in this case?

My conclusion is that the Company should be afforded an opportunity to earn a rate of return on common equity in the range of 11.00% to 11.50%. From this range, an 11.50% rate of return on common equity has been proposed for this case. My analysis of the Company and the superior performance of its management, as described in the testimony of Mr. Mark F. Alden, the Company's Vice President of Gas Operations, justify a rate of return at the top of the range. As shown on Schedule 1, I have calculated an 8.87% overall weighted average cost of capital for the Company at December 31, 2008. This figure, which is the product of weighting the individual capital costs by the proportion of each respective type of capital, should establish a compensatory level of return for the use of capital and provide the Company with the ability to attract capital on reasonable terms.

4. Q. **What background information have you considered in reaching your conclusion concerning the Company's cost of capital?**

The Company is a wholly-owned subsidiary of Exelon Corporation ("Exelon"). The common stock of Exelon is traded on the New York Stock Exchange. Exelon is a component of the S&P 500 Composite Index.

The Company provides natural gas distribution service to

approximately 481,000 customers located in the suburban counties surrounding the City of Philadelphia. PECO Energy also provides electric delivery service to 1.6 million electric customers in both the City of Philadelphia and the surrounding counties. Throughput to the Company's gas customers in 2007 comprised by approximately 44% to residential customers and approximately 56% to commercial, industrial, cogeneration and off-system customers. With about 630 large commercial, industrial and cogeneration customers representing 28% of throughput, the energy needs of a few customers can have a significant impact on the Company's operations. PECO Energy obtains its gas supplies from producers and marketers with transportation arrangements through connections with 3 interstate pipelines. The Company has storage arrangements with pipeline service providers and owns liquefied natural gas and propane facilities to supplement flowing gas.

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

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

6. Q. **In your opinion, what factors should the Commission consider when determining the Company's cost of capital in this proceeding?**

mo The Commission should consider the ratesetting principles that I have set forth in Appendix B. In this regard, the Commission's rate of return allowance must be set to cover the Company's interest and dividend payments, provide a reasonable level of earnings retention, produce an adequate level of internally generated funds to meet capital requirements, be commensurate with the risks to which the Company's capital is exposed, support reasonable credit quality, and allow the Company to raise capital on reasonable terms.

Q. What data have you used to apply each measure of the cost of equity?

mo The models that I used to measure the cost of common equity for the Company were applied with market and financial data developed for my proxy group of eight natural gas companies. The proxy group consists of natural gas companies that: (i) are engaged in the natural gas distribution business, (ii) have publicly-traded common stock, (iii) are contained in The Value Line Investment Survey, (iv) have not recently cut or omitted their dividend, (v) are not currently the target of a merger or acquisition, and (vi) have at least 60% of their assets subject to utility regulation. The companies in the proxy group are identified on page 2 of Schedule 3. I will refer to these companies as the "Gas Group" throughout my testimony. Aside from Peoples Energy which was acquired by WPS Resources to form Integrys Energy, these are the same gas companies that the Commission found acceptable for barometer group purposes in the recent rate case for PPL Gas Utilities

Corporation at Docket No. R-00061398.

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

A. I have applied the models/methods for estimating the cost of equity using the average data for the Gas Group. I have not measured separately the cost of equity for the individual companies within the Gas Group, because the determination of the cost of equity for an individual company has become increasingly problematic. By employing group average data, I have helped to minimize the effect of extraneous influences on the market data for an individual company.

Q. Please summarize your cost of equity analysis.

A. My cost of equity determination was derived from the results of the methods/models identified above. In general, the use of more than one method provides a superior foundation to arrive at the cost of equity. At any point in time, any single method can provide an incomplete measure of the cost of equity depending upon extraneous factors that may influence market sentiment. The specific application of these methods/models will be described later in my testimony. The following table provides a summary of the indicated costs of equity using each of these approaches.

	Gas Group
DCF	9.66%
RP	**11.25%**
CAPM	14.10%
CE	13.90%
Average	12.23%
Median	12.58%
Mid-point	11.88%

The indicated costs of equity shown by the models provided above reveal widely divergent results for the Gas Group. There are, however, serious problems with the DCF method that currently make those results less reliable using the Gas Group data. Moreover, there is significant uncertainty currently dominating the equity and credit markets attributed to the direction of the economy and the ongoing effects of the credit crunch. These factors are contributing to widely disparate results of models for the Gas Group. As I will later explain, of all the results shown above, the Risk Premium cost rate of 11.25% provides the best indication at this time of the cost of equity under the conditions we have today using the Gas Group evidence. In order to develop a reasonable range for this case, fifty basis points have been used to bracket the 11.25% result.

In summary, I recommend that the Commission set the Company's rate of return on common equity within the range of 11.00% to 11.50%. By proposing a cost of equity at the upper end of my findings, I have sought to

recognize the exemplary performance of the Company' s management. As described by Mr. Alden, the Company has undertaken many initiatives that have produced high quality service at reasonable prices. In particular, Mr. Alden has shown that the Company ranks high in customer service and management efficiency. In recognition of its outstanding performance and its goal of maintaining reasonable rates, the Company should be granted an opportunity to earn an 11.50% rate of return on common equity. My cost of equity recommendation makes no provision for the prospect that the rate of return may not be achieved due to attrition and/or other unforeseen events.

II. NATURAL GAS RISK FACTORS

10. Q. What factors currently affect the business risk of natural gas utilities?

A. Gas utilities face risks arising from competition, economic regulation, the business cycle, and customer usage patterns. Today, they operate in a more complex environment with time frames for decision-making considerably shortened. Their business profile is influenced by market-oriented pricing for the commodity distributed to customers and open access for the transportation of natural gas. Of particular concern for the Company, the recent high prices and volatility in natural gas commodity prices have had a negative impact on its customers, and, together with other factors, have contributed in declines in average use per customer. Higher and volatile gas costs may also result in further declines in average use per customer and in fewer new customers selecting natural gas to meet their energy needs.

In addition, natural gas utilities have focused increased attention on safety and reliability issues. In order to address these issues and to comply with new and pending pipeline safety regulations, natural gas companies are now allocating more of their resources to addressing aging infrastructure issues.

11. Q. **Are there other features of the Company's business that should be considered when assessing the Company's risk?**

Yes. Most of the Company's residential customers use natural gas for space heating purposes. This indicates that the energy requirements of a large proportion of the Company's residential customers are significantly influenced by temperature conditions, over which the Company has absolutely no control. Moreover, the throughput to the ten (10) largest volume customers that are engaged in manufacturing and electric generation (including cogeneration) equals 14.5 million cubic feet, or 19% of total throughput. This means that the energy demands of a relatively few customers can have a meaningful impact on the Company's operations. Large volume users, which have traditionally used transportation service, also have the ability to bypass the LDC system. Success in this aspect of the Company's market is subject to the business cycle, the price of alternative energy sources, and pressures from competitors. Moreover, external factors can also influence the Company's throughput to these customers because cost factors can impact their operations from facilities located outside the Company's service territory. This puts

fixed cost recovery at risk.

13. Q. Can the Company's construction program affect its risk profile?

A. Yes. The Company must undertake substantial investments to maintain and upgrade existing facilities in its service territory to ensure safe and reliable service to its customers. In particular, the rehabilitation of the Company' s infrastructure represents a non-revenue producing use of capital. For example, at year end 2006, 1,390 miles (or approximately 21%) of the Company's distribution mains consisted of cast iron, ductile iron and unprotected steel pipe. Also, 57,128 (or approximately 14%) of the Company's services were constructed of unprotected steel. The Company projects its construction expenditures for the gas division will approximate $280 million in the period 2008-2012, an increase of roughly 25% ($280 million + $1,106 million) of its net gas utility plant at December 31, 2007.

14. Q. How should the Commission respond to the issues facing natural gas utilities in general and PECO Energy in particular?

A. The Commission should recognize and take into account the heightened competitive environment in the natural gas business in determining the cost of equity for the Company. A fair rate of return represents a key to a financial profile that will provide the Company with the ability to raise the capital necessary to meet its capital needs on reasonable terms.

III. FUNDAMENTAL RISK ANALYSIS

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

Yes. It is necessary to establish a company's relative risk position within its industry through a fundamental analysis of various quantitative and qualitative factors that bear upon investors' assessment of overall risk. The qualitative factors that bear upon the Company's risk have already been discussed. The quantitative risk analysis follows. The items that influence investors' evaluation of risk and their required returns are described in Appendix C. For this purpose, I compared PECO Energy to the S&P Public Utilities, an industry-wide proxy consisting of various regulated businesses, and to the Gas Group.

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

mo The S&P Public Utilities is a widely recognized index that is comprised of electric power and natural gas companies. These companies are identified on page 3 of Schedule 4.

17. Q. **What criteria did you employ to assemble the Gas Group?**

I set forth the criteria that I employed to assemble the Gas Group above and will not repeat it here.

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

risk and cost of capital?

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

19. Q. How do the bond ratings compare for PECO Energy, the Gas Group, and the S&P Public Utilities?

mo Presently, the corporate credit rating ("CCR") for PECO Energy is BBB+ from Standard and Poor's Corporation ("S&P"), and the Long Term ("LT") issuer rating is A3 from Moody's Investors Services ("Moody' s"). The CCR designation by S&P and LT issuer rating by Moody's focus upon the credit quality of the issuer of the debt, rather than upon the debt obligation itself. S&P further designates PECO Energy with an "excellent" business profile and an "intermediate" financial profile. The average credit quality of the Gas Group is an A from S&P and A3 from Moody's. For the S&P Public Utilities, the average composite rating is BBB+ by S&P and Baal by Moody's. Most of the financial indicators that I will subsequently discuss are considered during the rating process.

20. Q. How do the financial data compare for PECO Energy, the Gas Group,

and the S&P Public Utilities?

mo The broad categories of financial data that I will discuss are shown on Schedules 2, 3, and 4. The data cover the five-year period 2002-2006. For PECO Energy, the financial statements contained in SEC Form 10-K, which is the source used by S&P Utility Compustat, include both its natural gas distribution and electric delivery and transmission businesses. I have modified the income statement and cash flow data for PECO Energy by removing the unique effects of the Intangible Transition Charge ("ITC") and Competitive Transition Charge ('CTC"), which are related to the Company's electric division. I have also adjusted the balance sheet for the effects of the transitional funding obligations related to the Company's electric division, the parent company receivable that is also related to the electric division, and Accumulated Other Comprehensive Income ("OCI"). The important categories of relative risk may be summarized as follows:

Size. In terms of capitalization, PECO Energy is larger than the average size of the Gas Group, but smaller than the average size of the S&P Public Utilities. All other things being equal, a smaller company is riskier than a larger company because a given change in revenue and expense has a proportionately greater impact on a small firm. As I will demonstrate later, the size of a firm can impact its cost of equity. This is the case for the Gas Group.

Market Ratios. Market-based financial ratios, such as earnings/price ratios and dividend yields, provide a partial measure of the investor-required

cost of equity. If all other factors are equal, investors will require a higher rate of return for companies that exhibit greater risk, in order to compensate for that risk. That is to say, a finn that investors perceive to have higher risks will experience a lower price per share in relation to expected earnings.[1] There are no market ratios available for PECO Energy because Exelon owns its stock. The five-year average price-earnings multiple for the Gas Group was fairly similar to that of the S&P Public Utilities. The five-year average dividend yields and average market-to-book ratios were somewhat higher for the Gas Group as compared to the S&P Public Utilities.

Common Equity Ratio. The level of financial risk is measured by the proportion of long-term debt and other senior capital that is contained in a company's capitalization. Financial risk is also analyzed by comparing common equity ratios (the complement of the ratio of debt and other senior capital). That is to say, a finn with a high common equity ratio has lower financial risk, while a firm with a low common equity ratio has higher financial risk. The five-year average common equity ratios, based on permanent capital, were 62.7% for PECO Energy, 53.0% for the Gas Group, and 41.2% for the S&P Public Utilities. However for the purpose of calculating the weighted average cost of capital for this case, the Company is proposing a 55.34% common equity that removes the transitional funding obligations and the parent company receivable. I have focused on the common equity ratios calculated from permanent capital because short-term

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

debt is used first to finance construction work in progress and, in the case of gas utilities, seasonal working capital needs and other regulatory assets.

Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's earned returns signifies relatively greater levels of risk, as shown by the coefficient of variation (standard deviation + mean) of the rate of return on book common equity. The higher the coefficients of variation, the greater degree of variability. For the five-year period, the coefficients of variation were 0.076 (1.0% + 13.1%) for PECO Energy, 0.057 (0.7% ÷ 12.3%) for the Gas Group, and 0.159 (1.7% + 10.7%) for the S&P Public Utilities. The coefficient of variation was somewhat higher for PECO Energy as compared to the Gas Group, thus indicating higher risk for the Company.

Operating Ratios. I have also compared operating ratios (the percentage of revenues consumed by operating expense, depreciation, and taxes other than income). 2 The five-year average operating ratios were 84.5% for PECO Energy, 88.7% for the Gas Group, and 84.0% for the S&P Public Utilities.

Coverage. The level of fixed charge coverage (i.e., the multiple by which available earnings cover fixed charges, such as interest expense) provides an indication of the earnings protection for creditors. Higher levels of coverage, and hence earnings protection for fixed charges, are usually associated with superior grades of creditworthiness. The five-year average interest coverage (excluding Allowance for Funds Used During Construction

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

("AFUDC") was 7.72 times for PECO Energy, 4.11 times for the Gas Group, and 2.89 times for the S&P Public Utilities. The Company's interest coverage is affected by its relatively lower borrowings after the removal of interest expense associated with the ITC/CTC (need to verify).

Quality of Earnings. Measures of earnings quality usually are revealed by the percentage of AFUDC related to income available for common equity, the effective income tax rate, and other cost deferrals. These measures of earnings quality usually influence a firm's internally generated funds because poor quality of earnings would not generate high levels of cash flow. Quality of earnings has not been a significant concern for PECO Energy, the Gas Group, and the S&P Public Utilities.

Internally Generated Funds. Internally generated funds ("IGF") provide an important source of new investment capital for a utility and represent a key measure of credit strength. Historically, the five-year average percentage of IGF to capital expenditures was 78.9% for PECO Energy, 94.3% for the Gas Group, and 110.1% for the S&P Public Utilities.

Betas. The financial data that I have been discussing relate primarily to company-specific risks. Market risk for firms with publicly-traded stock is measured by beta coefficients. Beta coefficients attempt to identify systematic risk, i.e., the risk associated with changes in the overall market for common equities. 3 Value Line publishes such a statistical measure of a

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

stock's relative historical volatility to the rest of the market. A comparison of market risk is shown by the Value Line beta of .88 as the average for the Gas Group (see page 2 of Schedule 3), and .95 as the average for the S&P Public Utilities (see page 3 of Schedule 4).

21. Q. Based on your analysis, does the Gas Group provide a reasonable basis to measure the Company's cost of equity for this case?

A. Yes. The Gas Group provides a reasonable basis to measure the cost of equity for the Company's gas division. In the area of bond ratings and associated credit quality, the Company' s risk is greater than that of the Gas Group. Hence, there is the potential for an understatement of the Company' s cost of equity because its risk is higher in this regard. On balance, the cost of equity for the Gas Group would provide a reasonable basis for measuring the Company' s cost of equity for this case.

IV. CAPITAL STRUCTURE RATIOS

22. Q. Please explain the selection of capital structure ratios for PECO Energy.

The capital structure ratios of PECO Energy should be employed for rate of return purposes. In the situation where the operating public utility raises its own debt directly in the capital markets, as is the case for the Company, it is proper to employ the capital structure ratios and senior capital cost rates of the regulated public utility for rate of return purposes. Furthermore, consistency requires that the embedded cost rates of the Company' s senior securities also

be employed. This procedure is consistent with the ratesetting procedures used by the Commission in prior rate cases for PECO Energy.

23. Q. Does Schedule 5 provide the Company's capitalization and capital structure ratios?

Yes. Schedule 5 presents the Company's capitalization and related capital structure ratios. The December 31, 2007 capitalization corresponds with the end of the historic test year in this case. The December 31, 2008 capital structure is estimated at the end of the future test year. During the future test year, $450 million of First Mortgage Bonds will mature on May 1, 2008 and will be refinanced with new debt, along with additional borrowing planned for the future test year. In fact, the Company issued $500 million of 10-year debt on March 3, 2008 and plans another issue of $300 million in September 2008. The Company also plans to retire $4.2 million of pollution control bonds in connection with the conversion from a variable rate to a fixed rate on pollution control bonds that I will describe below. A forecast increase in retained earnings by December 31, 2008 has also been included. In presenting the Company's capital structure on Schedule 5, I have removed several items for ratesetting purposes. Those eliminations include (i) the transitional funding obligations related to the Company's former electric generation business, (ii) the parent company receivable that also relates to the Company's former electric generation business, (iii) the treatment of the call premiums on the early redemption of high cost long-term debt and preferred stock, which

has been redeemed, and (iv) the OCI.

24. Q. Please describe the first adjustment.

A. Approximately one-half of the Company's debt shown on its balance sheet is represented by transitional funding obligations issued by a special purpose entity. The transitional funding obligations of PECO Energy were issued in connection with restructuring to cover stranded costs of its former electric generation business under Pennsylvania's Competition Act. For this debt, the Company merely acts as a conduit for revenues collected from customers that are turned over to the trustee for the payment of interest and principal on the transitional funding obligations. That is to say, the revenues used to service this debt are separate from the base rates for gas distribution and electric delivery service. As such, the transitional funding obligation must be removed from the Company's capital structure for ratesetting purposes.

25. Q. Please describe the second adjustment.

A. The accounts receivable from Exelon Corporation represent $784.122 million of PECO Energy's capitalization at December 31, 2007. This amount will decline to $498.622 million in the future test year and will be completely extinguished by 2010. This amount represents the remainder of an original $2 billion non-interest bearing receivable established in 2001, in connection with the Company's corporate restructuring. Originally, the parent receivable was reported on FERC Form No. 1 as an asset in Account 186 -- Miscellaneous Deferred Debits. However, the SEC and FERC required that the parent

company receivable be reclassified as a contra-equity entry in Account 211 -- Other Paid-in Capital. The purpose of the parent receivable was for Exelon to fund future income tax payments on the collection of the CTC and ITC by PECO Energy, which as discussed previously are separate from the base rates for gas distribution and electric delivery service. That is to say, there items are transitional in nature and relate to the Company's former electric generation business. Hence, these amounts are unrelated to the gas distribution and electric delivery rates. As such, these amounts must also be removed from the Company's capitalization for ratesetting purposes in a manner similar to the removal of the transitional funding obligations.

26. Q. Please describe the third adjustment.

A. I have also adjusted the principal amounts of long-term debt and preferred stock to exclude the amounts used to finance premiums on the early redemption of these securities. To do otherwise would deny PECO Energy the full return on the premiums paid to redeem this high cost capital since additional amounts of capital were issued to pay the call premiums. The amounts issued to finance the call premiums do not increase the Company's rate base. That is to say, no additional rate base was created through additional debt and preferred stock necessary to finance this transaction, and therefore an adjustment is required to provide the return necessary to service this additional capital. Hence, PECO Energy's long-term debt and preferred stock amounts must be adjusted for this disparity in order that the return

necessary to service the capitalization is produced from rate base investment times the overall rate of return.

This adjustment is equitable because customers receive the cost savings resulting from these refinancings in the form of a lower overall rate of return, and PECO Energy recovers all costs incurred in providing these benefits to customers. To produce these savings, the Company paid the debt and preferred stock holders a premium for surrendering their securities prior to maturity. These premiums represented an investment made by PECO Energy to reduce its overall cost of capital. Because the reduced interest costs and preferred stock dividends are reflected in the lower cost of capital to customers, it is appropriate that the Company recover the costs incurred to produce these savings. This includes both a return of and return on the unamortized premiums. Adjusting the principal amounts in the capital structure provides a return on the premium as a part of the embedded cost rates of capital.

27. Q. Please describe the fourth adjustment.

mo I also have removed the accumulated OCI from the capital structure for ratesetting purposes. OCI arises from a variety of sources, including: minimum pension liability, foreign currency hedges, unrealized gains and losses on securities available for sale, interest rate swaps, and other cash flow hedges. For PECO Energy, its OCI is represented by Unrealized Gains and Losses on Available-for-Sale Securities, Interest Rate Swaps, and Other Cash

Flow Hedges - representing the fair value of settled treasury locks, net. These accounting entries to accumulated OCI are unrelated to the Company's rate base determination and must be excluded from the common equity. That is to say, these accounting entries neither produce nor consume cash, and hence they cannot impact the rate base valuation.

28. Q. Should short-term debt be included in the capital structure for rate of return purposes?

mo Perhaps, but only after a thorough analysis. Short-term debt serves several purposes for a public utility. Principally, it provides bridge financing for construction work in progress, until the magnitude of short-term debt reaches a point where a permanent financing with long-term debt and equity is economic. That is to say, short-term debt is temporary financing pending the issuance of long-term debt and equity in the desired proportions that support the Company's capital structure goals. For natural gas utilities, short-term debt is also used to meet seasonal working capital needs related to stored gas inventory that accumulates during the summer and early fall prior to the send out to customers in the heating session. It is also used to finance customer accounts receivable during the heating season until those receivables are converted to cash. The cycle then repeats. Another use of short-term debt by some natural gas utilities relates to the temporary financing of regulatory assets, such as under-recovered purchased gas costs, deferred environmental remediation costs, and other costs incurred but not yet paid by customers. The

bottom line is that short-term debt should be included in the capital structure for rate of return purposes only after a detailed analysis.

29. Q. Does Schedule 5 show the Company's short-term debt outstanding?

Yes. For the future test year, the Company projects that its monthly average balance will be $142.046 million (see footnote 6 shown on Schedule 5). Of that amount, approximately $82.094 million, on average, is expected to be used to finance its construction work in progress ("CWIP"). As a consequence, approximately 58% of the short-term debt of PECO Energy is accounted for by the financing of CWIP. The importance of this fact relates to the AFUDC formula prescribed by the Commission and the FERC, which assumes that CWIP is financed first by short-term debt. Given the Company's procedure of calculating its AFUDC, it has been the Commission's practice in the past to exclude short-term debt from the Company's capital structure. Here, the average balance of short-term debt that is not financing CWIP is $59.952 million ($142.046 million - $82.094 million).

30. Q. What amount of short-term debt should be considered in the Company's capital structure?

As indicated above, the maximum amount of short-term debt that is eligible to be included in the capital structure in this case is $59.952 million.

31. Q. **What capital structure ratios do you recommend be adopted for rate of return purposes in this proceeding?**

Since ratesetting is prospective, the rate of return should, at a minimum, reflect known or reasonably foreseeable changes which will occur during the course of the test year. As a result, I will adopt the Company's future test year-end capital structure ratios of 43.95% (42.74% long-term and 1.20% short-term) debt, 1.71% preferred stock, and 54.34% common equity. I have verified the reasonableness of these ratios by considering analysts' forecasts, which influence investor expectations. Those comparisons are provided below based upon data widely available to investors from Value Line.

	Common Equity Ratio		
	2007	2008	2010-12
AGL Resources	51.5%	51.5%	51.5%
Atmos Energy	48.0%	48.0%	49.0%
Laclede Group, Inc.	55.0%	53.0%	51.0%
New Jersey Resources	67.0%	69.5%	72.8%
Nicor, Inc.	70.0%	71.0%	74.0%
Piedmont Natural Gas	51.0%	50.0%	50.8%
South Jersey Industries	57.0%	57.0%	59.0%
WGL Resources	60.3%	63.4%	65.8%
Gas Group Average	57.5%	57.9%	59.2%

Source:
The Value Line Investment Survey, December 14, 2007

These forecasts show that the Company's proposed capital structure ratios for this case are reasonable.

V. COSTS OF SENIOR CAPITAL

32. Q. What cost rate have you assigned to the debt portion of PECO Energy's capital structure?

mo The determination of the long-term debt cost rate is essentially an arithmetic exercise. This is due to the fact that the Company has contracted for the use of this capital for a specific period of time at a specified cost rate. As shown on page 1 of Schedule 6, I have computed the actual embedded cost rate of long-term debt at December 31, 2007. On page 3 of Schedule 6, I have shown the estimated embedded cost rate of long-term debt at December 31, 2008. The development of the individual effective cost rates for each series of long-term debt, using the cost rate to maturity technique, is shown on pages 2 and 4 of Schedule 6. The cost rate, or yield to maturity ("ytm"), is the rate of discount that equates the present value of all future interest and principal payments with the net proceeds of the bond. In my calculation of the embedded cost of long-term debt, I have recognized the costs associated with the Company's early redemption of high cost debt. As previously explained, it is necessary to compensate PECO Energy for the costs incurred to lower the embedded debt cost rate, which reduces the cost of capital charged to customers.

For the new issues of long-term debt, consisting of $500 million of long-term debt that was issued in March 2008 and $300 million of additional long-term debt to be issued in September 2008, I have used an actual coupon rate of 5.35% on the March issue and a 5.50% rate for the September issue.

The effective cost rates for these issues reflect estimated issuance costs, including the original issue discount that was incurred on the March issue.

33. Q. **Have you also reflected the conversion of the Company's variable rate pollution control bonds to a fixed rate in the future test year?**

A. Yes. As of December 31, 2007, PECO had $154.2 million of tax-exempt long-term debt that had a credit enhancement provided by the AAA-rated bond insurer Financial Guaranty Insurance Corp. (FGIC). Due to the exposure that FGIC has in connection with recent developments in the subprime credit market, the rating agencies put FGIC on review for possible downgrade. In fact, since December 31, 2007, S&P has downgraded FGIC to A from AAA, and Fitch downgraded FGIC to AA from AAA. The variable rate tax-exempt debt has its rates reset every 35 days at an auction. Due to the loss of confidence in the creditworthiness of the FGIC, PECO Energy has experienced a loss in liquidity of the markets for its insured bonds, which makes them more difficult and expensive for PECO to reset in the auction. During the week of February 18, 2008, PECO failed to attract enough buyers to successfully complete the auctions for the reset of the rates on these bonds. The instruments under which the original tax-exempt bonds were issued allowed PECO to, among other options, convert to a fixed-rate. With PECO's solid credit ratings and the short remaining term to maturity of December 1, 2012, PECO was able to lock in a very attractive fixed-rate of 4.00% on $150 million of these bonds. The Company also plans to redeem $ 4.2 million of

the remaining variable rate pollution control bonds.

34. Q. What cost rate have you determined for the Company's long-term debt?

A. I will adopt the 5.86% embedded cost of long-term debt at December 31, 2008, as shown on page 3 of Schedule 6. This rate is related to the amount of long-term debt shown on Schedule 5 which provides the basis for the 42.79% long-term debt ratio.

35. Q. What cost rate have you assigned to the short-term debt?

A. I have used the Company's current cost of short-term debt of 3.45%.

36. Q. What overall debt cost rate have you determined for rate of return purposes?

As shown on page 3 of Schedule 6, the combined cost of long- and short-term debt is 5.79% for the future test year.

37. Q. What preferred stock cost rate have you calculated for the Company?

A. For the future test year, I have calculated a 4.76% embedded cost of preferred stock, as shown on page 3 of Schedule 7. I have included in the embedded cost of preferred stock the unrecovered issuance costs and the call premium on the redemption of the preferred stock. The unrecovered issuance expenses and the call premium have been amortized over the remaining term of the issues that were redeemed. These adjustments correspond to those that I previously discussed regarding the Company's capital structure ratios. I will

adopt the 4.76% embedded cost of preferred stock, which is related to the 1.71% preferred stock ratio shown on Schedule 5. The details regarding the individual cost rates for each series of preferred stock are provided on page 4 of Schedule 7.

VI. COST OF EQUITY - GENERAL APPROACH

38. Q. Please describe the process you employed to determine the cost of equity for the Company.

Although my fundamental financial analysis provides the required framework to establish the risk relationships between PECO Energy, the Gas Group and the S&P Public Utilities, the cost of equity must be measured by standard financial models that ! describe in Appendix D. Differences in risk traits, such as size, business diversification, geographical diversity, regulatory policy, financial leverage, and bond ratings must be considered when analyzing the cost of equity indicated by the models.

It also is important to reiterate that no one method or model of the cost of equity can be applied in an isolated manner. Rather, informed judgment must be used to take into consideration the relative risk traits of the firm. It is for this reason that I have used more than one method to measure the Company's cost of equity. As noted in Appendix D and elsewhere in my direct testimony, each of the methods used to measure the cost of equity contains certain incomplete and/or overly restrictive assumptions and constraints that are not optimal. Therefore, I favor considering the results

from a variety of methods. In this regard, I applied each of the methods with data taken from the Gas Group and have arrived at a cost of equity of 11.00% to 11.50% for PECO Energy.

VII. DISCOUNTED CASH FLOW ANALYSIS

39. **Q. Please describe your use of the Discounted Cash Flow approach to determine the cost of equity.**

mo The details of my use of the DCF approach and the calculations and evidence in support of my conclusions are set forth in Appendix E. I will summarize them here. The DCF model seeks to explain the value of an asset as the present value of future expected cash flows discounted at the appropriate risk-adjusted rate of return. In its simplest form, the DCF return on common stocks consists of a current cash (dividend) yield and future price appreciation (growth) of the investment.

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

As I describe in Appendix E, the DCF approach has other limitations that diminish its usefulness in the ratesetting process when the market

capitalization diverges significantly from the book value capitalization. When this situation exists, the unadjusted DCF method will lead to a misspecified cost of equity when it is applied to a book value capital structure.

Q. Please explain the dividend yield component of a DCF analysis.

The DCF methodology requires the use of an expected dividend yield to establish the investor-required cost of equity. The monthly dividend yields of the Gas Group for the twelve months ended January 2008 are shown graphically on Schedule 8. The monthly dividend yields shown on Schedule 8 reflect an adjustment to the month-end prices to reflect the build up of the dividend in the price that has occurred since the last ex-dividend date (i.e., the date by which a shareholder must own the shares to be entitled to the dividend payment - usually about two to three weeks prior to the actual payment). An explanation of this adjustment is provided in Appendix E.

For the twelve months ending January 2008, the average dividend yield was 3.94% for the Gas Group based upon a calculation using annualized dividend payments and adjusted month-end stock prices. The dividend yields for the more recent six- and three- month periods were 4.01% and 4.07%, respectively. I have used, for the purpose of my direct testimony, a dividend yield of 4.01% for the Gas Group, which represents the six-month average yield. The use of this dividend yield will reflect current capital costs, while avoiding spot yields.

For the purpose of a DCF calculation, the average dividend yields

must be adjusted to reflect the prospective nature of the dividend payments i.e., the higher expected dividends for the future. Recall that the DCF is an expectational model that must reflect investor anticipated cash flows for the Gas Group. I have adjusted the six-month average dividend yield in three different, but generally accepted manners, and used the average of the three adjusted values as calculated in Appendix E. That adjusted dividend yield is 4.12% for the Gas Group.

41. Q. Please explain the underlying factors that influence investor's growth expectations.

Ao As noted previously, investors are interested principally in the future growth of their investment (i.e., the price per share of the stock). As I explain in Appendix E, future earnings per share growth represents their primary focus because under the constant price-earnings multiple assumption of the DCF model, the price per share of stock will grow at the same rate as earnings per share. In conducting a growth rate analysis, a wide variety of variables can be considered when reaching a consensus of prospective growth, including: earnings, dividends, book value, and cash flow stated on a per share basis. Historical values for these variables can be considered, as well as analysts' forecasts that are widely available to investors. A fundamental growth rate analysis also can be formulated, which consists of internal growth ("b x r"), where "r" represents the expected rate of return on common equity and "b" is the retention rate that consists of the fraction of earnings that are not paid out

as dividends. The internal growth rate can be modified to account for sales of new common stock -- this is called external growth ("s x v"), where "s" represents the new common shares expected to be issued by a firm and "v" represents the value that accrues to existing shareholders from selling stock at a price different from book value. Fundamental growth, which combines internal and external growth, provides an explanation of the factors that cause book value per share to grow over time. Hence, a fundamental growth rate analysis is duplicative of expected book value per share growth.

Growth also can be expressed in multiple stages. This expression of growth consists of an initial "growth" stage where a firm enjoys rapidly expanding markets, high profit margins, and abnormally high growth in earnings per share. Thereafter, a firm enters a "transition" stage where fewer technological advances and increased product saturation begin to reduce the growth rate and profit margins come under pressure. During the "transition" phase, investment opportunities begin to mature, capital requirements decline, and a firm begins to pay out a larger percentage of earnings to shareholders. Finally, the mature or "steady-state" stage is reached when a firm’s earnings growth, payout ratio, and return on equity stabilize at levels where they remain for the life of a firm. The three stages of growth assume a step-down of high initial growth to lower sustainable growth. Even if these three stages of growth can be envisioned for a firm, the third "steady-state" growth stage, which is assumed to remain fixed in perpetuity, represents an unrealistic expectation because the three stages of growth can be repeated. That is to say,

the stages can be repeated where growth for a firm ramps-up and ramps-down in cycles over time.

42. Q. What investor-expected growth rate is appropriate in a DCF calculation?

Investors consider both company-specific variables and overall market sentiment (i.e., level of inflation rates, interest rates, economic conditions, etc.) when balancing their capital gains expectations with their dividend yield requirements. I follow an approach that is not rigidly formatted because investors are not influenced by a single set of company-specific variables weighted in a formulaic manner. Therefore, in my opinion, all relevant growth rate indicators using a variety of techniques must be evaluated when formulating a judgment of investor expected growth.

43. Q. **What company-specific data have you considered in your growth rate analysis?**

mo I have considered the growth in the financial variables shown on Schedules 9 and 10. The bar graph provided on Schedule 9 shows the historical growth rates in earnings per share, dividends per share, book value per share, and cash flow per share for the Gas Group. The historical growth rates were taken from Value Line. As shown on Schedule 9, historical growth in earnings per share was in the range of 5.13% to 7.13% for the Gas Group.

Schedule 10 provides projected earnings per share growth rates taken from analysts' forecasts compiled by IBES/First Call, Zacks, Reuters/Market Guide and Value Line. IBES/First Call, Zacks, and Reuters/Market Guide

represent reliable authorities of projected growth upon which investors rely. The IBES/First Call, Zacks, and Reuters/Market Guide forecasts are limited to earnings per share growth, while Value Line makes projections of other financial variables. The Value Line forecasts of dividends per share, book value per share, and cash flow per share have also been included on Schedule 10 for the Gas Group.

Although five-year forecasts usually receive the most attention in the growth analysis for DCF purposes, present market performance has been strongly influenced by short-term earnings forecasts. Each of the major publications provides earnings forecasts for the current and subsequent years. These short-term earnings forecasts receive prominent coverage, and indeed they dominate these publications. While the DCF model typically focuses upon long-run estimates of earnings, stock prices are clearly influenced by current and near-term earnings forecasts.

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

Yes. In fact, it illustrates that the infinite form of the model contains an unrealistic assumption. Rather than viewing the DCF in the context of an endless stream of growing dividends (e.g., a century of cash flows), the growth in the share value (i.e., capital appreciation, or capital gains yield) is most relevant to investors' total return expectations. Hence, the sale price of a stock can be viewed as a liquidating dividend that can be discounted along

with the annual dividend receipts during the investment-holding period to arrive at the investor expected return. The growth in the price per share will equal the growth in earnings per share absent any change in price-earnings (P-E) multiple -- a necessary assumption of the DCF. As such, my company-specific growth analysis, which focuses principally upon five-year forecasts of earnings per share growth, conforms with the type of analysis that influences the total return expectations of investors. Moreover; academic research focuses on five-year growth rates as they influence stock prices. Indeed, if investors required forecasts which extended beyond five years in order to properly value common stocks, then I am sure that some investment advisory service would begin publishing that information for individual stocks in order to meet the demands of investors. The absence of such a publication signals that investors do not require infinite forecasts in order to purchase and sell stocks in the marketplace.

45. Q. What specific evidence have you considered in the DCF growth analysis?

mo As to the five-year forecast growth rates, Schedule 10 indicates that the projected earnings per share growth rates for the Gas Group are 4.73% by IBES/First Call, 5.21% by Zacks, 4.87% by Reuters/Market Guide, and 4.40% by Value Line. The Value Line projections indicate that earnings per share for the Gas Group will grow prospectively at a more rapid rate (i.e., 4.40%) than dividends per share (i.e., 3.86%), which indicates a declining dividend payout ratio for the future. As indicated earlier, and in Appendix E, with the

constant price-earnings multiple assumption of the DCF model, growth for these companies will occur at the higher earnings per share growth rate, thus producing the capital gains yield expected by investors.

4 46. Q. What conclusion have you drawn from these data?

mo Ideally historical and projected earnings and dividends per share growth indicators would be used to provide an assessment of investor growth expectations for a firm; however, the circumstances of the Gas Group mandate that greater emphasis be placed upon projected earnings per share growth. In this regard, it is worthwhile to note that Professor Myron Gordon, the foremost proponent of the DCF model in rate cases, concluded that the best measure of growth in the DCF model is forecasts of earnings per share growth.[4]

It is appropriate to consider all forecasts of earnings growth rates that are available to investors. In this regard, I have considered the forecasts from IBES/First Call, Zacks, Reuters/Market Guide and Value Line. The IBES/First Call, Zacks, and Reuters/Market Guide growth rates are consensus forecasts taken from a survey of analysts that make projections of growth for these companies. In addition, these estimates may be obtained from the Internet and are widely available to investors free-of-charge. First Call is probably quoted most frequently in the financial press when reporting on earnings forecasts. The Value Line forecasts are also widely available to

4 "Choice Among Methods of Estimating Share Yield," The Journal of Portfolio Management, spring 1989 by Gordon, Gordon & Gould.

investors and can be obtained by subscription or free-of-charge at most public and collegiate libraries.

The forecasts of earnings per share growth, as shown on Schedule 10, provide a range of growth rates of 4.40% to 5.21%. To those company-specific growth rates, consideration must be given to long-term growth in corporate profits. Although the DCF growth rates cannot be established solely with a mathematical formulation, it is my opinion that an investor-expected growth rate which is within the array of earnings per share growth rates shown by the analysts' forecasts is 5.00% for the Gas Group. The Value Line forecast of dividend per share growth is inadequate in this regard due to the forecast decline in the dividend payout. As I previously indicated, the restructuring and consolidation now taking place in the utility industry will provide additional risks and opportunities as the utility industry successfully adapts to the new business environment. These changes in growth fundamentals will undoubtedly develop beyond the next five years typically considered in the analysts' forecasts and will enhance the growth prospects for the future. In my opinion, a 5.00% growth rate will accommodate all these factors.

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

A. Only if the capital structure ratios are measured with the market value of debt

and equity. If book values are used to compute the capital structure ratios, then an adjustment is required.

48. Q. Please explain why.

mo If regulators rely upon the results of the DCF (which are based on the market price of the stock of the companies analyzed) and use those results in computing the weighted average cost of capital with a book value capital structure, those results will not reflect the degree of financial risk associated with the capital structure shown by the market capitalization. When the price diverges from book value, the potential exists for a financial risk difference, whereby the capitalization of a utility measured at its market value contains relatively less debt and more equity than the capitalization measured at its book value.

This shortcoming of the DCF has persuaded the Commission to adjust the cost of equity upward to make the return consistent with the book value capital structure. Provisions for this risk difference were made by the Commission in the following cases:

- January 10, 2002 for Pennsylvania-American Water Company in Docket No. R-00016339 -- 60 basis points adjustment.
- August 1, 2002 for Philadelphia Suburban Water Company in Docket No. R-00016750 -- 80 basis points adjustment.
- January 29, 2004 for Pennsylvania-American Water Company in Docket No. R-00038304 (affirmed by the Commonwealth Court on November 8, 2004) -- 60 basis points adjustment.
- August 5, 2004 for Aqua Pennsylvania, Inc. in Docket No. R-00038805 -- 60 basis points adjustment.
- December 22, 2004 for PPL Electric Utilities Corporation in Docket No. R-00049255 -- 45 basis points.
- February 8, 2007 for PPL Gas Utilities Corporation in Docket No. R-

00061398 -- 70 basis points adjustment.

It must be recognized that in order to make the DCF results relevant to the capitalization measured at book value (as is done for rate setting purposes), the market-derived cost rate cannot be used without modification. As I will explain later in my testimony, the results of the DCF model can be modified to account for differences in risk when the book value capital structure contains more financial leverage than the market value capital structure.

49. Q. Is your leverage adjustment dependent upon the market valuation or book valuation from an investor's perspective?

The only perspective that is important to investors is the return that they can realize on the market value of their investment. As I have measured the DCF, the simple yield (D/P) plus growth (g) provides a return applicable strictly to the price (P) that an investor is willing to pay for a share of stock. The DCF formula is derived from the standard valuation model: P -- D/(k-g), where P = price, D = dividend, k = the cost of equity, and g – growth in cash flows. By rearranging the terms, we obtain the familiar DCF equation: k= D/P+g. All of the terms in the DCF equation represent investors' assessment of expected future cash flows that they will receive in relation to the value that they set for a share of stock (P). The need for the leverage adjustment arises when the results of the DCF model (k) are to be applied to a capital structure that is different than indicated by the market price (P). From the market

perspective, the financial risk of the Gas Group is accurately measured by the capital structure ratios calculated from the market capitalization of a firm. If the ratesetting process utilizes the market capitalization ratios, then no additional analysis or adjustment would be required, and the simple yield (D/P) plus growth (g) components of the DCF would satisfy the financial risk associated with the market value of the equity capitalization. Since the ratesetting process uses a different set of ratios calculated from the book value capitalization, then further analysis is required to synchronize the financial risk of the book capitalization with the required return on the book value of the equity. This adjustment is developed through precise mathematical calculations, using well recognized analytical procedures that are widely accepted in the financial literature. To arrive at that return, the return rate on common equity is the unleveraged cost of capital (or equity return at 100% equity) plus a term(s) reflecting the increase in financial risk resulting from the use of leverage in the capital structure. Multiple terms are used in the case of both debt and preferred stock. The resulting return is the one that is necessary for the utility to earn on its own book value capital structure to reflect the financial risk that varies from the return that applies to the market value capital structure.

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

A. No. My leverage adjustment is not intended, nor was it designed, to address

the reasons that stock prices vary from book value. Hence, any observations concerning market prices relative to book are not on point. My leverage adjustment deals with the issue of financial risk and is not intended to transform the DCF result to a book value return through a market-to-book adjustment. Again, the leverage adjustment that I propose is based on the fundamental financial precept that the cost of equity is equal to the rate of return for an unleveraged firm (i.e., where the overall rate of return equates to the cost of equity with a capital structure that contains 100% equity) plus the additional return required for introducing debt and/or preferred stock leverage into the capital structure.

Further, the high market prices of utility stocks cannot be attributed solely to the notion that these companies are expected to earn a return on equity that differs from their cost of equity. Stock prices above book value are common for utility stocks, and indeed non-regulated stock prices exceed book values by even greater margins. In this regard, according to the Barron's issue of February 11, 2008, the major market indices' market-to-book ratios are well above unity. Thus, utility stocks trade at a multiple of 2.55 times book value; the S&P 500 index trades at 2.64 times book value; the S&P Industrial index is at 3.22 times book value; and the Dow Jones Industrial index is at 3.66 times book value. It is difficult to accept that the vast majority of all firms operating in our economy are generating returns far in excess of their cost of capital. Certainly, in our free-market economy, competition should contain such "excesses" if they indeed exist.

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

51. Q. What are the implications of a DCF derived return that is related to market value when the results are applied to the book value of a utility's capitalization?

A. The capital structure ratios measured at the utility's book value show more financial leverage, and higher risk, than the capitalization measured at its market values. Please refer to Appendix E for the comparison. This means that a market-derived cost of equity, using models such as DCF and CAPM, reflects a level of financial risk that is different -- in this instance, much lower -- from that shown by the book value capitalization. Hence, it is necessary to develop a cost of equity that reflects the higher financial risk related to the book value capitalization used for ratesetting purposes. Failure to make this modification would result in a mismatch of the lower financial risk related to market value used to measure the cost of equity and the higher financial risk of the book value capital structure used in the ratesetting process. That is to say, the cost of equity for the Gas Group that is related to the 55.34% common equity ratio using book values has higher financial risk than the 69.31%

common equity ratio using market values. Because the ratesetting process utilizes the book value capitalization, it is necessary to adjust the market-determined cost of equity for the higher financial risk related to the book value of the capitalization.

52. Q. How is the DCF-determined cost of equity adjusted for the financial risk associated with the book value of the capitalization?

mo In pioneering work, Nobel laureates Modigliani and Miller developed several theories about the role of leverage in a firm's capital structure. As part of that work, Modigliani and Miller established that, as the borrowing of a firm increases, the expected return on stockholders' equity also increases. Modigliani and Miller proposed several approaches to quantify the equity return associated with various degrees of debt leverage in a firm's capital structure. These formulas point toward an increase in the equity return associated with the higher financial risk of the book value capital structure. More specifically, and detailed in Appendix E, the Modigliani and Miller theory shows that the cost of equity increases by 0.54% (9.66% - 9.12%) when the book value of equity, rather than the market value of equity, is used for ratesetting purposes.

53. Q. Please provide the DCF return based upon your preceding discussion of dividend yield, growth, and leverage.

As explained previously, I have utilized a six-month average dividend yield ("D~/P0") adjusted in a forward-looking manner for my DCF calculation.

This dividend yield is used in conjtmction with the growth rate ("g ") previously developed. The DCF also includes the leverage modification ("lev.") required when the book value equity ratio is used in determining the weighted average cost of capital in the ratesetting process rather than the market value equity ratio related to the price of stock.

54. Q. What DCF cost rate have you calculated?

The resulting DCF cost rate is:

	$D1/Po$	+		+	$lev.$	=	k
Gas Group	4.12%	+	5.00%	+	0.54%	=	9.66%

The DCF result shown above represents the simplified (i.e., Gordon) form of the model that contains a constant growth assumption. I should reiterate, however, that the DCF indicated cost rate provides an explanation of the rate of return on common stock market prices without regard to the prospect of a change in the price-earnings multiple. An assumption that there will be no change in the price-earnings multiple is not supported by the realities of the equity market, because price-earnings multiples do not remain constant. I should note that at this time, the DCF model is providing atypical results. That is to say, the low DCF returns can be traced in part to the unfavorable investor sentiment for the gas companies. As shown on page 5 of Schedule 13, the gas distribution companies are viewed as relatively unattractive investments and are ranked 74 out of 98 industries by Value Line for probable performance over the next twelve months. The significance of this low

ranking is that performance for this group is expected to be subpar, thereby indicating that the DCF results will not provide a cost of equity indication that corresponds with the results of the other methods/models. Although I have not ignored the DCF results, I am recommending less reliance on DCF in this case.

VIII. RISK PREMIUM ANALYSIS

55. Q. Please describe your use of the Risk Premium approach to determine the cost of equity.

mo The details of my use of the Risk Premium approach and the evidence in support of my conclusions are set forth in Appendix G. I will summarize them here. With this method, the cost of equity capital is determined by corporate bond yields plus a premium to account for the fact that common equity is exposed to greater investment risk than debt capital. As with other models of the cost of equity, the Risk Premium approach has its limitations, including the difficulty in formulating an accurate assessment of the future cost of corporate debt and the measurement of the risk-adjusted common equity premium.

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

mo In my opinion, 6.00% represents a reasonable estimate of the prospective yield on long-term A-rated public utility bonds. The historical yields for long-

term public utility debt are shown graphically on page 2 of Schedule 11. For the twelve months ended January 2008, the average monthly yield on Moody's A-rated index of public utility bonds was 6.08%. For the six and three-month periods ended January 2008, the yields were 6.11% and 6.05%, respectively. During the twelve-months ended January 2008, the yields on A-rated public utility bonds ranged from 5.85% to 6.30%.

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

I have determined the prospective yield on A-rated public utility debt by using the Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that I describe above and in Appendix F. The Blue Chip is a reliable authority and contains consensus forecasts of a variety of interest rates compiled from a panel of banking, brokerage, and investment advisory services. In early 1999, Blue Chip stopped publishing forecasts of yields on A-rated public utility bonds because the Federal Reserve deleted these yields from its Statistical Release H. 15. To independently project a forecast of the yields on A-rated public utility bonds, I have combined the forecast yields on long-term Treasury bonds published on February 1, 2008, and the yield spread of 1.50%. For comparative purposes, I show below the Blue Chip Financial Forecasts for Aaa-rated and Baa-rated corporate bonds:

Blue Chip Financial Forecasts

Year	Quarter	Corporate Aaa-rated	Corporate Baa-rated	30-Year Treasury	A-rated Public Utility Spread	A-rated Public Utility Yield
2008	1st	5.2%	6.3%	4.2%	1.50%	5.70%
2008	2nd	5.1%	6.2%	4.1%	1.50%	5.60%
2008	3rd	5.2%	6.3%	4.2%	1.50%	5.70%
2008	4th	5.3%	6.4%	4.3%	1.50%	5.80%
2009	1st	5.5%	6.5%	4.5%	1.50%	6.00%
2009	2nd	5.6%	6.6%	4.6%	1.50%	6.10%

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

Yes. Twice yearly, Blue Chip provides long-term forecasts of interest rates. In its December 1, 2007 publication, the Blue Chip published forecasts of interest rates were as follows:

Blue Chip Financial Forecasts

Averages	Corporate Aaa-rated	Corporate Baa-rated	30-Year Treasury	A-rated Public Utility Spread	A-rated Public Utility Yield
2009-13	6.0%	7.0%	5.2%	1.50%	6.70%
2014-18	6.1%	7.0%	5.3%	1.50%	6.80%

Given these forecast interest rates, a 6.00% yield on A-rated public utility bonds represents a reasonable expectation.

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

Appendix G provides a discussion of the financial returns that I relied upon to develop the appropriate equity risk premium for the S&P Public Utilities. I have calculated the equity risk premium by comparing the market returns on utility stocks and the market returns on utility bonds. I chose the S&P Public Utility index for the purpose of measuring the market returns for utility stocks.

The S&P Public Utility index is reflective of the risk associated with regulated utilities, rather than some broader market indexes, such as the S&P 500 Composite index. The S&P Public Utility index is a subset of the overall S&P 500 Composite index. Use of the S&P Public Utility index reduces the role of judgment in establishing the risk premium for public utilities. With the equity risk premiums developed for the S&P Public Utilities as a base, I derived the equity risk premium for the Gas Group.

60. Q. What equity risk premium for the S&P Public Utilities have you determined for this case?

A. To develop an appropriate risk premium, I analyzed the results for the S&P Public Utilities by averaging (i) the midpoint of the range shown by the geometric mean and median and (ii) the arithmetic mean. This procedure was employed to provide a comprehensive way of measuring the central tendency of the historical returns. As shown by the values set forth on page 2 of Schedule 12, the indicated risk premiums for the various time periods analyzed are 5.37% (1928-2006), 6.40% (1952-2006), 5.61% (1974-2006), and 5.83% (1979-2006). The selection of the shorter periods taken from the entire historical series is designed to provide a risk premium that conforms more nearly to present investment fundamentals, and removes some of the more distant data from the analysis.

61. Do you have further support for the selection of the time periods used in your equity risk premium determination?

A. Yes. First, the terminal year of my analysis presented in Schedule 12 represents the returns realized through 2006. Second, the selection of the initial year of each period was based upon the events that I described in Appendix G. These events are fixed in history and cannot be manipulated as later financial data becomes available. That is to say, using the Treasury-Federal Reserve Accord as a defining event, the year 1952 is fixed as the beginning point for the measurement period regardless of the financial results that subsequently occurred. Likewise, 1974 represented a benchmark year because it followed the 1973 Arab Oil embargo. Also, the year 1979 was chosen because it began the deregulation of the financial markets. As such, additional data are merely added to the earlier results when they become available, clearly showing that the periods chosen were not driven by the desired results of the study.

62. Q. What conclusions have you drawn from these data?

A. Using the summary values provided on page 2 of Schedule 12, the 1928-2006 period provides the lowest indicated risk premium, while the 1952-2006 period provides the highest risk premium for the S&P Public Utilities. Within these bounds, a common equity risk premium of 5.72% (5.61% + 5.83% = 11.44% + 2) can be calculated from data covering the periods 1974-2006 and 1979-2006. Therefore, 5.72% represents a reasonable risk premium for the S&P Public Utilities in this case.

As noted earlier in my fundamental risk analysis, differences in risk characteristics must be taken into account when applying the results for the S&P Public Utilities to the Gas Group. I recognized these differences in the development of the equity risk premium in this case. I previously enumerated various differences in fundamentals between the Gas Group and the S&P Public Utilities, including size, market ratios, common equity ratio, return on book equity, operating ratios, coverage, quality of earnings, internally generated funds, and betas. In my opinion, these differences indicate that 5.25% represents a reasonable common equity risk premium in this case. This represents approximately 92% (5.25% + 5.72% = .92) of the risk premium of the S&P Public Utilities and is reflective of the risk of the Gas Group compared to the S&P Public Utilities.

63. Q. What common equity cost rate would be appropriate using this equity risk premium and the yield on long-term public utility debt?

mo The cost of equity (i.e., "k") is represented by the sum of the prospective yield for long-term public utility debt (i.e., "i") and the equity risk premium (i.e., "RP"). The Risk Premium approach provides a cost of equity of:

$$i + RP = k$$

Gas Group $6.00\% + 5.25\% = 11.25\%$

IX. CAPITAL ASSET PRICING MODEL

64. Q. Have you used the Capital Asset Pricing Model to measure the cost of equity in this case?

A. Yes, I have used the Capital Asset Pricing Model ("CAPM") in addition to my other methods. As with other models of the cost of equity, the CAPM contains a variety of assumptions that I discuss in Appendix H. Therefore, this method should be used with other methods to measure the cost of equity, as each will complement the other and will provide a result that will alleviate the unavoidable shortcomings found in each method.

65. Q. What are the features of the CAPM as you have used it?

A. The CAPM uses the yield on a risk-free interest bearing obligation plus a rate of return premium that is proportional to the systematic risk of an investment. The details of my use of the CAPM and evidence in support of my conclusions are set forth in Appendix H. To compute the cost of equity with the CAPM, three components are necessary: a risk-free rate of return ("Rf"), the beta measure of systematic risk ("13"), and the market risk premium ("Rm-Rf") derived from the total return on the market of equities reduced by the risk-free rate of return. The CAPM specifically accounts for differences in systematic risk (i.e., market risk as measured by the beta) between an individual firm or group of firms and the entire market of equities. As such, to calculate the CAPM it is necessary to employ firms with traded stocks. In this regard, I performed a CAPM calculation for the Gas Group. In contrast,

my Risk Premium approach also considers industry- and company-specific factors because it is not limited to measuring just systematic risk. As a consequence, the Risk Premium approach is more comprehensive than the CAPM. In addition, the Risk Premium approach provides a better measure of the cost of equity because it is founded upon the yields on corporate bonds rather than Treasury bonds.

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

mo For my CAPM analysis, I initially considered the Value Line betas. As shown on page 1 of Schedule 13, the average beta is .88 for the Gas Group.

67. Q. What betas have you used in the CAPM determined cost of equity?

mo The betas must be reflective of the financial risk associated with the ratesetting capital structure that is measured at book value. Therefore, Value Line betas cannot be used directly in the CAPM, unless those betas are applied to a capital structure measured with market values. To develop a CAPM cost rate applicable to a book value capital structure, the Value Line betas have been unleveraged and releveraged for the common equity ratios using book values using the Hamada formula. This adjustment has been made with the formula:

$$fll = flu\ [1 + (1- t)\ D/E + P/E]$$

where 131 = the leveraged beta, Bu = the unleveraged beta, t = income tax rate, D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas published by Value Line have been calculated with the market price of

stock and therefore are related to the market value capitalization. By using the formula shown above and the capital structure ratios measured at its market values, the beta would become .68 for the Gas Group if it employed no leverage and was 100% equity financed. With the unleveraged beta as a base, I calculated the leveraged beta of 1.04 for the Gas Group associated with book value capital structure. The betas and their corresponding common equity ratios are:

Market Values		Book Values	
Beta	Common Equity Ratio	Beta	Common Equity Ratio
0.88	69.31%	1.04	55.34%

The leveraged beta that I will employ in the CAPM cost of equity is 1.04 for the Gas Group.

68. Q. What risk-free rate have you used in the CAPM?

mo For reasons explained in Appendix H, I have employed the yields on 20-year Treasury bonds using both historical and forecast data to match the longer-term horizon associated with the ratesetting process. As shown on pages 3 of Schedule 13, for the twelve months ended January 2008, the average yield was 4.86%. For the six- and three-months ended January 2008, the yields on 20-year Treasury bonds were 4.69% and 4.49%, respectively. During the twelve-months ended January 2008, the range of the yields on 20-year Treasury bonds was 4.35% to 5.29%. As shown on page 4 of Schedule 13, forecasts published by Blue Chip on February 1, 2008 indicate that the yields on long-term Treasury bonds are expected to be in the range of 4.1% to 4.6%

during the next six quarters. The longer term forecasts described previously show that the yields on Treasury bonds will average 5.3% from 2009 through 2013 and 5.3% for 2014 to 2018. Hence, I have used a 4.50% risk-free rate of return for CAPM purposes, which reflects the recent easing of monetary policy by the Federal Open Market Committee.

69. Q. What market premium have you used in the CAPM?

mo As developed in Appendix H, the market premium is developed by averaging historical market performance (i.e., 6.5%) and the forecasts (i.e., 10.10%). For the historically based market premium, I have used the arithmetic mean. The resulting market premium is 8.30% (6.5% + 10.10% = 16.60% + 2), which represents the average market premium using historical and forecast data.

70. Q. Are there adjustments to the CAPM results that are necessary to fully reflect the rate of return on common equity?

Yes. The technical literature supports an adjustment relating to the size of the company or portfolio for which the calculation is performed. There would be an understatement of a firm's cost of equity with the CAPM unless the size of a firm is considered. That is to say, as the size of a firm decreases, its risk and, hence, its required return increases. Moreover, in his discussion of the cost of capital, Professor Brigham has indicated that smaller firms have higher capital costs then otherwise similar larger firms (see Fundamentals of Financial Management, fifth edition, page 623). Also, the Fama/French study

(see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June 1992) established that size of a firm helps explain stock returns. In an October 15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock Effect," it was demonstrated that the CAPM could understate the cost of equity significantly according to a company's size. Indeed, it was demonstrated in the SBBI Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) had returns in excess of those shown by the simple CAPM. In this regard, the Gas Group has an average market equity capitalization of $1.757 billion, which translates into a low cap portfolio. The low cap market capitalization would indicate a size premium of 1.76%. Absent such an adjustment, the CAPM would tmderstate the required return. However, for my CAPM analysis, I have adopted a more conservative size adjustment of 0.97%, which represents the mid-cap adjustment, because the market cap of the Gas Group was near the threshold of the mid-cap group.

71. Q. **What is the cost of equity you have determined using the CAPM?**

Using the 4.50% risk-free rate of return, the leverage adjusted beta of 1.04 for the Gas Group, the 8.30% market premium, and the size adjustments, the **following result is indicated.**

	Rf + fl x (	*Rm-Rf)*	*+ size =*	*K*
Gas Group	4.50% + 1.04 x (	8.30%)	+ 0.97% =	14.10%

X. COMPARABLE EARNINGS APPROACH

72. Q. How have you applied the Comparable Earnings approach in this case?

The technical aspects of the Comparable Earnings approach are set forth in Appendix I. Because regulation is a substitute for competitively-determined prices, the returns realized by non-regulated firms with comparable risks to a public utility provide useful insight into a fair rate of return. In order to identify the appropriate return, it is necessary to analyze returns earned (or realized) by other firms within the context of the Comparable learnings standard. The firms selected for the Comparable learnings approach should be companies whose prices are not subject to cost-based price ceilings (i.e., non-regulated firms) so that circularity is avoided. There are two avenues available to implement the Comparable Earnings approach. One method would involve the selection of another industry (or industries) with comparable risks to the public utility in question, and the results for all companies within that industry would serve as a benchmark. The second approach requires the selection of parameters that represent similar risk traits for the public utility and the comparable risk companies. Using this approach, the business lines of the comparable companies become unimportant. The latter approach is preferable with the further qualification that the comparable risk companies exclude regulated firms. As such, this approach to Comparable Earnings avoids the circular reasoning implicit in the use of the achieved earnings/book ratios of other regulated firms. The United States

Supreme Court has held that:

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

Therefore, it is important to identify the returns earned by firms that compete for capital with a public utility. This can be accomplished by analyzing the returns of non-regulated firms that are subject to the competitive forces of the marketplace.

73. **Q. How have you implemented the Comparable Earnings approach?**

In order to implement the Comparable Earnings approach, non-regulated companies were selected from the Value Line Investment Survey for Windows that have six categories (see Appendix I for definitions) of comparability designed to reflect the risk of the Gas Group. These screening criteria were based upon the range as defined generally by the rankings of the companies in the Gas Group. The items considered were: Timeliness Rank, Safety Rank, Financial Strength, Price Stability, Value Line betas, and Technical Rank. The identities of the companies comprising the Comparable Earnings group and their associated rankings within the ranges are identified on page 1 of Schedule 14.

Value Line data was relied upon because it provides a comprehensive basis for evaluating the risks of the comparable finns. As to the returns calculated by Value Line for these companies, there is some downward bias in the figures shown on page 2 of Schedule 14, because Value Line computes the returns on year-end rather than average book value. If average book values had been employed, the rates of return would have been slightly higher. Nevertheless, these are the returns considered by investors when taking positions in these stocks. Because many of the comparability factors, as well as the published returns, are used by investors for selecting stocks, and to the extent that investors rely on the Value Line service to gauge their returns, it is, therefore, an appropriate database for measuring comparable return opportunities.

74. Q. **What data have you used in your Comparable Earnings analysis?**

mo I have used both historical realized returns and forecast returns for non-utility companies. As noted previously, I have not used returns for utility companies in order to avoid the circularity that arises from using regulatory-influenced returns to determine a regulated return. It is appropriate to consider a relatively long measurement period in the Comparable Earnings approach in order to cover conditions over an entire business cycle. A ten-year period (5 historical years and 5 projected years) is sufficient to cover an average business cycle. Unlike the DCF and CAPM, the results of the Comparable Earnings method can be applied directly to the book value capitalization

because, the nature of the analysis relates to book value. Hence, Comparable Earnings does not contain the potential misspecification contained in market models when the market capitalization and book value capitalization diverge significantly. The historical rate of return on book common equity was 14.3% using the median value as shown on page 2 of Schedule 14. The forecast rates of return, as published by Value Line are shown by the 13.5% median values also provided on page 2 of Schedule 14.

75. Q. **What rate of return on common equity have you determined in this case using the Comparable Earnings approach?**

The average of the historical and forecast median rates of return is:

	Historical	*Forecast*	*Average*
Comparable Earnings Group	14.30%	13.50%	13.90%

XI. CONCLUSION ON COST OF EQUITY

76. Q. **What is your conclusion concerning the Company's cost of common equity?**

Based upon the application of a variety of methods and models described previously, it is my opinion that the Company's cost of common equity is in the range of 11.00% to 11.50%. The proposed rate of return on common equity of 11.50% is at the top (i.e., 11.25% to 11.50%) of the range and provides recognition of the high quality of the Company's service and the exemplary performance of its management.

77. Q. Does this conclude your prepared direct testimony?

A. Yes.

PECO STATEMENT NO. 1

APPENDICES A THROUGH I

TO ACCOMPANY THE

DIRECT TESTIMONY
OF
PAUL R. MOUL

DOCKET NO. R-2008~2028394

**Concerning Rate of Return
Including Capital Structure Ratios,
Embedded Cost of Debt and Preferred
Stock, and the Cost of Equity**

Date: March 31, 2008

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE AND QUALIFICATIONS

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

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

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

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

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

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

My studies and prepared direct testimony have been presented before thirty (30) federal, state and municipal regulatory commissions, including: the Federal Energy Regulatory Commission; state public utility commissions in Alabama, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and the Philadelphia Gas Commission. My testimony has been offered in over 200 rate cases involving electric power, natural gas distribution and transmission, resource recovery, solid waste collection and disposal, telephone, wastewater, and water service utility companies. While my testimony has involved principally fair rate of return and financial matters, I also testified on capital allocations, capital recovery, cash working capital, income taxes, factoring of accounts receivable, and take-or-pay expense recovery. My testimony has been offered on behalf of municipal and investor-owned public utilities and for the staff of a regulatory commission. I also testified at an Executive Session of the State of New Jersey Commission of Investigation concerning the BPU regulation of solid waste collection and disposal.

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

Further, I have been the consultant to the New York Chapter of the National Association of Water Companies which represented the water utility group in the Proceeding on Motion of the Commission to Consider Financial Regulatory Policies for New York Utilities (Case 91-M-0509). I have also submitted comments to the Federal Energy Regulatory Commission in its Notice of Proposed Rulemaking (Docket No. RM99-2-000) concerning Regional Transmission Organizations and on behalf of the Edison Electric Institute in its intervention in the case of Southern California Edison Company (Docket No. ER97-2355-000).

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

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

I am a member of the Society of Utility and Regulatory Financial Analysis (formerly the National Society of Rate of Return Analysts) and have attended several Financial Forums sponsored by the Society. I attended the first National Regulatory Conference at the Marshall-Wythe School of Law, College of William and Mary. I also attended an Executive Seminar

sponsored by the Colgate Darden Graduate Business School of the University of Virginia concerning Regulated Utility Cost of Equity and the Capital Asset Pricing Model. In October 1984, I attended a Standard & Poor's Seminar on the Approach to Municipal Utility Ratings, and in May 1985, I attended an S&P Seminar on Telecommunications Ratings.

My lecture and speaking engagements include:

Date	Occasion	Sponsor
April 2006	Thirty-eighth Financial Forum	Society of Utility & Regulatory Financial Analysts
April 2001	Thirty-third Financial Forum	Society of Utility & Regulatory Financial Analysts
December 2000	Pennsylvania Public Utility Law Conference: Non-traditional Players in the Water Industry	Pennsylvania Bar Institute
July 2000	EEl Member Workshop Developing Incentives Rates: Application and Problems	Edison Electric Institute
February 2000	The Sixth Annual FERC Briefing	Exnet and Bruder, Gentile & Marcoux, LLP
March 1994	Seventh Annual Proceeding	Electric Utility Business Environment Conf.
May 1993	Financial School	New England Gas Assoc.
April 1993	Twenty-Fifth Financial Forum	National Society of Rate of Return Analysts
June 1992	Rate and Charges Subcommittee Annual Conference	American Water Works Association
May 1992	Rates School	New England Gas Assoc.
October 1989	Seventeenth Annual Eastern Utility Rate Seminar	Water Committee of the National Association of Regulatory Utility Commissioners Florida Public Service Commission and University of Utah
October 1988	Sixteenth Annual Eastern Utility Rate Seminar	Water Committee of the National Association of Regulatory Utility Commissioners, Florida Public Service Commission and University

		of Utah
May 1988	Twentieth Financial Forum	National Society of Rate of Return Analysts
October 1987	Fifteenth Annual Eastern Utility Rate Seminar	Water Committee of the National Association of Regulatory Utility Commissioners, Florida Public Service Commission and University of Utah
September 1987	Rate Committee Meeting	American Gas Association
May 1987	Pennsylvania Chapter annual meeting	National Association of Water Companies
October 1986	Eighteenth Financial Forum	National Society of Rate of Return
October 1984	Fifth National on Utility Ratemaking Fundamentals	American Bar Association
March 1984	Management Seminar	New York State Telephone Association
February 1983	The Cost of Capital Seminar	Temple University, School of Business Admin.
May 1982	A Seminar on Regulation and The Cost of Capital	New Mexico State University, Center for Business Research and Services
October 1979	Economics of Regulation	Brown University

APPENDIX B TO DIRECT TESTIMONY OF PAUL R. MOUL

RATESETTING PRINCIPLES

Traditional cost of service regulation, as implemented by a regulatory agency engaged in ratesetting, such as the Commission, serves as a substitute for competition. In setting rates, a regulatory agency must carefully consider the public's interest in reasonably priced, as well as safe and reliable, service. The level of rates must also provide the public utility and its investors with an opportunity to earn a rate of return for the public utility and its investors that is commensurate with the risk to which the invested capital is exposed so that the public utility has access to the capital required to meet its service responsibilities to its customers. Without an opportunity to earn a fair rate of return, a public utility will be unable to attract sufficient capital required to meet its responsibilities over time.

It is important to remember that regulated firms must compete for capital in a global market with non-regulated finns, as well as mtmicipal, state and federal governments. Traditionally, a public utility has been responsible for providing a particular type of service to its customers within a specific market area. Although this relationship with customers has been changing, a regulated utility remains quite different from a non-regulated firm which is free to enter and exit competitive markets in accordance with available business opportunities.

As established by the landmark Bluefield and ~ cases,[1] several tests have been articulated through which the regulator can determine the fairness or reasonableness of the rate of return. These tests include a determination of whether the rate of return is (i) similar to that of other financially sound businesses having similar or comparable risks, (ii) sufficient to ensure confidence in the financial integrity of the public utility, and (iii) adequate to maintain and support the credit of the utility, thereby enabling it to attract, on a reasonable cost basis, the

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

funds necessary to satisfy its capital requirements so that it can meet the obligation to provide adequate and reliable service to the public.

A fair rate of return must not only provide the utility with the ability to attract new capital it must also be fair to existing investors. An appropriate rate of return which may have been reasonable at one point in time may become too high or too low at a subsequent point in time, based upon changing business risks, economic conditions and alternative investment opportunities. When applying the standards of a fair rate of return, it must be recognized that the end result must provide for the payment of interest on the company's debt, the payment of dividends on the company's stock, the recovery of costs associated with securing capital, the maintenance of reasonable credit quality for the company, and support of the company's financial condition, which today would include those measures of financial performance in the areas of interest coverage and adequate cash flow derived from a reasonable level of earnings.

APPENDIX C TO DIRECT TESTIMONY OF PAUL R. MOUL

EVALUATION OF RISK

The rate of return required by investors is directly linked to the perceived level of risk. The greater the risk of an investment, the higher is the required rate of return necessary to compensate for that risk all else being equal. Because investors will seek the highest rate of return available considering the risk involved, the rate of return must at least equal the investor-required, market-determined cost of capital if public utilities are to attract the necessary investment capital on reasonable terms.

In the measurement of the cost of capital, it is necessary to assess the risk of a firm. The level of risk for a firm is often def'med as the uncertainty of achieving expected performance, and is sometimes viewed as a probability distribution of possible outcomes. Hence, if the uncertainty of achieving an expected outcome is high, the risk is also high. As a consequence, high risk firms must offer investors higher returns than low risk firms, which pay less to attract capital from investors. This is because the level of uncertainty, or risk of not realizing expected returns, establishes the compensation required by investors in the capital markets. Of course, the risk of a firm must also be considered in the context of its ability to actually experience adequate earnings which conform with a fair rate of return. Thus, if there is a high probability that a firm will not perform well due to fundamentally poor market conditions, investors will demand a higher return.

The investment risk of a firm is comprised of its business risk and financial risk. Business risk is all risk other than f'mancial risk, and is sometimes defined as the staying power of the market demand for a firm's product or service and the resulting inherent uncertainty of realizing expected pre-tax returns on the firm's assets. Business risk encompasses all operating factors, e.g., productivity, competition, management ability, etc. that bear upon the expected

pre-tax operating income attributed to the fundamental nature of a firm's business. Financial risk results from a firm's use of borrowed funds (or similar sources of capital with fixed payments) in its capital structure, i.e., financial leverage. Thus, if a firm did not employ financial leverage by borrowing any capital, its investment risk would be represented by its business risk.

It is important to note that in evaluating the risk of regulated companies, financial leverage cannot be considered in the same context as it is for non-regulated companies. Financial leverage has a different meaning for regulated firms than for non-regulated companies. When rates are set for regulated public utilities, the cost of service formula gives the benefits of financial leverage to consumers in the form of lower revenue requirements, since the cost of borrowed funds is generally lower than the cost of equity invested in the company. For non-regulated companies, all benefits of financial leverage are retained by the common stockholder. Although retaining none of the benefits, regulated firms bear the risk of financial leverage. Therefore, a regulated firm's rate of return on common equity must recognize the greater financial risk shown by the higher leverage typically employed by public utilities.

Although no single index or group of indices can precisely quantify the relative investment risk of a firm, financial analysts use a variety of indicators to assess that risk. For example, the creditworthiness of a firm is revealed by its bond ratings. If the stock is traded, the price-earnings multiple, dividend yield, and beta coefficients (a statistical measure of a stock's relative volatility to the rest of the market) provide some gauge of overall risk. Other indicators, which are reflective of business risk, include the variability of the rate of return on equity, which is indicative of the uncertainty of actually achieving the expected earnings;

operating ratios (the percentage of revenues consumed by operating expenses, depreciation, and taxes other than income tax), which are indicative of profitability; the quality of earnings, which considers the degree to which earnings are the product of accounting principles or cost deferrals; and the level of internally generated funds. Similarly, the proportion of senior capital in a company's capitalization is the measure of financial risk which is often analyzed in the context of the equity ratio (i.e., the complement of the debt ratio).

APPENDIX D TO DIRECT TESTIMONY OF PAUL R. MOUL

COST OF EQUITY--GENERAL APPROACH

Through a fundamental financial analysis, the relative risk of a firm must be established prior to the determination of its cost of equity. Any rate of return recommendation which lacks such a basis will inevitably fail to provide a utility with a fair rate of return except by coincidence. With a fundamental risk analysis as a foundation, standard financial models can be employed by using informed judgment. The methods which have been employed to measure the cost of equity include: the Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") approach, the Capital Asset Pricing Model ("CAPM") and the Comparable Earnings ("CE") approach.

The traditional DCF model, while useful in providing some insight into the cost of equity, is not an approach that should be used exclusively. The divergence of stock prices from company-specific fundamentals can provide a misleading cost of equity calculation. As reported in The Wall Street Journal on June 6, 1991, a statistical study published by Goldman Sachs indicated that only 35% of stock price growth in the 1980's could be attributed to earnings and interest rates. Further, 38% of the rise in stock prices during the 1980's was attributed to unknown factors. The Goldman Sachs study highlights the serious limitations of a model, such as DCF, which is founded upon identification of specific variables to explain stock price growth. That is to say, when stock price growth exceeds growth in a company's earnings per share, models such as DCF will misspecify investor expected returns which are comprised of capital gains, as well as dividend receipts. As such, a combination of methods should be used to measure the cost of equity.

The Risk Premium analysis is founded upon the prospective cost of long-term debt, i.e., the yield that the public utility must offer to raise long-term debt capital directly from investors.

To that yield must be added a risk premium in recognition of the greater risk of common equity over debt. This additional risk is, of course, attributable to the fact that the payment of interest and principal to creditors has priority over the payment of dividends and return of capital to equity investors. Hence, equity investors require a higher rate of return than the yield on long-term corporate bonds.

The CAPM is a model not unlike the traditional Risk Premium. The CAPM employs the yield on a risk-free interest-bearing obligation plus a premium as compensation for risk. Aside from the reliance on the risk-free rate of return, the CAPM gives specific quantification to systematic (or market) risk as measured by beta.

The Comparable Earnings approach measures the returns expected/experienced by other non-regulated firms and has been used extensively in rate of return analysis for over a half century. However, its popularity diminished in the 1970s and 1980s with the popularization of market-based models. Recently, there has been renewed interest in this approach. Indeed, the financial community has expressed the view that the regulatory process must consider the returns which are being achieved in the non-regulated sector so that public utilities can compete effectively in the capital markets. Indeed, with additional competition being introduced throughout the traditionally regulated public utility industry, returns expected to be realized by non-regulated firms have become increasing relevant in the ratesetting process. The Comparable Earnings approach considers directly those requirements and it fits the established standards for a fair rate of return set forth in the landmark decisions on the issue of rate of return. These decisions require that a fair return for a utility must be equal to that earned by firms of comparable risk.

APPENDIX E TO DIRECT TESTIMONY OF PAUL R. MOUL

DISCOUNTED CASH FLOW ANALYSIS

Discounted Cash Flow ("DCF") theory seeks to explain the value of an economic or financial asset as the present value of future expected cash flows discounted at the appropriate risk-adjusted rate of return. Thus, if $100 is to be received in a single payment 10 years subsequent to the acquisition of an asset, and the appropriate risk-related interest rate is 8%, the present value of the asset would be $46.32 (Value = $100 + $(1.08)^{1°}$) arising from the discounted future cash flow. Conversely, knowing the present $46.32 price of an asset (where price = value), the $100 future expected cash flow to be received 10 years hence shows an 8% annual rate of return implicit in the price and future cash flows expected to be received.

In its simplest form, the DCF theory considers the number of years from which the cash flow will be derived and the annual compound interest rate which reflects the risk or uncertainty associated with the cash flows. It is appropriate to reiterate that the dollar values to be discounted are future cash flows.

DCF theory is flexible and can be used to estimate value (or price) or the annual required rate of return under a wide variety of conditions. The theory underlying the DCF methodology can be easily illustrated by utilizing the investment horizon associated with a preferred stock not having an annual sinking fund provision. In this case, the investment horizon is infinite, which reflects the perpetuity of a preferred stock. If P represents price, *Kp* is the required rate of return on a preferred stock, and D is the annual dividend (P and D with time subscripts), the value of a preferred share is equal to the present value of the dividends to be received in the future discounted at the appropriate risk-adjusted interest rate, *Kp. In* this circumstance:

$$Po = \frac{D1}{(1+Kp)^1} + \frac{D2}{(1+Kp)^2} + \frac{D3}{(1+Kp)^3} + \ldots \frac{D\sim}{(1+Kp)^n}$$

If D1 = D 2 = D 3 = ... D,, as is the case for preferred stock, and n approaches infinity, as is the case for non-callable preferred stock without a sinking fund, then this equation reduces to:

$$po = \frac{D1}{gp}$$

This equation can be used to solve for the annual rate of return on a preferred stock when the current price and subsequent annual dividends are known. For example, with D1 = $1.00, and *Po* = $10, then *Kp* = $1.00 + $10, or 10%.

The dividend discount equation, first shown, is the generic DCF valuation model for all equities, both preferred and common. While preferred stock generally pays a constant dividend, permitting the simplification subsequently noted, common stock dividends are not constant. Therefore, absent some other simplifying condition, it is necessary to rely upon the generic form of the DCF. If, however, it is assumed that DI, D2, D3, ...D,, are systematically related to one another by a constant growth rate *(g),* so that *Do (1 + g) = DI, D~ (1 + g) = D2, D2 (1 + g)* = D~ and so on approaching inf'mity, and if *Ks* (the required rate of return on a common stock)

$$Po = \frac{DI}{Ks - g} \text{ or } Po = \frac{Do(1+g)}{Ks - g}$$

is greater than g, then the DCF equation can be reduced to:

which is the periodic form of the "Gordon" model.~ Proof of the DCF equation is found in all

Although the popular application of the DCF model is often attributed to the work of Myron J. Gordon in

modem basic finance textbooks. This DCF equation can be easily solved as:

$$\frac{Ks - Do\,(1 + g)}{Po} + g$$

which is the periodic form of the Gordon Model commonly applied in estimating equity rates of return in rate cases. When used for this purpose, *Ks* is the annual rate of return on common equity demanded by investors to induce them to hold a firm's common stock. Therefore, the variables *Do, Po* and g must be estimated in the context of the market for equities, so that the rate of return, which a public utility is permitted the opportunity to earn, has meaning and reflects the investor-required cost rate.

Application of the Gordon model with market derived variables is straightforward. For example, using the most recent prior annualized dividend *(Do)* of $0.80, the current price *(Po)* of $10.00, and the investor expected dividend growth rate *(g)* of 5%, the solution of the DCF formula provides a 13.4% rate of return. The dividend yield component in this instance is 8.4%, and the capital gain component is 5%, which together represent the total 13.4% annual rate of return required by investors. The capital gain component of the total return may be calculated with two adjacent future year prices. For example, in the eleventh year of the holding period, the price per share would be $17.10 as compared with the price per share of $16.29 in the tenth year which demonstrates the 5% annual capital gain yield.

Some DCF devotees believe that it is more appropriate to estimate the required return on equity with a model which permits the use of multiple growth rates. This may be a plausible approach to DCF, where investors expect different dividend growth rates in the near term and

the mid-1950's, J. B. Williams exposited the DCF model in its present form nearly two decades earlier.

long run. If two growth rates, one near term and one long-run, are to be used in the context of a price *(Po)* of $10.00, a dividend *(Do)* of $0.80, a near-term growth rate of 5.5%, and a long-run expected growth rate of 5.0% beginning at year 6, the required rate of return is 13.57% solved with a computer by iteration.

Dividend Yield

The historical annual dividend yield is shown on Schedule 3 for the Gas Group. The 2002-2006 five-year average dividend yield was 4.3% for the Gas Group. The monthly dividend yields for the twelve months ending in January 2008 are shown graphically on Schedule 8. These dividend yields reflect an adjustment to the month-end closing prices to remove the pro rata accumulation of the quarterly dividend amount since the last ex-dividend date.

The ex-dividend date usually occurs two business days before the record date of the dividend (i.e., the date by which a shareholder must own the shares to be entitled to the dividend payment--usually about two to three weeks prior to the actual payment). During a quarter (here defined as 91 days), the price of a stock moves up ratably by the dividend amount as the ex-dividend date approaches. The stock's price then falls by the amount of the dividend on the ex-dividend date. Therefore, it is necessary to calculate the fraction of the quarterly dividend since the time of the last ex-dividend date and to remove that amount from the price. This adjustment reflects normal recurring pricing of stocks in the market, and establishes a price which will reflect the true yield on a stock.

A six-month average dividend yield has been used to recognize the prospective orientation of the ratesetting process as explained in the direct testimony. For the purpose of a DCF calculation, the average dividend yields must be adjusted to reflect the prospective nature

of the dividend payments, i.e., the higher expected dividends for the future rather than the recent dividend payment annualized. An adjustment to the dividend yield component, when computed with annualized dividends, is required based upon investor expectation of quarterly dividend increases.

The procedure to adjust the average dividend yield for the expectation of a dividend increase during the initial investment period will be at a rate of one-half the growth component, developed below. The DCF equation, showing the quarterly dividend payments as *Do*, may be stated in this fashion:

$$K = \frac{Do(1+g)o + Do(1+g)o + Do(1+g)1 + Do(1+g)1}{Po} + g$$

The adjustment factor, based upon one-half the expected growth rate developed in my direct testimony, will be 2.500% (5.00% x .5) for the Gas Group, which assumes that two dividend payments will be at the expected higher rate during the initial investment period. Using the six-month average dividend yield as a base, the prospective (forward) dividend yield would be 4.11% (4.01% x 1.02500) for the Gas Group.

Another DCF model that reflects the discrete growth in the quarterly dividend *(Do)* is as follows:

$$K = \frac{Do(1+g).25 + Do(1+g).50 + Do(1+g).75 + Do(1+g)1.00}{Po} + g$$

This procedure confirms the reasonableness of the forward dividend yield previously calculated. The quarterly discrete adjustment provides a dividend yield of 4.13% (4.01% x

1.03106) for the Gas Group. The use of an adjustment is required for the periodic form of the DCF in order to properly recognize that dividends grow on a discrete basis.

In either of the preceding DCF dividend yield adjustments, there is no recognition for the compound returns attributed to the quarterly dividend payments. Investors have the opportunity to reinvest quarterly dividend receipts. Recognizing the compounding of the periodic quarterly dividend payments *(Do),* results in a third DCF formulation:

$$k = 1 + \frac{Do}{} - 1 + g$$

This DCF equation provides no further recognition of growth in the quarterly dividend. Combining discrete quarterly dividend growth with quarterly compounding would provide the following DCF formulation, stating the quarterly dividend payments *(Do):*

$$k = \underline{1 + D^{\circ}(1+g} \qquad -1 + g$$
$$Po$$

A compounding of the quarterly dividend yield provides another procedure to recognize the necessity for an adjusted dividend yield. The unadjusted average quarterly dividend yield was 1.0025% (4.01% + 4) for the Gas Group. The compound dividend yield would be 4.12% (1.0101484-1) for the Gas Group, recognizing quarterly dividend payments in a forward-

looking manner. These dividend yields conform with investors' expectations in the context of reinvestment of their cash dividend.

For the Gas Group, a 4.12% forward-looking dividend yield is the average (4.11% + 4.13% + 4.12% = 12.36% + 3) of the adjusted dividend yield using the form *Do/Po (1+..5g)*, the dividend yield recognizing discrete quarterly growth, and the quarterly compound dividend yield with discrete quarterly growth.

Growth Rate

If viewed in its infinite form, the DCF model is represented by the discounted value of an endless stream of growing dividends. It would, however, require 100 years of future dividend payments so that the discounted value of those payments would equate to the present price so that the discount rate and the rate of return shown by the simplified Gordon form of the DCF model would be about the same. A century of dividend receipts represents an unrealistic investment horizon from almost any perspective. Because stocks are not held by investors forever, the growth in the share value (i.e., capital appreciation, or capital gains yield) is most relevant to investors' total return expectations. Hence, investor expected returns in the equity market are provided by capital appreciation of the investment as well as receipt of dividends. As such, the sale price of a stock can be viewed as a liquidating dividend which can be discounted along with the annual dividend receipts during the investment holding period to arrive at the investor expected return.

In its constant growth form, the DCF assumes that with a constant return on book common equity and constant dividend payout ratio, a firm's earnings per share, dividends per share and book value per share will grow at the same constant rate, absent any external financing by a firm. Because these constant growth assumptions do not actually prevail in the

capital markets, the capital appreciation potential of an equity investment is best measured by the expected growth in earnings per share. Since the traditional form of the DCF assumes no change in the price-earnings multiple, the value of a firm's equity will grow at the same rate as earnings per share. Hence, the capital gains yield is best measured by earnings per share growth using company-specific variables.

Investors consider both historical and projected data in the context of the expected growth rate for a firm. An investor can compute historical growth rates using compound growth rates or growth rate trend lines. Otherwise, an investor can rely upon published growth rates as provided in widely-circulated, influential publications. However, a traditional constant growth DCF analysis that is limited to such inputs suffers from the assumption of no change in the price-earnings multiple, i.e., that the value of a firm's equity will grow at the same rate as earnings. Some of the factors which actually contribute to investors' expectations of earnings growth and which should be considered in assessing those expectations, are: (i) the earnings rate on existing equity, (ii) the portion of earnings not paid out in dividends, (iii) sales of additional common equity, (iv) reacquisition of common stock previously issued, (v) changes in financial leverage, (vi) acquisitions of new business opportunities, (vii) profitable liquidation of assets, and (viii) repositioning of existing assets. The realities of the equity market regarding total return expectations, however, also reflect factors other than these inputs. Therefore, the DCF model contains overly restrictive limitations when the growth component is stated in terms of earnings per share (the basis for the capital gains yield) or dividends per share (the basis for the infinite dividend discount model). In these situations, there is inadequate recognition of the capital gains yields arising from stock price growth which could exceed earnings or dividends growth.

To assess the growth component of the DCF, analysts' projections of future growth influence investor expectations as explained above. One influential publication is The Value Line Investment Survey which contains estimated future projections of growth. The Value Line Investment Survey provides growth estimates which are stated within a common economic environment for the purpose of measuring relative growth potential. The basis for these projections is the Value Line 3 to 5 year hypothetical economy. The Value Line hypothetical economic environment is represented by components and subcomponents of the National Income Accounts which reflect in the aggregate assumptions concerning the unemployment rate, manpower productivity, price inflation, corporate income tax rate, high-grade corporate bond interest rates, and Fed policies. Individual estimates begin with the correlation of sales, earnings and dividends of a company to appropriate components or subcomponents of the future National Income Accounts. These calculations provide a consistent basis for the published forecasts. Value Line's evaluation of a specific company's future prospects are considered in the context of specific operating characteristics that influence the published projections. Of particular importance for regulated firms, Value Line considers the regulatory quality, rates of return recently authorized, the historic ability of the firm to actually experience the authorized rates of return, the firm's budgeted capital spending, the firm's financing forecast, and the dividend payout ratio. The wide circulation of this source and frequent reference to Value Line in financial circles indicate that this publication has an influence on investor judgment with regard to expectations for the future.

There are other sources of earnings growth forecasts. One of these sources is the Institutional Brokers Estimate System ("IBES"). The IBES service provides data on consensus earnings per share forecasts and five-year earnings growth rate estimates. The publisher of

IBES has been purchased by Thomson/First Call. The IBES forecasts have been integrated into the First Call consensus growth forecasts. The earnings estimates are obtained from financial analysts at brokerage research departments and from institutions whose securities analysts are projecting earnings for companies in the First Call universe of companies. Other services that tabulate earnings forecasts and publish them are Zacks Investment Research and Market Guide (which is provided over the Internet by Reuters). As with the IBES/First Call forecasts, Zacks and Reuters/Market Guide provide consensus forecasts collected from analysts for most publically traded companies.

In each of these publications, forecasts of earnings per share for the current and subsequent year receive prominent coverage. That is to say, IBES/First Call, Zacks, Reuters/Market Guide, and Value Line show estimates of current-year earnings and projections for the next year. While the DCF model typically focusses upon long-rim estimates of growth, stock prices are clearly influenced by current and near-term earnings prospects. Therefore, the near-term earnings per share growth rates should also be factored into a growth rate determination.

Although forecasts of future performance are investor influencing[2], equity investors may also rely upon the observations of past performance. Investors' expectations of future growth rates may be determined, in part, by an analysis of historical growth rates. It is apparent that any serious investor would advise himself/herself of historical performance prior to taking an investment position in a firm. Earnings per share and dividends per share represent the principal financial variables which influence investor growth expectations.

[2] AS shown in a National Bureau of Economic Research monograph by John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices University of Chicago Press 1982.

Other financial variables are sometimes considered in rate case proceedings. For example, a company's internal growth rate, derived from the return rate on book common equity and the related retention ratio, is sometimes considered. This growth rate measure is represented by the Value Line forecast "BxR" shown on Schedule 10. Internal growth rates are often used as a proxy for book value growth. Unfortunately, this measure of growth is often not reflective of investor-expected growth. This is especially important when there is an indication of a prospective change in dividend payout ratio, earned return on book common equity, change in market-to-book ratios or other fundamental changes in the character of the business. Nevertheless, I have also shown the historical and projected growth rates in book value per share and internal growth rates.

Leverage Adjustment

As noted previously, the divergence of stock prices from book values creates a conflict within the DCF model when the results of a market-derived cost of equity are applied to the common equity account measured at book value in the ratesetting context. This is the situation today where the market price of stock exceeds its book value for most companies. This divergence of price and book value also creates a financial risk difference, whereby the capitalization of a utility measured at its market value contains relatively less debt and more equity than the capitalization measured at its book value. It is a well-accepted fact of financial theory that a relatively higher proportion of equity in the capitalization has less financial risk than another capital structure more heavily weighted with debt. This is the situation for the Gas Group where the market value of its capitalization contains more equity than is shown by the book capitalization. The following comparison demonstrates this situation where the market capitalization is developed by taking the "Fair Value of Financial Instruments" (Disclosures

about Fair Value of Financial Instruments -- Statement of Financial Accounting Standards ("FAS") No. 107) as shown in the annual report for these companies and the market value of the common equity using the price of stock. The comparison of capital structure ratios is:

Water Group	Capitalization at Market Value (Fair Value)	Capitalization at Book Value (Carrying Amounts)
	Gas Group	**Gas** Group
Long-term Debt	**30.52%**	**44.41%**
Preferred Stock	0.18%	0.25%
Common Equity	69.31%	55.34%
Total	100.00%	100.00%

With regard to the capital structure ratios represented by the carrying amounts shown above, there are some variances from the ratios shown on Schedule 3. These variances arise from the use of balance sheet values in computing the capital structure ratios shown on Schedule 3 and the use of the Carrying Amounts of the Financial Instruments according to FAS 107 (the Carrying Amounts were used in the table shown above to be comparable to the Fair Value amounts used in the comparison calculations).

With the capital ratios calculated above, it is necessary to first calculate the cost of equity for a firm without any leverage. The cost of equity for an unleveraged firm using the capital structure ratios calculated with market values is:

$$ku = ke \quad (((ku \quad i)\ 1\text{-}0\ D / E) - \quad (ku - \quad d)\ P / E$$

$$8.44\% = 9.12\% - (((8.44\%-6.11\%)\ .65)\ 30.52\%/69.31\%) - (8.44\% - 6.13\%)\ 0.18\%/69.31\%$$

where ku = cost of equity for an all-equity firm, ke = market determined cost of equity, i = cost

of debt[3], d = dividend rate on preferred stock[4], D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The formula shown above indicates that the cost of equity for a firm with 100% equity is 8.44% using the market value of the Gas Group's capitalization. Having determined that the cost of equity is 8.44% for a firm with 100% equity, the rate of return on common equity associated with the book value capital structure is:

ke = ku + (((ku - i)l-t) D / E) +(ku d) P / E

9.66% = 8.44% + (((8.44%-6.11%).65) 44.41%/55.34%) + (8.44%-6.13%) 0.25%/55.34%

[3] The cost of debt is the six-month average yield on Moody's A rated public utility bonds.

[4] The cost of preferred is the six-month average yield on Moody's "a" rated preferred stock.

APPENDIX F TO DIRECT TESTIMONY OF PAUL R. MOUL

INTEREST RATES

Interest rates can be viewed in their traditional nominal terms (i.e., the stated rate of interest) and in real terms (i.e., the stated rate of interest less the expected rate of inflation). Absent consideration of inflation, the real rate of interest is determined generally by supply factors which are influenced by investors' willingness to forego current consumption (i.e., to save) and demand factors that are influenced by the opportunities to derive income from productive investments. Added to the real rate of interest is compensation required by investors for the inflationary impact of the declining purchasing power of their income received in the future. While interest rates are clearly influenced by the changing annual rate of inflation, it is important to note that the expected rate of inflation that is reflected in current interest rates, may be quite different than the prevailing rate of inflation.

Rates of interest also vary by the type of interest bearing instrument. Investors require compensation for the risk associated with the term of the investment and the risk of default. The risk associated with the term of the investment is usually shown by the yield curve, i.e., the difference in rates across maturities. The typical structure is represented by a positive yield curve which provides progressively higher interest rates as the maturities are lengthened. Flat (i.e., relatively level rates across maturities) or inverted (i.e., higher short-term rates than long-term rates) yield curves occur less frequently.

The risk of default is typically associated with the creditworthiness of the borrower. Differences in interest rates can be traced to the credit quality ratings assigned by the bond rating agencies, such as Moody's Investors Service, Inc. and Standard & Poor's Corporation. Obligations of the United States Treasury are usually considered to be free of default risk, and hence reflect only the real rate of interest, compensation for expected inflation, and maturity risk.

The Treasury has been issuing inflation-indexed notes which automatically provide compensation to investors for future inflation, thereby providing a lower current yield on these issues.

Interest Rate Environment

Federal Reserve Board ("Fed") policy actions which impact directly short-term interest rates also substantially affect investor sentiment in long-term fixed-income securities markets. In this regard, the Fed has often pursued policies designed to build investor confidence in the fixed-income securities market. Formative Fed policy has had a long history, as exemplified by the historic 1951 Treasury-Federal Reserve Accord, and more recently, deregulation within the financial system which increased the level and volatility of interest rates. The Fed has indicated that it will follow a monetary policy designed to promote non-inflationary economic growth.

As background to the recent levels of interest rates, history shows that the Open Market Committee of the Federal Reserve board ("FOMC") began a series of moves toward lower short-term interest rates in mid-1990 -- at the outset of the previous recession. Monetary policy was influenced at that time by (i) steps taken to reduce the federal budget deficit, (ii) slowing economic growth, (iii) rising unemployment, and (iv) measures intended to avoid a credit crunch. Thereafter, the Federal government initiated several bold proposals to deal with future borrowings by the Treasury. With lower expected federal budget deficits and reduced Treasury borrowings, together with limitations on the supply of new 30-year Treasury bonds, long-term interest rates declined to a twenty-year low, reaching a trough of 5.78% in October 1993.

On February 4, 1994, the FOMC began a series of increases in the Fed Funds rate (i.e., the interest rate on excess overnight bank reserves). The initial increase represented the first rise in short-term interest rates in five years. The series of seven increases doubled the Fed Funds

rate to 6%. The increases in short-term interest rates also caused long-term rates to move up, continuing a trend which began in the fourth quarter of 1993. The cyclical peak in long-term interest rates was reached on November 7 and 14, 1994 when 30-year Treasury bonds attained an 8.16% yield. Thereafter, long-term Treasury bond yields generally declined.

Beginning in mid-February 1996, long-term interest rates moved upward from their previous lows. After initially reaching a level of 6.75% on March 15, 1996, long-term interest rates continued to climb and reached a peak of 7.19% on July 5 and 8, 1996. For the period leading up to the 1996 Presidential election, long-term Treasury bonds generally traded within this range. After the election, interest rates moderated, returning to a level somewhat below the previous trading range. Thereafter, in December 1996, interest rates returned to a range of 6.5% to 7.0% which existed for much of 1996.

On March 25, 1997, the FOMC decided to tighten monetary conditions through a one-quarter percentage point increase in the Fed Funds rate. This tightening increased the Fed Funds rate to 5.5%. In making this move, the FOMC stated that it was concerned by persistent strength of demand in the economy, which it feared would increase the risk of inflationary imbalances that could eventually interfere with the long economic expansion.

In the fourth quarter of 1997, the yields on Treasury bonds began to decline rapidly in response to an increase in demand for Treasury securities caused by a flight to safety triggered by the currency and stock market crisis in Asia. Liquidity provided by the Treasury market makes these bonds an attractive investment in times of crisis. This is because Treasury securities encompass a very large market which provides ease of trading and carry a premium for safety. During the fourth quarter of 1997, Treasury bond yields pierced the psychologically important 6% level for the first time since 1993.

Through the first half of 1998, the yields on long-term Treasury bonds fluctuated within a range of about 5.6% to 6.1% reflecting their attractiveness and safety. In the third quarter of 1998, there was further deterioration of investor confidence in global financial markets. This loss of confidence followed the moratorium (i.e., defaul0 by Russia on its sovereign debt and fears associated with problems in Latin America. While not significant to the global economy in the aggregate, the August 17 default by Russia had a significant negative impact on investor confidence, following earlier discontent surrounding the crisis in Asia. These events subsequently led to a general pull back of risk-taking as displayed by banks growing reluctance to lend, worries of an expanding credit crunch, lower stock prices, and higher yields on bonds of riskier companies. These events contributed to the failure of the hedge fund, Long-Term Capital Management.

In response to these events, the FOMC cut the Fed Funds rate just prior to the mid-term Congressional elections. The FOMC's action was based upon concerns over how increasing weakness in foreign economies would affect the U.S. economy. As recently as July 1998, the FOMC had been more concerned about fighting inflation than the state of the economy. The initial rate cut was the first of three reductions by the FOMC. Thereafter, the yield on long-term Treasury bonds reached a 30-year low of 4.70% on October 5, 1998. Long-term Treasury yields below 5% had not been seen since 1967. Unlike the first rate cut that was widely anticipated, the second rate reduction by the FOMC was a surprise to the markets. A third reduction in short-term interest rates occurred in November 1998 when the FOMC reduced the Fed Funds rate to 4.75%.

All of these events prompted an increase in the prices for Treasury bonds which lead to the low yields described above. Another factor that contributed to the decline in yields on long-

term Treasury bonds was a reduction in the supply of new Treasury issues coming to market due to the Federal budget surplus -- the first in nearly 30 years. The dollar amount of Treasury bonds being issued declined by 30% in two years, thus resulting in higher prices and lower yields. In addition, rumors of some struggling hedge funds unwinding their positions further added to the gains in Treasury bond prices.

The financial crisis that spread from Asia to Russia and to Latin America pushed nervous investors from stocks into Treasury bonds, thus increasing demand for bonds, just when supply was shrinking. There was also a move from corporate bonds to Treasury bonds to take advantage of appreciation in the Treasury market. This resulted in a certain amount of exuberance for Treasury bond investments that formerly was reserved for the stock market. Moreover, yields in the fourth quarter of 1998 became extremely volatile as shown by Treasury yields that fell from 5.10% on September 29 to 4.70 percent on October 5, and thereafter returned to 5.10% on October 13. A decline and rebound of 40 basis points in Treasury yields in a two-week time frame is remarkable.

Beginning in mid-1999, the FOMC raised interest rates on six occasions reversing its actions in the fall of 1998. On June 30, 1999, August 24, 1999, November 16, 1999, February 2, 2000, March 21, 2000, and May 16, 2000, the FOMC raised the Fed Funds rate to 6.50%. This brought the Fed Funds rate to its highest level since 1991, and was 175 basis points higher than the level that occurred at the height of the Asian currency and stock market crisis. At the time, these actions were taken in response to more normally functioning financial markets, tight labor markets, and a reversal of the monetary ease that was required earlier in response to the global financial market turmoil.

As the year 2000 drew to a close, economic activity slowed and consumer confidence

began to weaken. In two steps at the beginning and at the end of January 2001, the FOMC reduced the Fed Funds rate by one percentage point. These actions brought the Fed Funds rate to 5.50%. The FOMC described its actions as "a rapid and forceful response of monetary policy" to eroding consumer and business confidence exemplified by weaker retail sales and business spending on capital equipment and cut backs in manufacturing production. Subsequently, on March 20, 2001, April 18, 2001, May 15, 2001, June 27, 2001, and August 21, 2001, the FOMC lowered the Fed Funds in steps consisting of three 50 basis points decrements followed by two 25 basis points decrements. These actions took the Fed Funds rate to 3.50%. The FOMC observed on August 21, 2001:

> "Household demand has been sustained, but business profits and capital spending continue to weaken and growth abroad is slowing, weighing on the U.S. economy. The associated easing of pressures on labor and product markets is expected to keep inflation contained.
>
> Although long-term prospects for productivity growth and the economy remain favorable, the Committee continues to believe that against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the risks are weighted mainly toward conditions that may generate economic weakness in the foreseeable future."

After the terrorist attack on September 11, 2001, the FOMC made two additional 50 basis points reductions in the Fed Ftmds rate. The first reduction occurred on September 17, 2001 and followed the four-day closure of the financial markets following the terrorist attacks. The second reduction occurred at the October 2 meeting of the FOMC where it observed:

> "The terrorist attacks have significantly heightened uncertainty in an economy that was already weak. Business and household spending as a consequence are being further damped. Nonetheless, the long-term prospects for productivity growth and the economy remain favorable and should become evident once the unusual forces restraining demand abate."

Afterward, the FOMC reduced the Fed Funds rate by 50 basis points on November 6, 2001 and by 25 basis points on December 11, 2001. In total, short-term interest rates were reduced by the FOMC eleven (11) times during the year 2001. These actions cut the Fed Funds rate by 4.75% and resulted in 1.75% for the Fed Funds rate.

In an attempt to deal with weakening ftmdamentals in the economy recovering from the recession that began in March 2001, the FOMC provided a psychologically important one-half percentage point reduction in the federal funds rate. The rate cut was twice as large as the market expected, and brought the fed funds rate to 1.25% on November 6, 2002. The FOMC stated that:

> "The Committee continues to believe that an accommodative stance of monetary policy, coupled with still-robust underlying growth in productivity, is providing important ongoing support to economic activity. However, incoming economic data have tended to confirm that greater uncertainty, in part attributable to heightened geopolitical risks, is currently inhibiting spending, production, and employment. Inflation and inflation expectations remain well contained.
>
> In these circumstances, the Committee believes that today's additional monetary easing should prove helpful as the economy works its way through this current soft spot. With this action, the Committee believes that, against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the risks are balanced with respect to the prospects for both goals in the foreseeable future."

As 2003 unfolded, there was a continuing expectation of lower yields on Treasury securities. In fact, the yield on ten-year Treasury notes reached a 45-year low near the end of the second quarter of 2003. For long-term Treasury bonds, those yields culminated with a 4.24% yield on June 13, 2003. Soon thereafter, the FOMC reduced the Fed Funds rate by 25 basis points on June 25, 2003. In announcing its action, the FOMC stated:

> "The Committee continues to believe that an accommodative stance of monetary policy, coupled with still robust underlying growth in productivity, is providing important ongoing support to economic activity. Recent signs point to a firming in spending, markedly improved financial conditions, and labor and product markets that are stabilizing. The economy, nonetheless, has yet to exhibit sustainable growth. With inflationary expectations subdued, the Committee judged that a slightly more expansive monetary policy would add further support for an economy which it expects to improve over time."

Thereafter, intermediate and long-term Treasury yields moved marketedly higher. Higher yields on long-term Treasury bonds, which exceeded 5.00% can be traced to: (i) the market's disappointment that the Fed Funds rate was not reduced below 1.00%, (ii) an indication that the Fed will not use unconventional methods for implementing monetary policy, (iii) growing confidence in a strengthening economy, and (iv) a Federal budget deficit that is projected to be $455 billion in 2003 (reported, subsequently, the actually deficit was $374 billion) and $475 billion in 2004 (revised subsequently, the estimated deficit is $500 billion in 2004). All these factors significantly changed the seniment in the bond market.

For the remainder of 2003, the FOMC continued with its balanced monetary policy, thereby retaining the 1% Fed Funds rate. However, in 2004, the FOMC initiated a policy of moving toward a more neutral Fed Funds rate (i.e., removing the bias of abnormal low rates). On June 30, 2004, August 10, 2004, September 21, 2004, November 10, 2004, December 14, 2004, February 2, 2005, March 22, 2005, May 3, 2005, June 30, 2005, August 9, 2005, September 20, 2005, November 1, 2005, December 13, 2005, January 31, 2006, March 28, 2006, May 10, 2006, and June 29, 2006, the FOMC increased the Fed Funds rate in seventeen 25 basis point increments. These policy actions are widely interpreted as part of the process of moving toward a more neutral range for the Fed Funds rate.

Just after the FOMC meeting on August 7, 2007, where the FOMC decided to retain a 5.25% Fed Funds rate, turmoil in the credit markets prompted central banks throughout the world to inject over $325 billion of reserves into the banking system over a three-day period in reaction to a credit crunch. Problems had been developing earlier in 2007, beginning in the market for asset-backed securities linked to subprime mortgages. Valuation uncertainties for these securities caused liquidity concerns for hedge funds, investment banks, and financial institutions. The market for commercial paper, the most liquid part of the credit markets for non-Treasury securities, was also affected. In response to the market turmoil, the FOMC issued the following statement, the first of its type since after the September 11, 2001 terrorists' attack.

> "The Federal Reserve is providing liquidity to facilitate the orderly functioning of financial markets.
>
> The Federal Reserve will provide reserves as necessary through open market operations to promote trading in the federal funds market at rates close to the Federal Open Market Committee's target rate of 5-1/4 percent. In current circumstances, depository institutions may experience unusual funding needs because of dislocations in money and credit markets. As always, the discount window is available as a source of funding."

Then, one week after its initial announcement, the FOMC made a surprise reduction of 50 basis points in the discount rate to narrow the spread between this rate and the target Fed Funds rate. At the same time, the FOMC made the following statement:

> "Financial market conditions have deteriorated, and tighter credit conditions and increased uncertainty have the potential to restrain economic growth going forward. In these circumstances, although recent data suggest that the economy has continued to expand at a moderate pace, the Federal Open Market Committee judges that the downside risks to growth have increased appreciably. The Committee is monitoring the situation and is prepared to act as needed to mitigate the adverse effects on the economy arising from the disruptions in financial markets."

Thereafter, at its regularly scheduled meeting on September 18, 2007, the FOMC reduced the target Fed Funds rate to 4.75% and the discount rate was reduced to 5.25% in an effort to forestall the adverse effects of the financial market turmoil on the economy generally. Further reductions of 25 basis points occurred at the next two FOMC meetings on October 31, 2007 and on December 11, 2007. The December 11, 2007 FOMC statement indicated that:

> Incoming information suggests that economic growth is slowing, reflecting the intensification of the housing correction and some softening in business and consumer spending. Moreover, strains in financial markets have increased in recent weeks. Today's action, combined with the policy actions taken earlier, should help promote moderate growth over time.
>
> Readings on core inflation have improved modestly this year, but elevated energy and commodity prices, among other factors, may put upward pressure on inflation. In this context, the Committee judges that some inflation risks remain, and it will continue to monitor inflation developments carefully.
>
> Recent developments, including the deterioration in financial market conditions, have increased the uncertainty surrounding the outlook for economic growth and inflation. The Committee will continue to assess the effects of financial and other developments on economic prospects and will act as needed to foster price stability and sustainable economic growth.

With these actions, the Fed Funds rate and the discount rate closed the calendar year 2007 at 4.25% and 4.75%, respectively.

In 2008, the FOMC again acted decisively in response to further deterioration of credit conditions and perceived weakness in the economy. Acting prior to its first regularly scheduled meeting in 2008, the FOMC reduced the fed funds target by 75 basis points to 3.50% and the discount rate was reduced by a corresponding amount to 4.00%. Actions by the FOMC between meetings are unusual occurrences in recent years, thereby signifying the urgency that the FOMC saw in taking immediate action on monetary policy. Then on January 30, 2008, the fed funds

target rate and discount rate were further reduced by 50 basis points, bringing those rates to 3.00% and 3.50%, respectively. In taking this action the FOMC stated:

> Financial markets remain under considerable stress, and credit has tightened further for some businesses and households. Moreover, recent information indicates a deepening of the housing contraction as well as some softening in labor markets.
>
> The Committee expects inflation to moderate in coming quarters, but it will be necessary to continue to monitor inflation developments carefully.
>
> Today's policy action, combined with those taken earlier, should help to promote moderate growth over time and to mitigate the risks to economic activity. However, downside risks to growth remain. The Committee will continue to assess the effects of financial and other developments on economic prospects and will act in a timely manner as needed to address those risks.

Public Utility Bond Yields

The Risk Premium analysis of the cost of equity is represented by the combination of a firm's borrowing rate for long-term debt capital plus a premium that is required to reflect the additional risk associated with the equity of a firm as explained in Appendix G. Due to the senior nature of the long-term debt of a firm, its cost is lower than the cost of equity due to the prior claim which lenders have on the earnings and assets of a corporation.

As a generalization, all interest rates track to varying degrees of the benchmark yields established by the market for Treasury securities. Public utility bond yields usually reflect the underlying Treasury yield associated with a given maturity plus a spread to reflect the specific credit quality of the issuing public utility. Market sentiment can also have an influence on the spreads as described below. The spread in the yields on public utility bonds and Treasury bonds varies with market conditions, as does the relative level of interest rates at varying maturities shown by the yield curve.

Pages 1 and 2 of Schedule 11 provide the recent history of long-term public utility bond yields for the rating categories of Aa, A and Baa (no yields are shown for Aaa rated public utility bonds because this index has been discontinued). The top four rating categories of Aaa, Aa, A, and Baa are known as "investment grades" and are generally regarded as eligible for bank investments under commercial banking regulations. These investment grades are distinguished from "junk" bonds which have ratings of Ba and below.

A relatively long history of the spread between the yields on long-term A-rated public utility bonds and 20-year Treasury bonds is shown on page 3 of Schedule 11. There, it is shown that those spreads were about the one percentage during for the years 1994 through 1997. With the aversion to risk and flight to quality described earlier, a significant widening of the spread in the yields between corporate (e.g., public utility) and Treasury bonds developed in 1998, after an initial widening of the spread that began in the fourth quarter of 1997. The significant widening of spreads in 1998 was unexpected by some technically savvy investors, as shown by the debacle at the Long-Term Capital Management hedge fund. When Russia defaulted its debt on August 17, some investors had to cover short positions when Treasury prices spiked upward. Short covering by investors that guessed wrong on the relationship between corporate and Treasury bonds also contributed to run-up in Treasury bond prices by increasing the demand for them. This helped to contribute to a widening of the spreads between corporate and Treasury bonds.

As shown on page 3 of Schedule 11, the spread in yields between A-rated public utility bonds and 20-year Treasury bonds were about one percentage point prior to 1998, 1.32% in 1998, 1.42% in 1999, 2.01% in 2000, 2.13% in 2001, 1.94% in 2002, 1.62% in 2003, 1.12% in 2004, 1.01% in 2005, 1.08% in 2006, and 1.16% in 2007. As shown by the monthly data presented on pages 4 and 5 of Schedule 11, the interest rate spread between the yields on 20-year

Treasury bonds and A-rated public utility bonds was 1.22 percentage points for the twelve-months ended January 2008. For the six- and three-month periods ending January 2008, the yield spread was 1.42% and 1.56%, respectively. Beginning in January 2008, spreads widened significantly with the development of the credit crunch.

Risk-Free Rate of Return in the CAPM

Regarding the risk-free rate of return (see Appendix H), pages 2 and 3 of Schedule 13 provide the yields on the broad spectrum of Treasury Notes and Bonds. Some practitioners of the CAPM would advocate the use of short-term treasury yields (and some would argue for the yields on 91-day Treasury Bills). Other advocates of the CAPM would advocate the use of longer-term treasury yields as the best measure of a risk-free rate of return. As Ibbotson has indicated:

> The Cost of Capital in a Regulatory Environment. When discounting cash flows projected over a long period, it is necessary to discount them by a long-term cost of capital. Additionally, regulatory processes for setting rates often specify or suggest that the desired rate of return for a regulated firm is that which would allow the firm to attract and retain debt and equity capital over the long term. Thus, the long-term cost of capital is typically the appropriate cost of capital to use in regulated ratesetting. (Stocks, Bonds, Bills and Inflation - 1992 Yearbook, pages 118-119)

As indicated above, long-term Treasury bond yields represent the correct measure of the risk-free rate of return in the traditional CAPM. Very short term yields on Treasury bills should be avoided for several reasons. First, rates should be set on the basis of financial conditions that will exist during the effective period of the proposed rates. Second, 91-day Treasury bill yields are more volatile than longer-term yields and are greatly influenced by FOMC monetary policy, political, and economic situations. Moreover, Treasury bill yields have been shown to be empirically inadequate for the CAPM. Some advocates of the theory would argue that the risk-

free rate of return in the CAPM should be derived from quality long-term corporate bonds.

APPENDIX G TO DIRECT TESTIMONY OF PAUL R. MOUL

RISK PREMIUM ANALYSIS

The cost of equity requires recognition of the risk premium required by common equities over long-term corporate bond yields. In the case of senior capital, a company contracts for the use of long-term debt capital at a stated coupon rate for a specific period of time and in the case of preferred stock capital at a stated dividend rate, usually with provision for redemption through sinking fund requirements. In the case of senior capital, the cost rate is known with a high degree of certainty because the payment for use of this capital is a contractual obligation, and the future schedule of payments is known. In essence, the investor-expected cost of senior capital is equal to the realized return over the entire term of the issue, absent default.

The cost of equity, on the other hand, is not fixed, but rather varies with investor perception of the risk associated with the common stock. Because no precise measurement exists as to the cost of equity, informed judgment must be exercised through a study of various market factors which motivate investors to purchase common stock. In the case of common equity, the realized return rate may vary significantly from the expected cost rate due to the uncertainty associated with earnings on common equity. This uncertainty highlights the added risk of a common equity investment.

As one would expect from traditional risk and return relationships, the cost of equity is affected by expected interest rates. As noted in Appendix F, yields on long-term corporate bonds traditionally consist of a real rate of return without regard to inflation, an increment to reflect investor perception of expected future inflation, the investment horizon shown by the term of the issue until maturity, and the credit risk associated with each rating category.

The Risk Premium approach recognizes the required compensation for the more risky common equity over the less risky secured debt position of a lender. The cost of equity stated in terms of the familiar risk premium approach is:

$$k=i+RP$$

where, the cost of equity *("k")* is equal to the interest rate on long-term corporate debt *("i")*, plus an equity risk premium *("RP")* which represents the additional compensation for the riskier common equity.

Equity Risk Premium

The equity risk premium is determined as the difference in the rate of return on debt capital and the rate of return on common equity. Because the common equity holder has only a residual claim on earnings and assets, there is no assurance that achieved returns on common equities will equal expected returns. This is quite different from returns on bonds, where the investor realizes the expected return during the entire holding period, absent default. It is for this reason that common equities are always more risky than senior debt securities. There are investment strategies available to bond portfolio managers that immunize bond returns against fluctuations in interest rates because bonds are redeemed through sinking funds or at maturity, whereas no such redemption is mandated for public utility common equities.

It is well recognized that the expected return on more risky investments will exceed the required yield on less risky investments. Neither the possibility of default on a bond nor the maturity risk detracts from the risk analysis, because the common equity risk rate differential (i.e., the investor-required risk premium) is always greater than the return components on a bond. It should also be noted that the investment horizon is typically long-run for both

corporate debt and equity, and that the risk of default (i.e., corporate bankruptcy) is a concern to both debt and equity investors. Thus, the required yield on a bond provides a benchmark or starting point with which to track and measure the cost rate of common equity capital. There is no need to segment the bond yield according to its components, because it is the total return demanded by investors that is important for determining the risk rate differential for common equity. This is because the complete bond yield provides the basis to determine the differential, and as such, consistency requires that the computed differential must be applied to the complete bond yield when applying the risk premium approach. To apply the risk rate differential to a partial bond yield would result in a misspecification of the cost of equity because the computed differential was initially determined by reference to the entire bond return.

The risk rate differential between the cost of equity and the yield on long-term corporate bonds can be determined by reference to a comparison of holding period returns (here defined as one year) computed over long time spans. This analysis assumes that over long periods of time investors' expectations are on average consistent with rates of return actually achieved. Accordingly, historical holding period returns must not be analyzed over an unduly short period because near-term realized results may not have fulfilled investors' expectations. Moreover, specific past period results may not be representative of investment fundamentals expected for the future. This is especially apparent when the holding period returns include negative returns which are not representative of either investor requirements of the past or investor expectations for the future. The short-run phenomenon of unexpected returns (either positive or negative) demonstrates that an unduly short historical period would not adequately support a risk premium analysis. It is important to distinguish between investors' motivation to invest, which

encompass positive return expectations, and the knowledge that losses can occur. No rational investor would forego payment for the use of capital, or expect loss of principal, as a basis for investing. Investors will hold cash rather than invest with the expectation of a loss.

Within these constraints, page 1 of Schedule 12 provides the historical holding period returns for the S&P Public Utility Index which has been independently computed and the historical holding period returns for the S&P Composite Index which have been reported in Stocks, Bonds, Bills and Inflation published by Ibbotson & Associates. The tabulation begins with 1928 because January 1928 is the earliest monthly dividend yield for the S&P Public Utility Index. I have considered all reliable data for this study to avoid the introduction of a particular bias to the results. The measurement of the common equity return rate differential is based upon actual capital market performance using realized results. As a consequence, the underlying data for this risk premium approach can be analyzed with a high degree of precision. Informed professional judgment is required only to interpret the results of this study, but not to quantify the component variables.

The risk rate differentials for all equities, as measured by the S&P Composite, are established by reference to long-term corporate bonds. For public utilities, the risk rate differentials are computed with the S&P Public Utilities as compared with public utility bonds.

The measurement procedure used to identify the risk rate differentials consisted of arithmetic means, geometric means, and medians for each series. Measures of the central tendency of the results from the historical periods provide the best indication of representative rates of return. In regulated ratesetting, the correct measure of the equity risk premium is the arithmetic mean because a utility must expect to earn its cost of capital in each year in order to

provide investors with their long-term expectations. In other contexts, such as pension determinations, compound rates of return, as shown by the geometric means, may be appropriate. The median returns are also appropriate in ratesetting because they are a measure of the central tendency of a single period rate of return. Median values have also been considered in this analysis because they provide a return which divides the entire series of annual returns in half and are representative of a return that symbolizes, in a meaningful way, the central tendency of all annual returns contained within the analysis period. Medians are regularly included in many investor-influencing publications.

As previously noted, the arithmetic mean provides the appropriate point estimate of the risk premium. As further explained in Appendix H, the long-term cost of capital in rate cases requires the use of the arithmetic means. To supplement my analysis, I have also used the rates of return taken from the geometric mean and median for each series to provide the bounds of the range to measure the risk rate differentials. This further analysis shows that when selecting the midpoint from a range established with the geometric means and medians, the arithmetic mean is indeed a reasonable measure for the long-term cost of capital. For the years 1928 through 2006, the risk premiums for each class of equity are:

	S&P Composite	**S&P** Public Utilities
Arithmetic Mean	5.86 %	5.41%
Geometric Mean	4.25%	3.35%
Median	10.17%	7.29%
Midpoint of Range	7.21%	5.32%
Average	6.54%	5.37%

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The empirical evidence suggests that the common equity risk premium is higher for the S&P Composite Index compared to the S&P Public Utilities.

If, however, specific historical periods were also analyzed in order to match more closely historical fundamentals with current expectations, the results provided on page 2 of Schedule 12 should also be considered. One of these sub-periods included the 54-year period, 1952-2006. These years follow the historic 1951 Treasury-Federal Reserve Accord which affected monetary policy and the market for government securities.

A further investigation was undertaken to determine whether realignment has taken place subsequent to the historic 1973 Arab Oil embargo and during the deregulation of the financial markets. In each case, the public utility risk premiums were computed by using the arithmetic mean, and the geometric means and medians to establish the range shown by those values. The time periods covering the more recent periods 1974 through 2006 and 1979 through 2006 contain events subsequent to the initial oil shock and the advent of monetarism as Fed policy, respectively. For the 55-year, 33-year and 28-year periods, the public utility risk premiums were 6.40%, 5.61%, and 5.83% respectively, as shown by the average of the specific point-estimates and the midpoint of the ranges provided on page 2 of Schedule 12.

APPENDIX H TO DIRECT TESTIMONY OF PAUL R. MOUL

CAPITAL ASSET PRICING MODEL

Modem portfolio theory provides a theoretical explanation of expected returns on portfolios of securities. The Capital Asset Pricing Model ("CAPM") attempts to describe the way prices of individual securities are determined in efficient markets where information is freely available and is reflected instantaneously in security prices. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium which is proportional to the non-diversifiable (or systematic) risk of a security.

The CAPM theory has several unique assumptions that are not common to most other methods used to measure the cost of equity. As with other market-based approaches, the CAPM is an expectational concept. There has been significant academic research conducted that found that the empirical market line, based upon historical data, has a less steep slope and higher intercept than the theoretical market line of the CAPM. For equities with a beta less than 1.0, such as utility common stocks, the CAPM theoretical market line will underestimate the realistic expectation of investors in comparison with the empirical market line which shows that the CAPM may potentially misspecify investors' required return.

The CAPM considers changing market fundamentals in a portfolio context. The balance of the investment risk, or that characterized as unsystematic, must be diversified. Some argue that diversifiable (unsystematic) risk is unimportant to investors. But this contention is not completely justified because the business and financial risk of an individual company, including regulatory risk, are widely discussed within the investment community and therefore influence investors in regulated firms. In addition, I note that the CAPM assumes that through portfolio diversification, investors will minimize the effect of the unsystematic (diversifiable) component of investment risk. Because it is not known whether the average

investor holds a well-diversified portfolio, the CAPM must also be used with other models of the cost of equity.

To apply the traditional CAPM theory, three inputs are required: the beta coefficient ("fl"), a risk-free rate of return *("Rff),* and a market premium ("Rm - *Rff').* The cost of equity stated in terms of the CAPM is:

$$k=Rf+fl(Rm-Rf)$$

As previously indicated, it is important to recognize that the academic research has shown that the security market line was flatter than that predicted by the CAPM theory and it had a higher intercept than the risk-free rate. These tests indicated that for portfolios with betas less than 1.0, the traditional CAPM would understate the return for such stocks. Likewise, for portfolios with betas above 1.0, these companies had lower returns than indicated by the traditional CAPM theory. Once again, CAPM assumes that through portfolio diversification investors will minimize the effect of the unsystematic (diversifiable) component of investment risk. Therefore, the CAPM must also be used with other models of the cost of equity, especially when it is not known whether the average public utility investor holds a well-diversified portfolio.

Bet~a

The beta coefficient is a statistical measure which attempts to identify the non-divergifiable (systematic) risk of an individual security and measures the sensitivity of rates of return on a particular security with general market movements. Under the CAPM theory, a security that has a beta of 1.0 should theoretically provide a rate of return equal to the return rate provided by the market. When employing stock price changes in the derivation of beta, a stock with a beta of 1.0 should exhibit a movement in price which would track the movements

in the overall market prices of stocks. Hence, if a particular investment has a beta of 1.0, a one percent increase in the retum on the market will result, on average, in a one percent increase in the return on the particular investment. An investment which has a beta less than 1.0 is considered to be less risky than the market.

The beta coefficient *("fl"),* the one input in the CAPM application which specifically applies to an individual firm, is derived from a statistical application which regresses the returns on an individual security (dependent variable) with the returns on the market as a whole (independent variable). The beta coefficients for utility companies typically describe a small proportion of the total investment risk because the coefficients of determination (R^2) are low.

Page 1 of Schedule 13 provides the betas published by Value Line. By way of explanation, the Value Line beta coefficient is derived from a "straight regression" based upon the percentage change in the weekly price of common stock and the percentage change weekly of the New York Stock Exchange Composite average using a five-year period. The raw historical beta is adjusted by Value Line for the measurement effect resulting in overestimates in high beta stocks and underestimates in low beta stocks. Value Line then rounds its betas to the nearest .05 increment. Value Line does not consider dividends in the computation of its betas.

Market Premium

The final element necessary to apply the CAPM is the market premium. The market premium by definition is the rate of return on the total market less the risk-free rate of return *("Rm - Rf'). In* this regard, the market premium in the CAPM has been calculated from the total return on the market of equities using forecast and historical data. The future market return is established with forecasts by Value Line using estimated dividend yields and capital

appreciation potential.

With regard to the forecast data, I have relied upon the Value Line forecasts of capital appreciation and the dividend yield on the 1,700 stocks in the Value Line Survey. According to the February 8, 2008 edition of The Value Line Investment Survey Summary and Index, (see page 5 of Schedule 13) the total return on the universe of Value Line equities is:

	Dividend Yield	+	Median Appreciation Potential	=	Median Total Return
As of February 8, 2008	2.1%	+	13.34%[1]	=	15.44%

The tabulation shown above provides the dividend yield and capital gains yield of the companies followed by Value Line. Another measure of the total market return is provided by the DCF return on the S&P 500 Composite index. As shown below, that return is 13.76%.

DCF Result for the S&P 500 Composite

D/P (1+.5g)	+	g	=	k
2.21% (1.05750)	+	11.42%	=	13.76%

where:	Price (P)	at 31-Jan-2008	=	1378.55
	Dividend (D)	for 4th Qtr. '07	=	7.62
	Dividend (D)	annualized	=	30.48
	Growth (g)	First Call EpS	=	11.42%

Using these indicators, the total market return is 14.60% (15.44% + 13.76% = 29.20% + 2) using both the Value Line and S&P derived returns. With the 14.60% forecast market return and the 4.50% risk-free rate of return, a 10.10% (14.60% - 4.50%) market premium would be indicated using forecast market data.

With regard to the historical data, I provided the rates of return from long-term

[1] The estimated median appreciation potential is forecast to be 65% for 3 to 5 years hence. The annual capital gains yield at the midpoint of the forecast period is 13.34% (i.e., $1.65^{.25}$ - 1).

historical time periods that have been widely circulated among the investment and academic community over the past several years, as shown on page 6 of Schedule 13. These data are published by Ibbotson Associates in its Stocks, Bonds, Bills and Inflation ("SBBI"). From the data provided on page 6 of Schedule 13, I calculate a market premium using the common stock arithmetic mean returns of 12.3% less government bond arithmetic mean returns of 5.8%. For the period 1926-2006, the market premium was 6.5% (12.3% - 5.8%). I should note that the arithmetic mean must be used in the CAPM because it is a single period model. It is further confirmed by Ibbotson who has indicated:

> *Arithmetic Versus Geometric Differences*
> For use as the expected equity risk premium in the CAPM, the *arithmetic* or *simple difference* of the *arithmetic* means of stock market returns and riskless rates is the relevant number. This is because the CAPM is an additive model where the cost of capital is the sum of its parts. Therefore, the CAPM expected equity risk premium must be derived by arithmetic, *not geometric,* subtraction.
>
> *Arithmetic Versus Geometric Means*
> The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values. This makes the arithmetic mean return appropriate for computing the cost of capital. The discount rate that equates expected (mean) future values with the present value of an investment is that investment's cost of capital. The logic of using the discount rate as the cost of capital is reinforced by noting that investors will discount their (mean) ending wealth values from an investment back to the present using the arithmetic mean, for the reason given above. They will therefore require such an expected (mean) return prospectively (that is, in the present looking toward the future) to commit their capital to the investment. (Stocks, Bonds, Bills and Inflation - 1996 Yearbook, pages 153-154)

For the CAPM, a market premium of 8.30% (6.5% + 10.10% = 16.60% + 2) would be

reasonable which is the average of the 6.5% using historical data and a market premium of 10.10% using forecasts.

APPENDIX I TO DIRECT TESTIMONY OF PAUL R. MOUL

COMPARABLE EARNINGS APPROACH

Value Line's analysis of the companies that it follows includes a wide range of financial and market variables, including nine items that provide ratings for each company. From these nine items, one category has been removed dealing with industry performance because, under approach employed, the particular business type is not significant. In addition, two categories have been ignored that deal with estimates of current earnings and dividends because they are not useful for comparative purposes. The remaining six categories provide relevant measures to establish comparability. The definitions for each of the six criteria (from the Value Line Investment Survey - Subscriber Guide) follow:

Timeliness Rank

> The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

> A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating an ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies.

Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average)will probably advance or decline with the market. Investors ~,;hould use the Technical and Timeliness Ranks as complements; to one another.