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IN THE MATTER OF THE APPLICATION OF VALLEY UTILITIES WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR AN INCREASE IN ITS RATES AND CHARGES FOR UTILITY SERVICE BASED THEREON.

DOCKET NO. W-01412A-12-0195

NOTICE OF FILING STAFF'S DIRECT TESTIMONIES

The Utilities Division ("Staff") of the Arizona Corporation Commission ("Commission") hereby files Direct Testimonies of John Cassidy and Marlin Scott, Jr., for the cost-of-capitol and engineering testimony only. Staff will file the Direct Testimony of Brendan Aladi regarding revenue requirement and rate design on January 8, 2013.

RESPECTFULLY SUBMITTED this 7th day of January, 2013.

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Arizona Corporation Commission
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Original and thirteen (13) copies of the foregoing filed this 7th day of January, 2013, with:

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Arizona Corporation Commission
DOCKETED
JAN 07 2013
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Copy of the foregoing mailed this 7th day of January, 2013, to:

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Roseann Osorio

BEFORE THE ARIZONA CORPORATION COMMISSION

BOB STUMP
Chairman
GARY PIERCE
Commissioner
BRENDA BURNS
Commissioner
BOB BURNS
Commissioner
SUSAN BITTER-SMITH
Commissioner

IN THE MATTER OF THE APPLICATION OF VALLEY UTILITIES WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR AN INCREASE IN ITS RATES AND CHARGES FOR UTILITY SERVICE BASED THEREON.	)	DOCKET NO. W-01412A-12-0195

DIRECT
TESTIMONY
OF

JOHN A. CASSIDY

PUBLIC UTILITIES ANALYST
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION

JANUARY 7, 2013

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SCHEDULES

EXECUTIVE SUMMARY
VALLEY UTILITIES WATER COMPANY, INC.
DOCKET NO. W-01412A-12-0195

The direct testimony of Staff witness John A. Cassidy addresses the following issues:

Capital Structure – Staff recommends that the Commission adopt a capital structure for Valley Utilities Company ("Company") for this proceeding consisting of 87.1 percent debt and 12.9 percent equity.

Cost of Equity – Staff recommends that the Commission adopt a 9.4 percent return on equity ("ROE") for the Company. Staff's estimated ROE for the Company is based on the average of its discounted cash flow method ("DCF") and capital asset pricing model ("CAPM") cost of equity methodology estimates for the sample companies of 8.8 percent for the CAPM and 8.8 percent for DCF. Staff's recommended ROE includes an upward economic assessment adjustment of 60 basis points.

Cost of Debt – Staff recommends that the Commission adopt a 5.8 percent cost of debt for the Company.

Overall Rate of Return – Staff recommends that the Commission adopt a 6.2 percent overall rate of return.

Mr. Jones' Testimony – The Commission should reject the Company's proposed 11.0 percent ROE for the following reasons:

> Mr. Jones' proposed cost of equity is not supported by any formal market based cost of equity estimation analysis, and inappropriately includes a significant risk premium intended to compensate the Company for a deteriorating financial condition, negative cash flow and a highly leveraged capital structure.

I. INTRODUCTION

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

A. My name is John A. Cassidy. I am a Public Utilities Analyst employed by the Arizona Corporation Commission ("Commission") in the Utilities Division ("Staff"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Briefly describe your responsibilities as a Public Utilities Analyst.

A. I am responsible for the examination of financial and statistical information included in utility rate applications and other financial matters, including studies to estimate the cost of capital component in rate filings used to determine the overall revenue requirement, and for preparing written reports, testimonies and schedules to present Staff's recommendations to the Commission on these matters.

Q. Please describe your educational background and professional experience.

A. I hold a Bachelor of Arts degree in History from Arizona State University, a Master of Library Science degree from the University of Arizona, and an MBA degree with an emphasis in Finance from Arizona State University. While pursuing my MBA degree, I was inducted into Beta Gamma Sigma, the National Business Honor Society. I have passed the CPA exam, but opted not to pursue certification. I have worked professionally as a librarian, financial consultant, tax auditor, and, as a former Commission employee, served as Staff's cost of capital witness in rate case evidentiary proceedings.

Q. What is the scope of your testimony in this case?

A. My testimony provides Staff's recommended capital structure, return on equity ("ROE") and overall rate of return ("ROR") for establishing the revenue requirements for Valley

Utilities Water Company's ("Valley Utilities" or "Company") pending rate case application.

Summary of Testimony and Recommendations

Q. Briefly summarize how Staff's cost of capital testimony is organized.

A. Staff's cost of capital testimony is presented in eleven sections. Section I is this introduction. Section II discusses the concept of weighted average cost of capital ("WACC"). Section III presents the concept of capital structure and presents Staff's recommended capital structure for Valley Utilities in this proceeding. Section IV presents Staff's cost of debt for Valley Utilities. Section V discusses the concepts of ROE and risk. Section VI presents the methods employed by Staff to estimate Valley Utilities' ROE. Section VII presents the findings of Staff's ROE analysis. Section VIII presents Staff's final cost of equity estimates for Valley Utilities. Section IX presents Staff's ROR recommendation. Section X presents Staff's comments on the direct testimony of the Company's witness, Mr. Ray L. Jones. Finally, section XI presents the conclusions.

Q. Have you prepared any exhibits to accompany your testimony?

A. Yes. I prepared ten schedules (JAC-1 to JAC-9) that support Staff's cost of capital analysis.

Q. What is Staff's recommended rate of return ("ROR") for Valley Utilities?

A. Staff recommends a 6.2 percent overall ROR, as shown in Schedule JAC-1. Staff's ROR recommendation is based on cost of equity estimates for the sample companies of 8.8 percent for both the capital asset pricing method ("CAPM") and the discounted cash flow method ("DCF"). Staff recommends adoption of a 60 basis point upward Economic Assessment Adjustment, resulting in a 9.4 percent return on equity.

Valley Utilities' Proposed Overall Rate of Return

Q. Briefly summarize Valley Utilities' proposed capital structure, cost of debt, ROE and overall ROR for this proceeding.

A. Table 1 summarizes the Company's proposed capital structure, cost of debt, ROE and overall ROR in this proceeding:

Table 1

	Weight	Cost	Weighted Cost
Long-term Debt	87.11%	5.778%	5.034%
Common Equity	12.89%	11.0%	1.418%
Cost of Capital/ROR			**6.451%**

Valley Utilities is proposing an overall rate of return of 6.451 percent.

II. THE WEIGHTED AVERAGE COST OF CAPITAL

Q. Briefly explain the cost of capital concept.

A. The cost of capital is the opportunity cost of choosing one investment over others with equivalent risk. In other words, the cost of capital is the return that stakeholders expect for investing their financial resources in a determined business venture over another business venture.

Q. What is the overall cost of capital?

A. The cost of capital to a company issuing a variety of securities (i.e., stock and indebtedness) is an average of the cost rates on all issued securities adjusted to reflect the relative amounts for each security in the company's entire capital structure. Thus, the overall cost of capital is the WACC.

Q. How is the WACC calculated?

A. The WACC is calculated by adding the weighted expected returns of a firm's securities. The WACC formula is:

Equation 1.

$$WACC = \sum_{i=1}^{n} W_i * r_i$$

In this equation, W_i is the weight given to the i^{th} security (the proportion of the i^{th} security relative to the portfolio) and r_i is the expected return on the i^{th} security.

Q. Can you provide an example demonstrating application of Equation 1?

A. Yes. For this example, assume that an entity has a capital structure composed of 60 percent debt and 40 percent equity. Also, assume that the embedded cost of debt is 6.0 percent and the expected return on equity, i.e., the cost of equity, is 10.5 percent. Calculation of the WACC is as follows:

$WACC = (60\% * 6.0\%) + (40\% * 10.5\%)$

$WACC = 3.60\% + 4.20\%$

$WACC = 7.80\%$

The weighted average cost of capital in this example is 7.80 percent. The entity in this example would need to earn an overall rate of return of 7.80 percent to cover its cost of capital.

III. CAPITAL STRUCTURE

Background

Q. Please explain the capital structure concept.

A. The capital structure of a firm is the relative proportions of each type of security:--short-term debt, long-term debt (including capital leases), preferred stock and common stock--that are used to finance the firm's assets.

Q. How is the capital structure expressed?

A. The capital structure of a company is expressed as the percentage of each component of the capital structure (capital leases, short-term debt, long-term debt, preferred stock and common stock) relative to the entire capital structure.

As an example, the capital structure for an entity that is financed by $20,000 of short-term debt, $85,000 of long-term debt (including capital leases), $15,000 of preferred stock and $80,000 of common stock is shown in Table 2.

Table 2

Component			%
Short-Term Debt	$20,000	($20,000/$200,000)	10.0%
Long-Term Debt	$85,000	($85,000/$200,000)	42.5%
Preferred Stock	$15,000	($15,000/$200,000)	7.5%
Common Stock	$80,000	($80,000/$200,000)	40.0%
Total	$200,000		100%

The capital structure in this example is composed of 10.0 percent short-term debt, 42.5 percent long-term debt, 7.5 percent preferred stock and 40.0 percent common stock.

Valley Utilities' Capital Structure

Q. What capital structure does Valley Utilities propose?

A. The Company proposes a capital structure composed of 87.11 percent debt and 12.89 percent common equity. Valley Utilities' proposed capital structure reflects the Company's actual capital structure as of the December 31, 2011 test-year end date.

Q. How does Valley Utilities' capital structure compare to capital structures of publicly-traded water utilities?

A. Schedule JAC-4 shows the capital structures of six publicly-traded water companies ("sample water companies" or "sample water utilities") as of December 2011. The average capital structure for the sample water utilities is comprised of approximately 51.6 percent debt and 48.4 percent equity.

Staff's Capital Structure

Q. What is Staff's recommended capital structure for Valley Utilities?

A. Staff recommends a capital structure composed of 87.1 percent debt and 12.9 percent equity, and reflects the Company's actual capital structure as of the December 31, 2011, test year end.. Staff's recommended capital structure is identical to that proposed by the Company, the only difference being that Staff rounds to one digit (i.e., tenths) while the Company rounds to two digits (i.e., hundredths).

IV. COST OF DEBT

Q. What is the basis for the Company's proposed 5.778 percent cost of debt?

A. The proposed 5.778 percent cost of debt represents the Company's embedded cost of long-term debt. At present, Valley Utilities has two WIFA loans outstanding, one having

a principal balance of $1,540,318 at an interest rate of 5.775 percent, and the other having a principal balance of $229,773 at an interest rate of 5.80 percent.

V. RETURN ON EQUITY

Background

Q. Please define the term "cost of equity capital."

A. The cost of equity is the rate of return that investors expect to earn on their investment in a business entity given its risk. In other words, the cost of equity to the entity is the investors' expected rate of return on other investments of similar risk. As investors have a wide selection of stocks to choose from, they will choose stocks with similar risks but higher returns. Therefore, the market determines the entity's cost of equity.

Q. Is there a correlation between interest rates and the cost of equity?

A. Yes, there is a positive correlation between interest rates and the cost of equity, as the two tend to move in the same direction. This relationship is reflected in the CAPM formula. The CAPM is a market-based model employed by Staff for estimating the cost of equity. The CAPM is further discussed in Section VI of this testimony.

Q. What has been the general trend of interest rates in recent years?

A. A chronological chart of interest rates is a good tool to show interest rate history and identify trends. Chart 1 graphs intermediate U.S. treasury rates from January 18, 2002, to January 27, 2012.

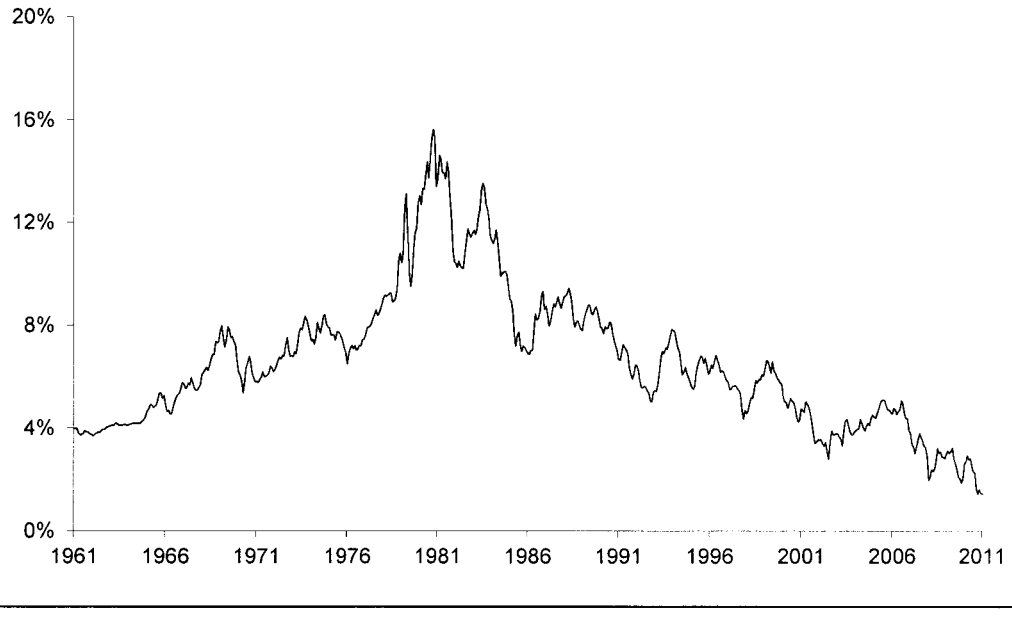
Chart 1: Average Yield on 5-, 7-, & 10-Year Treasuries

Chart 1 shows that intermediate-term interest rates trended downward from 2002 to mid-2003, trended upward through early-2008, trended downward through early-2009, trended upward through mid-2010, trended downward through late 2010, trended upward to mid-2011, and are currently trending down from the existing, relatively low rates.

Q. What has been the general trend in interest rates longer term?

A. U.S. Treasury rates from December 1961 - December 2011 are shown in Chart 2. The chart shows that interest rates trended upward through the mid-1980s and have trended downward over the last 25 years.

Chart 2: History of 5- and 10-Year Treasury Yields



Source: Federal Reserve

Q. Do these trends suggest anything in terms of cost of equity?

A. Yes. As previously noted, interest rates and cost of equity tend to move in the same direction; therefore, the cost of equity has declined in the past 25 years.

Q. Do actual returns represent the cost of equity?

A. No. The cost of equity represents investors' *expected* returns and not realized returns.

Q. Is there any information available that leads to an understanding of the relationship between the equity returns required for a regulated water utility and those required in the market as a whole?

A. Yes. A comparison of betas, a component of the CAPM discussed in Section VI, for the water utility industry and the market provide insight into this relationship. In theory, the market has a beta value of 1.0, with stocks bearing greater risk (less risk) than the market having beta values higher than (lower than) 1.0, respectively. Furthermore, in accordance with the CAPM, the cost of equity capital moves in the same direction as beta. Therefore, because the average beta value (0.71)[1] for a water utility is less than 1.0, the required return on equity for a regulated water utility is below that of the market as a whole.

Risk

Q. Please define risk in relation to cost of capital.

A. Risk, as it relates to an investment, is the variability or uncertainty of the returns on a particular security. Investors are risk averse and require a greater potential return to invest in relatively greater risk opportunities, i.e., investors require compensation for taking on additional risk. Risk is generally separated into two components. Those components are market risk (systematic risk) and non-market risk (diversifiable risk or firm-specific risk).

Q. What is market risk?

A. Market risk or systematic risk is the risk of an investment that cannot be reduced through diversification. Market risk stems from factors that affect all securities, such as recessions, war, inflation and high interest rates. Since these factors affect the entire market they cannot be eliminated through diversification. Market risk does not impact

[1] See Schedule JAC-7.

each security to the same degree. The degree to which a given security's return is affected by market fluctuations can be measured using Beta. Beta reflects the business risk and the financial risk of a security.

Q. Please define business risk.

A. Business risk is the fluctuation of earnings inherent in a firm's operations and environment, such as competition and adverse economic conditions that may impair its ability to provide returns on investment. Companies in the same or similar line of business tend to experience the same fluctuations in business cycles.

Q. Please define financial risk.

A. Financial risk is the fluctuation of earnings, inherent in the use of debt financing, that may impair a firm's ability to provide adequate return; the higher the percentage of debt in a company's capital structure, the greater its exposure to financial risk.

Q. Do business risk and financial risk affect the cost of equity?

A. Yes.

Q. Is a firm subject to any other risk?

A. Yes. Firms are also subject to unsystematic or firm-specific risk. Examples of unsystematic risk include losses caused by labor problems, nationalization of assets, loss of a big client or weather conditions. Investors can eliminate firm-specific risk by holding a diverse portfolio; thus, it is not of concern to diversified investors.

Q. How does Valley Utilities' financial risk exposure compare to that of Staff's sample group of water companies?

A. JAC-4 shows the capital structures of the six sample water companies as of December 31, 2011, and Valley Utilities' adjusted capital structure as of the end of the test year, December 31, 2011. As shown, the sample water utilities were capitalized with approximately 51.6 percent debt and 48.4 percent equity, while Valley Utilities' capital structure consists of 87.1 percent debt and 12.9 percent equity. Thus, because Valley Utilities' capital structure is more highly leveraged than the capital structures of Staff's sample companies, Valley Utilities has greater exposure to financial risk.

Q. Is firm-specific risk measured by beta?

A. No. Firm-specific risk is not measured by beta.

Q. Is the cost of equity affected by firm-specific risk?

A. No. Since firm-specific risk can be eliminated through diversification, it does not affect the cost of equity.

Q. Can investors expect additional returns for firm-specific risk?

A. No. Investors who hold diversified portfolios can eliminate firm-specific risk and, consequently, do not require any additional return. Since investors who choose to be less than fully-diversified must compete in the market with fully-diversified investors, the former cannot expect to be compensated for unique risk.

VI. ESTIMATING THE COST OF EQUITY

Introduction

Q. Did Staff directly estimate the cost of equity for Valley Utilities?

A. No. Since Valley Utilities is not a publicly-traded company, Staff is unable to directly estimate its cost of equity due to the lack of firm-specific market data. Instead, Staff estimated the Company's cost of equity indirectly, using a representative sample group of publicly traded water utilities as a proxy, taking the average of the sample group to reduce the sample error resulting from random fluctuations in the market at the time the information is gathered.

Q. What companies did Staff select as proxies or comparables for Valley Utilities?

A. Staff's sample consists of the following six publicly-traded water utilities: American States Water, California Water, Connecticut Water Services, Middlesex Water, Aqua America and SJW Corp. Staff chose these companies because they are publicly-traded and receive the majority of their earnings from regulated operations.

Q. What models did Staff implement to estimate Valley Utilities' cost of equity?

A. Staff used two market-based models to estimate the cost of equity for Valley Utilities: the DCF model and the CAPM.

Q. Please explain why Staff chose the DCF and CAPM models.

A. Staff chose to use the DCF and CAPM models because they are widely-recognized market-based models and have been used extensively to estimate the cost of equity. An explanation of the DCF and CAPM models follows.

Discounted Cash Flow Model Analysis

Q. Please provide a brief summary of the theory upon which the DCF method of estimating the cost of equity is based.

A. The DCF method of stock valuation is based on the theory that the value of an investment is equal to the sum of the future cash flows generated from the aforementioned investment discounted to the present time. This method uses expected dividends, market price and dividend growth rate to calculate the cost of capital. Professor Myron Gordon pioneered the DCF method in the 1960s. The DCF method has become widely used to estimate the cost of equity for public utilities due to its theoretical merit and its simplicity. Staff used the financial information for the relevant six sample companies in the DCF model and averaged the results to determine an estimated cost of equity for the sample companies.

Q. Does Staff use more than one version of the DCF?

A. Yes. Staff uses two versions of the DCF model: the constant-growth DCF and the multi-stage or non-constant growth DCF. The constant-growth DCF assumes that an entity's dividends will grow indefinitely at the same rate. The multi-stage growth DCF model assumes the dividend growth rate will change at some point in the future.

The Constant-Growth DCF

Q. What is the mathematical formula used in Staff's constant-growth DCF analysis?

A. The constant-growth DCF formula used in Staff's analysis is:

Equation 2 :

$$K = \frac{D_1}{P_0} + g$$

where :
K = the cost of equity
D_1 = the expected annual dividend
P_0 = the current stock price
g = the expected infinite annual growth rate of dividends

Equation 2 assumes that the entity has a constant earnings retention rate and that its earnings are expected to grow at a constant rate. According to Equation 2, a stock with a current market price of $10 per share, an expected annual dividend of $0.45 per share and an expected dividend growth rate of 3.0 percent per year has a cost of equity to the entity of 7.5 percent reflected by the sum of the dividend yield ($0.45/ $10 = 4.5 percent) and the 3.0 percent annual dividend growth rate.

Q. How did Staff calculate the expected dividend yield (D_1/P_0) component of the constant-growth DCF formula?

A. Staff calculated the expected yield component of the DCF formula by dividing the expected annual dividend (D_1) by the spot stock price (P_0) after the close of market on December 5, 2012, as reported by *MSN Money*.

Q. Why did Staff use the December 5, 2012, spot price rather than a historical average stock price to calculate the dividend yield component of the DCF formula?

A. The current, rather than historic, market price is used in order to be consistent with financial theory. In accordance with the Efficient Market Hypothesis, the current stock price is reflective of all available information on a stock, and as such reveals investors' expectations of future returns. Use of historical average stock prices illogically discounts the most recent information in favor of less recent information. The latter is stale and is representative of underlying conditions that may have changed.

Q. How did Staff estimate the dividend growth (g) component of the constant-growth DCF model represented by Equation 2?

A. The dividend growth component used by Staff is determined by the average of six different estimation methods, as shown in Schedule JAC-8. Staff calculated historical and projected growth estimates on dividend-per-share ("DPS"),[2] earnings-per-share ("EPS")[3] and sustainable growth bases.

Q. Why did Staff examine EPS growth to estimate the dividend growth component of the constant-growth DCF model?

A. Historic and projected EPS growth are used because dividends are related to earnings. Dividend distributions may exceed earnings in the short run, but cannot continue indefinitely. In the long term, dividend distributions are dependent on earnings.

[2] Derived from information provided by *Value Line.*
[3] Derived from information provided by *Value Line.*

Q. How did Staff estimate historical DPS growth?

A. Staff estimated historical DPS growth by calculating a compound annual DPS growth rate for each of its sample companies over the 10-year period, 2002-2011. As shown in Schedule JAC-5, the average historical DPS growth rate for the sample was 3.2 percent.

Q. How did Staff estimate projected DPS growth?

A. Staff calculated an average of the projected DPS growth rates for the sample water utilities from *Value Line* through the period, 2015-2017. The average projected DPS growth rate is 4.1 percent, as shown in Schedule JAC-5.

Q. How did Staff estimate historical EPS growth rate?

Staff estimated historical EPS growth by calculating a compound annual EPS growth rate for each of its sample companies over the 10-year period, 2002-2011. As shown in Schedule JAC-5, the average historical EPS growth rate for the sample was 4.2 percent.

Q. How did Staff estimate projected EPS growth?

A. Staff calculated an average of the projected EPS growth rates for the sample water utilities from *Value Line* through the period, 2015-2017. The average projected EPS growth rate is 6.2 percent, as shown in Schedule JAC-5.

Q. How does Staff calculate its historical and projected sustainable growth rates?

A. Historical and projected sustainable growth rates are calculated by adding their respective retention growth rate terms (br) to their respective stock financing growth rate terms (vs), as shown in Schedule JAC-6.

Q. What is retention growth?

A. Retention growth is the growth in dividends due to the retention of earnings. The retention growth concept is based on the theory that dividend growth cannot be achieved unless the company retains and reinvests some of its earnings. The retention growth is used in Staff's calculation of sustainable growth shown in Schedule JAC-6.

Q. What is the formula for the retention growth rate?

A. The retention growth rate is the product of the retention ratio and the book/accounting return on equity. The retention growth rate formula is:

Equation 3 :

$$\text{Retention Growth Rate} = br$$

where : b = the retention ratio (1 – dividend payout ratio)
r = the accounting/book return on common equity

Q. How did Staff calculate the average historical retention growth rate (br) for the sample water utilities?

A. Staff calculated the mean of the 10-year average historical retention rate for each sample company over the period, 2002-2011. As shown in Schedule JAC-6, the historical average retention (br) growth rate for the sample is 2.9 percent.

Q. How did Staff estimate its projected retention growth rate (br) for the sample water utilities?

A. Staff used the retention growth projections for the sample water utilities for the period, 2015-2017, from *Value Line.* As shown in Schedule JAC-6, the projected average retention growth rate for the sample companies is 4.3 percent.

Q. When can retention growth provide a reasonable estimate of future dividend growth?

A. The retention growth rate is a reasonable estimate of future dividend growth when the retention ratio is reasonably constant and the entity's market price to book value ("market-to-book ratio") is expected to be 1.0. The average retention ratio has been reasonably constant in recent years. However, the market-to-book ratio for the sample water utilities is 2.0, notably higher than 1.0, as shown in Schedule JAC-7.

Q. Is there any financial implication of a market-to-book ratio greater than 1.0?

A. Yes. A market-to-book ratio greater than 1.0 implies that investors expect an entity to earn an accounting/book return on its equity that exceeds its cost of equity. The relationship between required returns and expected cash flows is readily observed in the fixed securities market. For example, assume an entity contemplating issuance of bonds with a face value of $10 million at either 6 percent or 8 percent and, thus, paying annual interest of $600,000 or $800,000, respectively. Regardless of investors' required return on similar bonds, investors will be willing to pay more for the bonds if issued at 8 percent than if the bonds are issued at 6 percent. For example, if the current interest rate required by investors is 6 percent, then they would bid $10 million for the 6 percent bonds and more than $10 million for the 8 percent bonds. Similarly, if equity investors require a 9 percent return and expect an entity to earn accounting/book returns of 13 percent, the market will bid up the price of the entity's stock to provide the required return of 9 percent.

Q. How has Staff generally recognized a market-to-book ratio exceeding 1.0 in its cost of equity analyses in recent years?

A. Staff has assumed that investors expect the market-to-book ratio to remain greater than 1.0. Given that assumption, Staff has added a stock financing growth rate (vs) term to the retention ratio (br) term to calculate its historical and projected sustainable growth rates.

Q. Do the historical and projected sustainable growth rates Staff uses to develop its DCF cost of equity in this case continue to include a stock financing growth rate term?

A. Yes.

Q. What is stock financing growth?

A. Stock financing growth is the growth in an entity's dividends due to the sale of stock by that entity. Stock financing growth is a concept derived by Myron Gordon and discussed in his book *The Cost of Capital to a Public Utility.*[4] Stock financing growth is the product of the fraction of the funds raised from the sale of stock that accrues to existing shareholders (v) and the fraction resulting from dividing the funds raised from the sale of stock by the existing common equity (s).

[4] Gordon, Myron J. *The Cost of Capital to a Public Utility.* MSU Public Utilities Studies, Michigan, 1974. pp 31-35.

Q. What is the mathematical formula for the stock financing growth rate?

A. The mathematical formula for stock financing growth is:

Equation 4:

$$\text{Stock Financing Growth} = vs$$

where: v = Fraction of the funds raised from the sale of stock that accrues to existing shareholders

s = Funds raised from the sale of stock as a fraction of the existing common equity

Q. How is the variable *v* presented above calculated?

A. Variable v is calculated as follows:

Equation 5:

$$v = 1 - \left(\frac{book\ value}{market\ value} \right)$$

For example, assume that a share of stock has a $30 book value and is selling for $45. Then, to find the value of v, the formula is applied:

$$v = 1 - \left(\frac{30}{45} \right)$$

In this example, v is equal to 0.33.

Q. How is the variable *s* presented above calculated?

A. Variable s is calculated as follows:

Equation 6:

$$s = \frac{\text{Funds raised from the issuance of stock}}{\text{Total existing common equity before the issuance}}$$

For example, assume that an entity has $150 in existing equity, and it sells $30 of stock. Then, to find the value of *s*, the formula is applied:

$$s = \left(\frac{30}{150}\right)$$

In this example, *s* is equal to 20.0 percent.

Q. What is the *vs* term when the market-to-book ratio is equal to 1.0?

A. A market-to-book ratio of 1.0 reflects that investors expect an entity to earn a book/accounting return on their equity investment equal to the cost of equity. When the market-to-book ratio is equal to 1.0, none of the funds raised from the sale of stock by the entity accrues to the benefit of existing shareholders, i.e., the term *v* is equal to zero (0.0). Consequently, the *vs* term is also equal to zero (0.0). When stock financing growth is zero, dividend growth depends solely on the *br* term.

Q. What is the effect of the *vs* term when the market-to-book ratio is greater than 1.0?

A. A market-to-book ratio greater than 1.0 reflects that investors expect an entity to earn a book/accounting return on their equity investment greater than the cost of equity. Equation 5 shows that, when the market-to-book ratio is greater than 1.0, the *v* term is also greater than zero. The excess by which new shares are issued and sold over book value per share of outstanding stock is a contribution that accrues to existing stockholders in the form of a higher book value. The resulting higher book value leads to higher expected earnings and dividends. Continued growth from the *vs* term is dependent upon the continued issuance and sale of additional shares at a price that exceeds book value per share.

Q. What *vs* estimate did Staff calculate from its analysis of the sample water utilities?

A. Staff estimated an average stock financing growth of 1.9 percent for the sample water utilities, as shown in Schedule JAC-6.

Q. What would occur if an entity had a market-to-book ratio greater than 1.0 as a result of investors expecting earnings to exceed its cost of equity, and subsequently experienced newly-authorized rates equal only to its cost of equity?

A. *Ceteris paribus*, holding all other factors constant, one would expect market forces to move the company's stock price lower, closer to a market-to-book ratio of 1.0, to reflect investor expectations of reduced expected future cash flows.

Q. If the average market-to-book ratio of Staff's sample water utilities were to fall to 1.0 due to authorized ROEs equaling their cost of equity, would inclusion of the vs term be necessary to Staff's constant-growth DCF analysis?

A. No. As discussed above, when the market-to-book ratio is equal to 1.0, none of the funds raised from the sale of stock by the entity accrues to the benefit of existing shareholders because the *v* term equals to zero and, consequently, the *vs* term also equals zero. When the market-to-book ratio equals 1.0, dividend growth depends solely on the *br* term. Staff's inclusion of the *vs* term assumes that the market-to-book ratio continues to exceed 1.0 and that the water utilities will continue to issue and sell stock at prices above book value with the effect of benefitting existing shareholders.

Q. What are Staff's historical and projected sustainable growth rates?

A. Staff's estimated historical sustainable growth rate is 4.8 percent based on an analysis of earnings retention for the sample water companies. Staff's projected sustainable growth

rate is 6.3 percent based on retention growth projected by *Value Line.* Schedule JAC-6 presents Staff's estimates of the sustainable growth rate.

Q. What is Staff's expected infinite annual growth rate in dividends?

A. Staff's expected dividend growth rate (g) is 4.8 percent, which is the average of historical and projected DPS, EPS, and sustainable growth estimates. Staff's calculation of the expected infinite annual growth rate in dividends is shown in Schedule JAC-8.

Q. What is Staff's constant-growth DCF estimate for the sample utilities?

A. Staff's constant-growth DCF estimate is 8.0 percent, as shown in Schedule JAC-3.

The Multi-Stage DCF

Q. Why did Staff implement the multi-stage DCF model to estimate Valley Utilities's cost of equity?

A. Staff generally uses the multi-stage DCF model to consider the assumption that dividends may not grow at a constant rate. The multi-stage DCF uses two stages of growth, the first stage (near-term) having a four-year duration, followed by the second stage (long-term) of constant growth.

Q. What is the mathematical formula for the multi-stage DCF?

A. The multi-stage DCF formula is shown in the following equation:

Equation 7 :

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K-g_n}\left[\frac{1}{(1+K)}\right]^n$$

Where : P_0 = current stock price
D_t = dividends expected during stage 1
K = cost of equity
n = years of non – constant growth
D_n = dividend expected in year n
g_n = constant rate of growth expected after year n

Q. What steps did Staff take to implement its multi-stage DCF cost of equity model?

A. First, Staff projected future dividends for each of the sample water utilities using near-term and long-term growth rates. Second, Staff calculated the rate (cost of equity) which equates the present value of the forecasted dividends to the current stock price for each of the sample water utilities. Lastly, Staff calculated an overall sample average cost of equity estimate.

Q. How did Staff calculate near-term (stage-1) growth?

A. The stage-1 growth rate is based on *Value Lines*'s projected dividends for the next twelve months, when available, and on the average dividend growth (g) rate of 4.8 percent, calculated in Staff's constant DCF analysis for the remainder of the stage.

Q. How did Staff estimate long-term (stage-2) growth?

A. Staff calculated the stage-2 growth rate using the arithmetic mean rate of growth in Gross Domestic Product ("GDP") from 1929 to 2011.[5] Using the GDP growth rate assumes that the water utility industry is expected to grow at the same rate as the overall economy.

Q. What is the historical GDP growth rate that Staff used to estimate stage-2 growth?

A. Staff used 6.5 percent to estimate the stage-2 growth rate.

Q. What is Staff's multi-stage DCF estimate for the sample utilities?

A. Staff's multi-stage DCF estimate is 9.6 percent, as shown in Schedule JAC-3.

Q. What is Staff's overall DCF estimate for the sample utilities?

A. Staff's overall DCF estimate is 8.8 percent. Staff calculated the overall DCF estimate by averaging the constant growth DCF (8.0%) and multi-stage DCF (9.6%) estimates, as shown in Schedule JAC-3.

Capital Asset Pricing Model

Q. Please describe the CAPM.

A. The CAPM is used to determine the prices of securities in a competitive market. The CAPM model describes the relationship between a security's investment risk and its market rate of return. Under the CAPM, an investor requires the expected return of a security to equal the rate on a risk-free security plus a risk premium. If the investor's expected return does not meet or beat the required return, the investment is not economically justified. The model also assumes that investors will sufficiently diversify

[5] www.bea.doc.gov.

their investments to eliminate any non-systematic or unique risk.[6] In 1990, Professors Harry Markowitz, William Sharpe, and Merton Miller earned the Nobel Prize in Economic Sciences for their contribution to the development of the CAPM.

Q. Did Staff use the same sample water utilities in its CAPM and DCF cost of equity estimation analyses?

A. Yes. Staff's CAPM cost of equity estimation analysis uses the same sample water companies as its DCF cost of equity estimation analysis.

Q. What is the mathematical formula for the CAPM?

A. The mathematical formula for the CAPM is:

Equation 8:

$$K = R_f + \beta (R_m - R_f)$$

where:
R_f = risk free rate
R_m = return on market
β = beta
$R_m - R_f$ = market risk premium
K = expected return

The equation shows that the expected return (K) on a risky asset is equal to the risk-free interest rate (R_f) plus the product of the market risk premium ($R_m - R_f$) multiplied by beta (β) where beta represents the riskiness of the investment relative to the market.

[6] The CAPM makes the following assumptions: 1) single holding period; 2) perfect and competitive securities market; 3) no transaction costs; 4) no restrictions on short selling or borrowing; 5) the existence of a risk-free rate; and 6) homogeneous expectations.

Q. What is the risk-free rate?

A. The risk-free rate is the rate of return of an investment free of default risk.

Q. What does Staff use as surrogates to represent estimations of the risk-free rates of interest in its historical and current market risk premium CAPM methods?

A. Staff uses separate parameters as surrogates for the estimations of the risk-free rates of interest for the historical market risk premium CAPM cost of equity estimation and the current market risk premium CAPM cost of equity estimation. Staff uses the average of three (5-, 7-, and 10-year) intermediate-term U.S. Treasury securities' spot rates in its historical market risk premium CAPM cost of equity estimation, and the 30-year U.S. Treasury bond spot rate in its current market risk premium CAPM cost of equity estimation. Rates on U.S. Treasuries are largely verifiable and readily available.

Q. What does beta measure?

A. Beta is a measure of a security's price volatility, or systematic risk, relative to the market as a whole. Since systematic risk cannot be diversified away, it is the only risk that is relevant when estimating a security's required return. Using a baseline market beta coefficient of 1.0, a security having a beta value less than 1.0 will be less volatile (i.e., less risky) than the market. A security with a beta value greater than 1.0 will be more volatile (i.e., more risky) than the market.

Q. How did Staff estimate Valley Utilities' beta?

A. Staff used the average of the *Value Line* betas for the sample water utilities as a proxy for the Company's beta. Schedule JAC-7 shows the *Value Line* betas for each of the sample water utilities. The 0.71 average beta coefficient for the sample water utilities is Staff's

estimated beta value for Valley Utilities. A security with a beta value of 0.71 has less volatility than the market.

Q. What is the market risk premium ($R_m - R_f$)?

A. The market risk premium is the expected return on the market, minus the risk-free rate. Simplified, it is the return an investor expects as compensation for market risk.

Q. What did Staff use for the market risk premium?

A. Staff uses separate calculations for the market risk premium in its historical and current market risk premium CAPM methods.

Q. How did Staff calculate an estimate for the market risk premium in its historical market risk premium CAPM method?

A. Staff uses the intermediate-term government bond income returns published in the Ibbotson Associates' *Stocks, Bonds, Bills, and Inflation 2011 Yearbook* to calculate the historical market risk premium. Ibbotson Associates calculates the historical risk premium by averaging the historical arithmetic differences between the S&P 500 and the intermediate-term government bond income returns for the period 1926-2011. Staff's historical market risk premium estimate is 7.2 percent, as shown in Schedule JAC-3.

Q. How did Staff calculate an estimate for the market risk premium in its current market risk premium CAPM method?

A. Staff solves equation 8 above to arrive at a market risk premium using a DCF-derived expected return (K) of 14.77 (2.3 + 12.47[7]) percent using the expected dividend yield (2.3 percent over the next twelve months) and the annual per share growth rate (12.47 percent)

[7] The three to five year price appreciation is 60%. $1.60^{0.25}$ - 1 = 12.47%.

that *Value Line* projects for all dividend-paying stocks under its review[8] along with the current long-term risk-free rate (30-year Treasury note at 2.78 percent) and the market's average beta of 1.0. Staff calculated the current market risk premium as 12.00 percent,[9] as shown in Schedule JAC-3.

Q. What is the result of Staff's historical market risk premium CAPM and current market risk premium CAPM cost of equity estimations for the sample utilities?

A. Staff's cost of equity estimates are 6.2 percent using the historical market risk premium CAPM and 11.3 percent using the current market risk premium CAPM.

Q. What is Staff's overall CAPM estimate for the sample utilities?

A. Staff's overall CAPM cost of equity estimate is 8.8 percent which is the average of the historical market risk premium CAPM (6.2 percent) and the current market risk premium CAPM (11.3 percent) estimates, as shown in Schedule JAC-3.

VII. SUMMARY OF STAFF'S COST OF EQUITY ANALYSIS

Q. What is the result of Staff's constant-growth DCF analysis to estimate the cost of equity for the sample water utilities?

A. Schedule JAC-3 shows the result of Staff's constant-growth DCF analysis. The result of Staff's constant-growth DCF analysis is as follows:

$$k = 3.2\% + 4.8\%$$

$$k = \mathbf{8.0\%}$$

[8] December 7, 2012 issue date.
[9] 14.77% = 2.78% + (1) (11.99%).

Staff's constant-growth DCF estimate of the cost of equity for the sample water utilities is 8.0 percent.

Q. What is the result of Staff's multi-stage DCF analysis to estimate of the cost of equity for the sample utilities?

A. Schedule JAC-9 shows the result of Staff's multi-stage DCF analysis. The result of Staff's multi-stage DCF analysis is:

Company	**Equity Cost Estimate (k)**
American States Water	9.3%
California Water	10.0%
Aqua America	9.1%
Connecticut Water	9.5%
Middlesex Water	10.4%
SJW Corp	9.5%
Average	**9.6%**

Staff's multi-stage DCF estimate of the cost of equity for the sample water utilities is 9.6 percent.

Q. What is Staff's overall DCF estimate of the cost of equity for the sample utilities?

A. Staff's overall DCF estimate of the cost of equity for the sample utilities is 8.8 percent. Staff calculated an overall DCF cost of equity estimate by averaging Staff's constant growth DCF (8.0 percent) and Staff's multi-stage DCF (9.6 percent) estimates, as shown in Schedule JAC-3.

Q. What is the result of Staff's historical market risk premium CAPM analysis to estimate of the cost of equity for the sample utilities?

A. Schedule JAC-3 shows the result of Staff's CAPM analysis using the historical risk premium estimate. The result is as follows:

$$k = 1.1\% + 0.71 * 7.2\%$$

$$k = 6.2\%$$

Staff's CAPM estimate (using the historical market risk premium) of the cost of equity to the sample water utilities is 6.2 percent.

Q. What is the result of Staff's current market risk premium CAPM analysis to estimate the cost of equity for the sample utilities?

A. Schedule JAC-3 shows the result of Staff's CAPM analysis using the current market risk premium estimate. The result is:

$$k = 2.8\% + 0.71 * 12.0\%$$

$$k = 11.3\%$$

Staff's CAPM estimate (using the current market risk premium) of the cost of equity to the sample water utilities is 11.3 percent.

Q. What is Staff's overall CAPM estimate of the cost of equity for the sample utilities?

A. Staff's overall CAPM estimate for the sample utilities is 8.8 percent. Staff's overall CAPM estimate is the average of the historical market risk premium CAPM (6.2 percent) and the current market risk premium CAPM (11.3 percent) estimates, as shown in Schedule JAC-3.

Q. Please summarize the results of Staff's cost of equity analysis for the sample utilities.

A. The following table shows the results of Staff's cost of equity analysis:

Table 2

Method	Estimate
Average DCF Estimate	8.8%
Average CAPM Estimate	8.8%
Overall Average	**8.8%**

Staff's average estimate of the cost of equity to the sample water utilities is 8.8 percent.

VIII. FINAL COST OF EQUITY ESTIMATES FOR VALLEY UTILITIES

Q. Please compare Valley Utilities' capital structure to that of the six sample water companies.

A. The average capital structure for the sample water utilities is composed of 48.4 percent equity and 51.6 percent debt, as shown in Schedule JAC-4. Valley Utilities' capital structure is composed of 12.9 percent equity and 87.1 percent debt. In this case, since Valley Utilities' capital structure is more leveraged than that of the average sample water utilities' capital structure, its stockholders bear more financial risk than the sample water utilities.

Q. Does Valley Utilities' reduced financial risk affect its cost of equity?

A. Yes. As previously discussed, financial risk is a component of market risk and investors require compensation for market risk. Since Valley Utilities' financial risk exposure is greater than that of the average sample water companies, its cost of equity is higher than that of the sample water companies. However, Staff is not recommending an upward financial risk adjustment in this proceeding. In Decision No. 71482, [10] the Commission directed Valley Utilities to continue improving its equity position. Although the

[10] Page 35, Finding of Fact No. 93.

Company's equity has improved, it remains inappropriately low. Since the Commission has already directed the Company to increase its equity position, it would be inconsistent for Staff to recommend an upward ROE adjustment in this Docket, because that recommendation would effectively provide the Company with an incentive to keep its percent of equity capital lower instead of higher, which was the Commission's directive in its Decision No. 71482.

Q. Did Staff consider factors other than the results of its technical models in its cost of equity analysis?

A. Yes. In consideration of the relatively uncertain status of the economy and the market that currently exists, Staff is proposing an Economic Assessment Adjustment to the cost of equity. In this case, Staff recommends a 60 basis point (0.6 percent) upward Economic Assessment Adjustment, as shown in Schedule JAC-3.

Q. What is Staff's ROE estimate for Valley Utilities?

A. Staff determined an ROE estimate of 9.4 percent for Valley Utilities based on cost of equity estimates for the sample companies of 8.8 percent for both the CAPM and the DCF. Staff recommends adoption of a 60 basis point upward Economic Assessment Adjustment, resulting in a 9.4 percent Staff-recommended cost of equity, as shown in Schedule JAC-3.

IX. RATE OF RETURN RECOMMENDATION

Q. What overall rate of return did Staff determine for Valley Utilities?

A. Staff determined a 6.2 percent ROR for the Company, as shown in Schedule JAC-1 and the following table:

Table 3

	Weight	Cost	Weighted Cost
Long-term Debt	87.1%	5.8%	5.0%
Common Equity	12.9%	9.4%	1.2%
Overall ROR			**6.2%**

X. STAFF RESPONSE TO COMPANY'S COST OF CAPITAL WITNESS MR. RAY L. JONES

Q. Please summarize Mr. Jones' analyses and recommendations.

A. Mr. Jones recommends an 11.0 percent COE for Valley Utilities. In doing so, however, he presents no market based estimates for the cost of equity from either the DCF or CAPM models. Instead, as justification for his proposed COE, he cites the Company's "deteriorating financial condition, negative cash flow and highly leveraged capital structure," stating that his recommended 11.0 percent COE includes a "significant risk premium" to compensate Valley Utilities (See Jones Direct, p. 18). His overall recommended rate of return for the Company is 6.451 percent.

Q. What comment did the Commission have associated with Valley Utilities' capital structure in the prior rate case?

A. In Decision No. 71482 (dated February 3, 2010), while acknowledging that Valley Utilities had significantly improved its equity position since its last rate case, the Commission nevertheless found that the Company needed to improve its equity position so that its rates might be set using a rate of return on its FVRB as opposed to an operating margin determination.[11]

[11] Decision No. 71482, Finding of Fact No. 93, p. 35.

Q. What is the relationship between capital structure and a financial risk premium?

A. As discussed above, financial risk increases along with increasing debt in the capital structure. However, it is not effective regulatory practice to continue rewarding a utility via a risk premium/upward financial risk adjustment to its authorized COE.

XI. CONCLUSION

Q. Please summarize Staff's recommendations.

A. Staff recommends that the Commission adopt a 9.4 percent overall rate of return for the Company based on a capital structure composed of 87.1 percent debt and 12.9 percent equity, Staff's 8.8 percent cost of equity estimate, and Staff's 60 basis point (0.6 percent) upward economic assessment adjustment.

Q. Does this conclude your direct testimony?

A. Yes, it does.

Valley Utilities Cost of Capital Calculation
Capital Structure
And Weighted Average Cost of Capital
Staff Recommended and Company Proposed

[A]	[B]	[C]	[D]
Description	Weight (%)	Cost	Weighted Cost
Staff Recommended Structure			
Debt	87.1%	5.8%	5.0%
Common Equity	12.9%	9.4%	1.2%
Weighted Average Cost of Capital			**6.2%**
Company Proposed Structure			
Debt	87.1%	5.8%	5.0%
Common Equity	12.9%	11.0%	1.4%
Weighted Average Cost of Capital			**6.5%**

[D] : [B] x [C]

Supporting Schedules: JAC-3 and JAC-4.

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Valley Utilities Cost of Capital Calculation
Final Cost of Equity Estimates
Sample Water Utilities

[A]	[B]		[C]		[D]		[E]
DCF Method			D_1/P_0 [1]	+	g [2]	=	**k**
Constant Growth DCF Estimate			3.2%	+	4.8%	=	8.0%
Multi-Stage DCF Estimate						=	9.6%
Average DCF Estimate							**8.8%**
CAPM Method	**Rf**	+	β [5]	x	**(Rp)**	=	**k**
Historical Market Risk Premium [3]	1.1%	+	0.71	x	7.2% [6]	=	6.2%
Current Market Risk Premium [4]	2.8%	+	0.71	x	12.0% [7]	=	11.3%
Average CAPM Estimate							**8.8%**
					Average of Overall Estimates		**8.8%**
					Economic Assessment Adjustment		0.6%
					Sub-Total		9.4%
					Financial risk adjustment		0.0%
					Total		**9.4%**

1 MSN Money and Value Line

2 Schedule JAC-8

3 Risk-free rate (Rf) for 5, 7, and 10 year Treasury rates from the U.S. Treasury Department at www.ustreas.gov

4 Risk-free rate (Rf) for 30 Year Treasury bond rate from the U.S. Treasury Department at www.ustreas.gov

5 Value Line

6 Historical Market Risk Premium (Rp) calculated from Ibbotson Associates SBBI 2011 Yearbook data

7 Testimony

Valley Utilities Cost of Capital Calculation
Average Capital Structure of Sample Water Utilities

[A]	[B]	[C]	[D]
Company	Debt	Common Equity	Total
American States Water	46.0%	54.0%	100.0%
California Water	53.3%	46.7%	100.0%
Aqua America	53.9%	46.1%	100.0%
Connecticut Water	57.1%	42.9%	100.0%
Middlesex Water	43.3%	56.7%	100.0%
SJW Corp	55.7%	44.3%	100.0%
Average Sample Water Utilities	**51.6%**	**48.4%**	**100.0%**
Valley - Actual Capital Structure	**87.1%**	**12.9%**	**100.0%**

Source:
Sample Water Companies from Value Line

Valley Utilities Cost of Capital Calculation
Growth in Earnings and Dividends
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]
Company	Dividends Per Share 2002 to 2011 DPS[1]	Dividends Per Share Projected DPS[1]	Earnings Per Share 2002 to 2011 EPS[1]	Earnings Per Share Projected EPS[1]
American States Water	2.4%	7.8%	5.1%	4.7%
California Water	1.0%	3.0%	6.2%	8.6%
Aqua America	7.7%	4.9%	7.3%	5.6%
Connecticut Water	1.6%	No Projection	0.4%	No Projection
Middlesex Water	1.6%	1.8%	2.4%	8.3%
SJW Corp	4.8%	3.0%	3.7%	4.0%
Average Sample Water Utilities	**3.2%**	**4.1%**	**4.2%**	**6.2%**

1 Value Line

Valley Utilities Cost of Capital Calculation
Sustainable Growth
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]
Company	Retention Growth **2002 to 2011** br	Retention Growth Projected br	Stock Financing Growth vs	Sustainable Growth **2002 to 2011** br + vs	Sustainable Growth Projected br + vs
American States Water	3.6%	5.3%	2.3%	5.9%	7.6%
California Water	2.2%	4.8%	2.0%	4.2%	6.8%
Aqua America	4.4%	5.2%	2.2%	6.7%	7.5%
Connecticut Water	2.2%	No Projection	1.0%	3.2%	No Projection
Middlesex Water	1.3%	3.3%	3.5%	4.8%	6.7%
SJW Corp	3.7%	2.9%	0.1%	3.8%	3.0%
Average Sample Water Utilities	**2.9%**	**4.3%**	**1.9%**	**4.8%**	**6.3%**

[B]: Value Line
[C]: Value Line
[D]: Value Line and MSN Money
[E]: [B]+[D]
[F]: [C]+[D]

Valley Utilities Cost of Capital Calculation
Selected Financial Data of Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]	[G]
Company	Symbol	Spot Price 12/5/2012	Book Value	Mkt To Book	*Value Line* Beta β	Raw Beta βraw
American States Water	AWR	**45.54**	22.14	2.1	**0.70**	0.52
California Water	CWT	**17.96**	11.34	1.6	**0.65**	0.45
Aqua America	WTR	**25.01**	9.44	2.7	**0.60**	0.37
Connecticut Water	CTWS	**31.27**	13.62	2.3	**0.75**	0.60
Middlesex Water	MSEX	**18.66**	11.91	1.6	**0.70**	0.52
SJW Corp	SJW	**24.00**	15.28	1.6	**0.85**	0.75
Average				**2.0**	**0.71**	**0.53**

[C]: Msn Money

[D]: Value Line

[E]: [C] / [D]

[F]: Value Line

[G]: (-0.35 + [F]) / 0.67

Valley Utilities Cost of Capital Calculation
Calculation of Expected Infinite Annual Growth in Dividends
Sample Water Utilities

[A]	[B]
Description	g
DPS Growth - Historical[1]	3.2%
DPS Growth - Projected[1]	4.1%
EPS Growth - Historical[1]	4.2%
EPS Growth - Projected[1]	6.2%
Sustainable Growth - Historical[2]	4.8%
Sustainable Growth - Projected[2]	6.3%
Average	**4.8%**

1 Schedule JAC-5

2 Schedule JAC-6

Valley Utilities Cost of Capital Calculation
Multi-Stage DCF Estimates
Sample Water Utilities

[A]	[B]	[C]	[D]	[E]	[F]	[H]	[I]
Company	Current Mkt. Price (P_o)[1] 12/5/2012	Projected Dividends[2] (Stage 1 growth) (D_t) d_1	d_2	d_3	d_4	Stage 2 growth[3] (g_n)	Equity Cost Estimate (K)[4]
American States Water	45.5	1.30	1.37	1.43	1.50	6.5%	9.3%
California Water	18.0	0.66	0.69	0.73	0.76	6.5%	10.0%
Aqua America	25.0	0.67	0.70	0.73	0.77	6.5%	9.1%
Connecticut Water	31.3	0.98	1.03	1.08	1.13	6.5%	9.5%
Middlesex Water	18.7	0.75	0.78	0.82	0.86	6.5%	10.4%
SJW Corp	24.0	0.74	0.78	0.82	0.86	6.5%	9.5%

Average **9.6%**

$$P_0 = \sum_{t=1}^{n} \frac{D_t}{(1+K)^t} + \frac{D_n(1+g_n)}{K-g_n}\left[\frac{1}{(1+K)}\right]^n$$

Where : P_0 = current stock price
D_t = dividends expected during stage 1
K = cost of equity
n = years of non – constant growth
D_n = dividend expected in year n
g_n = constant rate of growth expected after year n

1 [B] see Schedule JAC-7

2 Derived from Value Line Information

3 Average annual growth in GDP 1929 - 2011 in current dollars.

4 Internal Rate of Return of Projected Dividends

BEFORE THE ARIZONA CORPORATION COMMISSION

BOB STUMP
Chairman
GARY PIERCE
Commissioner
BRENDA BURNS
Commissioner
BOB BURNS
Commissioner
SUSAN BITTER-SMITH
Commissioner

IN THE MATTER OF THE APPLICATION OF VALLEY UTILITIES WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR AN INCREASE IN ITS RATES AND CHARGES FOR UTILITY SERVICE BASED THEREON.	DOCKET NO. W-01412A-12-0195

DIRECT

TESTIMONY

OF

MARLIN SCOTT, JR.

UTILITIES ENGINEER

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JANUARY 7, 2013

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EXECUTIVE SUMMARY
VALLEY UTILITIES WATER COMPANY, INC.
DOCKET NO. W-01412A-08-0586

CONCLUSIONS

A. Valley Utilities Water Company, Inc. ("Company") has a water loss of 8.3% which is within the acceptable limits.

B. The Company's current well and storage capacity is sufficient to serve the present customer base at this time and reasonable growth. The emergency interconnection with the Liberty Utilities' water system also provides a supplemental source of water.

C. According to the Maricopa County Environmental Service Department ("MCESD") Compliance Status Report, the Company's system has no deficiencies and is in compliance with MCESD requirements.

D. The Company is located in the Arizona Department of Water Resources' ("ADWR") Phoenix Active Management Area and ADWR has reported that the Company is in compliance with ADWR's requirements governing water providers and/or community water systems.

E. According to the Utilities Division Compliance database, the Company has no delinquent Arizona Corporation Commission ("ACC") compliance items.

F. The Company has an approved curtailment tariff on file with the ACC.

G. The Company has an approved backflow prevention tariff on file with the ACC.

H. The Company has Best Management Practice Tariffs that were approved by Decision No. 72005, dated December 10, 2010.

I. The Company has an Arsenic Impact Fee Tariff that was approved by Decision No. 67669, dated March 9, 2005.

RECOMMENDATIONS

1. Staff recommends the adoption of the Company's water testing expense of $10,732 for this proceeding.

2. For the requested post-test year ("PTY") plant items; a) the drainage improvement project at the Bethany Site has yet to commence and is not complete at this time, and b) Well #6A's pump replacement is completed and is currently in service. Based on these factors, Staff concludes that only the requested PTY plant item – Well #6A project is used and useful, as of September 2012, for the provision of service to customers with plant adjustments totaling to $24,561 as shown in Table H-1.

3. Wells #2 and #4 are no longer in service. Staff recommends the removal of Wells #2 and #4 at a total cost of $18,520 from the plant-in-service because these wells are not used and useful.

4. Staff recommends that the Company continue to use the depreciation rates by individual National Association of Regulatory Utility Commissioners category as presented in Table I-1.

5. Staff recommends the acceptance of the Company's proposed service line and meter installation charges which includes "Note: To include the actual cost incurred when road crossing is required." as presented in Table J-1 of Exhibit MSJ.

INTRODUCTION

Q. Please state your name, place of employment and job title.

A. My name is Marlin Scott, Jr. My place of employment is the Arizona Corporation Commission ("Commission"), Utilities Division, 1200 West Washington Street, Phoenix, Arizona 85007. My job title is Utilities Engineer.

Q. How long have you been employed by the Commission?

A. I have been employed by the Commission since November 1987.

Q. Please list your duties and responsibilities.

A. As a Utilities Engineer, specializing in water and wastewater engineering, my responsibilities include: the inspection, investigation, and evaluation of water and wastewater systems; preparing reconstruction cost new and/or original cost studies, reviewing cost of service studies and preparing investigative reports; providing technical recommendations and suggesting corrective action for water and wastewater systems; and providing written and oral testimony on rate applications and other cases before the Commission.

Q. How many cases have you analyzed for the Utilities Division?

A. I have analyzed approximately 580 cases covering various responsibilities for the Utilities Division.

Q. Have you previously testified before this Commission?

A. Yes, I have testified in 90 proceedings before this Commission.

Q. What is your educational background?

A. I graduated from Northern Arizona University in 1984 with a Bachelor of Science degree in Civil Engineering Technology.

Q. Briefly describe your pertinent work experience.

A. Prior to my employment with the Commission, I was Assistant Engineer for the City of Winslow, Arizona, for about two years. Prior to that, I was a Civil Engineering Technician with the U.S. Public Health Service in Winslow for approximately six years.

Q. Please state your professional membership, registrations, and licenses.

A. I am a member of the National Association of Regulatory Utility Commissioners ("NARUC") Staff Subcommittee on Water.

PURPOSE OF TESTIMONY

Q. Were you assigned to provide Staff's engineering analysis and recommendation for the Valley Utilities Water Company, Inc. ("Company") in this proceeding?

A. Yes. I reviewed the Company's rate application and I inspected the water system on September 7, 2012. This testimony and the attached Exhibit MSJ present Staff's engineering evaluation.

ENGINEERING REPORT

Q. Please describe the attached Engineering Report, Exhibit MSJ.

A. Exhibit MSJ presents the details and analyses of Staff's findings for this rate case, and is attached to this direct testimony. Exhibit MSJ contains the following major topics: (1) a description of the water system and the processes, (2) water use, (3) growth, (4) compliance with the rules of the Maricopa County Environmental Services Department,

Arizona Department of Water Resources, and the Arizona Corporation Commission, (5) plant-in-service adjustments, (6) depreciation rates, (7) service line and meter installation charges, and (8) tariff filings.

Staff's conclusions and recommendations from the Engineering Report are contained in the "EXECUTIVE SUMMARY" above.

Q. Does this conclude your direct testimony?

A. Yes, it does.

Engineering Report
For
Valley Utilities Water Company, Inc.
Docket No. W-01412A-12-0195 (Rates)

November 15, 2012

A. LOCATION OF VALLEY UTILITIES WATER COMPANY, INC. ("COMPANY")

The Company serves a community located in Maricopa County, just east of Luke Air Force Base, in the Phoenix West Valley. Figure A-1 shows the location of the Company within Maricopa County and Figure A-2 shows the approximate five square-miles of certificated area.

B. DESCRIPTION OF WATER SYSTEM

The water system was field inspected on September 7, 2012, by Marlin Scott, Jr., Staff Utilities Engineer, in the accompaniment of Robert Prince, representing the Company. The current operation of the water system consisted of five producing wells, six storage tanks, four booster stations and a distribution system serving over 1,400 customers as of June 2008. This system is also interconnected with Liberty Utilities with a 6-inch meter (monthly minimum of $283.00), limited to a maximum of 400 GPM, for emergency purposes. A system schematic is shown in Figure B-1 with detailed plant facility descriptions as follows:

Table 1. Well Data

Well #	ADWR ID No.	Pump Hp (Submersible)	Flow Rate (GPM)	Casing Size & Depth	Meter Size	Year Drilled
#1	55-639720	25	75	12" x 650'	3"	1942
#2 (retired)	55-639721	30	-	10" x 650'	3"	1969
#3	55-639723	25	90	8" x 425'	4"	1965
*#4 (OOS)	55-639722	25	-	12" x 800'	4"	1970
#5	55-503273	75 - Turbine	450	20" x 850'	8"	1982
* #6A	55-216455	125 – Turbine	150	16" x 810'	8"	2008
* #7	55-208819	125 - Turbine	450	16" x 715'	8"	2007
		TOTAL:	1,215			

*Notes: Well #4 was taken out-of-service ("OOS") in 2007 due to well casing deterioration. This well is still OOS.
Well #6A has a down-hole sand separator and Well 7 has an above-ground sand separator.

Table 2. Storage Tanks

Capacity (Gallons)	Quantity (Each)	Location
560,000 1,000,000	1 1	@ Maryland Booster Station
200,000	1	@ Bethany Hills West
100,000	3	Two tanks @ Glendale Yard & one tank @ Lux Yard
Totals: 2,060,000 gal.	6	

Table 3. Booster Systems

Location	Booster Systems	Storage Tanks (From Table 2)
Glendale Yard (Wells #1 & #7)	40, 20 & 15-Hp booster pumps 5,000 gal. pressure tank	Two 100,000 gal. storage tanks
Lux Yard (Well #3)	30, 30 & 15-Hp booster pumps 5,000 gallon pressure tank	100,000 gal. storage tank
Bethany Hills West (Wells #4, #5 & #6A)	40 & 40-Hp booster pumps 7,500 gal. pressure tank	200,000 gal. storage tank
Maryland Booster Station	50,50, 20 & 20-Hp booster pumps 10,000 gal. pressure tank	560,000 gal. & 1.0 MG storage tanks

Table 4. Water Mains

Diameter	Material	Length
4-inch	AC & PVC	10,000 ft.
6-inch	AC & DIP	78,034 ft.
8-inch	AC & DIP	52,911 ft.
10-inch	DIP	2,952 ft.
12-inch	AC & DIP	5,925 ft.
	Total:	149,822 ft. or 28.4 miles

Table 5. Customer Meters

Size	Quantity
5/8 x 3/4-inch	104
3/4-inch	844
1- inch	398
1-1/2-inch	12
2-inch	50
3-inch	2
Total:	1,410

Table 6. Fire Hydrants

Size	Quantity
Standard	201

Table 7. Structures & Treatment Equipment

Structures & Treatment Equipment
Glendale Site: 500 GPM arsenic treatment system with a 17,000 gallon backwash tank, liquid chlorination unit and 175 kW diesel generator. Arsenic treatment building is 22 ft. by 36 ft. metal building & motor control center building is 11 ft. by 22 ft. metal building. Chain linking fencing (CLF) is 200 ft. by 75 ft.
Lux Site: Liquid chlorination unit and CLF is 100 ft. by 100 ft.
Maryland Site: Storage building is 14 ft. by 14 ft. metal building & motor control center building is 12 ft. by 38 ft. metal building. 125 kW diesel generator. Block fencing is 150 ft. by 250 ft. & CLF is 200 ft. by 250 ft.
Bethany Site: 1,500 GPM arsenic treatment system with a 75,000 gallon backwash tank & liquid chlorination. Arsenic treatment building is 40 ft. x 60 ft. metal building. CLF is 130 ft. by 325 ft.

C. WATER USE

Water Sold

Based on the information provided by the Company, water use for the test year is presented in Figure C-1. Customer consumption experienced a high monthly average water use

of 979 gallons per day ("GPD") per connection in July and a low monthly average water use of 370 GPD per connection in December for an average annual use of 599 GPD per connection.

Non-Account Water

Non-account water should be 10% or less. The Company reported 328,826,000 gallons pumped/purchased and 301,430,000 gallons sold, resulting in a water loss of 8.3%. This 8.3% is within the acceptable limits.

System Analysis

The system's current well capacity of 1,215 GPM and storage capacity of 2,060,000 gallons is sufficient to serve the present customer base at this time and reasonable growth. The emergency interconnection with the Liberty Utilities' water system also provides a supplemental source of water.

D. GROWTH

Figure D-1 depicts the customer growth using linear regression analysis by using the number of customers obtained from annual reports that were submitted to the Commission. During the test year ending December 2011, the Company had approximately 1,400 customers and it is projected that the Company could have approximately 1,440 customers by December 2016.

E. MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT ("MCESD") COMPLIANCE

Compliance

According to a MCESD Compliance Status Report, dated August 29, 2012, the Company's system, PWS No. 07-079, has no deficiencies and is in compliance with MCESD requirements.

Water Testing Expense

The Company is subject to mandatory participation in the ADEQ Monitoring Assistance Program. The Company reported its water testing expense of $10,732 during the test year. Staff has reviewed the Company's reported expense amount and recommends that the Company's water testing expense of $10,732 be adopted for this proceeding.

F. ARIZONA DEPARTMENT OF WATER RESOURCES ("ADWR") COMPLIANCE

The Company is located in the Phoenix Active Management Area. According to ADWR's Water Provider Compliance Report, dated August 28, 2012, the Company is currently in compliance with ADWR requirements governing water providers and/or community water systems.

G. ARIZONA CORPORATION COMMISSION ("ACC") COMPLIANCE

According to the Utilities Division Compliance database, the Company had no delinquent ACC compliance items.

J. PLANT-IN-SERVICE ADJUSTMENTS

Post-Test Year Plant

In its rate application filing, the Company submitted $94,500 worth of post-test year ("PTY") plant for; 1) a well pump replacement and installation of a sand separator on Well #6A and 2) drainage improvement at the Bethany Arsenic Treatment Facility. Through Staff's field inspection and Company data responses, updates of the PTY plant items are as follows:

Table H-1. Post-Test Year Plant

Acct. No.	Plant items	Updated Original Costs
304	Structures & Improvements	
	Drainage improvement at the Bethany Site, estimated at $60,000. (Construction has not commenced as of Staff's field inspection on September 7, 2012. Therefore, this project is not complete.)	$0
311	Pumping Equipment	
	Well #6A – new pump/sand separator, installed and returned to service in May 2012.	$31,231
	Well #6A – retire old pump, installed in 2009	($6,670)
	Total:	**$24,561**

As stated above, the drainage improvement project at the Bethany Site has yet to commence and was not completed at the time of Staff's field inspection. The Well #6A project has been completed and is currently in service. Based on these factors, Staff concludes that only the requested PTY plant item – Well #6A project is used and useful for the provision of service to customers with plant adjustments totaling to $24,561 as shown in Table H-1.

Not Used and Useful Plant

During Staff's field inspection, Staff noted that Wells #2 and #4 were disconnected from the system. Through Company data responses, Well #2 was taken out of service due to the failure of the well casing in 2010 and was retired in 2011. Well #4 was taken out of service due

to well casing deterioration in 2007 and is still out of service. Based on these factors, Staff found these two wells not used and useful with corresponding data as follows:

Table H-2. Plant Not Used and Useful

Acct. No.	Plant Items	Year Installed	Year Retired	Original Cost
307	Wells & Springs			
	– Well #2	1969	2011	2,408
	– Well #4	1970	2011	12,202
311	Pumping Equipment			
	– Well #2, 30-Hp sub. pump	2006	2011	3,150
	– Well #4, 25-Hp sub. pump	1970	2011	760
	Total:			**$18,520**

Staff recommends the removal of Wells #2 and #4 at a total cost of $18,520 from the plant-in-service because these wells are not used and useful.

I. DEPRECIATION RATES

In the prior rate case, the Company adopted Staff's typical and customary water depreciation rates. These rates are presented in Table I-1 and it is recommended that the Company continue to use these depreciation rates by individual National Association of Regulatory Utility Commissioners category.

J. SERVICE LINE AND METER INSTALLATION CHARGES

In its application, the Company requested no changes to its service line and meter installation charges. However, in the prior rate case and its Decision No. 71482 (February 3, 2010), the service line charge's Note 1 stating, "For long-side service line installation, charges will be at actual cost" was inadvertently omitted in the ordering paragraph. During Staff's field inspection, the Company requested that this noted language be reconsidered and adopted in this proceeding. Staff recommends the acceptance of the Company's proposed installation charges which includes "Note: To include the actual cost incurred when road crossing is required." as shown in Table J-1.

K. CURTAILMENT TARIFF

The Company has an approved Curtailment Tariff with an effective date of December 1, 2005.

L. BACKFLOW PREVENTION TARIFF

The Company has an approved Backflow Prevention Tariff with an effective date of October 1, 2000.

M. ADWR BEST MANAGEMENT PRACTICE ("BMP") TARIFFS

The Company has BMP Tariffs that were approved by Decision No. 72005, dated December 10, 2010.

N. ARSENIC IMPACT FEE ("AIF") TARIFF

The Company has an AIF Tariff that was approved by Decision No. 67669, dated March 9, 2005, and the Company requests no changes to this tariff. Staff has no objection to continue this tariff.

FIGURES

TABLES

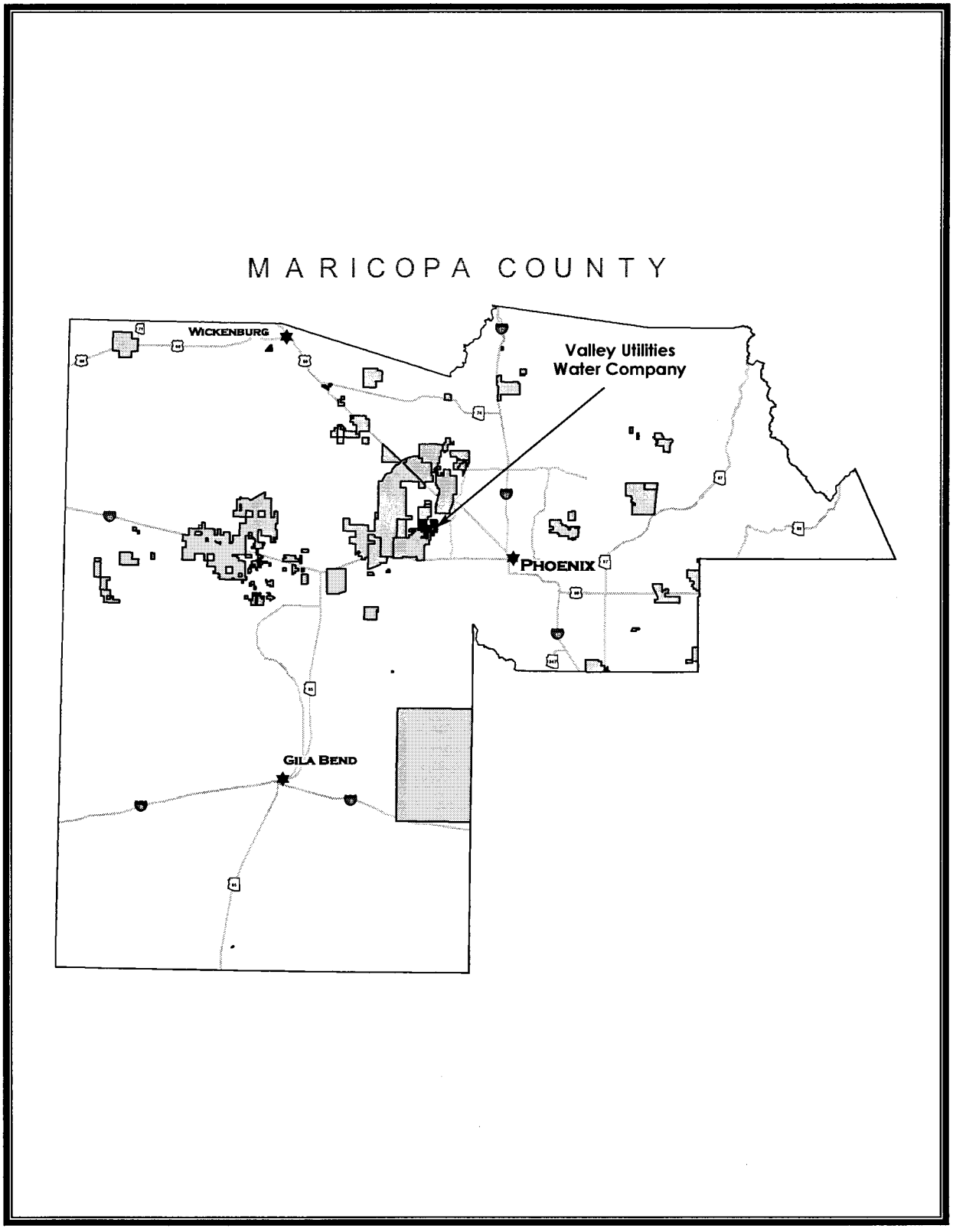

Figure A-1. Maricopa County Map

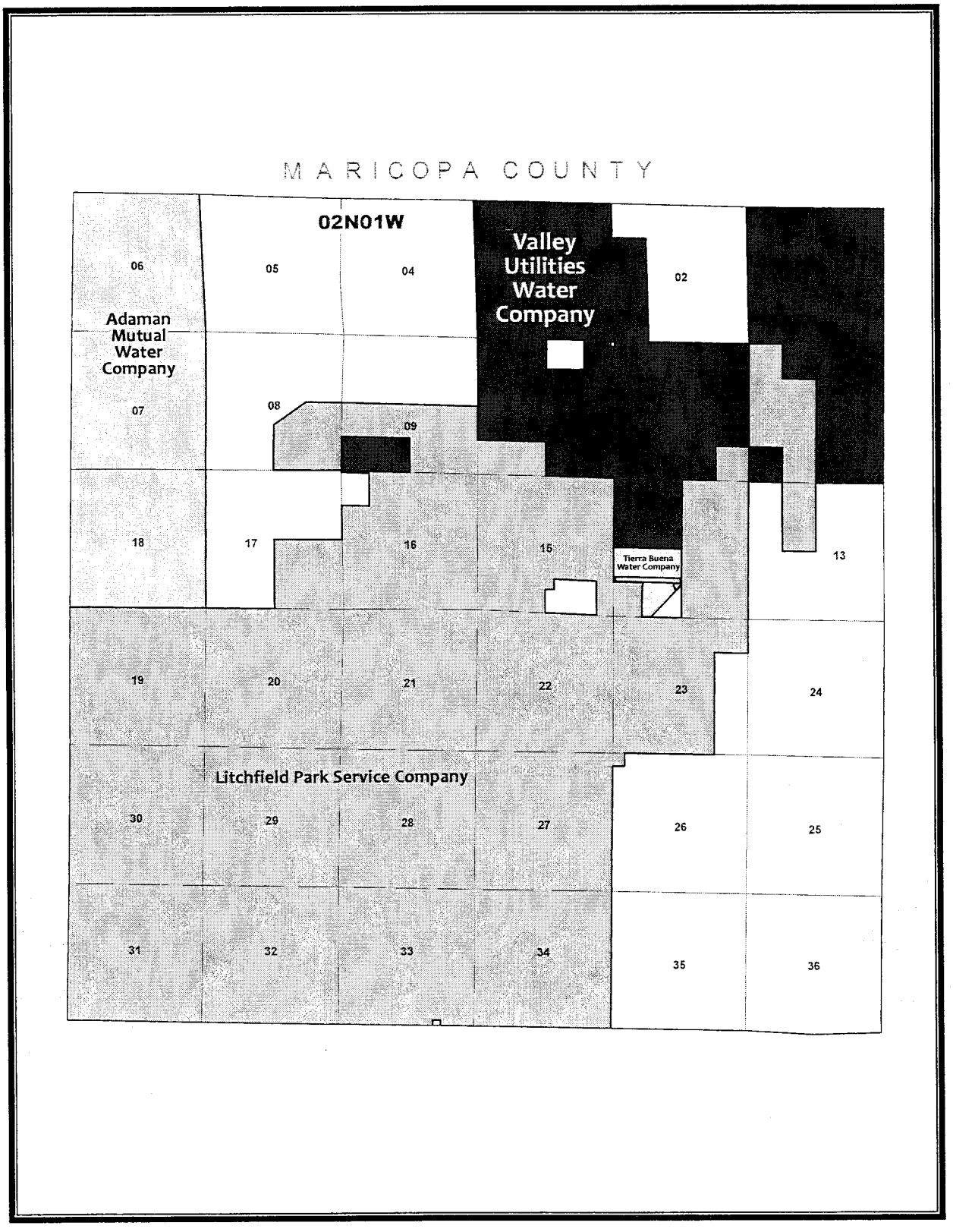

Figure A-2. Certificated Area

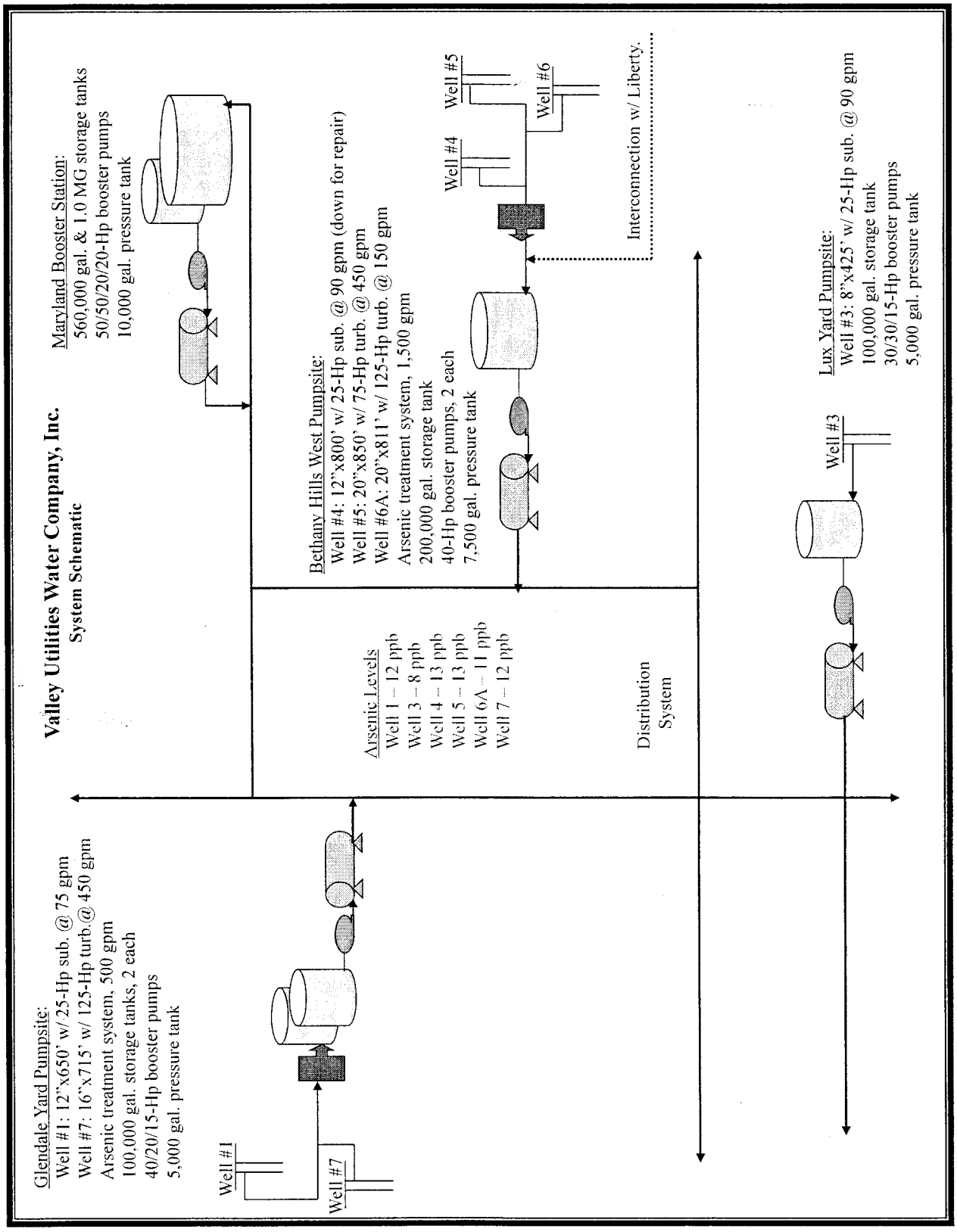

Figure B-1. System Schematic

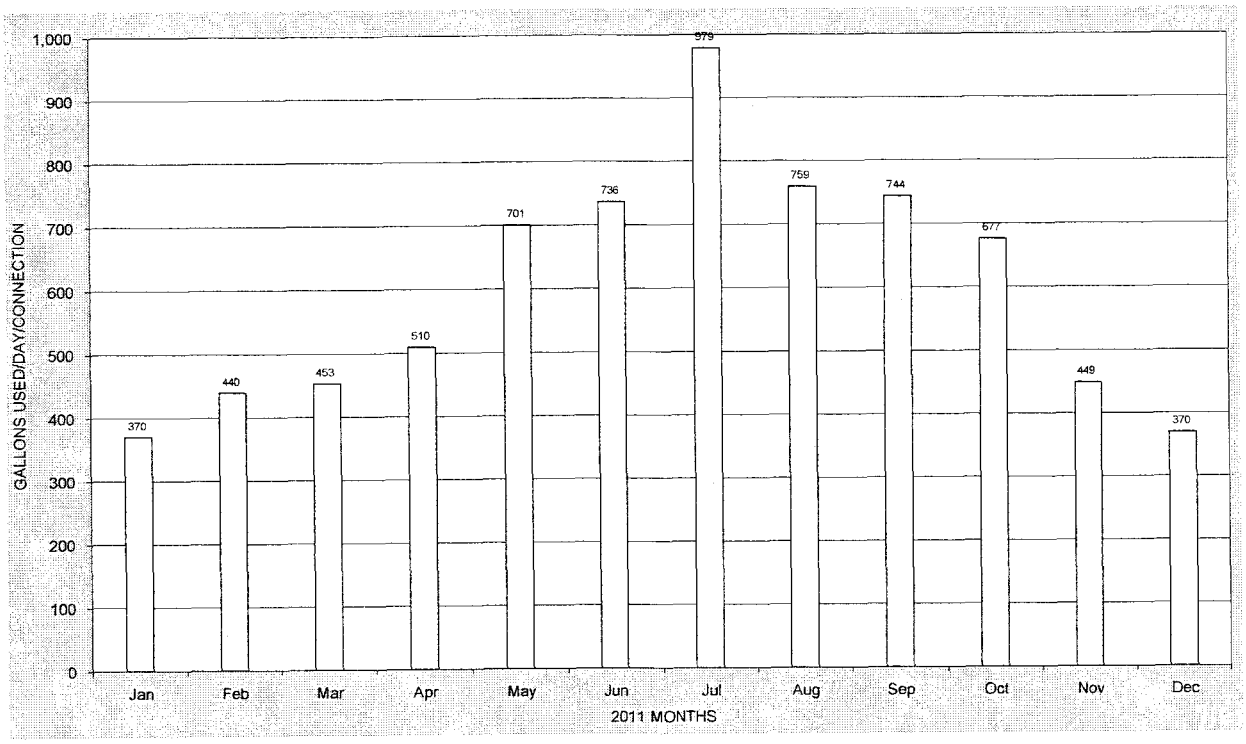

Figure C-1. Water Use

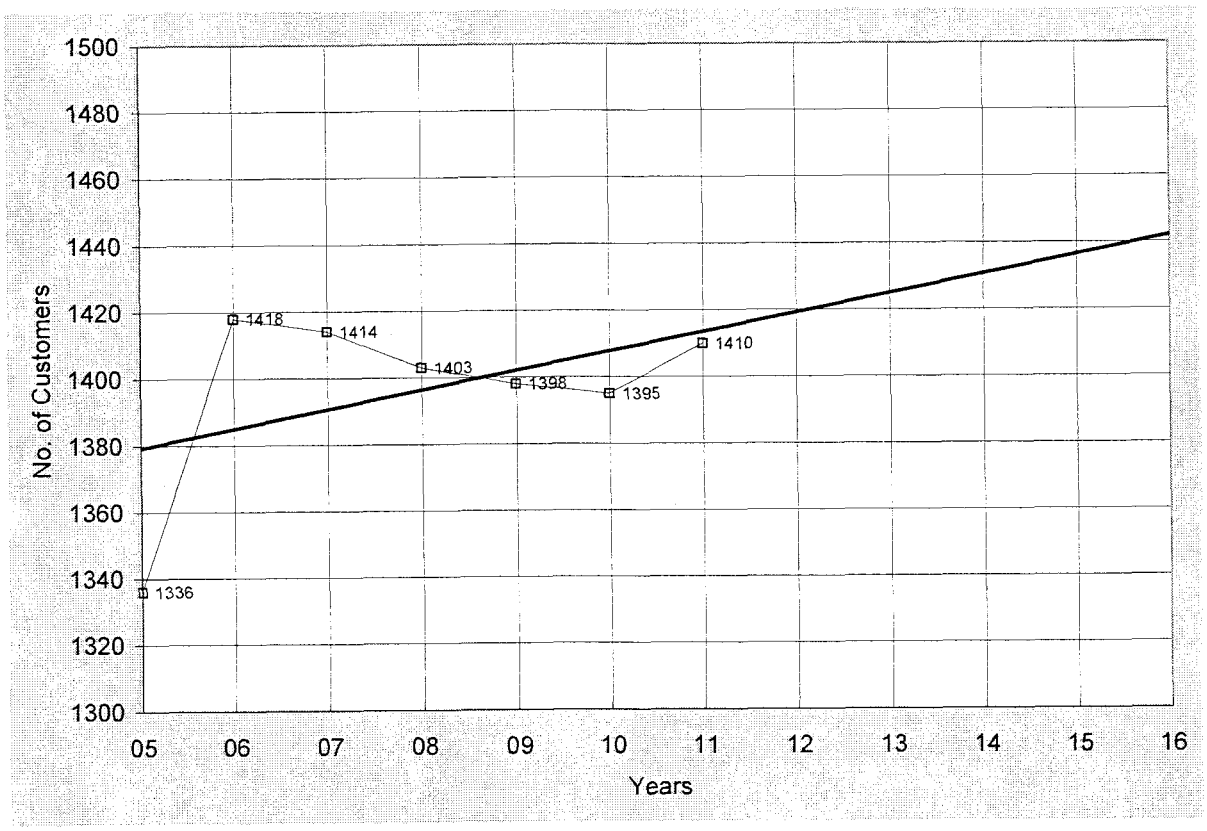

Figure D-1. Growth

Table I-1. Depreciation Rates

NARUC Acct. No.	Depreciable Plant	Company's Current Rates (%)	Company's Proposed Rates (%)
304	Structures & Improvements	3.33	3.33
305	Collecting & Impounding Reservoirs	2.50	2.50
306	Lake, River, Canal Intakes	2.50	2.50
307	Wells & Springs	3.33	3.33
308	Infiltration Galleries	6.67	6.67
309	Raw Water Supply Mains	2.00	2.00
310	Power Generation Equipment	5.00	5.00
311	Pumping Equipment	12.5	12.5
320	Water Treatment Equipment		
320.1	Water Treatment Plants	3.33	3.33
320.2	Solution Chemical Feeders	20.0	20.0
330	Distribution Reservoirs & Standpipes		
330.1	Storage Tanks	2.22	2.22
330.2	Pressure Tanks	5.00	5.00
331	Transmission & Distribution Mains	2.00	2.00
333	Services	3.33	3.33
334	Meters	8.33	8.33
335	Hydrants	2.00	2.00
336	Backflow Prevention Devices	6.67	6.67
339	Other Plant & Misc Equipment	6.67	6.67
340	Office Furniture & Equipment	6.67	6.67
340.1	Computers & Software	20.00	20.00
341	Transportation Equipment	20.00	20.00
342	Stores Equipment	4.00	4.00
343	Tools, Shop & Garage Equipment	5.00	5.00
344	Laboratory Equipment	10.00	10.00
345	Power Operated Equipment	5.00	5.00
346	Communication Equipment	10.00	10.00
347	Miscellaneous Equipment	10.00	10.00
348	Other Tangible Plant	3.33	3.33

Table J-1. Service Line and Meter Installation Charges

Meter Size	Present Service Line Charges	Present Meter Charges	**Present Total Charges**	Proposed Service Line Charges **	Proposed Meter Charges	**Proposed Total Charges**
5/8 x3/4"	$445	$155	$600	$445	$155	$600
3/4"	$445	$255	$700	$445	$255	$700
1"	$495	$315	$810	$495	$315	$810
1-1/2"	$550	$525	$1,075	$550	$525	$1,075
2" Turbine	$830	$1,045	$1,875	$830	$1,045	$1,875
2" Compound	$830	$1,890	$2,720	$830	$1,890	$2,720
3" Turbine	$1,045	$1,670	$2,715	$1,045	$1,670	$2,715
3" Compound	$1,165	$2,545	$3,710	$1,165	$2,545	$3,710
4" Turbine	$1,490	$2,670	$4,160	$1,490	$2,670	$4,160
4" Compound	$1,670	$3,645	$5,315	$1,670	$3,645	$5,315
6" Turbine	$2,210	$5,025	$7,235	$2,210	$5,025	$7,235
6" Compound	$2,330	$6,920	$9,250	$2,330	$6,920	$9,250
8" or larger	Cost	Cost	Cost	Cost	Cost	Cost

** Note: To include the actual cost incurred when road crossing is required.