State of Florida

Public Service Commission

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DATE: JUNE 4, 1998

TO: DIRECTOR, DIVISION OF RECORDS AND REPORTING (BAYÓ)

FROM: DIVISION OF AUDITING AND FINANCIAL ANALYSIS (LESTER, DRAPER)
DIVISION OF WATER AND WASTEWATER (KYLE, MERCHANT)
DIVISION OF LEGAL SERVICES (VACCARO)

RE: DOCKET NO. 980006-WS - WATER AND WASTEWATER INDUSTRY - ANNUAL REESTABLISHMENT OF AUTHORIZED RANGE OF RETURNS ON COMMON EQUITY OF WATER AND WASTEWATER UTILITIES; PURSUANT TO SECTION 367.081(4)(f), FLORIDA STATUTES.

AGENDA: 06/16/98 - REGULAR AGENDA - PROPOSED AGENCY ACTION - INTERESTED PERSONS MAY PARTICIPATE

CRITICAL DATES: FINAL DECISION BY THE END OF 1998

SPECIAL INSTRUCTIONS: NONE

FILE NAME AND LOCATION: S:\PSC\AFA\WP\980006.RCM

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DISCUSSION OF ISSUES

ISSUE 1: What is the appropriate range of returns on common equity for water and wastewater utilities pursuant to Section 367.081(4)(f), Florida Statutes?

RECOMMENDATION: Staff recommends that the Commission continue with the current leverage formula. Based on the current range of returns on equity authorized by the Commission for other regulated utilities, the 9.21% to 10.46% range of returns indicated by the current leverage formula approved in Order No. PSC-97-0660-FOF-WS, issued June 10, 1997, in Docket No. 970006-WS, is still reasonable for WAW utilities.

The current formula is:

Return on Common Equity = 8.38% + 0.832/Equity Ratio where the

Equity Ratio = Common Equity / (Common Equity + Preferred Equity + Long-Term and Short-Term Debt)

Staff further recommends that the Commission limit the authorized return on common equity (ROE) to a maximum of 10.46% for all equity ratios of less than 40% to discourage imprudent financial risk. (LESTER, DRAPER)

STAFF ANALYSIS: Section 367.081(4)(f), Florida Statutes, authorizes the Commission to establish a leverage formula to calculate a reasonable range of returns on equity for water and wastewater (WAW) utilities. The Commission should establish this leverage formula not less than once a year.

The Commission last established the WAW leverage formula in Order No. PSC-97-0660-FOF-WS, and staff believes that this leverage formula is still appropriate. The Commission has not changed the allowed return for any telephone, natural gas, or electric utility in the past 18 months. Only one ROE decision was rendered in 1996. In Order No. PSC-96-1404-FOF-GU, issued November 20, 1996, in Docket No. 960502-GU, the Commission maintained the same ROE of 11.3% approved in the previous rate case in Order No. PSC-94-1570-FOF-GU, issued December 19, 1994, in Docket No. 940276-GU. Only two ROE decisions were rendered in 1995. In Order No. PSC-95-0518-FOF-GU, issued April 26, 1995, in Docket No. 940620-GU, the Commission approved an increase in the ROE for Florida Public Utilities Company from 11.0% to 11.4%. In Order No. PSC-95-0580-FOF-EI, issued May 10, 1995, in Docket No. 950379-EI, the Commission approved an increase in the ROE for Tampa Electric Company from 11.35% to 11.75%.

In staff's opinion, the range of returns of 9.21% to 10.46% indicated by the current leverage formula is still reasonable for WAW utilities. Staff believes the current authorized leverage formula should remain in effect because it produces results that are consistent with the currently authorized ROEs ranging from 11.0% to 12.0% in the electric and gas industries. Therefore, staff recommends that the Commission continue with the current leverage formula for determining the allowed returns for WAW utilities.

Staff has recommended the leverage formula remain unchanged from one year to the next on three previous occasions. In Order No. PSC-93-1107-FOF-WS, issued July 29, 1993, in Docket No. 930006-WS, the Commission denied staff's recommendation and approved the updated version of the leverage formula. In Order No. PSC-96-0729-FOF-WS, issued May 31, 1996, in Docket No. 960006-WS, the Commission approved staff's recommendation to leave the allowed leverage formula in place. Last year, the Commission denied staff's recommendation and approved an updated leverage formula by Order No. PSC-97-0660-FOF-WS.

Though staff recommends the current leverage formula remain in place, staff has provided, in the attached schedules, the most current information available for determining an updated leverage formula. The determination of an updated leverage formula results in the following formula:

<u>Updated Leverage Formula for 1998</u>

Return on Common Equity = 7.72% + .952/Equity Ratio

The above formula produces a range of 8.67% to 10.10%. The midpoint of the updated range represents a decrease of 45 basis points when compared to the midpoint of the current range.

In developing the updated leverage formula, staff relied on the same methodologies used in the leverage formula docket since 1995. In Docket No. 950006-WS, following two workshops on the leverage formula, the Commission revised the methodology for calculating the leverage formula. The difference between the existing leverage formula and the updated formula is the result of changes in underlying market conditions; that is, changes in bond yields and required rates of return.

The basic assumptions remain unchanged from the previous three years and are as follows:

1) Business risk is similar for all WAW utilities.
2) The cost of equity is an exponential function of the equity ratio.

3) The marginal weighted average cost of investor capital is constant over the 40% to 100% equity ratio range.
4) The cost rate at an assumed Moody's Baa3 bond rating, plus 25 basis points, represents the average marginal cost of debt to a Florida WAW utility over a 40% to 100% equity ratio range.

In the leverage formula, the 10.10% return on common equity can be divided into three segments. First, a 9.15% ROE is derived by averaging the results of two Discounted Cash Flow (DCF) analyses, a Risk Premium analysis, and a Capital Asset Pricing Model (CAPM) analysis. Staff assigned or› third weight to the average of the two DCF analyses, one third weight to the Risk Premium analysis, and one third weight to the CAPM analysis.

The DCF models are applied to an index of publicly traded WAW utilities. The difference between the two applications is one version relies on historical growth rates and the other version relies on projected growth rates. Before 1995, only a DCF analysis using historical growth rates was used because of a lack of projected financial information on publicly traded WAW utilities. (See pages 3-4 of Attachment 1)

Staff has added one refinement in calculating the historical DCF result. In the past, the result was the simple average of the calculated returns on equity for the six companies in the index. In calculating the current historical DCF result, staff used a weighted average weighted by market capitalization. This provides a result more closely related to the stock market.

The Risk Premium model is applied to an index of publicly traded natural gas utilities. For past risk premium analyses, and for calculation of the current leverage formula, staff adjusted the leverage formula to reflect the difference in risk between WAW utilities and natural gas utilities. Staff calculated this adjustment using the difference between the average beta of the WAW and natural gas indices and the prospective market risk premium determined in staff's CAPM analysis. This adjustment is made to compensate for the perceived difference in risk between the index of natural gas utilities and the index of WAW utilities.

The Commission noted in Order No. PSC-95-0982-FOF-WS, issued August 10, 1995, in Docket No. 950006-WS, that this adjustment could be negative in the future if the average beta for the natural gas index were to rise above the average beta for the WAW index, and once this change was adopted, this adjustment would be made whether the risk differential adjustment was positive or negative. The average beta for the natural gas index has risen above the average beta for the WAW index. This makes the adjustment negative whereas it was positive when the Commission initiated it. Staff believes the Commission should no longer make this adjustment. The original intent of the adjustment was to allow for the increased risk of WAW utilities compared to natural gas utilities. Since the current betas for each index do not indicate WAW utilities are riskier, the adjustment should be dropped. Therefore, as presented on Attachment 1, page 1 of 10, staff did not make this risk differential adjustment.

Finally, a CAPM analysis is performed. This return is based on the market return for all dividend-paying stocks followed by Value Line, the yield on the 30 year Treasury bond projected by Blue Chip Financial Forecasts, and the average beta of the WAW utilities followed by Value Line. (See page 6 of Attachment 1)

After the ROE for the indices is determined, a bond yield differential adjustment of 45 basis points is added to reflect the difference in risk between the indices of companies used in the DCF and Risk Premium models and an average WAW utility in Florida. Next, a private placement premium of 25 basis points is added to recognize that Florida WAW utilities do not have access to the public debt and equity markets. Finally, an adjustment of 25 basis points is added to reflect the required return on equity at a 40% equity ratio. (See page 1 of Attachment 1)

The bond yield differential adjustment of 45 basis points is comprised of the bond yield differential between the yield on A1-rated bonds and the yield on Baa3-rated bonds. (See page 8 of Attachment 1) The A1 rating is the average bond rating for both the natural gas index and WAW index and the Baa3 rating is the bond rating assumed for the average WAW utility in Florida. Baa3 is the lowest possible rating for investment grade bonds.

The private placement premium of 25 basis points is added to recognize that, because of their small size, a lack of institutional interest in their securities, and the lack of liquidity of their issues, Florida WAW utilities must rely on the private placement market to obtain capital. This premium is based on the results of surveys of participants in the private placement market conducted by staff and a review of the financial literature.

The final 25 basis point adjustment represents the difference between the required ROE at a 40.0% equity ratio and the required return at the average equity ratio for the indices of WAW utilities and natural gas utilities of 44.57%. (See pages 9-10 of Attachment 1) Using the most recently available capital structure for the index of publicly traded WAW utilities and the index of natural gas utilities as a proxy for the capital structure of an average WAW utility in Florida, staff calculates the marginal cost of investor capital for an average WAW utility in Florida to be 8.67%.

In summary, staff recommends the authorized range of allowed ROEs for WAW utilities remain unchanged based on the following formula:

Return on Common Equity = 8.38% + 0.832/Equity Ratio

We further recommend the authorized ROE be limited to a maximum of 10.46% for all equity ratios of less than 40%. This leverage formula maintains the range of returns approved in Order No. PSC-97-0660-FOF-WS.

ISSUE 2: Should this docket be closed?

RECOMMENDATION: No, upon expiration of the protest period, this docket should remain open. (VACCARO)

STAFF ANALYSIS: Upon expiration of the protest period, if a timely protest is not received, this docket should remain open. This will allow staff to monitor the movement in capital costs and to readdress the reasonableness of the leverage formula as conditions warrant.

SUMMARY OF RESULTS

Leverage Formula Update

	1996	1997	1998
(A) DCF ROE for Water Index (Historical)	10.32%	9.28%	9.96%[1]
(B) DCF ROE for Water Index (Projected)	9.13%	8.66%	8.39%
(C) Risk Premium ROE for Gas Index	9.57%	9.52%	8.80%
(D) Gas Index premium	.44%	(.24)%	- [2] -
(E) CAPM ROE for Water Index	10.17%	10.23%	9.46%
AVERAGE [(((A+B)/2)+(C+D)+E)/3]	9.97%	9.49%	9.15%
Bond Yield Differential	.49%	.49%	.45%
Private Placement Premium	.25%	.25%	.25%
Adjustment to Reflect Required Equity Return at a 40% Equity Ratio	.29%	.23%	.25%
Cost of Equity for Average Florida WAW Utility at a 40% Equity Ratio	11.00%	10.46%	10.10%

1997 Leverage Formula (Currently in effect)

Return on Common Equity = 8.38% + .832/ER

Range of Returns on Equity = 9.21% - 10.46%

1998 Leverage Formula (Updated)

Return on Common Equity = 7.72% + .952/ER

Range of Returns on Equity = 8.67% - 10.10%

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[1] 1998 DCF ROE for Water Index calculated using historical data weighted by Market Capitalization amounts listed in Value Line.

[2] Gas Index premium discontinued due to its negative effect on ROE

Marginal Cost of Investor Capital

Average Water and Wastewater Utility

Capital Component	Ratio	Marginal Cost Rate	Weighted Marginal Cost Rate
Common Equity	44.57%	9.85%	4.39%
Total Debt	55.43%	7.72% *	4.28%
	100.00%		8.67%

A 40% equity ratio is the floor for calculating the required return on common equity. The return on equity at a 40% equity ratio = 7.72% + 0.952/.40 = 10.10%

Marginal Cost of Investor Capital

Average Water & Wastewater Utility at 40% Equity Ratio

Capital Component	Ratio	Marginal Cost Rate	Weighted Marginal Cost Rate
Common Equity	40.00%	10.10%	4.04%
Total Debt	60.00%	7.72% *	4.63%
	100.00%		8.67%

Where: ER = Equity Ratio = Common Equity/(Common Equity + Preferred Equity + Long-Term Debt + Short-Term Debt)

* Assumed Baa3 rate for April 1998 plus a 25 basis point private placement premium.

Source: Moody's Credit Perspectives, 5/04/98

	Annual Rate of Change	D(1)	Current Avg. Stock Price	Reqd. ROE		Market Capital (Mil.)	Weighted ROE
American Water Works	9.50%	$0.90	$30.66	12.17%		$2400	6.80%
Aquarion Company	1.50	1.67	32.50	6.55		225	0.34
California Water Ser. Co.	4.00	1.11	27.53	7.89		325	0.60
Consumers Water Co.	3.50	1.26	20.45	9.46		175	0.39
Philadelphia Sub. Corp.	2.50	0.67	21.03	5.59		550	0.72
United Water Resources	2.50	0.94	17.47	7.77		625	1.13
Average	3.92%	$1.09	$24.94	8.24%	Total	$4300	9.96%

DCF Analysis:

K	= D(1)/P(0) + g = Investors' required rate of return
D(1)	= Current Dividend 1998 x g
P(0)	= Current stock price = April 1998 average stock price
g	= Historical growth in dividends = Annual Rate of Change - Past 10 years.

Source: Standard & Poor's Stock Guide, May 1998; Current Dividend, Stock Price
Value Line 5/8/98; Annual Rate of Change, Market Capital

COST OF EQUITY FOR WATER INDEX COMPANIES

DISCOUNTED CASH FLOW MODEL

COST OF EQUITY

INDEX: VALUE LINE WATER UTILITY INDUSTRY

YEAR: 1998 Quarter: 1st

COMPANY	DIV1	DIV2	DIV3	DIV4	EPS4	ROE4	GR1-4	GR4+	APRIL HI-PR	APRIL LO-PR	AVER-PR
AMERICAN WATER WORKS	0.82	0.90	1.00	1.10	2.20	12.00	1.1029	1.0600	33.188	28.125	30.656
AQUARION CO.	1.65	1.71	1.78	1.85	2.45	12.00	1.0389	1.0294	33.875	31.125	32.500
CALIFORNIA WATER SVC	1.10	1.19	1.29	1.40	2.00	13.50	1.0837	1.0405	30.188	24.875	27.531
CONSUMERS WATER	1.22	1.23	1.23	1.24	1.50	9.50	1.0054	1.0185	21.406	19.500	20.453
PHILADELPHIA SUBURBAN	0.65	0.72	0.81	0.90	1.35	12.00	1.1148	1.0400	22.563	19.500	21.031
UNITED WATER RESOURCES	0.92	0.95	0.97	1.00	1.35	10.50	1.0282	1.0272	18.438	16.500	17.469
AVERAGE	1.0600	1.1167	1.1806	1.2483	1.81	11.5833	1.0623	1.0356			24.940

$24.19 = April 1998 average stock price less 3% flotation costs, or Po(1-fc)

8.39% = Cost of equity required to match the current stock price with the expected cash flows

Sources:
1. Stock Prices - S&P Stock Guide , May 1998 Edition
2. DPS, EPS, ROE - Value Line Edition 9, February 6, 1998.

Risk Premium Cost of Equity for Moody's Natural Gas
Distribution Index

Estimated Monthly Risk Premium	2.902 %	(1)
Blue Chip Forecast for 30-Year Treasury Bond	5.90 %	(2)
	8.80 %	

Sources:

(1) Page 8 of Attachment 1

(2) Blue Chip Financial Forecasts, May 1, 1998

Capital Asset Pricing Model Cost of Equity for
Water and Wastewater Industry

CAPM analysis formula

K = RF + Beta(MR - RF)

K = Investor's required rate of return

RF = Risk-free rate (Blue Chip forecast for 30-year Treasury bond)

Beta = Measure of industry-specific risk (Average for water utilities followed by Value Line)

MR = Market return

9.46% = 5.90% + .59(11.94% - 5.90%)

Source: Blue Chip Financial Forecasts, May 1, 1998
Value Screen, May 1998

BOND YIELD DIFFERENTIALS
Public Utility Long Term Bond Yield Averages
Source: Moody's Credit Perspectives

YEAR	MONTH	Aaa	SPREAD	Aa1	SPREAD	Aa2	SPREAD	Aa3	SPREAD	A1	SPREAD	A2	SPREAD	A3	SPREAD	Baa1	SPREAD	Baa2	SPREAD	Baa3
120 Month Average -			[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
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1996	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEPT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JULY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1994	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	APR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	FEB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1990	JAN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	DEC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	NOV	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	OCT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	AUG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	JUN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	MAY	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Docket No. 980006-WS
Date: June 4, 1998

ESTIMATED MONTHLY RISK PREMIUMS
MOODY'S NAT'L GAS DISTRIBUTION INDEX
1979 - 1998

YEAR	MONTH	Quarterly Cost of Equity Gas	Annual Cost of Equity Gas	Risk Free Rate	Risk Premium Quarterly	Risk Premium Annual
	OCT	8.813	8.875	5.99	2.823	2.885
	NOV	8.843	8.693	5.93	2.913	2.763
	DEC	9.136	8.968	6.21	2.926	2.758
1994	JAN	9.133	8.960	6.24	2.893	2.720
	FEB	8.805	8.632	6.28	2.525	2.352
	MAR	8.885	8.721	6.49	2.395	2.231
	APR	9.126	8.965	6.90	2.226	2.065
	MAY	9.431	9.232	7.25	2.181	1.982
	JUN	9.560	9.361	7.40	2.160	1.961
	JUL	9.737	9.553	7.39	2.347	2.163
	AUG	9.723	9.514	.57	2.153	1.944
	SEP	9.802	9.599	7.48	2.322	2.119
	OCT	9.921	9.727	7.69	2.231	2.037
	NOV	9.813	9.618	7.93	1.883	1.688
	DEC	10.198	9.972	8.07	2.128	1.902
1995	JAN	10.342	10.124	7.86	2.482	2.264
	FEB	10.071	9.831	7.83	2.241	2.001
	MAR	9.891	9.677	7.60	2.291	2.077
	APR	9.865	9.669	7.44	2.425	2.229
	MAY	9.226	9.036	7.35	1.876	1.686
	JUNE	9.888	9.679	6.93	2.958	2.749
	JULY	9.858	9.667	6.57	3.288	3.097
	AUGUST	9.885	9.656	6.71	3.175	2.946
	SEPT	9.956	9.738	6.85	3.106	2.888
	OCT	9.502	9.323	6.55	2.952	2.773
	NOV	9.573	9.393	6.37	3.203	3.023
	DEC	9.622	9.431	6.25	3.372	3.181
1996	JAN	9.788	9.603	6.06	3.728	3.543
	FEB	9.216	9.032	6.05	3.166	2.982
	MAR	9.255	9.085	6.24	3.015	2.845
	APR	9.389	9.227	6.60	2.789	2.627
	MAY	9.748	9.555	6.79	2.958	2.765
	JUN	9.816	9.636	6.92	2.896	2.716
	JUL	9.710	9.552	7.05	2.660	2.502
	AUG	10.158	9.957	7.03	3.128	2.927
	SEP	9.984	9.810	6.84	3.144	2.970
	OCT	10.241	10.072	7.02	3.221	3.052
	NOV	9.930	9.760	6.80	3.130	2.960
	DEC	9.781	9.616	6.48	3.301	3.136
1997	JAN	9.894	9.741	6.55	3.344	3.191
	FEB	9.768	9.575	6.82	2.948	2.755
	MAR	9.838	9.658	6.68	3.158	2.978
	APR	9.932	9.766	6.83	3.102	2.936
	MAY	10.357	10.148	7.08	3.277	3.068
	JUN	10.199	10.018	6.93	3.269	3.088
	JUL	10.056	9.901	6.77	3.286	3.131
	AUG	10.107	9.920	6.51	3.597	3.410
	SEP	10.124	9.955	6.57	3.554	3.385
	OCT	10.010	9.865	6.49	3.520	3.375
	NOV	10.032	9.869	6.32	3.712	3.549
	DEC	9.725	9.576	6.10	3.625	3.476
1998	JAN	9.693	9.563	5.98	3.713	3.583
	FEB	9.529	9.371	5.81	3.719	3.561
	MAR	9.638	9.493	5.88	3.758	3.613
	APR	9.662	9.533	5.95	3.712	3.583
	MAY	9.600	9.443	5.92	3.680	3.523
	AVERAGE RISK PREMIUM				2.864	2.637

UPDATED: 05/18/98

SOURCE: Value Line 1979-1998
Moody's Bond Survey
U.S. Treasuries - 30-Year Bond

Natural Gas Index

12/31/97 Equity Ratios of Water Index Companies

	Book Value Per Share	Common Shares Outstanding (millions)	Common Equity (millions)	Total Debt (millions)	Preferred Equity (millions)	Equity Ratio
American Water Works	$14.31	$79.99	$1,144.70	$2,030.70	$98.00	34.97%
Aquarion Company	$18.26	$7.33	$133.90	$165.40	$0.00	44.73%
California Water Service Co.	$13.00	$12.62	$164.00	$151.70	$3.50	51.39%
Consumers Water Company	$12.11	$8.99	$108.90	$196.60	$1.10	35.52%
Philadelphia Suburban Corp.	$7.39	$27.50	$203.20	$249.60	$2.80	44.60%
United Water Resource	$11.53	$36.29	$418.50	$705.60	$95.60	34.31%
					Average	40.92%

Date Common Shares Outstanding was determined by Value Line

American Water Works	03/08/98
Consumers Water Company	03/11/98
Philadelphia Suburban Corp.	03/02/98
All Others	12/31/97

Source: Value Line Investment Survey, Edition 9 - May 8, 1998

12/31/97 Equity Ratios of Natural Gas Index Companies

	Book Value Per Share	Common Share Outstanding (millions)	Common Equity (millions)	Total Debt (millions)	Preferred Equity (millions)	Equity Ratio
Atlanta Gas & Light	$10.99	$56.46	$620.50	$810.50	$118.80	40.04%
Bay State Gas	$17.35	$13.52	$234.60	$329.00	$4.90	41.27%
KeySpan Energy Corp.	$19.09	$51.16	$976.60	$800.40	$0.00	54.96%
Indiana Energy	$12.96	$22.59	$292.80	$241.00	$0.00	54.85%
Laclede Gas	$14.26	$17.59	$250.90	$306.60	$2.00	44.84%
Northwest Natural Gas	$16.00	$22.78	$364.50	$401.30	$37.40	45.38%
Peoples Energy	$20.43	$35.23	$719.70	$587.50	$0.00	55.06%
Washington Gas & Light	$13.48	$43.64	$588.20	$574.20	$28.40	49.40%
					Average	48.22%

<u>Date Common Shares Outstanding was determined by Value Line</u>

Laclede Gas	02/11/98
Northwest Natural Gas	11/07/97
Peoples Energy	01/31/98
All Others	12/31/97

Source: Value Line Investment Survey, Edition 9 - May 8, 1998