Docket Nos. 12-0603/12-0604
Consolidated
ICC Staff Exhibit 5.0

# Direct Testimony

of

Janis Freetly

Finance Department

Financial Analysis Division

Illinois Commerce Commission

Apple Canyon Utility Company
Proposed General Rate Increase in Water Service

Lake Wildwood Utilities Corporation
Proposed General Rate Increase in Water Service

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## Witness Identification

**Q. Please state your name and business address.**

A. My name is Janis Freetly. My business address is 527 East Capitol Avenue, Springfield, Illinois 62701.

**Q. What is your current position with the Illinois Commerce Commission ("Commission")?**

A. I am currently employed as a Senior Financial Analyst in the Finance Department of the Financial Analysis Division.

**Q. Please describe your qualifications and background.**

A. In May of 1995, I earned a Bachelor of Business from Western Illinois University. I received a Master of Business Administration degree, with a concentration in Finance, from Western Illinois University in May of 1998. I have been employed by the Commission in my present position since September of 1998. I was promoted to Senior Financial Analyst on August 31, 2001.

**Q. What is the purpose of your testimony in this proceeding?**

A. The purpose of my testimony and accompanying schedules is to present the overall cost of capital and recommend a fair rate of return on rate base for Apple Canyon Utility Company ("Apple Canyon") and Lake Wildwood Utilities Corporation ("Lake Wildwood") (collectively, "the Companies"). The Companies are wholly owned subsidiaries of Utilities, Inc. ("UI").

**Cost of Capital**

**Q. Please summarize your conclusions.**

A. The overall cost of capital for the Companies is 7.95% as shown on Schedule 5.1.

**Q. Why must one determine an overall cost of capital for a public utility?**

A. Under the traditional regulatory model, ratepayer and shareholder interests are balanced when the Commission authorizes a rate of return on rate base equal to the public utility's overall cost of capital, as long as that overall cost of capital is not unnecessarily expensive.[1] If the authorized rate of return on rate base exceeds the overall cost of capital, then ratepayers bear the burden of excessive prices. Conversely, if the authorized rate of return on rate base is lower than the overall cost of capital, the financial strength of the utility could deteriorate, making it difficult for the utility to raise capital at a reasonable cost. Ultimately, the utility's inability to raise sufficient capital would impair service quality. Therefore, ratepayer interests are served best when the authorized rate of return on rate base equals the utility's overall cost of capital.

In authorizing a rate of return on rate base equal to the overall cost of capital, all costs of service are assumed reasonable and accurately measured, including the costs and balances of the components of the capital structure. If unreasonable

[1] The remainder of the discussion assumes that the utility's overall cost of capital is not unnecessarily expensive; that is, the utility's cost of capital reflects a reasonable balance between financial strength and cost.

costs continue to be incurred, or if any reasonable cost of service component is measured inaccurately, then the allowed rate of return on rate base will not balance ratepayer and investor interests.

**Q. Please define the overall cost of capital for a public utility.**

A. The overall cost of capital for a public utility equals the sum of the costs of the components of the capital structure (i.e., debt, preferred stock, and common equity) after weighing each by its proportion to total capital.

## Capital Structure

**Q. What capital structure did the Company propose for setting rates?**

A. The Company proposed using a capital structure for the year ended December 31, 2011, comprised of 50.42% debt and 49.58% common equity.[2]

**Q. What capital structure do you propose for setting rates?**

A. I propose using UI's capital structure for the year ended December 31, 2011, comprised of 50.24% long-term debt, and 49.76% common equity, as shown on Schedule 5.1.

[2] Direct Testimony of Dimitry Neyzelman, Apple Canyon Ex. 1.0, pp. 7-8; Lake Wildwood Ex. 1.0, pp. 7-8.

**Q. Did you adjust the long-term capital components to recognize the Commission's formula for calculating AFUDC?**

A. No. The Commission's formula for calculating AFUDC assumes short-term debt is the *first* source of funds financing CWIP; however, it is not necessarily the *only* source. That formula also assumes that any CWIP not funded by short-term debt is funded proportionally by the remaining sources of capital (i.e., long-term debt and common equity). However, when the balance of short-term debt is zero, this adjustment does not affect the capital structure ratios. Therefore, no adjustment is necessary since UI's capital structure does not contain any short-term debt.

**Q. What balance of long-term debt did you include in your recommended capital structure?**

A. I began with the $180,000,000 balance of long-term debt outstanding on December 31, 2011, as presented on Schedule 5.2. I then adjusted that balance to reflect the unamortized debt expense incurred to issue the debt.[3] This produced a long-term debt balance of $178,726,842.

**Q. What balance of common equity did you include in your recommended capital structure?**

A. I used the $177,007,000 balance of common shareholders equity on December 31, 2011 from the Consolidated Financial Statements of Utilities, Inc. provided in response to Staff Data Request ("DR") JF 1.01.

[3] Company Response to Staff DR JF-1.09.

**Q. How does capital structure affect the overall cost of capital?**

A. Capital structure affects the value of a firm and, therefore, its cost of capital, to the extent it affects the expected level of cash flows that accrue to parties other than debt and stock holders. Employing debt as a source of capital reduces a company's income taxes,[4] thereby reducing the cost of capital; however, as reliance on debt as a source of capital increases, so does the probability of default. As the probability of default rises, expected payments to attorneys, trustees, and other outside parties increase. Further, the expected cash flows decline as the company foregoes investment that would have been available to it had its financial condition been stronger, including the expected value of the income tax shield from debt financing. Beyond a certain point, a growing dependence on debt as a source of funds increases the overall cost of capital. Therefore, the Commission should not determine the overall rate of return from a utility's actual capital structure if the Commission concludes that capital structure adversely affects the overall cost of capital.

An optimal capital structure would minimize the cost of capital and maintain a utility's financial integrity. Unfortunately, determining whether a capital structure is optimal remains problematic because: (1) the cost of capital is a continuous

[4] The tax advantage debt has over equity at the corporate level is partially offset at the individual investor level. Debt investors receive returns largely in the form of current income (i.e., interest). In contrast, equity investors receive returns in the form of both current income (i.e., dividends) and capital appreciation (i.e., capital gains). Taxes on common dividends and capital gains are lower than taxes on interest income because common dividends and capital gains tax rates are lower, and taxes on capital gains are deferred until realized.

function of the capital structure, rendering its precise measurement along each segment of the range of possible capital structures problematic; (2) the optimal capital structure is a function of operating risk, which is dynamic; and (3) the relative costs of the different types of capital vary with dynamic market conditions. Consequently, one should determine whether the capital structure is consistent with the financial strength necessary to access the capital markets under most economic conditions, and if so, whether the cost of that financial strength is reasonable.

**Q. How did you evaluate your proposed capital structure for UI?**

A. I compared my proposed common equity ratio for UI to the common equity ratio for the water utility industry. In the third quarter of 2012, the mean common equity ratio for the water utility industry was 48.01% with a standard deviation of 6.17%.[5] My proposed common equity ratio of 49.76% compares favorably with the other companies in the water utility industry.

## Cost of Long-Term Debt

**Q. What is the embedded cost of long-term debt for UI?**

A. UI's average embedded cost of long-term debt for 2011 is 6.66%, as shown on Schedule 5.2.

**Q. Please describe the adjustments you made to UI's cost of long-term debt.**

[5] Standard & Poor's Compustat database.

A. I included the annual amortization of debt expense, which reflects straight-line amortization of the unamortized balance over the remaining life of the outstanding issue of long-term debt.

**Cost of Common Equity**

**Q. What is UI's cost of common equity?**

A. My analysis indicates that the cost of common equity for UI subsidiaries Apple Canyon and Lake Wildwood is 9.25%.

**Q. How did you measure the investor-required rate of return on common equity for UI?**

A. I measured the investor-required rate of return on common equity for UI with the discounted cash flow ("DCF") and risk premium models. Since UI does not have market-traded common stock, DCF and risk premium models cannot be applied directly to UI; for this reason, and to minimize measurement error, I applied both models to water utility and public utility samples (hereafter, referred to as "Water sample" and "Utility sample," respectively).

**Sample Selection**

**Q. How did you select your Water sample?**

A. I selected my Water sample based on two criteria. First, I began with a list of all domestic corporations assigned an industry number of 4941 (i.e., water utilities) within Standard & Poor's *Utility Compustat II* that have publicly-traded common stock. Second, I removed any company that did not have the data needed for my cost of capital analyses. The remaining companies, American States Water Company, American Water Works Company, Aqua America, Inc., Artesian Resources, California Water Service Group, Connecticut Water Service Inc., Middlesex Water Company and York Water Company, compose my Water sample.

**Q. How did you select a Utility sample comparable in risk to UI?**

A. To form the Utility sample, I began with a list of all domestic dividend paying publicly-traded corporations assigned an industry number of 4911, 4922, 4923, 4924, 4931, or 4932 in the Standard & Poor's ("S&P") *Utility Compustat II* database that have been assigned (1) an S&P credit rating of BBB or BBB-; (2) an S&P business risk profile score of "excellent;" and (3) an S&P financial risk profile of "intermediate," "significant," or "aggressive." Next, I removed any company that did not have the data needed for my cost of capital analyses. Finally, I eliminated any company that was in the process of being acquired by another company or acquiring a company of similar size. The remaining companies, American Electric Power Company, Avista Corp., Black Hills Corp., Cleco Corp., CMS Energy Corp., El Paso Electric Co., Great Plains Energy Inc., IDACORP, Inc., NiSource Inc., Northwestern Corp., PPL Corp., Pinnacle West Capital Corp., Portland General Electric Company and Westar Energy, Inc. compose my Utility sample.

**Q. Why did you limit your Utility sample to those with a Standard & Poor's credit rating of BBB or BBB-?**

A. The credit rating agencies do not rate the creditworthiness of UI. Therefore, I used Moody's Investors Service ("Moody's") rating methodology for water utilities to estimate the credit rating of UI. Specifically, I calculated the four ratios that Moody's focuses on to assess the financial strength for the regulated water utility industry: (1) funds from operations ("FFO") interest coverage; (2) debt to capitalization; (3) FFO to net debt; and (4) retained cash flow ("RCF") to capital expenditures ("CapEx").[6] For UI, the three-year average FFO interest coverage ratio is 3.02x, which falls within the bottom third of the benchmark range of a Baa credit rating (i.e., Baa3). The three-year average debt-to-capitalization ratio for UI is 54.90%, which falls within the bottom third of the benchmark range of an A credit rating (i.e., A3). The three-year average FFO-to-net debt ratio for UI is 13.84%, which falls within the middle third of the benchmark range of a Baa credit rating (i.e., Baa2). The three-year average RCF-to-capital expenditures ratio for UI is 0.86, which falls within the top third of the benchmark range of a Ba credit rating (i.e., Ba1). Together, the four ratios that I calculated for UI are consistent with a Baa2 rating, when weighted in accordance with the Moody's

[6] Moody's Investors Service, Rating Methodology: Global Regulated Water Utilities, December 2009, pp. 19-22.

rating methodology for regulated water utilities.[7] Hence, I considered electric and gas utilities in the BBB range for my Utility sample.

**Q. Please describe Standard & Poor's business risk and financial risk profile scores and why you limited the composition of the Utility sample to those companies with a business profile score of "excellent" and a financial risk profile of "intermediate," "significant," or "aggressive."**

A. According to financial theory, the market-required rate of return on common equity is a function of operating and financial risk. Thus, the method used to select a sample should reflect both the operating and financial characteristics of a firm. S&P's rating methodology is organized around fundamental business and financial analysis. In ascending order of risk, S&P categorizes business risk profiles as "excellent," "strong," "satisfactory," "fair," "weak," or "vulnerable." The key factors of a utility's business risk profile are markets and service area economy; competitive position; operations; regulation; and management. In ascending order of risk, S&P characterizes financial risk profiles as "minimal," "modest," "intermediate," "significant," "aggressive" and "highly leveraged." The primary determinants of S&P's financial risk profile analysis are accounting characteristics; financial governance/policies and risk tolerance; cash flow adequacy; capital structure and leverage; and liquidity and short-term factors.[8] I

[7] Moody's assigns 15% weighting to FFO interest coverage and Debt to capitalization and 5% weighting to FFO-to-Debt and RCF-to-CapEx. Moody's assigns the financial ratios a weight of 40% in determining the overall credit rating for regulated water utilities.

[8] S&P Ratings Direct, *U.S. Investor-Owned Water Utilities, Strongest to Weakest*, December 21, 2010, http://www.globalcreditportal.com/ratingsdirect.

used S&P the business risk profiles and financial risk profiles for a typical water utility for the Company, since S&P does not rate UI. I began with all sixteen of the water utilities S&P rates.[9] Those sixteen water utilities have an average financial risk profile of "significant." The business risk profile of all sixteen water utilities is "excellent." From that, I concluded that a business risk profile of "excellent" and a financial risk profile of "significant" are representative of the business and financial risk of a typical water utility and are therefore reasonable estimates for UI. To obtain a sample with a sufficient number of companies to minimize measurement error associated with estimates of cost of common equity for individual companies, I also included utilities with the financial risk profiles of "intermediate" and "aggressive," which are on either side of "significant."

## DCF Analysis

**Q. Please describe DCF analysis.**

A. For a utility to attract common equity capital, its investors must expect it to provide a rate of return on common equity sufficient to meet their requirements. DCF analysis establishes a rate of return directly from investor requirements. The DCF model does not include a separate term for the quantity of a security's operating and financial risks. The market consensus of those risks is embodied in the market prices of securities.

[9] S&P Ratings Direct, *U.S. Regulated Water, Gas, And Electric Utilities, Strongest to Weakest*, October 22, 2012, http://www.standardandpoors.com/ratingsdirect.

According to DCF theory, a security price equals the present value of the cash flow investors expect it to generate. Specifically, the market value of common stock equals the cumulative value of the expected stream of future dividends after each is discounted by the investor-required rate of return.

**Q. Please describe the DCF model with which you measured the investor-required rate of return on common equity.**

A. As it applies to common stocks, DCF analysis is generally employed to determine appropriate stock prices given a specified discount rate. Since a DCF model incorporates time-sensitive valuation factors, it must correctly reflect the timing of the dividend payments that stock prices embody. As such, incorporating stock prices that the financial market sets on the basis of quarterly dividend payments into a model that ignores the time value of quarterly cash flows constitutes a misapplication of DCF analysis. The companies in the samples pay dividends quarterly; therefore, I applied a non-constant-growth quarterly DCF model to measure the annual required rate of return on common equity.

**Q. Why did you apply a non-constant growth DCF model in this proceeding?**

A. A single-stage, constant growth DCF model employs a single growth rate estimate which is assumed to be sustainable infinitely. Thus, the cost of common equity calculation derived from a constant growth estimate is appropriate if the near-term growth rate forecast for each company in the sample is expected to equal its average long-term dividend growth. However, the level of growth indicated by the average 3-5 year growth rates for my Water and Utility samples is not sustainable over the long-term. Therefore, I implemented a multi-stage, non-constant growth DCF model.

In this proceeding, the average 3-5 year growth rate is 5.73% for the Water sample and 4.74% for the Utility sample, while my estimate of the long-term growth rate is 4.86%. Since the near term growth rate estimates for my Water sample exceeds the expected long-term overall economic growth rate, the sustainability of the average 3-5 year growth rates for my Water sample is unlikely. Thus, I used a non-constant growth DCF model that employs three distinct growth rate estimates for each of three discrete time periods.

As an additional evaluation of the sustainability of the 3-5 year growth rates, I also calculated the return on equity ("ROE") those growth rates imply, based on the dividend payout and other data published in Value Line for each company in the Water and Utility samples. That calculation produced an average ROE of 15.06% for the Water sample and 12.96% for the Utility sample. In comparison, Value Line forecasts an implied average ROE for the 2014-2016 period of 10.80% for the Water sample and 9.55% for the Utility sample.[10] Therefore, the implication that investors expect those companies to sustain a 15.06% or 12.96%

[10] The published Value Line ROE forecasts for the Water and Utility sample companies reflect return on end of year equity. Therefore, I adjusted the Value Line published forecasts to reflect the return on average 2015 common equity.

rate of return on equity indefinitely is unlikely. Consequently, I implemented a multi-stage NCDCF analysis.

**Q. Please describe how you modeled your non-constant growth DCF analysis.**

A. I modeled three stages of dividend growth. The first, a near-term growth stage, is assumed to last five years. The second stage is a transitional growth period lasting from the end of the fifth year to the end of the tenth year. Finally, the third, or "steady-state," growth stage is assumed to begin after the tenth year and continue into perpetuity. An expected stream of dividends is estimated by applying these stages of growth to the current dividend. The discount rate that equates the present value of this expected stream of cash flows to the company's current stock price equals the market-required return on common equity. Schedule 5.3 mathematically presents the relationship between the cash flow stream, stock price, and market required rate of return on common equity.

**Q. How did you estimate the growth rate parameters?**

A. Determining the market-required rate of return with the DCF methodology requires a growth rate that reflects the expectations of investors. Although the current market price reflects aggregate investor expectations, market-consensus expected growth rates cannot be observed directly.

For the first stage, which is assumed to last five years, I used the average of Zacks and Reuters growth rate estimates as of December 19, 2012. Zacks and Reuters summarize and publish the 3-5 year earnings growth expectations of financial analysts employed by the research departments of investment brokerage firms.

The growth rate employed in the intervening, five-year transitional stage equals the average of the first and third stage growth rates.

For the third stage, which begins at the end of the tenth year, I calculated the nominal overall economic growth beginning in 2022 to estimate the long-term growth expectations of investors. The overall economic growth rate is composed of two parts, the expected real growth rate and the expected inflation rate. I estimated the expected real growth rate from the average of the Energy Information Administration's ("EIA") and Global Insight's forecasts of real gross domestic product ("GDP"). EIA forecasts that real GDP will average 2.6% over the 2022-2035 period. Similarly, Global Insight forecasts that real GDP will average 2.5% over the 2021-2042 period.

I extracted an estimate of the expected inflation rate from the difference in yields on U.S. Treasury bonds, which contain a premium for expected inflation, and U.S. Treasury Inflation-Protected Securities ("TIPS"), which do not contain a premium for expected inflation. The formula for this calculation is:

$$\text{Expected inflation} = (1+UST) / (1+TIPS) - 1$$

Where UST = yield on U.S. Treasury bonds; and
TIPS = yield on U.S. Treasury Inflation-Protected Securities.

An implied 20-year forward TIPS yield in ten years of 0.95% was derived from the -0.66% 10-year and 0.41% 30-year TIPS rates as of December 19, 2012. An implied 20-year forward U.S. Treasury rate in ten years of 3.61% was derived from the 1.82% 10-year and 2.99% 30-year U.S. Treasury rates as of December 19, 2012. The implied 20-year forward rates were calculated using the following formula:

$$ {}_{20}f_{10} = [(1+{}_{30}r_0)^{30} / (1+{}_{10}r_0)^{10}]^{1/20} - 1 $$

Where ${}_{20}f_{10}$ = the implied 20-year forward rate in ten years;
${}_{30}r_0$ = the current 30-year rate; and
${}_{10}r_0$ = the current 10-year rate.

Therefore, the estimate of long-term expected inflation equals 2.6%:

$$ (1+3.61\%) / (1+0.95\%) - 1 = 2.6\% $$

The two components of nominal overall economic growth were then combined to estimate the long-term growth rate for the third stage, using the following formula:

$$ \text{Nominal overall economic growth} = [(1+\text{Real GDP}) * (1+\text{Inflation})] - 1 $$

Therefore, from the long-term estimates of real GDP growth of 2.5% and expected inflation of 2.6%, the long-term estimate of overall economic growth equals 5.2%:

$$ \text{Nominal overall economic growth} = (1+2.5\%) * (1+2.6\%) - 1 = 5.2\% $$

I also calculated the nominal economic growth EIA forecasted for the 2022-2035 period (4.70%) and Global Insight forecasted for the 2022-2042 period (4.4%). Finally, I combined the 4.5% average of the EIA and Global Insight forecasts with the 5.2% nominal economic growth estimate described above to derive my long-term estimate of overall economic growth of 4.86%.

Schedule 5.4 presents the growth rate estimates for the companies in the Water and Utility samples.

**Q. Is an estimate of the long-term overall economic growth rate a reasonable estimate for the steady-state stage growth for your Water and Utility samples?**

A. Ideally, company-specific steady-state growth rate estimates are preferable. Unfortunately, company specific steady-state growth rate forecasts are not available. Further, for the reasons presented above, it is evident that investors cannot reasonably expect utilities in the Water and Utility samples to sustain growth over the very long term at the level of analysts' current 3-5 growth rate estimates. Thus, while the overall economic growth rate might be biased upward for generally low-growth companies such as utilities, it is much closer to the growth rate that investors could reasonably expect utilities to sustain over the long term.

**Q. How did you measure the stock price?**

A. A current stock price reflects all information that is available and relevant to the market; thus, it represents the market's assessment of the common stock's current value. I measured each company's current stock price with its closing market price from December 19, 2012. Those stock prices for the companies in the Water and Utility samples appear on Schedule 5.5.

Since stock prices reflect the market's concurrent expectation of the cash flows the securities will produce and the rate at which those cash flows are discounted, an observed change in the market price does not necessarily indicate a change in the required rate of return on common equity. Rather, a price change may reflect investors' re-evaluation of the expected dividend growth rate. In addition, stock prices change with the approach of dividend payment dates. Consequently, when estimating the required return on common equity with the DCF model, one should measure the expected dividend yield and the corresponding expected growth rate concurrently. Using a historical stock price along with current growth expectations or combining an updated stock price with past growth expectations would likely produce an inaccurate estimate of the market-required rate of return on common equity.

**Q. Please explain the significance of the column titled "Next Dividend Payment Date" shown on Schedule 5.5.**

A. Estimating the present value of each dividend requires measuring the length of time between its payment date and the stock observation date. For the first dividend payment, that length of time is measured from the "Next Dividend Payment Date." Subsequent dividend payments occur in quarterly intervals.

**Q. How did you estimate the next four expected quarterly dividends?**

A. Most utilities declare and pay the same dividend per share for four consecutive quarters before adjusting the rate. Consequently, I assumed the current declared dividend rate would adjust during the same quarter it changed the previous year. If the utility did not increase its dividend over the previous four quarters, I assumed the dividend would increase during the next quarter. For those companies that had announced the next dividend payment by the date that I performed my analysis, I input the dividend payment amount announced by the company. Otherwise, the average expected growth rate was applied to the current declared dividend rate to estimate the expected dividend rate. Schedule 5.5 presents the current quarterly dividends for the companies in the water and utility samples. Schedule 5.6 presents the expected quarterly dividends for the companies in the water and utility samples.

**Q. Based on your DCF analysis, what are the estimated required rates of return on common equity for the water sample and the utility sample?**

A. The DCF analysis estimated an 8.71% required rate of return on common equity estimate for the water sample and 9.07% for the utility sample as shown on Schedule 5.7. Those results represent averages of the DCF estimates for the individual companies. However, I did not include the DCF estimates for

Middlesex Water Co. in the 8.71% required rate of return on common equity estimate for the Water sample because the 7.42% cost of equity estimate for Middlesex Water Co. was more than two standard deviations below the average for the Water sample. The DCF estimates for the Water and Utility samples are derived from the growth rates presented on Schedule 5.4, the stock price and dividend payment dates presented on Schedule 5.5, and the expected quarterly dividends presented on Schedule 5.6.

**Risk Premium Analysis**

**Q. Please describe the risk premium model.**

A. The risk premium model is based on the theory that the market-required rate of return for a given security equals the risk-free rate of return plus a risk premium associated with that security. A risk premium represents the additional return investors expect in exchange for assuming the risk inherent in an investment. Mathematically, a risk premium equals the difference between the expected rate of return on a risk factor and the risk-free rate. If the risk of a security is measured relative to a portfolio, then multiplying that relative measure of risk and the portfolio's risk premium produces a security-specific risk premium for that risk factor.

The risk premium methodology is consistent with the theory that investors are risk-averse. That is, investors require higher returns to accept greater exposure to risk. Thus, if investors had an opportunity to purchase one of two securities with equal expected returns, they would purchase the security with less risk. Similarly, if investors had an opportunity to purchase one of two securities with equal risk, they would purchase the security with the higher expected return. In equilibrium, two securities with equal quantities of risk have equal required rates of return.

The Capital Asset Pricing Model ("CAPM") is a one-factor risk premium model that mathematically depicts the relationship between risk and return as:

$$R_j = R_f + \beta_j \times (R_m - R_f)$$

where $R_j$ ≡ the required rate of return for security *j*;

$R_f$ ≡ the risk-free rate;

$R_m$ ≡ the expected rate of return for the market portfolio; and

$\beta_j$ ≡ the measure of market risk for security *j*.

In the CAPM, the risk factor is market risk, which is defined as risk that cannot be eliminated through portfolio diversification. To implement the CAPM, one must estimate the risk-free rate of return, the expected rate of return on the market portfolio, and a security or portfolio-specific measure of market risk.

**Q. How did you estimate the risk-free rate of return?**

A. I examined the suitability of the yields on four-week U.S. Treasury bills and thirty-year U.S. Treasury bonds as estimates of the risk-free rate of return.

**Q. Why did you examine the yields on U.S. Treasury bills and bonds as measures of the risk-free rate?**

A. The proxy for the nominal risk-free rate should contain no risk premium and reflect similar inflation and real risk-free rate expectations to the security being analyzed through the risk premium methodology.[11] The yields of fixed income securities include premiums for default and interest rate risk. Default risk pertains to the possibility of default on principal or interest payments. Securities of the United States Treasury are virtually free of default risk by virtue of the federal government's fiscal and monetary authority. Interest rate risk pertains to the effect of unexpected interest rate fluctuations on the value of securities.

Since common equity theoretically has an infinite life, its market-required rate of return reflects the inflation and real risk-free rates anticipated to prevail over the long run. U.S. Treasury bonds, the longest term treasury securities, are issued with terms to maturity of thirty years;[12] U.S. Treasury notes are issued with terms to maturity ranging from two to ten years; U.S. Treasury bills are issued with terms to maturity ranging from four weeks to fifty-two weeks. Therefore, U.S. Treasury bonds are more likely to incorporate within their yields the inflation and real risk-free rate expectations that drive, in part, the prices of common stocks than either U.S. Treasury notes or Treasury bills.

[11] Real risk-free rate and inflation expectations comprise the non-risk portion of a security's rate of return.

[12] In February 9, 2006, the U.S. Department of Treasury resumed the issuance of 30-year U.S. Treasury Bonds.

However, due to relatively long terms to maturity, U.S. Treasury bond yields also contain an interest rate risk premium that diminishes their usefulness as measures of the risk-free rate. U.S. Treasury bill yields contain a smaller premium for interest rate risk. Thus, in terms of interest rate risk, U.S. Treasury bill yields more accurately measure the risk-free rate.

**Q. Given that the inflation and real risk-free rate expectations reflected in the yields on U.S. Treasury bonds and the prices of common stocks are similar, does it necessarily follow that the inflation and real risk-free rate expectations that are reflected in the yields on U.S. Treasury bills and the prices of common stocks are dissimilar?**

A. No. To the contrary, short and long-term inflation and real risk-free rate expectations, including those that are reflected in the yields on U.S. Treasury bills, U.S. Treasury bonds, and the prices of common stocks, should equal over time. Any other assumption implausibly implies that the real risk-free rate and inflation is expected to systematically and continuously rise or fall.

Although expectations for short and long-term real risk-free rates and inflation should equal over time, in finite time periods, short- and long-term expectations may differ. Short-term interest rates tend to be more volatile than long-term interest rates.[13] Consequently, over time U.S. Treasury bill yields are less biased (i.e., more accurate) but less reliable (i.e., more volatile) estimators of the long-

[13] Fabozzi and Fabozzi, ed., *The Handbook of Fixed Income Securities*, Fourth Edition, Irwin, p. 789.

term risk-free rate than U.S. Treasury bond yields. In comparison, U.S. Treasury bond yields are more biased (i.e., less accurate) but more reliable (i.e., less volatile) estimators of the long-term risk-free rate. Therefore, an estimator of the long-term nominal risk-free rate should not be chosen mechanistically. Rather, the similarity in current short- and long-term nominal risk-free rates should be evaluated. If those risk-free rates are similar, then U.S. Treasury bill yields should be used to measure the long-term nominal risk-free rate. If not, some other proxy or combination of proxies should be used.

**Q. What are the current yields on four-week U.S. Treasury bills and thirty-year U.S. Treasury bonds?**

A. Four-week U.S. Treasury bills are currently yielding 0.03%. Thirty-year U.S. Treasury bonds are currently yielding 3.01%. Both estimates are derived from quotes for December 19, 2012.[14] Schedule 5.8 presents the published quotes and effective yields.

**Q. Of the U.S. Treasury bill and bond yields, which is currently a better proxy for the long-term risk-free rate?**

A. In terms of the gross domestic product ("GDP") price index, the Energy Information Administration ("EIA") forecasts the annual inflation rate will average 1.9% during the 2012-2035 period.[15] In comparison, Global Insight forecasts that

[14] The Federal Reserve Board, *Federal Reserve Statistical Release: Selected Interest Rates, H.15 Daily Update*, http://www.federalreserve.gov/releases/H15/update/, December 21, 2012.

[15] Energy Information Administration, *Annual Energy Outlook 2012,* Table A20. Macroeconomic Indicators, www.eia.doe.gov/oiaf/aeo/, July 2012.

annual GDP price inflation will average 1.8% during the 2012-2042 period.[16] In terms of the Consumer Price Index ("CPI"), the *Survey of Professional Forecasters* ("*Survey*") forecasts that inflation rate will average 2.2% during the next ten years.[17] Although EIA, Global Insight and the *Survey* do not forecast the real risk-free rate, they do forecast real GDP growth, which is a proxy for the real risk-free rate. EIA forecasts real GDP growth will average 2.6% during the 2012-2035 period.[18] Global Insight forecasts real GDP growth will average 2.5% during the 2012-2042 period.[19] The *Survey* forecasts real GDP growth will average 2.7% during the next ten years.[20] Those forecasts imply a long-term, nominal risk-free rate between 4.3% and 4.9%.[21] Therefore, EIA, Global Insight, and *Survey* forecasts of inflation and real GDP growth expectations suggest that, currently, the U.S. Treasury bond yield of 3.01% more closely approximates the long-term risk-free rate. It should be noted, however, that the U.S. Treasury bond yield is an upwardly biased estimator of the long-term risk-free rate due to

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[16] Global Insight, *The U.S. Economy: The 30-Year Focus, Fourth Quarter 2012*, Table 1: Summary of the U.S. Economy.

[17] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, Fourth Quarter 2012, www.phil.frb.org/files/spf/survq403.html, November 9, 2012. The *Survey* aggregates the forecasts of approximately fifty forecasters.

[18] Energy Information Administration*, Annual Energy Outlook 2012,* Table A20. Macroeconomic Indicators, www.eia.doe.gov/oiaf/aeo/, July 2012.

[19] Global Insight, *The U.S. Economy: The 30-Year Focus, Fourth Quarter 2012*, Table 1: Summary of the U.S. Economy.

[20] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, First Quarter 2012, www.phil.frb.org/files/spf/survq403.html, February 10, 2012.

[21] Nominal interest rates are calculated as follows:

$$r = (1 + R) \times (1 + i) - 1.$$

where $r$ ≡ nominal interest rate;
$R$ ≡ real interest rate; and
$i$ ≡ inflation rate.

the inclusion of an interest rate risk premium associated with its relatively long term to maturity.

**Q. Please explain why the real risk-free rate and the GDP growth rate should be similar.**

A. Risk-free securities provide a rate of return sufficient to compensate investors for the time value of money, which is a function of production opportunities, time preferences for consumption, and inflation.[22] The real risk-free rate does not include premiums for inflation; therefore, only production opportunities and consumption preferences affect it. The real GDP growth rate measures output of goods and services excluding inflation and, as such, also reflects both production and consumers' consumption preferences. Therefore, both the real GDP growth rate and the real risk-free rate of return should be similar since both are a function of production opportunities and consumption preferences without the effects of a risk premium or an inflation premium.

**Q. How was the expected rate of return on the market portfolio estimated?**

A. The expected rate of return on the market was estimated by conducting a DCF analysis on the firms composing the S&P 500 Index ("S&P 500") as of September 30, 2012. That analysis used dividend information and closing market prices reported by Zacks Research Wizard and in the October 2012 edition of *S&P Security Owner's Stock Guide*. October 1, 2012 growth rate

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[22] Brigham and Houston, Fundamentals of Financial Management, 8th edition.

estimates were also obtained primarily from Zacks and secondarily from Reuters.[23] Firms not paying a dividend as of September 30, 2012, or for which neither Zacks nor Reuters growth rates were available were eliminated from the analysis. The resulting company-specific estimates of the expected rate of return on common equity were then weighted using market value data from Zacks Research Wizard. The estimated weighted average expected rate of return for the remaining 401 firms, composing 87.46% of the market capitalization of the S&P 500, equals 12.81%.

**Q. How did you measure market risk on a security-specific basis?**

A. Beta measures risk in a portfolio context. When multiplied by the market risk premium, a security's beta produces a market risk premium specific to that security. I used Value Line's betas, Zacks' betas, and a regression analysis to estimate the betas of the Water and Utility samples.

When available, I used published Value Line beta estimates for each company in each sample. For those companies that did not have published Value Line beta estimates, I calculated beta estimates using the Value Line beta methodology.[24] Value Line estimates beta for a security with the following model using an ordinary least-squares technique:[25]

[23] Growth rates were obtained from Reuters only if unavailable from Zacks.

[24] The Value Line service to which the Commission subscribes does not provide beta estimates for Artesian Resources, Connecticut Water Service, Middlesex Water Company, and York Water Company.

[25] Statman, Meir, "Betas Compared: Merrill Lynch vs. Value Line," *The Journal of Portfolio Management*, Winter 1981.

$$R_{j,t} = a_j + \beta_j \times R_{m,t} + e_{j,t}$$

where $R_{j,t}$ ≡ the return on security *j* in period *t*;

$R_{m,t}$ ≡ the return on the market portfolio in period *t*;

$a_j$ ≡ the intercept term for security *j*;

$\beta_j$ ≡ beta, the measure of market risk for security *j*; and

$e_{j,t}$ ≡ the residual term in period *t* for security *j*.

A beta can be calculated for firms with market-traded common stock. Value Line calculates its betas in two steps. First, the returns of each company are regressed against the returns of the New York Stock Exchange Composite Index ("NYSE Index") to estimate a raw beta. The regression analysis employs 259 weekly observations of stock return data. Then, an adjusted beta is estimated through the following equation:

$$\beta_{adjusted} = 0.35 + 0.67 \times \beta_{raw}.$$

The regression analysis estimate of beta for a security or portfolio of securities is estimated with the following model using an ordinary least-squares technique:

$$R_{j,t} - R_{f,t} = a_j + \beta_j \times (R_{m,t} - R_{f,t}) + e_{j,t}$$

where $R_{j,t}$ ≡ the return on security *j* in period *t*;

$R_{f,t}$ ≡ the risk-free rate of return in period *t*;

$R_{m,t}$ ≡ the return on the market portfolio in period *t*;

$a_j$ ≡ the intercept term for security *j*;

$\beta_j$ ≡ beta, the measure of market risk for security *j*; and

$e_{j,t}$ ≡ the residual term in period *t* for security *j*.

Next, a beta estimate for both samples was calculated in three steps using regression analysis. First, the U.S. Treasury bill return is subtracted from both the average percentage change in the two samples' stock prices and the percentage change in the NYSE Index to estimate each portfolio's return in excess of the risk-free rate. Second, the excess returns of each of the samples are regressed against the excess returns of the NYSE Index to estimate a raw beta. The regression analysis employs sixty monthly observations of stock and U.S. Treasury bill return data. Third, the beta is adjusted through the following equation:

$$\beta_{adjusted} = 0.33743 + 0.66257 \times \beta_{raw}.$$

Like Staff's regression beta, Zacks employs 60 monthly observations in its beta estimation. However, Zacks' betas regress stock returns against the S&P 500 Index rather than the NYSE Index. Further, the beta estimates Zacks publishes are raw betas. Thus, I adjusted the Zacks raw betas using the same formula used to adjust the regression beta.

**Q. Why do you use an adjusted beta estimate?**

A. I use an adjusted beta estimate for two reasons. First, betas tend to regress towards the market mean value of 1.0 over time; therefore, the adjustment represents an attempt to estimate a forward-looking beta. Second, some empirical tests of the CAPM suggest that the linear relationship between risk, as measured by raw beta, and return is flatter than the CAPM predicts. That is, securities with raw betas less than one tend to realize higher returns than the CAPM predicts. Conversely, securities with raw betas greater than one tend to realize lower returns than the CAPM predicts. Adjusting the raw beta estimate towards the market mean value of 1.0 results in a linear relationship between the beta estimate and realized rate of return that more closely conforms to the CAPM prediction.[26] Securities with betas less than one are adjusted upwards thereby increasing the predicted required rate of return towards observed realized rates of return. Conversely, securities with betas greater than one are adjusted downwards thereby decreasing the predicted required rate of return towards observed realized rates of return.[27]

**Q. What are the beta estimates for the samples?**

[26] Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to the Estimation of A Public Utility's Cost of Equity Capital," *Journal of Finance*, May 1980, pp. 375-376.

[27] In other words, the linear relationship between risk, as measured by adjusted beta, and return is steeper than the linear relationship between risk, as measured by raw beta, and return.

A. The regression beta estimate for the Water sample is 0.55. The average Value Line beta and average Zacks beta for the Water sample are 0.66 and 0.58, respectively, as shown in Table 1 below.[28]

**Table 1**

| Company | Value Line Estimate | Zacks Estimate* |
|---|---|---|
| American States Water | 0.70 | 0.56 |
| American Water Works | 0.65 | 0.53 |
| Aqua America | 0.60 | 0.46 |
| Artesian Resources | 0.60 | 0.63 |
| California Water Service | 0.65 | 0.52 |
| Connecticut Water Service | 0.80 | 0.66 |
| Middlesex Water Company | 0.70 | 0.66 |
| York Water Company | 0.60 | 0.64 |
| Average | 0.66 | 0.58 |

* after adjustment

Since the Zacks beta estimate (0.58) and the regression beta estimate (0.55) are calculated using monthly data[29] rather than weekly data (as Value Line uses), I averaged those results to avoid over-weighting that approach. The average of the two monthly beta estimates is 0.57. I then averaged that result with the Value Line beta (0.66), which produces a beta for the Water sample of 0.61.

[28] The Value Line Investment Survey, "Summary and Index," December 7, 2012, pp. 2-23; Zacks Research Wizard, December 19, 2012.

[29] Hereafter referred to as "monthly betas."

The regression beta estimate for the Utility sample is 0.68. The average Value Line beta and average Zacks beta for the Utility sample are 0.71 and 0.73, respectively, as shown in Table 2 below.[30]

**Table 2**

| Company | Value Line Estimate | Zacks Estimate* |
|---|---|---|
| American Electric Power | 0.65 | 0.65 |
| Avista Corp. | 0.70 | 0.78 |
| Black Hills Corp. | 0.80 | 0.97 |
| Cleco Corp. | 0.65 | 0.65 |
| CMS Energy Corp. | 0.75 | 0.66 |
| El Paso Electric | 0.70 | 0.72 |
| Great Plains Energy Inc. | 0.75 | 0.79 |
| IDACORP Inc. | 0.70 | 0.63 |
| Nisource Inc. | 0.80 | 0.82 |
| Northwestern Corp. | 0.70 | 0.78 |
| Pinnacle West Capital Corp. | 0.70 | 0.68 |
| Portland General Electric | 0.75 | 0.76 |
| PPL Corp. | 0.65 | 0.61 |
| Westar Energy | 0.70 | 0.70 |
| Average | 0.71 | 0.73 |

* after adjustment

The average of the two monthly beta estimates is 0.71. I then averaged that result with the Value Line beta (0.71), which produces a beta for the Utility sample of 0.71.

**Q. What required rate of return on common equity does the risk premium model estimate for the samples?**

[30] The Value Line Investment Survey, "Summary and Index," December 7, 2012, pp. 2-23; Zacks Research Wizard, December 19. 2012.

A. The risk premium model estimates a required rate of return on common equity of 8.99% for the Water sample and 9.97% for the Utility sample. The computation of those estimates appears on Schedule 5.8.

## Cost of Equity Recommendation

**Q. Based on your entire analysis, what is your estimate of the required rate of return on the common equity for UI?**

A. A thorough analysis of the required rate of return on common equity requires both the application of financial models and the analyst's informed judgment. An estimate of the required rate of return on common equity based solely on judgment is inappropriate. Nevertheless, because techniques to measure the required rate of return on common equity necessarily employ proxies for investor expectations, judgment remains necessary to evaluate the results of such analyses. Along with DCF and risk premium analyses, I have considered the observable 4.13% rate of return the market currently requires on less risky A-rated utility long-term debt.[31] Based on my analysis, in my judgment, the investor-required rate of return on common equity for UI's subsidiaries Apple Canyon and Lake Wildwood equals 9.25%.

**Q. Please summarize how you determined that the investor-required rate of return on common equity for UI's subsidiaries Apple Canyon and Lake Wildwood equals 9.25%.**

[31] *Value Line Selection & Opinion,* December 7, 2012, p. 1237.

A. First, I estimated the investor-required rate of return on common equity for the two samples from the results of the DCF and risk premium analyses for the samples. The average investor required rate of return on common equity for the Water sample, 8.85%, is based on the average of the DCF-derived results (8.71%) and the risk premium-derived results (8.99%). The average investor required rate of return on common equity for the Utility sample, 9.52%, is based on the average of the DCF-derived results (9.07%) and the risk premium-derived results (9.97%). I then weighted the cost of common equity for the Water sample at 40% and weighted the cost of common equity for the Utility sample at 60%. Thus, the investor required rate of return on common equity for the Companies, 9.25%, is based on the weighted average for the Water and Utility samples.

**Q. How did you minimize measurement error in your cost of equity analysis?**

A. The models from which the individual company estimates were derived are correctly specified and thus contain no source of bias. Moreover, excepting the use of U.S. Treasury bond yields are proxies for the long-term risk-free rate, I am unaware of bias in my proxy for investor expectations. In addition, measurement error has been minimized through the use of samples, since estimates for a sample as a whole are subject to less measurement error than individual company estimates.

**Q. Why did you weight your estimates of the investor-required rate of return on common equity for the Water and Utility samples to estimate the Companies' cost of common equity?**

A. The Water and Utility samples serve as proxies for the target companies and should therefore reflect the risks of the Companies. If the proxy does not accurately reflect the risk level of the target company, an adjustment should be made. Since the operating risks of the Water sample is similar to the operations of the Companies and the Utility sample reflects similar operating risk to an average water utility, a review of the relative financial risks of UI and the Water and Utility samples remains. To assess relative financial risk, I estimated the credit ratings that are implied by the key credit metrics that Moody's publishes for global regulated water utilities and regulated electric and gas utilities.

**Q. How did you estimate the implied credit ratings for the Water and Utility samples and UI?**

A. Although no formula exists for determining an assigned credit rating, Moody's provides broad guidelines on the ratio ranges that are typical for different credit rating levels for regulated utilities. As discussed earlier, for the regulated water utility industry, Moody's focuses on four ratios to assess the financial strength: (1) funds from operations ("FFO") interest coverage; (2) debt to capitalization; (3) FFO to net debt; and (4) retained cash flow ("RCF") to capital expenditures

("CapEx").[32] For regulated electric and gas utilities. Moody's focuses on four ratios to assess the financial strength: (1) FFO interest coverage; (2) FFO-to-debt; (3) RCF-to-debt; and (4) debt-to-capitalization.[33] I compared three-year average financial ratios for UI and the Water sample to Moody's key credit metrics for global regulated water utilities.[34] I compared three-year average financial ratios for the Utility sample to Moody's key credit metrics for regulated electric and gas utilities.

The Moody's financial guidelines for regulated water utilities, along with the three-year average scores for UI and the Water sample on those financial ratios are shown below in Table 3.

**Table 3 – Moody's Guideline Ratios for Water Utilities**

| | A (6) | Baa (9) | Ba (12) | B (15) |
|---|---|---|---|---|
| ***Financial Guideline Ratios*** | | | | |
| FFO / Interest | 4.5 - 7.0X | 2.5 – 4.5X | 1.8 – 2.5X | 1.5 – 1.8X |
| Debt / Capitalization | 40 - 55% | 55 - 70% | 70 - 85% | 85 - 100% |
| FFO / Debt | 15 – 25% | 10 - 15% | 6 - 10% | 4 – 6% |
| RCF / CapEx | 1.5 – 2.5X | 1.0 – 1.5X | 0.5 – 1.0X | 0.25 – 0.5X |
| **Water sample** | | | | |
| FFO / Interest | | 4.34X | | |
| Debt / Capitalization | 53.07% | | | |
| FFO / Debt | 18.01% | | | |
| RCF / CapEx | | | 0.70X | |
| **Utilities, Inc.** | | | | |
| FFO / Interest | | 3.02X | | |
| Debt / Capitalization | 54.90% | | | |
| FFO / Debt | | 13.84% | | |
| RCF / CapEx | | | 0.86X | |

[32] Moody's Investors Service, *Rating Methodology: Global Regulated Water Utilities*, December 2009, pp. 19-22.
[33] Moody's Investors Service, *Rating Methodology: Regulated Electric and Gas Utilities*, August 2009, pp. 10-13.
[34] The three-year average was computed using the years 2007, 2008, and 2009.

The Moody's financial guidelines for regulated electric and gas utilities, along with the three-year average scores for the Utility sample on those financial ratios are shown below in Table 4.

**Table 4 – Moody's Guideline Ratios for Electric and Gas Utilities**

| | A | Baa | Ba |
|---|---|---|---|
| **Financial Guideline Ratios** | | | |
| FFO/IC | 4.5-6.0x | 2.7-4.5x | 1.5-2.7x |
| FFO/Debt | 22-30% | 13-22% | 5-13% |
| RCF/Debt | 17-25% | 9-17% | 0-9% |
| Debt/Capitalization | 35-45% | 45-55% | 55-65% |
| **Utility Sample** | | | |
| FFOIC | | 4.21x | |
| FFO/Debt | | 19.66% | |
| RCF/Debt | | 15.66% | |
| Debt/Capitalization | | | 55.93% |

As discussed earlier, the four ratios that I calculated for UI are consistent with a Baa2 rating, when weighted in accordance with the Moody's rating methodology for regulated water utilities.  In contrast, the average financial ratios for 2009-2011, shown in Tables 3 and 4 above, are indicative of a level of financial risk that is commensurate with a Baa1 credit rating for the Water sample and Baa2 for the Utility sample.  The samples' implied credit ratings indicate that the Water sample has slightly less financial risk than UI and the Utility sample has similar financial risk to UI.  Thus, in my judgment, given the small difference between the implied credit ratings of UI and the implied credit ratings of the Water sample, the cost of common equity for the Companies should be derived giving slightly less weight to the cost of common equity for the Water sample.  Thus, I assigned 40% weighting to the 8.85% cost of common equity for the Water sample and 60%

weighting to the 9.51% cost of common equity for the Utility sample to derive an appropriate estimate of the Companies' costs of common equity of 9.25%.

**Q. How are the financial ratios for utilities calculated?**

A. FFO reflects cash flow from operations excluding working capital movements net of interest expense. The FFO is then divided by the net interest expense to derive the FFO interest coverage ratio. The FFO to Debt is derived by dividing FFO by net debt. Debt to Capitalization is debt divided by total capitalization. RCF is calculated by subtracting any dividends paid from FFO, which is then divided by capital expenditures to derive the RCF to CapEx ratio. The RCF to Debt is derived by dividing RCF by net debt.

## Rate of Return on Rate Base Conclusion

**Q. What is your recommended rate of return on rate base for UI?**

A. I recommend a 7.95% rate of return on rate base for UI, which incorporates my 9.25% rate of return on common equity for UI. My rate of return recommendation is presented on Schedule 5.1.

**Q. Does this conclude your direct testimony?**

A. Yes, it does.

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

**Weighted Average Cost of Capital**
**December 31, 2011**

**Staff Proposal**

| | Amount | Percent of Total Capital | Cost | Weighted Cost |
|---|---|---|---|---|
| Long-term Debt | $178,726,842 | 50.24% | 6.66% | 3.35% |
| Common Equity | $177,007,000 | 49.76% | 9.25% | 4.60% |
| Total Capital | $355,733,842 | 100.00% | | |
| **Weighted Average Cost of Capital** | | | | **7.95%** |

**Company Proposal**

| | Percent of Total Capital | Cost | Weighted Cost |
|---|---|---|---|
| Long-term Debt | 50.42% | 6.60% | 3.33% |
| Common Equity | 49.58% | 10.45% | 5.18% |
| Total Capital | 100.00% | | |
| **Weighted Average Cost of Capital** | | | **8.51%** |

## Apple Canyon Utility Company
## Lake Wildwood Utilities Corporation

## Embedded Cost of Long-term Debt
## December 31, 2011

| Debt Issue Type, Coupon Rate | | Date Issued | Maturity Date | Principal Amount | Face Amount Outstanding | Unamortized Debt Expense | Carrying Value | Annual Interest Cost | Annualized Amort. of Debt Expense | Annualized Interest Expense |
|---|---|---|---|---|---|---|---|---|---|---|
| (A) | | (B) | (C) | (D) | (E) | (F) | (G)=(E-F) | (H) = (A*D) | (I) | (J)=(H+I) |
| 6.58% | Collateral Trust Notes | 7/19/2006 | 7/21/2036 | $ 180,000,000 | $ 180,000,000 | $ 1,273,158 | $ 178,726,842 | $ 11,844,000 | $ 51,812 | $ 11,895,812 |

**Embedded Cost of Long-term Debt** **6.66%**

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

## The Non-Constant Growth Discounted Cash Flow Model

The formula for measuring the cost of common equity, *k*, when growth, *g*, does not become constant until period $\varphi$, is as follows:

$$k = \left[\frac{D_{1,1}(1+k)^{\varphi-0.25} + D_{1,2}(1+k)^{\varphi-0.50} + D_{1,3}(1+k)^{\varphi-0.75} + \ldots + D_{\varphi,4} + P_{\varphi,4}}{P}\right]^{\left(\frac{1}{x+\varphi-0.25}\right)} - 1$$

where: $P$ ≡ the current market value;

$D_{\varphi,q}$ ≡ the expected dividend at the end of quarter $q$ in year $\varphi$, where $q$ = 1 to 4 and $\varphi$ = the number of periods until the steady-state growth period;

$k$ ≡ the cost of common equity; and

$x$ ≡ the elapsed time between the stock observation and first dividend payment dates, in years.

$P_{\varphi,4}$, the market value at the beginning of the steady-state growth stage, is calculated from the following equation:

$$P_{\varphi,4} = \frac{\sum_{q=1}^{4} D_{\varphi,q}(1+g_l)(1+k)^{1-[x+0.25(q-1)]}}{k-g_l}$$

where: $D_{\varphi,q}$ ≡ the dividend paid in quarter q during the last year of the transitional growth stage; and

$g_l$ ≡ the steady-state growth rate.

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

## Growth Rate Estimates

### Water Sample

| Company | Growth Rates Stage 1[1] | Stage 2[2] | Stage 3[3] |
|---|---|---|---|
| American States Water | 8.65% | 6.76% | 4.86% |
| American Water Works | 9.66% | 7.26% | 4.86% |
| Aqua America | 7.51% | 6.19% | 4.86% |
| Artesian Resources | 6.00% | 5.43% | 4.86% |
| California Water Service | 5.00% | 4.93% | 4.86% |
| Connecticut Water Service | 8.00% | 6.43% | 4.86% |
| Middlesex Water Co. | -5.00% | -0.07% | 4.86% |
| York Water Co. | 6.00% | 5.43% | 4.86% |

### Utility Sample

| Company | Growth Rates Stage 1[1] | Stage 2[2] | Stage 3[3] |
|---|---|---|---|
| American Electric Power | 3.24% | 4.05% | 4.86% |
| Avista Corp. | 4.42% | 4.64% | 4.86% |
| Black Hills Corp. | 6.00% | 5.43% | 4.86% |
| CMS Energy Corp. | 6.13% | 5.49% | 4.86% |
| Cleco Corp. | 3.00% | 3.93% | 4.86% |
| El Paso Electric Co. | 3.73% | 4.29% | 4.86% |
| Great Plains Energy Inc. | 8.03% | 6.44% | 4.86% |
| IDACORP | 4.00% | 4.43% | 4.86% |
| NiSource Inc. | 6.25% | 5.56% | 4.86% |
| Northwestern Corp. | 6.17% | 5.51% | 4.86% |
| PPL Corp | -1.40% | 1.73% | 4.86% |
| Pinnacle West Captial Corp. | 6.39% | 5.62% | 4.86% |
| Portland General Electric Co. | 4.04% | 4.45% | 4.86% |
| Westar Energy, Inc. | 6.40% | 5.63% | 4.86% |

[1] Equals the average of Zacks 3-5 year earnings per share growth rate estimates (Zacks Investment Research, Inc.) and Reuters long-term growth rates (Reuters.com)

[2] Equals the average of Stage 1 and Stage 3 growth rates.

[3] The implied 20-year forward U.S. Treasury Inflation-Protected Securities yield in ten years (${}_{20}f_{10}$), based on the 10- and 30-year U.S. Treasury Inflation-Protected Securities rates as of Dec. 19, 2012. (The Federal Reserve Board, Federal Reserve Statistical Release: Selected Interest Rates, H.15 Daily Update, http://www.federalreserve.gov/releases/H15/update/, December 21, 2012.)

Energy Information Administration, *Annual Energy Outlook 2012,* Table A20. Macroeconomic Indicators, www.eia.doe.gov/oiaf/aeo/, July 2012.

Global Insight, *The U.S. Economy: The 30-Year Focus, Fourth Quarter 2012*, Table 1: Summary of the U.S. Economy.

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

**Prices and Dividends**

**Water Sample**

| Company | Current Dividend $D_{0,1}$ | $D_{0,2}$ | $D_{0,3}$ | $D_{0,4}$ | Next Dividend ($D_1$) Payment Date | 12/19/2012 Stock Price |
|---|---|---|---|---|---|---|
| American States Water | $ 0.280 | $ 0.280 | $ 0.355 | $ 0.355 | 3/1/2013 | $ 47.34 |
| American Water Works | 0.230 | 0.250 | 0.250 | 0.250 | 6/1/2013 | $ 37.28 |
| Aqua America | 0.165 | 0.165 | 0.165 | 0.175 | 3/1/2013 | $ 24.69 |
| Artesian Resources | 0.193 | 0.198 | 0.198 | 0.203 | 2/22/2013 | $ 22.31 |
| California Water Service | 0.158 | 0.158 | 0.158 | 0.158 | 2/15/2013 | $ 18.15 |
| Connecticut Water Service | 0.238 | 0.238 | 0.243 | 0.243 | 3/15/2013 | $ 30.26 |
| Middlesex Water Co. | 0.185 | 0.185 | 0.185 | 0.188 | 3/1/2013 | $ 19.14 |
| York Water Co. | 0.134 | 0.134 | 0.134 | 0.134 | 1/15/2013 | $ 17.59 |

**Utility Sample**

| Company | Current Dividend $D_{0,1}$ | $D_{0,2}$ | $D_{0,3}$ | $D_{0,4}$ | Next Dividend ($D_1$) Payment Date | 12/19/2012 Stock Price |
|---|---|---|---|---|---|---|
| American Electric Power | $ 0.470 | $ 0.470 | $ 0.470 | $ 0.470 | 3/8/2013 | $ 43.51 |
| Avista Corp. | 0.290 | 0.290 | 0.290 | 0.290 | 3/15/2013 | $ 24.11 |
| Black Hills Corp. | 0.370 | 0.370 | 0.370 | 0.370 | 3/1/2013 | $ 36.26 |
| CMS Energy Corp. | 0.240 | 0.240 | 0.240 | 0.240 | 2/28/2013 | $ 24.56 |
| Cleco Corp. | 0.313 | 0.313 | 0.338 | 0.338 | 2/15/2013 | $ 40.85 |
| El Paso Electric Co. | 0.220 | 0.250 | 0.250 | 0.250 | 3/29/2013 | $ 31.85 |
| Great Plains Energy Inc. | 0.213 | 0.213 | 0.213 | 0.218 | 3/20/2013 | $ 20.64 |
| IDACORP | 0.330 | 0.330 | 0.330 | 0.380 | 2/28/2013 | $ 44.14 |
| NiSource Inc. | 0.230 | 0.230 | 0.240 | 0.240 | 2/20/2013 | $ 24.69 |
| Northwestern Corp. | 0.370 | 0.370 | 0.370 | 0.370 | 3/29/2013 | $ 35.10 |
| PPL Corp | 0.360 | 0.360 | 0.360 | 0.360 | 4/1/2013 | $ 29.14 |
| Pinnacle West Captial Corp. | 0.525 | 0.525 | 0.525 | 0.545 | 3/1/2013 | $ 51.86 |
| Portland General Electric Co. | 0.265 | 0.265 | 0.270 | 0.270 | 1/15/2013 | $ 27.60 |
| Westar Energy, Inc. | 0.330 | 0.330 | 0.330 | 0.330 | 4/1/2013 | $ 28.88 |

# Apple Canyon Utility Company
# Lake Wildwood Utilities Corporation

## Expected Quarterly Dividends

### Water Sample

| Company | $D_{1,1}$ | $D_{1,2}$ | $D_{1,3}$ | $D_{1,4}$ |
|---|---|---|---|---|
| American States Water | $ 0.355 | $ 0.355 | $ 0.386 | $ 0.386 |
| American Water Works | 0.250 | 0.274 | 0.274 | 0.274 |
| Aqua America | 0.175 | 0.175 | 0.175 | 0.188 |
| Artesian Resources | 0.203 | 0.210 | 0.210 | 0.215 |
| California Water Service | 0.165 | 0.165 | 0.165 | 0.165 |
| Connecticut Water Service | 0.243 | 0.243 | 0.262 | 0.262 |
| Middlesex Water Co. | 0.188 | 0.188 | 0.188 | 0.178 |
| York Water Co. | 0.142 | 0.142 | 0.142 | 0.142 |

### Utility Sample

| Company | $D_{1,1}$ | $D_{1,2}$ | $D_{1,3}$ | $D_{1,4}$ |
|---|---|---|---|---|
| American Electric Power | $ 0.485 | $ 0.485 | $ 0.485 | $ 0.485 |
| Avista Corp. | $ 0.303 | $ 0.303 | $ 0.303 | $ 0.303 |
| Black Hills Corp. | $ 0.392 | $ 0.392 | $ 0.392 | $ 0.392 |
| CMS Energy Corp. | $ 0.255 | $ 0.255 | $ 0.255 | $ 0.255 |
| Cleco Corp. | $ 0.338 | $ 0.338 | $ 0.348 | $ 0.348 |
| El Paso Electric Co. | $ 0.250 | $ 0.259 | $ 0.259 | $ 0.259 |
| Great Plains Energy Inc. | $ 0.218 | $ 0.218 | $ 0.218 | $ 0.235 |
| IDACORP | $ 0.380 | $ 0.380 | $ 0.380 | $ 0.395 |
| NiSource Inc. | $ 0.240 | $ 0.240 | $ 0.255 | $ 0.255 |
| Northwestern Corp. | $ 0.370 | $ 0.393 | $ 0.393 | $ 0.393 |
| PPL Corp | $ 0.355 | $ 0.355 | $ 0.355 | $ 0.355 |
| Pinnacle West Captial Corp. | $ 0.545 | $ 0.545 | $ 0.545 | $ 0.545 |
| Portland General Electric Co. | $ 0.270 | $ 0.270 | $ 0.281 | $ 0.281 |
| Westar Energy, Inc. | $ 0.351 | $ 0.351 | $ 0.351 | $ 0.351 |

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

**Non-Constant DCF Estimates**

**Water Sample**

| Company | DCF Estimate |
|---|---|
| American States Water | 8.88% |
| American Water Works | 8.66% |
| Aqua America | 8.36% |
| Artesian Resources | 9.01% |
| California Water Service | 8.68% |
| Connecticut Water Service | 8.97% |
| York Water Co. | 8.44% |
| Average | 8.71% |

**Utility Sample**

| Company | DCF Estimate |
|---|---|
| American Electric Power | 9.10% |
| Avista Corp. | 9.96% |
| Black Hills Corp. | 9.63% |
| CMS Energy Corp. | 9.47% |
| Cleco Corp. | 7.98% |
| El Paso Electric Co. | 7.97% |
| Great Plains Energy Inc. | 10.18% |
| IDACORP | 8.28% |
| NiSource Inc. | 9.37% |
| Northwestern Corp. | 9.81% |
| PPL Corp | 8.25% |
| Pinnacle West Captial Corp. | 7.77% |
| Portland General Electric Co. | 8.85% |
| Westar Energy, Inc. | 10.30% |
| Average | 9.07% |

Docket Nos. 12-0603 -12-0604
Consolidated
ICC Staff Exhibit 5.0
Schedule 5.8

**Apple Canyon Utility Company**
**Lake Wildwood Utilities Corporation**

**Risk Premium Analysis**

Interest Rates as of December 19, 2012

| U.S. Treasury Bills | | U.S. Treasury Bonds | |
|---|---|---|---|
| Discount Rate | Effective Yield | Equivalent Yield | Effective Yield |
| 0.03% | 0.03% | 2.99% | 3.01% |

**Risk Premium Cost of Equity Estimates***
**Water Sample**

| Risk-Free Rate | | Beta | | Risk Premium | | Cost of Common Equity |
|---|---|---|---|---|---|---|
| 3.01% | + | 0.61 | * | (12.81% - 3.01%) | = | 8.99% |

**Risk Premium Cost of Equity Estimates***
**Utility Sample**

| Risk-Free Rate | | Beta | | Risk Premium | | Cost of Common Equity |
|---|---|---|---|---|---|---|
| 3.01% | + | 0.71 | * | (12.81% - 3.01%) | = | 9.97% |

*Risk-Free Rate Proxy is the 30-year U.S. Treasury Bond Yield.