NEW APPLICATION

BEFORE THE ARIZONA CORPORATION COM

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Commissioner

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT AND ITS SUN CITY WATER DISTRICT.	DOCKET NO. W-01303A-09- **W-01303A-09-0343** **SW-01303A-09-0343**
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT, ITS SUN CITY WASTEWATER DISTRICT AND ITS SUN CITY WEST WASTEWATER DISTRICT.	DOCKET NO. SW-01303A-09-

Arizona Corporation Commission
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APPLICATION OF

ARIZONA-AMERICAN WATER COMPANY

1. **Application**. Arizona-American Water Company ("Arizona-American" or the "Company") is a wholly-owned subsidiary of American Water. Arizona-American applies in accordance with A.R.S. § 40-250 and the Commission's Rule R14-2-103 for rate increases for the following districts:

- Anthem Water District;
- Sun City Water District;
- Anthem/Agua Fria Wastewater District;
- Sun City Wastewater District;
- Sun City West Wastewater District

2. **Arizona-American's Financial Condition**. Arizona-American's operating districts have under-earned for several years, and Arizona-American, as a whole, has lost over $31 million since American Water purchased the water and wastewater assets of Citizens Utilities in 2002. Arizona-American had a net loss of $1.8 million in 2008 and a net loss of $4.6 million in 2007.

3. **Times Interest Earned Ratio.** Arizona-American's Times Interest Earned Ratio ("TIER") is evidence of the Company's poor financial condition. A company's TIER represents the number of times earnings will cover interest expense on short-term and long-term debt. A TIER of less than 1.0 is not sustainable in the long-term. At the end of 2006, the Commission concluded that Arizona-American's TIER was only 0.44, meaning that Arizona-American cannot be a viable long-term water utility unless it can improve its TIER. So far, despite many actions taken, the Company's TIER has not improved to ensure long-term viability. Arizona-American's TIER was just 0.52 at December 31, 2008.

4. **Reasons for Poor Financial Condition.** Arizona-American's current financial condition can be attributed to at least three factors. First, in Decision No. 65453 (December 12, 2002), the Commission imposed a moratorium on filing rate case

applications from January 2003 until January 2006. This largely prevented Arizona-American from transferring capital investments into rate base and from recovering increased operating expenses. Second, Decision No. 63584 (April 24, 2001) also included a provision that assets purchased from Citizens Utilities would not be immediately included in rate base, but would instead be amortized into rate base over a period ranging from six and one-half years to ten years. This was accomplished by imputing regulatory Advances in Aid of Construction ("imputed regulatory AIACs") and regulatory Contributions in Aid of Construction ("imputed regulatory CIACs"). Despite the resulting delay in recognizing these assets, Arizona-American had agreed to this condition with Commission Staff, including an agreed upon one-year rate moratorium. The Commission-imposed three-year moratorium meant that Arizona-American could only begin to recover these assets after the moratorium expired, new rate cases were filed, and the Commission approved recovery. The first case to approve recovery of any portion of the amortization was Decision No. 69440, dated May 1, 2007, for the Mohave Water and Wastewater Districts. To date, Arizona-American has been authorized rate recovery of only $44 million of imputed regulatory AIACs out of a total of $113.4 million of imputed regulatory AIACs. Third, the nature of historic test years in Arizona automatically causes a lag between the date a company expends capital and the date that a company starts to earn a return on that capital. This is a particular issue for companies like Arizona-American that must invest to meet the needs of their customers in faster growing areas like the Phoenix metropolitan area and Mohave County.

5. **Steps Already Taken by Arizona-American to Improve Its Financial Health.** Arizona-American has taken many steps to improve its financial condition. First, Arizona-American has not paid a dividend to its parent, American Water, since 2003. This has helped slow the erosion of Arizona-American's equity balance. Second, despite Arizona-American's failure to pay dividends, or even to generate positive earnings,

American Water has up until recently still been willing to infuse new equity to offset the equity ratio erosions caused by these continuing losses and the need to issue new debt to fund capital projects. American Water infused $35 million of equity in 2006, $15 million more in 2007, and another $20.2 million in 2008. The goal of these equity infusions was to maintain Arizona-American's equity ratio within the Commission's 40% to 45% target. There are no further planned equity investments from American Water. Third, although Arizona-American will continue to provide quality water and wastewater services to its customers, it has minimized operating losses by carefully managing operating expenses and eliminating any discretionary projects that do not have a Commission-approved funding mechanism. Fourth, this rate application seeks timely and adequate rate relief. This is a critical part of the Company's strategy to restore Arizona-American's long-term financial health.

In addition to these items, Arizona-American also has cut its planned capital expenditures over the next five years by almost fifty percent. For 2009 and beyond, Arizona-American has reduced staff positions by 25, which represents $1.1 million in gross salary dollar savings. These position reductions come from the deferral or elimination of planned positions, the consolidation of existing positions as vacancies occur, and the elimination of certain existing positions. Management has also examined all costs in the business and has reduced its budget for controllable costs compared to its previous plan including a variety of measures such as reductions in office expenses, reductions in telecommunication expenses, reductions in training and travel expenses, elimination of all business-development costs, reductions or deferral of certain maintenance expenses, and other items.

6. **General Reasons For Rate Increases.** In order to be a financially viable and stable water and wastewater utility for its customers and investors, Arizona-American must make a reasonable return on and return of the investment made by the Company's

shareholder. Currently, only $164.8 million of Arizona-American's investment is in rate base. In other words, although customers in Arizona are enjoying the benefit of $354.5 million worth of Arizona-American's permanent capital investment, they are only paying for approximately 46% of the assets. In this case, the Company is seeking to put an additional $55.6 million of its capital investment in rate base.

7. **Need for Timely Rate Relief.** It is also important that the Commission timely approve the requested rate relief. The last two Arizona-American rate cases (Docket Nos. WS-01303A-06-0403 and WS-01303A-06-0491) experienced prolonged delays during the Commission-approval process, resulting in approximately $3.7 million lost in revenue. The revenue lost from these two delays can never be recovered by Arizona-American. Given the magnitude of the rate relief sought in this case, while operating losses are expected to continue in 2009, Arizona-American cannot bear any delays in obtaining timely Commission approval of the rate increases requested in this application.

8. **Required Revenue Increase**. The total requested revenue increase is $20,628,634 and the test year is calendar-year 2008.

9. **Rate Increase by District.** Arizona-American seeks the following rate increases for the five districts:

District	Anthem Water	Sun City Water	Anthem / Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
Revenue Increase	$7,391,931	$2,531,127	$7,060,837	$2,156,882	$1,487,857

10. **Other Requested Approvals.** As more specifically explained by its witnesses, Arizona-American also requests the following additional approvals:

Witness	Approvals
Broderick	• Cost recovery of conservation programs for Anthem and Sun City
Buls	• Infrastructure improvement surcharge for the Sun City Water District
Hubbard	• Tank maintenance reserve account

11. Witnesses. This Application is supported by the testimony and exhibits of the following witnesses:

a. **Thomas M. Broderick**. Mr. Broderick is employed by American Water as Director, Rates & Regulation for operations in Arizona, New Mexico and Hawaii.

Mr. Broderick begins by summarizing the total requested revenue increase of $20,628,634, based on a test year ending December 31, 2008.

Mr. Broderick describes the primary increased investment and expenses in the three years since the previous test years for these districts, which include:

1) Additional original cost utility plant in service totaling $70.7 million (all 5 districts), including the Verrado wastewater treatment plant expansion (only Anthem/Agua Fria wastewater district);

2) Additional amortization of imputed regulatory advances and contributions totaling $28.4 million (all 5 districts);

3) Anthem developer refunds totaling $28.1 million (only Anthem Water and Anthem/Agua Fria Wastewater Districts);

4) Additional depreciation expense associated with additional original cost utility plant in service (all districts);

5) Increased labor and labor related expenses associated with increased activities across many functions (all districts).

Mr. Broderick next testifies that Arizona-American's cost of capital is not less than 8.5%. The average cost of long-term debt is 5.47% and the cost of equity is 12.25%. The forecasted equity ratio is 45.15% and the debt ratio is 54.85%. Short-term debt has again been excluded from the calculation of the capital structure.

Mr. Broderick testifies that Arizona-American's proposed rate case expense is $678,425.

Mr. Broderick further explains that amortizations of imputed regulatory AIAC ended July 14, 2008, the end of the six and one-half year amortization period.

b. **Paul G. Townsley**. Mr. Townsley is Arizona-American's President.

Mr. Townsley discusses Arizona-American's current poor financial condition. He explains that the Company has taken a number of important steps to reduce expenses and other drags on its earnings, and that timely and adequate rate relief from the Commission is critical.

Mr. Townsley further explains the benefits of the Fourth Amendment to the Agreement for Anthem Water/Wastewater Infrastructure to its customers. Accordingly, Arizona-American's request to include the March 31, 2008, refund of Advances in Aid of Construction to Del Webb/Pulte in the rate base for the Company's Anthem Water District and Anthem Wastewater District is appropriate.

Mr. Townsley explains the benefits that Arizona-American's Achievement Incentive Pay provides to the Company's customers.

Mr. Townsley discusses the long-term benefits to customers from consolidating Arizona-American districts for ratemaking purposes. Mr. Townsley explains that Arizona-American supports consolidation of its districts but needs to insure that the consolidation process does not cause further financial harm to Arizona-American through delays in this case.

c. **Christopher C. Buls**. Mr. Buls is employed by American Water Works Service Company as Vice President of Finance.

Mr. Buls supports the implementation of an infrastructure improvement surcharge in the Sun City Water District and a pro forma adjustment for certain assurance fees related to transferring the Anthem water lease from Del Webb to Arizona-American.

Mr. Buls explains that Sun City Water has the oldest infrastructure of any of Arizona-American's Districts, and the infrastructure is at a point in the asset life cycle where significant levels of replacement capital will begin to be invested. The qualifying assets would be limited to replacement of existing assets, including replacement mains, hydrants, meters (including AMR replacements), services, tanks and booster stations.

Mr. Buls next testifies that, if rate consolidation is approved, this surcharge should be spread across all of the Company's water customers rather than just the Sun City Water customers and that eligibility should be expanded to include qualifying assets in all water districts rather than limiting it only to Sun City.

Mr. Buls also explains that Arizona-American is currently seeking an assignment of the Ak-Chin Community water lease from Del Webb. Mr. Buls explains the reasons for the use of a letter of credit in relation to the assignment of the lease and supports the pro forma adjustment for the assurance fees relating to the transfer of the lease.

d. **Bradley J. Cole**. Mr. Cole is Arizona-American's Director of Operations for Central Arizona.

Mr. Cole first describes the service areas and facilities for each of the districts included in this case.

Mr. Cole then testifies regarding the infrastructure in the Sun City Water District that he recommends including as part of the infrastructure improvement surcharge. The infrastructure includes replacement mains, replacement meters, replacement pumps, motors, electrical and control equipment at Sun City booster stations. The Company has identified certain segments of water main in the Sun City Water District that have a higher frequency, or concentration, of failure rates than the rest of the water district and seeks to include the costs of these replacements as part of the surcharge, as well as the cost of repairs for other segments that may need work. Mr. Cole also discusses the Sun City Water District main replacement program and the booster replacement program, the cost of which the Company also seeks to include as part of the infrastructure improvement surcharge.

Mr. Cole next testifies regarding the Tank Maintenance Program in the Sun City Water District. In 2009, the Company procured the services of Tank Industry Consultants to perform inspections on thirteen of its fourteen Sun City water storage tanks. This included a careful study of the tanks' interior, exterior, foundation(s), and accessories. As a result of these inspections, Arizona-American has planned a 14-year maintenance schedule.

Mr. Cole describes the Company's plan to reduce water loss in the Sun City Water District below 10% in compliance with Decision No. 70351. Mr. Cole explains that much of the increase in water loss resulted from an open valve at an interconnection to a neighboring municipal utility, which was subsequently closed. The Plan includes numerous measures to achieve water loss of 10 percent or less in the Sun City Water District.

In the final portions of his testimony, Mr. Cole discusses the agreement with Tolleson for wastewater treatment and the rate components in that agreement. Mr.

Cole also describes the benefits of this Agreement as opposed to the Company building its own treatment plant.

e. **Joseph E. Gross**. Mr. Gross is the Director of Engineering for Arizona, New Mexico, Hawaii, and Texas.

Mr. Gross testifies regarding certain capital improvement projects included in the proposed rate base in Schedule B-2 Adjustments LJG-5.

Mr. Gross describes the abandonment and replacement of Sun City Well 5.1 and the rehabilitation of Sun City Well 6.4. Due to excessive sand and high nitrates, Sun City Well 5.1 had been out of service since January 2007. The Company replaced the well within close proximity to the original well. Due to favorable construction bids for the equipment phase, the project was completed under budget and placed in service on May 27, 2009, at a cost of $1,587,149.

Mr. Gross testifies that Sun City Well 6.4 was taken out of service in 1997 due to the large volume of sand it produced. The rehabilitation of this well was successful, producing about 800gpm with very little sand. The well was placed back in service during the test year on December 31, 2008; however, the work order was not closed to Utility Plant in Service until February 2009. Therefore, the additional post test year capital expenditures should be added to test year end amounts for Utility Plant in Service. The total cost of the new additions to Well 6.4 was $502,625.

Mr. Gross describes the headworks of the Anthem Wastewater Treatment Plant, which has a screening step to remove larger particles prior to reaching the bioreactor membrane treatment process. Larger particles, if not removed, reduce the life of the membranes thereby increasing costs of operation and maintenance. Membranes have a 20-year life for rate-making purposes and the life of membranes will be much less than 20-years absent the head-works project. This project

improves the process by augmenting the existing screens to remove finer particles. This improvement was placed in service December 31, 2008; however, by the end of the test year, only $1,918,925 of the total cost of $2,524,948 had been moved to Utility Plant in Service. The remaining invoices were received within the first four months of 2009 and added project costs of $606,023.

Mr. Gross next testifies regarding the Verrado WRF plant expansion that went into service October 31, 2007. The total project cost was $12,650,000. Arizona-American expects a true-up payment in the amount of $1,415,610 to occur in late 2010. Even though this is a post test year event, this future contribution has been reflected by the Company as a proposed reduction to rate base as an additional means of mitigating the rate increase requested herein.

f. **Linda. J. Gutowski**. Ms. Gutowski is a Senior Rate Analyst for Arizona-American.

Ms. Gutowski sponsors rate base Schedules B-1 through B-6 for each district.

Ms. Gutowski also sponsors and explains the following rate base adjustments for each district (as applicable): LJG-3, LJG-4, LJG-5, and LJG-6.

Ms. Gutowski explains that the Company has not submitted an RCND study and requests that Fair Value Rate Base be the same value as Original Cost Rate Base.

Ms. Gutowski sponsors the Working Capital Calculation. Materials & Supplies are based on a 13-month average of the monthly balances and Prepayments are the ending test year balances for their portion of the Working Capital Calculation. The Cash Working Capital is determined by a lead/lag study based on the test year experience.

Ms. Gutowski sponsors and explains the following income statement adjustments for each district (as applicable): LJG-1; LJG-2; LJG-3; LJG-4; and LJG-5.

Ms. Gutowski next sponsors and explains the H Schedules and explains that the Company is proposing across-the-board rate increases for both the basic service charges and the volumetric rates.

g. **Sheryl L. Hubbard**. Ms. Hubbard is Arizona-American's Manager, Rates & Regulation.

Ms. Hubbard sponsors the following schedules for each district in the case:

- Schedule A-2 – Arizona American Summary of Results of Operations
- Schedule A-4 – Arizona American Construction Expenditures and Gross Utility Plant in Service
- Schedule A-5 – Arizona American Summary Statements of Cash Flows
- Schedule C-1 – Arizona American Adjusted Test Year Income Statement
- Schedule C-2 – Arizona American Income Statement Pro Forma Adjustments
- Schedule C-3 – Arizona American Computation of Gross Revenue Conversion Factor
- Schedule E-3 – Comparative Statement of Changes in Financial Position
- Schedule E-7 – Operating Statistics
- Schedule E-8 – Taxes Charged to Operations
- Schedule F-1 – Projected Income Statements
- Schedule F-2 – Projected Statements of Changes in Financial Position
- Schedule F-3 – Projected Construction Requirements
- Schedule F-4 – Assumptions Used in Rate Filing

Ms. Hubbard also sponsors the following adjustments to operating income:

- Adjustment SLH-1 – Annualize Payroll and Payroll Tax Expense
- Adjustment SLH-2 – Annualize Pension Expense
- Adjustment SLH-3 – Annualize 401k Expense
- Adjustment SLH-4 – Annualize Insurance Expense
- Adjustment SLH-5 - Annualize Purchased Water
- Adjustment SLH-6 – Remove CAP Revenue and Expense

- Adjustment SLH-7 – Annualize Waste Disposal Expense
- Adjustment SLH-8 – Water Testing Expense
- Adjustment SLH-9 – Specialist on Industrial Pre-Treatment
- Adjustment SLH-10 – Adjust Conservation Expenses
- Adjustment SLH-11 – Tank Maintenance Accrual
- Adjustment SLH-12 – Annualize Property Taxes
- Adjustment SLH-13 – Remove Other Income and Deductions
- Adjustment SLH-14 – Annualize OPEBs
- Adjustment SLH-15 – Interest Synchronization
- Adjustment SLH-16 – Federal and State Income Taxes

Ms. Hubbard also supports the following requests by Arizona-American:

- Allocation of the Northwest Valley Regional Treatment Facility plant investment and operating expenses between Sun City West Wastewater district and the Anthem/Agua Fria Wastewater district; and

- Arizona-American's request for a tank maintenance reserve to fund tank maintenance expenditures.

h. **John C. (Jake) Lenderking**. Mr. Lenderking is Arizona-American's Water Resources Manager.

Mr. Lenderking first testifies regarding water conservation in the Anthem Water District. In compliance with Decision No. 70372, Arizona-American has implemented six Best Management Practices ("BMPs"), and the BMPs chosen are from Categories 1, 3, 4, and 7.

Mr. Lenderking also testifies regarding water conservation in the Sun City Water District. Arizona-American implemented a number of conservation BMPs in the Sun City district. They include a regional messaging program, adult education and training, residential audit program, interior retrofit program, and a meter replacement program.

i. **Sandra L. Murrey**. Ms. Murrey is employed by Arizona-American as a Rate Analyst.

Ms. Murrey sponsors the following rate base adjustments for each district: SLM-1; SLM-2; SLM-7; and SLM-8.

j. **Bente Villadsen**. Dr. Villadsen is a Principal of The Battle Group, an economic, environmental, and management consulting firm with offices in Cambridge, Washington, San Francisco, London and Brussels.

Dr. Villadsen selects two benchmark samples, water utilities and gas local distribution companies ("LDC"). She estimates the sample companies' cost of equity, associated after-tax weighted-average cost of capital, and the corresponding cost of equity at 45 percent equity. Dr. Villadsen also examines recent decisions of the Arizona Corporation Commission and the impact of the on-going financial crisis. Dr. Villadsen finds that Arizona-American's request for a 12.25% return on equity is reasonable and fully supported by her analysis.

In performing her analysis, Dr. Villadsen uses two versions of the Discounted Cash Flow ("DCF") method and three versions of the Capital Asset Pricing Model ("CAPM") to estimate the sample companies' after-tax weighted-average cost of capital. Having estimated the samples' after-tax weighted-average cost of capital, she then determines the corresponding cost of equity for Arizona-American Water at its 45 percent equity. In undertaking her analysis, Dr. Villadsen notes that the overall cost of capital is constant within a broad middle range of capital structures although the distribution of costs and risks among debt and equity holders is not. Because Arizona-American Water's 45 percent equity is lower than the percentage equity among many utilities, its financial risk is higher and the return required by investors increases with the level of risk they carry, but this return is paid on a smaller amount of equity than is typical in the water industry. Therefore, the dollar amount paid by customers is the same as if the Company had a lower return on equity but a higher equity percentage.

Dr. Villadsen next discusses the impact of the ongoing financial crisis on utilities' cost of capital and notes that while the yield on government issued bills and bonds is currently very low, the yield on investment-grade utility bonds is not. As utilities cannot raise debt (or equity) at the same rates as the government, it is necessary to take the yield on investment grade utility bonds into account in assessing the cost of capital for Arizona-American Water. Specifically, the yields on government bills and bonds have been driven artificially down by monetary policy and a flight to safety, so that the yields on these securities are not reflective of normal economic conditions. Consequently, Dr. Villadsen bases her CAPM models on a normalized risk-free rate which consists of the observed risk-free rate plus an adjustment for the increase in the spread between risk-free rates and investment grade utility bond yields. Further, equity investors have lost substantial value in capital markets over the past ¾ year and stock prices have been extremely volatile. As a result, investors' risk aversion has increased and the premium they require to invest in stocks going forward has increased. Therefore, the risk premium associated with equity investments is currently higher than it has been in the recent past. Dr. Villadsen performs several sensitivity analyses on the impact of the higher risk premium, but the requested return on equity is fully supported by her baseline analysis, which relies on a historical market risk premium. In other words, her recommended return on equity does not include the current higher risk premium making her recommendation more conservative.

In addition to the cost of capital estimation discussed above, Dr. Villadsen reviewed 20 recent decisions by the Arizona Corporation Commission to assess the reasonableness of Arizona-American Water's current request. When compared in terms of the overall return, the cost of equity requested by Arizona-American Water

in this proceeding is comparable to that granted to other water and wastewater utilities in Arizona as adjusted using Arizona-American's equity percentage.

Lastly, Dr. Villadsen notes that the water industry has seen substantial stock price drops in recent months, volatility in stock prices, and increased cost of debt. At the same time, the most commonly used measure of companies' systematic risk, the stock's beta, has remained high for water utilities. This indicates that capital markets continue to perceive water utilities as risky investments rather than safe havens. At the same time the water industry, including Arizona-American Water needs to invest substantial amounts in infrastructure to upgrade the distribution and transmission system as well as to develop new water resources. The industry also needs to invest in wastewater collection and treatment. The needed infrastructure investment requires substantial external financing (i.e., new debt and equity) and access to capital requires that investors expect to earn their required return. Failure to provide adequate returns may discourage potential investors. While it may seem counterintuitive to increase the cost of capital during an economic recession, it is necessary to attract needed capital. Specifically, the increase in investment-grade utility bond yields and the decline in available equity capital show that investors are holding onto their funds and in order to attract investments, they will need to expect that they can earn a sufficient return on their investment that is worth the risk. The June 2009 sale of American Water stock had been expected by the market for a long time and was priced at 80 percent of American Water's April 2008 Initial Public Offering price. The lower price means that everything else equal, investors expect to realize a higher return on their investment than they did a year ago. Thus, at the same income level as a year ago, it is consistent with an increased market risk premium. Based on the evidence from the samples, Dr. Villadsen finds that Arizona-American Water's request for 12.25% return on equity is reasonable and

fully supported by her analysis. The financial crisis has made the range of a reasonable return on equity wider and especially increased the upper bound on the range, so the requested return on equity is below the midpoint of the best range estimate of 11¾ percent to 13 percent.

12. **Organization of Filing**. The filing is organized as follows:

a. **Application;**

b. **Testimony;**

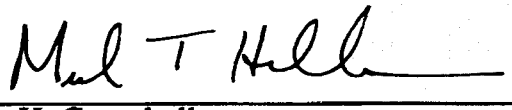
c. **Other Required Information; and**

d. **Required Schedules (By District).**

13. **Requested Relief**. Arizona-American requests that the Commission issue an order consistent with the requests set forth in this Application, as more fully set forth in the testimony, exhibits and schedules that accompany this Application.

RESPECTFULLY SUBMITTED this 2nd day of July, 2009.

LEWIS AND ROCA LLP



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ORIGINAL and thirteen (13) copies of the foregoing filed this 2nd day of July, 2009, with:

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Copy of the foregoing hand-delivered
this 2nd day of July, 2009, to:

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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-
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DIRECT TESTIMONY
OF
THOMAS M. BRODERICK
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
THOMAS M. BRODERICK
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
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EXECUTIVE SUMMARY

Thomas M. Broderick testifies that:

The total requested revenue increase is $20,628,634 and the test year is 2008.

This case includes the districts of Anthem Water, Anthem / Agua Fria Wastewater, Sun City Water, Sun City Wastewater, and Sun City West Wastewater.

The Company has continued to make necessary capital investments to adequately provide water and wastewater service to its customers and it has experienced increases in its operations and maintenance expenses since the 2005 test years for previous rate cases for the districts in this new case (except Sun City Water – 2006 previous test year). The Company is also eligible – due to the passage of time – to include capital investments that were made much earlier than 2005 in rate base pursuant to an earlier agreement with the Commission regarding imputed regulatory advances and contributions.

The primary increased investment and expenses in the three years since the previous test years for these districts include:

1) Additional original cost utility plant in service totaling $70.7 million (all 5 districts), including the Verrado wastewater treatment plant expansion (only Anthem / Agua Fria wastewater district);

2) Additional amortization of imputed regulatory advances and contributions totaling $28.4 million (all 5 districts);

3) Anthem developer refunds totaling $28.1 million (only Anthem water and Anthem / Agua Fria wastewater districts);

4) Additional depreciation expense associated with additional original cost utility plant in service (all districts);

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Arizona-American's cost of capital is not less than 8.5%. The average cost of long-term debt is 5.47% and the cost of equity is 12.25%. The forecasted equity ratio is 45.15% and the debt ratio is 54.85%. Short-term debt has again been excluded from the calculation of the capital structure.

Arizona-American's proposed rate case expense is $678,425.

Amortizations of imputed regulatory advances ended July 14, 2008, the end of the six and one-half year amortization period.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Thomas M. Broderick. My business address is 19820 N. 7th Street, Suite 201, Phoenix, Arizona 85024, and my business phone is 623-445-2420.

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

A. I am employed by American Water as Director, Rates & Regulation for operations in Arizona, New Mexico and Hawaii. Arizona-American Water Company ("Arizona-American" or the "Company") is one of the many wholly-owned state utility subsidiaries of American Water.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE COMPANY.

A. I am responsible for state-level water and wastewater rate cases and public utility regulation.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. For more than 20 years before joining the Company in 2004, I held various management positions in the electric-utility industry with responsibilities for regulatory and government affairs, corporate economics, planning, load forecasting, finance and budgeting with Arizona Public Service Company, PG&E National Energy Group and Energy Services, and the United States Agency for International Development. I was employed at APS for nearly 14 years as Supervisor, Regulatory Affairs, then Supervisor, Forecasting, and then Manager, Planning. For PG&E National Energy Group, I was

Director, Western Region-External Relations. For USAID, I was Senior Energy Advisor to Ukraine.

I have a Masters Degree in Economics from the University of Wisconsin – Madison and a Bachelors Degree in Economics from Arizona State University.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes, on many occasions.

II PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please see the executive summary of my direct testimony.

III SUMMARY OF RATE CASE (ALL DISTRICTS)

Q. WHAT IS ARIZONA-AMERICAN'S REQUESTED REVENUE REQUIREMENT INCREASE IN THIS CASE?

A. Arizona-American's requested revenue increases, rate base and operating expenses are summarized on Exhibit TMB-1 Summary of Schedule A-1s, B-1s and C-1s. The total requested annual revenue increase is $20.6 million or a 55.9% increase. The requested rate base for these five districts is $165,939,204.

Q. WHAT ARE THE PRIMARY REASONS THE COMPANY IS REQUESTING COMMISSION APPROVAL TO INCREASE RATES BY SUCH A LARGE AMOUNT AT THIS TIME?

A. The Company has continued to make necessary capital investments to adequately provide water and wastewater service to its customers and it has experienced increases in its operations and maintenance expenses since the 2005 test years for previous rate cases for the districts in this new case (except Sun City Water – 2006 previous test year). The

Company is also eligible – due to the passage of time – to include capital investments that were made much earlier than 2005 in rate base pursuant to an earlier agreement with the Commission regarding imputed regulatory advances and contributions.

The primary increased investment and expenses in the three years since the previous test years for these districts include:

1) Additional original cost utility plant in service totaling $70.7 million (all 5 districts), including the Verrado wastewater treatment plant expansion (only Anthem / Agua Fria wastewater district);

2) Additional amortization of imputed regulatory advances and contributions totaling $28.4 million (all 5 districts);

3) Anthem developer refunds totaling $28.1 million (only Anthem water and Anthem / Agua Fria wastewater districts);

4) Additional depreciation expense associated with additional original cost utility plant in service (all districts);

5) Increased labor and labor related expenses associated with increased activities across many functions (all districts).

Q. HAVE THE PROCEEDS OF ANTHEM'S HOOK – UP FEE (TARIFF RBR-1) BEEN REFLECTED AS A REDUCTION TO RATE BASE?

A. Yes. As of the test year end, $1,907,780 in contributions had been received as per tariff RBR-1 and reflected as a reduction to Anthem Water's rate base and, therefore, as a reduction to the requested revenues for Anthem Water.

Q. HAS THE COMPANY REQUESTED COST RECOVERY OF ITS CONSERVATION PROGRAMS FOR ANTHEM AND SUN CITY?

A. Yes, the direct testimony of Ms. Sheryl Hubbard addresses this cost recovery.

Q. WHAT ARE ARIZONA-AMERICAN'S OTHER REQUESTS IN THIS RATE CASE?

A. On the assumption the Commission will embrace rate consolidation in pending Docket Nos. W-01303A-08-0227 and SW-01303A-08-0227 ("Docket No. 08-227"), the Company is requesting a consolidation of the rates for all of its districts in Arizona. The Company also is requesting an Infrastructure Improvement Surcharge ("IIS") for its Sun City Water district in anticipation of future investments to maintain that district's now aging infrastructure. If rate consolidation is implemented, the IIS for Sun City can be expanded to accommodate consolidation.

Q. WHAT DIRECT TESTIMONY WITNESSES ARE SUPPORTING ARIZONA-AMERICAN'S APPLICATION?

A. In addition to my testimony, the following witnesses are providing direct testimony to support Arizona-American's application. Their primary topic areas are indicated in parentheses:

Mr. Paul G. Townsley (Anthem developer refunds, compliance with Decision No. 70372 concerning selection of Anthem's test year, the annual achievement incentive plan ("AIP"), rate consolidation policy and efficiency of operations)

Mr. Joseph E. Gross (Utility plant additions since the previous test year for each district)

Mr. Bradley J. Cole (Operations, tank painting, City of Tolleson wastewater treatment plant, and unaccounted for water compliance in Decision No. 70351 (Sun City))

Mr. John C. (Jake) Lenderking (Compliance with Decision No. 70372 to implement at least six water conservation best management practices or "BMPs" in the Anthem Water District)

Mr. Christopher C. Buls (Infrastructure Improvement Surcharge for Sun City Water District)

Ms. Sheryl L. Hubbard (Test year adjusted operating income results and various expense pro forma adjustments)

Mr. Miles H. Kiger (Various expense pro forma adjustments)

Ms. Linda J. Gutowski (Test year adjusted rate base results and various rate base pro forma adjustments)

Ms. Sandra L. Murrey (Various rate base pro forma adjustments)

Dr. Bente Villadsen (Return on equity).

Q. DOES THIS NEW RATE CASE INCLUDE EVERY ARIZONA-AMERICAN WATER AND WASTEWATER DISTRICT?

A. No. For revenue requirement and rate design determination ***at the district level***, this case only includes Anthem Water, Sun City Water, Anthem / Agua Fria Wastewater, Sun City Wastewater, and Sun City West Wastewater. The balance of Arizona-American's water and wastewater districts are presently being processed in an on-going rate case that is nearing a conclusion (Docket No. 08-227) expected in late summer 2009.

However, this case may later also involve all of the Company's districts for consolidated rate design determination ***at the state-wide level*** based on the summation of the individual revenue requirements established for each district in both of these rate cases. Additionally, the Company, at the initiative of Madam Chair Mayes and other parties to Docket No. 08-227, is proposing in this rate case the statewide rate consolidation of all of the Company's water district tariffs into single price tariffs and all of its wastewater district tariffs into single price tariffs in lieu of implementing the district level tariffs proposed herein. This is pursuant to positions provided by Commission Staff in testimony and closing briefs in the on-going rate case which include a position to leave open the record in Docket No. 08-227 for the sole purpose of rate consolidation. This approach is acceptable to the Company. I discuss in detail the process and scheduling details of rate consolidation later in my direct testimony.

SCHEDULES SPONSORED - BRODERICK (ALL DISTRICTS)

Q. WHAT SCHEDULES ARE YOU SPONSORING?

A. I sponsor the A-1, A-3, D-1, D-2, D-3, D-4, E-4, E-9 and G Schedules.

Q. WHAT IS SCHEDULE A-1?

A. Schedule A-1 titled "Computation of Increase in Gross Revenue Requirements" shows the calculation of the increase in gross revenue requested by Arizona-American for each district in this proceeding. This increase in gross revenue represents the amount necessary for Arizona-American to continue providing safe and reliable service to its customers of each district, while providing an opportunity for Arizona-American to earn a reasonable rate of return on its investment in plant and equipment eligible for recovery as per the Commission's rules and procedures. The increase in gross revenue

requirement for each district based on an adjusted 2008 test-year is shown in the following table:

District	Anthem Water	Sun City Water	Anthem / Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
Revenue Increase	$7,391,931	$2,531,127	$7,060,837	$2,156,882	$1,487,857

Q. WHAT IS SCHEDULE A-3?

A. Schedule A-3 titled "Summary of Capital Structure" summarizes the debt and equity of the Company allocated to the operating districts for the years 2006, 2007, and 2008 as well as projected year 2009. The allocation method is the same as previous Company rate cases.

Q. WHAT ARE SCHEDULES D-1 THROUGH D-4?

A. These schedules provide the overall cost of capital and the component details – cost of equity, cost of debt and the capital structure for Arizona-American and each district.

Q. WHAT IS SCHEDULE E-4?

A. Schedule E-4 titled "Statement of Changes in Stockholder's Equity-Test Year Ended December 31, 2008" details the changes in components comprising stockholder's equity since the beginning of 2006 to the end of the test year. In 2008, American Water made yet another equity infusion into the Company – this time $20,192,058.

Q. WHAT IS SCHEDULE E-9?

A. Schedule E-9 has the self-explanatory title of "Notes to Financial Statements."

Q. WHY HAS THE COMPANY NOT SUBMITTED G SCHEDULES IN ITS APPLICATION?

A. Since the Company is not proposing rate design changes ***at the district level***, it therefore, has not prepared a cost of service study for this case. The revenue requirement increases by district have been allocated pro-rata to each customer class / tariff for that district. Since the Company has not submitted a new cost of service study, the Company accepts any party's use of the cost of service data from the previous rate case for each district for purposes of supporting their rate design proposals in this case.

The Company does plan to submit a cost of service study ***at the state-wide level*** later in the case to facilitate rate consolidation, but even this study will be based on the summation of the billing and cost of service data from the studies in the prior rate case for each district. Thus, a state-wide cost of service study will only totalize and analyze previously submitted data rather than introduce new cost of service data. Commission Staff has been informed of this intention.

Q. IS ARIZONA-AMERICAN WILLING TO USE ITS ORIGINAL COST RATE BASE AS ITS FAIR VALUE RATE BASE IN THIS PROCEEDING?

A. Yes.

IV <u>COST OF CAPITAL (ALL DISTRICTS)</u>

Q. WHAT IS THE REQUESTED COST OF CAPITAL?

A. Arizona-American's cost of capital is not less than 8.53%. This amount is calculated in the D Schedules, which I sponsor.

Q. WHAT IS THE AMOUNT AND COST OF DEBT?

A. Schedule D-2 displays long-term debt in the amount of $188,208,140, with an average cost of debt of 5.468%.

Q. ARE ANY ADDITIONAL DEBT ISSUANCES ANTICIPATED DURING THE CONDUCT OF THIS CASE?

A. Perhaps, but they have not been included in the requested cost of capital. First, Arizona-American is in the preliminary stages of planning a $5 million long-term debt issuance to partially pay down short-term debt. This issuance is being planned on a stand-alone basis as opposed to financing through the affiliate American Water Capital Corp ("AWCC"). Since the Company has already reached the Commission approved long-term debt ceiling, such an issuance would require Commission approval as per a financing application. Second, an existing $10.635 million long-term debt issuance of Industrial Development Revenue Bonds (displayed in Schedule D-2, Line 5 at an interest rate of 3.2%), otherwise maturing in September 2028, has recently been failing its periodic re-marketing required as per the terms of the bonds. This is a consequence of market turmoil emerging since 2008. As a result, when a periodic re-marketing fails, AWCC has temporarily been financing the bonds. This situation cannot persist and evaluation of a replacement issuance is underway, but the interest rate on the replacement is likely to be significantly higher (presently between 6.5% to 8% interest rate based on a similar situation for Illinois American Water).

If there is a timely development on either of these possible long-term debt issuances during the conduct of this case, the requested cost of long-term debt can be updated.

Q. WHAT IS THE REQUESTED CAPITAL STRUCTURE?

A. Arizona-American's actual equity ratio is 45.15% and its debt ratio is 54.85%. Short-term debt has again been excluded from the Company's calculation of the capital

structure because it finances construction work in progress that is not in rate base. Schedule D-2 does, however, display short-term debt for informational purposes.

Q. WHAT IS THE AMOUNT AND ESTIMATED COST OF EQUITY?

A. The amount of equity is $154,949,595 with an associated estimated cost of equity of 12.25%. Dr. Bente Villadsen's direct testimony on behalf of the Company supports this cost of equity as fair and reasonable.

Q. WHY ARE ARIZONA-AMERICAN'S RETAINED EARNINGS, A COMPONENT OF EQUITY, NEGATIVE?

A. Arizona-American has been **un**profitable for many years and retained earnings were a negative ($30,233,571) at the end of the 2008 test year. Arizona-American's negative retained earnings reflect the cumulative result of net income losses nearly every year since American Water acquired the properties from Citizens in 2002. Unfortunately, this serious state of affairs continued through 2008. In addition to the Company's negative retained earnings, as a result of net income losses, the state of Arizona has been hurt as well because Arizona-American has paid essentially no state income taxes for years because it has had no state taxable income.[1]

V <u>RATE CASE EXPENSE (ALL DISTRICTS)</u>

Q. WHAT IS ARIZONA-AMERICAN'S PROPOSED RATE CASE EXPENSE FOR THIS PROCEEDING?

A. Exhibit TMB-2 Rate Case Expense displays by cost component proposed rate case expense of $678,425. Although higher than the rate case expense in Docket No. 08-227,

[1] AZ state taxable income for 2008 was ($350,410), 2007 was ($344,434), 2006 was $970,688, 2005 was ($96,395), 2004 was ($1,158,433) (as Amended), 2003 was $0 (as Amended).

the Company has aggressively reduced its rate case expense estimate. The primary reason this estimate is higher than the most recent (seven district) rate case is primarily due to the anticipated additional requirement to provide a required public notice to all 154,000 Arizona-American customers of the proposed consolidated rates – at a cost of roughly $95,957. There is additional cost to have our rate design expert, Mr. Paul Herbert, design, support and explain consolidated rates. We also anticipate mailing a postcard to all customers concerning public meetings about rate consolidation at a cost of approximately $40,000.

Mr. Kiger sponsors Schedule C-2 income statement adjustment MHK-8, which relies on a four-factor allocation of the proposed rate case expense to each district amortized over three years. A small component of the rate case amortization relates to remaining unamortized rate case expense from the prior rate cases for these districts.

VI ACQUISITION PREMIUM (ALL DISTRICTS)

Q. HAS THE COMPANY AGAIN REMOVED THE ASSET PREMIUM IT PAID TO ACQUIRE ASSETS FROM CITIZENS FROM THE REQUESTED RATE BASE?

A. Yes. Schedule B-2 rate base adjustment TMB-10 removes the remaining (unamortized) asset premium from the requested rate base.

VII IMPUTED REGULATORY ADVANCES AND CONTRIBUTIONS (ALL DISTRICTS)

Q. WHAT ARE THE TEST-YEAR ADJUSTMENTS TO REFLECT IMPUTED REGULATORY ADVANCES AND CONTRIBUTIONS ON THE B (RATE BASE) SCHEDULES AND C (INCOME) SCHEDULES?

A. Schedule B-2 rate base adjustment TMB-9 and a portion of Schedule C-2 income statement adjustment LJG-5 result from Commission Decision No. 63584 (dated April

24, 2001), which approved a settlement agreement requiring the imputation of advances in aid of construction ("AIAC") and contributions in aid of construction ("CIAC") for ratemaking purposes in future rate proceedings involving the former Citizens' Districts. In this case, the imputed regulatory AIAC has been amortized through July 14, 2008, which is the end of the agreement's six and one-half year Commission established amortization period. The imputed regulatory CIAC has been amortized through December 31, 2008, the end of the test year. The Decision also required re-establishing the imputed regulatory CIAC through reductions to actual depreciation expense and this occurs in Schedule C-2 adjustment LJG-5. The rate making treatment of the imputed regulatory CIAC reduce both rate base and depreciation expense until they have been fully amortized on a ten-year timetable ending in 2012, also established in Decision No. 63584. The method used to calculate eligible recovery in this case is identical to the method approved by the Commission in previous rate cases involving these amortizations.

VIII COMPLIANCE WITH PRIOR COMMISSION DECISIONS (ANTHEM AND SUN CITY WATER DISTRICTS)

A ANTHEM TIERED WATER RATES STUDY

Q. COMMISSION DECISION NO. 70372 REQUIRED THE COMPANY TO SUBMIT A STUDY OF TIERED WATER RATES FOR ITS ANTHEM WATER SYSTEM. HAS THE COMPANY COMPLETED THAT STUDY?

A. No, Decision No. 70372 does not require the study's completion until July 2010. It is the Company's intention to start the study soon because the rates approved in Decision No. 70372 have now been in effect for one year. It is important to have at least a one-year post rate increase database to analyze. Over the coming months, the Company will

endeavor to meet with Commission Staff on the study's research design and submittal date.

B NOTICE TO POTENTIAL ANTHEM CUSTOMERS

Q. COMMISSION DECISION NO. 70372 REQUIRED THE COMPANY TO PROVIDE NOTICE TO POTENTIAL CUSTOMERS OF THE PENDING RATE CASE TO ANTHEM WATER AND ANTHEM / AGUA FRIA WASTEWATER CUSTOMERS. DOES THIS COMPLIANCE REQUIREMENT STILL APPLY?

A. I do not think so, but I request the assigned Administrative Law Judge to make that determination. The reason I think it no longer applies is that the phrase "pending rate case" refers to the on-going rate case (08-227) for which Anthem Water and Anthem / Agua Fria Wastewater were withdrawn shortly after Decision No. 70372 was issued.

Q. IF THE COMPANY WERE STILL REQUIRED TO NOTICE POTENTIAL CUSTOMERS, DOES IT HAVE A PREFERRED METHOD?

A. Yes. Since we do not know with any precision our potential future customers, a letter to realtors in Anthem (which includes the required public notice) encouraging each realtor to inform prospective home buyers of the information contained in the required notice, is a viable approach. I question whether, on balance, this would be beneficial in light of the current housing downturn in Anthem. Also, if the Anthem Community Counsel intervenes in this rate case, the Commission could order them to include the required public notice on their website as potential home buyers may visit that site, but again, only if there is a desire to try to notice potential customers.

IX SUN CITY LOW-INCOME PROGRAM

Q. WHAT WAS THE CUSTOMER ENROLLMENT IN THE SUN CITY LOW INCOME PROGRAM AT TEST YEAR END AND MOST RECENTLY?

A. Of a total program maximum of 1,000 residential Sun City customers eligible for a $4 per month discount, there was a participation of only 115 customers at May 31, 2009. The Company promoted the program primarily through bill text messages and word of mouth to various local charities and agencies initiated by Sun City based employees. The Company recently mailed a bill insert to Sun City residential customers to further advertise the program. I recommend that if we cannot significantly increase the program enrollment during the conduct of this case or figure out why there are not more enrollees, then the program should be terminated and a refund of the remaining accumulated high block proceeds should be calculated and issued. Alternatively, a portion of the fund's balance could be retained to fund the few customers on the low income program for a few years.

Q. WHAT IS THE PROCESS TO ENROLL?

A. Residential customers merely need to drop in to the Sun City office or request an application form be mailed to them. Next, they complete the application and provide it to the Company for processing. That's it. In order to save administrative costs of the program, the Company did not engage $ Energy to administer the program. However, when we receive an application, we do not verify income; we only ask for a self-declaration that the applicant's income is lower than the thresholds in the application.

X <u>RATE CONSOLIDATION</u>

Q. WHAT FORMAL ACTION INITIATED THE EVALUATION OF WHETHER IT WOULD BE BENEFICIAL FOR ARIZONA-AMERICAN TO CONSOLIDATE ITS RATES, POSSIBLY INTO A SINGLE STATEWIDE SET OF TARIFFS FOR ITS WATER AND WASTEWATER CUSTOMERS?

A. On November 10, 2008, now Madam Chair Mayes docketed in Docket No. 08-227 a letter, which among other things, requested an analysis of the impact of rate consolidation applied to the Company's Arizona districts.

Q. CAN YOU SUMMARIZE WHAT HAS OCCURRED SUBSEQUENT TO THAT LETTER?

A. Yes. All the parties to Docket No. 08-227 contributed useful and varied responses to the letter. The Company submitted a statewide water consolidated rate calculation and estimates of rate increases and decreases by district due to such a hypothetical consolidation. The Company also provided several parties with various sub-group combinations, and during the hearing, several Company witnesses discussed at length criteria and a road map for moving forward with consolidation. RUCO submitted a rate calculation for the districts included in Docket No. 08-227 and Mr. Magruder, a Tubac-based intervenor, contributed with cross examination questions and his own analyses. Although a decision in that case has yet to be rendered, the Company, Staff and RUCO concluded that Docket No. 08-227 was not appropriate for implementing rate consolidation because it did not involve all of the Company's water and wastewater districts, customers had not earlier received notice that such an important issue was under consideration, and the parties were simply unable to devote the time to this large topic on short notice during Docket No.08-227's timeline. Although each party can speak for itself, my understanding is that Staff, the Company and Mr. Magruder generally support proceeding with further evaluation and possible implementation of rate consolidation and RUCO appears to be leaning that way, but withholding judgment pending further details. Various, well-informed, individual customers made comments both in favor of and in opposition to rate consolidation at Commission public comment sessions in Docket No.

08-227. Clearly, what transpired in Docket No. 08-227 served to put rate consolidation on the radar screen of many customers and community groups.

Q. WHAT NEEDS TO HAPPEN NEXT?

A. As I (and others) stated during the conduct of Docket No. 08-227, the Company and the parties next need a clear Commission policy statement or guidance in the final order in Docket No. 08-227 in order to move forward constructively. The evidentiary record in Docket No. 08-227 provides an abundance of statements upon which the Commission can base a policy statement or guidance. The analyses submitted in Docket No. 08-227 clearly indicated that some districts and customer classes would experience significant short-term increases or decreases in rates in a statewide consolidation as well as in other sub-group configured consolidations. The policy statement is critical to informing customers, especially those that would experience short-term rate increases under consolidation, what the Commission has concluded regarding the overall long-term benefits of consolidation.

Q. CAN THE COMPANY GO IT ALONE?

A. No. It is necessary – at a minimum - that both Commission Staff and RUCO support rate consolidation throughout the entire rate consolidation process to achieve the Commission's policy or guidance. The Company is prepared to be flexible and timely provide the bulk of the rate design technical resources to facilitate a transparent consensus process. This process should be active in the Company's districts to allow customer participation and not just in the Commission's hearing room. Field participation by Staff and RUCO are critical, of course, along with the Company's participation. I am not speaking of a rate consolidation settlement process per se, rather a significant public input process. There may be important trade-offs to be made along the

way and the public outreach and input process will be crucial to building community support and deciding the difficult trade-offs.

Q. WHEN CAN THE COMPANY PUT FORTH A PROPOSAL FOR DISCUSSION?

A. After about sixty days following a decision in Docket No. 08-227, the Company will docket an initial, complete statewide rate consolidation proposal. This is likely to occur in October or November 2009. The revenue requirement embodied in that proposal would be the amount approved in Docket No. 08-227 for the districts in that case, plus the Company's requested revenue requirement for the districts in this new case. As this new case progresses through the rounds of testimony and to hearing, the various revenue requirement recommendations of the parties can be run through the consolidation model so that each party can keep track on its consequential rate consolidation recommendation.

Q. PROCEDURALLY, WHAT DO YOU ENVISION?

A. I envision a separate required public notice of the proposed consolidated rates to all of Arizona-American's customers shortly after the October/November 2009 filing. We must be careful so as to not confuse customers about the district level rates proposed in this case and to be approved in Docket No. 08-227. Thus, for the districts in Docket No. 08-227, the consolidation notice should go out after they have received notice of the rates approved in Docket No. 08-227. Likewise, the consolidated rates notice should go out to the customers in the districts for this new case **after** they have received the initial public notice of rates requested at the district level in this case. The issue of whether or not separate procedural dates should be established for considering rate consolidation should be discussed at the initial procedural conference. It may be useful to treat rate consolidation as a separate case phase distinct from the revenue requirement phase. This should be discussed at a procedural conference.

Q. CAN YOU PROVIDE A PREVIEW OF THE OCTOBER / NOVEMBER RATE CONSOLIDATION PROPOSAL?

A. Yes, in rough terms. The initial proposal will be for a statewide consolidation of all eight of the Company's water districts tariffs and another consolidation of tariffs for all five wastewater districts. We expect to propose five **residential** water rate tiers so as to span the range of water usage which runs from low use per customer to very high use per customer. We have not yet formed an opinion of the number of commercial rate tiers. Both the monthly (fixed) basic service charge and the commodity charges would be consolidated. Larger meter sizes would continue to pay a higher (consolidated) monthly basic service charge.

We expect to propose only flat **residential** monthly consolidated rates for wastewater, although a hybrid of flat and volumetric would be possible to maintain Anthem / Agua Fria's volumetric wastewater residential rates.

We are willing to support a statewide residential low income program if that resulted from the public input process and was embraced by the Commission.

Q. PLEASE SUMMARIZE THE POSSIBLE RATE IMPACTS AT THE WATER DISTRICT LEVEL?

A. There is an extensive amount of information in Docket No. 08-227. For **residential** customers, absent rate consolidation, the highest rates at the district level are/will be in the Tubac and Anthem water districts. Tubac's rates at the district level are not at issue in this new case, but Anthem's rates are at issue.

Absent consolidation, the lowest rates are/will be in the Sun City and Mohave water districts. It will be important to public acceptance of consolidation to be able to continue to provide Sun City and Mohave residential customers using less than 4,000 gallons a

month--a rate that is not dramatically higher than their current rates. Alternatively, phasing-in the consolidated rate slowly for the relatively low user may be a useful option. There appears to be a synergy between rate consolidation and water conservation such that to the extent it is reasonable to place more cost recovery on the higher rate blocks (i.e., tiers 3 to 5) in the consolidation process, then rates do not need to increase as much for the low volume users and further incentives for water conservation can result. An offsetting consideration is that the Company cannot have too much of its revenues dependent on commodity charges in the higher tiers; this must be analyzed in detail as this case progresses.

Q. DOES THE COMPANY SUPPORT DECONSOLIDATING THE RATES FOR ITS ANTHEM / AGUA FRIA WASTEWATER DISTRICT AS WAS DISCUSSED AT LENGTH IN THE PREVIOUS ANTHEM / AGUA FRIA WASTEWATER RATE CASE?

A. No, on the assumption the Commission's forthcoming policy guidance will embrace rate consolidation. It would be counter-productive to put forth an effort to **de**-consolidate these districts' rates and then later **re**-consolidate them with the Company's other wastewater districts.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS CASE?

A. Yes.

Arizona American Water Company
Test Year Ended December 31, 2008
Computation of Increase in Gross Revenue Requirement

Summary of Schedule A-1s

Line No.		Total Water & Wastewater Districts	Total Water Districts	Anthem Water	Sun City Water	Total Wastewater Districts	Anthem/Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
1	Original Cost Rate Base	$ 165,939,204	$ 85,618,047	$ 57,431,984	$ 28,186,063	$ 80,321,158	$ 47,735,732	$ 14,764,087	$ 17,821,339
2									
3	Adjusted Operating Income	$ 1,671,796	$ 1,301,050	$ 439,964	$ 861,085	$ 370,746	$ (191,785)	$ (51,593)	$ 614,124
4									
5	Current Rate of Return	1.01%	1.52%	0.77%	3.06%	0.46%	-0.40%	-0.35%	3.45%
6									
7	Required Operating Income	$ 14,154,614	$ 7,303,219	$ 4,898,948	$ 2,404,271	$ 6,851,395	$ 4,071,858	$ 1,259,377	$ 1,520,160
8									
9	Required Rate of Return	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%
10									
11	Operating Income Deficiency	$ 12,482,818	$ 6,002,170	$ 4,458,984	$ 1,543,186	$ 6,480,648	$ 4,263,643	$ 1,310,969	$ 906,036
12									
13	Gross Revenue Conversion Factor	1.6526	1.6532	1.6578	1.6402	1.6519	1.6561	1.6453	1.6422
14									
15	**Increase in Gross Revenue**								
16	**Requirement**	**$ 20,628,634**	**$ 9,923,058**	**$ 7,391,931**	**$ 2,531,127**	$ 10,705,576	**$ 7,060,837**	**$ 2,156,882**	**$ 1,487,857**
17									
18	Test Year Adjusted Present Rate Revenue	$ 36,872,097	$ 16,640,089	$ 7,356,987	$ 9,283,101	$ 20,232,008	$ 8,637,123	$ 5,940,381	$ 5,654,504
19									
20	Percent Rate Increase	55.9%	59.6%	100.5%	27.3%	52.9%	81.7%	36.3%	26.3%
21									
22	**Test Year Adjusted Current ROE**	-0.12%	-0.24%	-2.26%	-0.01%	-9.170%	-3.04%	-3.08%	-3.05%
23									
24	Year End Number of Annualized Customers	81,378	31,606	8,673	22,933	$ 49,772	12,820	21,934	15,018
25									
26									
27									
28	Required Rate of Return	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%	8.53%
29									

Arizona American Water Company
Test Year Ended December 31, 2008
Summary of Fair Value Rate Base

Line No.	Summary of Schedule B-1s	Total Water & Wastewater Districts	Total Water Districts	Anthem Water	Sun City Water	Total Wastewater Districts	Anthem/Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
1									
2	Gross Utility Plant in Service	$ 341,063,238	$ 149,301,019	$ 85,684,602	$ 63,616,418	$ 191,762,219	$ 131,361,186	$ 24,469,337	$35,931,696
3	Phoenix Interconnection	5,000,000	5,000,000	5,000,000	-	-			
4									
5	Less: Amortization of Phx Interconnect	116,667	116,667	116,667	-	-			
6	Less: Accumulated Depreciation	84,545,871	31,762,996	12,789,099	18,973,897	52,782,875	22,837,366	10,761,769	19,183,739
7									
8	Net Utility Plant in Service	$ 261,400,701	$ 122,421,356	$ 77,778,836	$ 44,642,520	$ 138,979,344	$ 108,523,819	$ 13,707,569	$16,747,956
9									
10	Less:								
11	Advances in Aid of								
12	Construction	$ 75,497,502	$ 24,418,393	$ 18,557,742	$ 5,860,651	$ 51,079,109	$ 48,273,364	$ 2,660,292	$ 145,453
13	Contributions in Aid of								
14	Construction - Net of amortization	29,419,209	15,572,984	2,393,271	13,179,713	13,846,225	13,829,151	12,327	4,747
15	Imputed Regulatory Advances	0	0	0	0	-	0	0	0
16	Imputed Regulatory Contributions	1,616,617	669,222	326,764	342,458	947,394	143,475	360,708	443,212
17	Customer Meter Deposits	4,370	4,370	1,920	2,450	-	0	0	0
18	Deferred Income Taxes & Credits	(6,741,896)	(2,624,884)	(720,067)	(1,904,817)	(4,117,012)	(1,049,621)	(1,824,256)	(1,243,135)
19	Investment tax Credits	0	0	0	0	-	0	0	0
20	Plus:								
21	Unamortized Finance								
22	Charges	0	0	0	0	-	0	0	0
23	Deferred Debits	2,731,178	489,620	51,714	437,906	2,241,558	75,382	2,057,405	108,771
24	Allowance for Working Capital	1,603,127	747,155	161,064	586,091	855,972	332,901	208,182	314,889
25	Utility Plant Acquisition Adjustment	0	0	0	0	-	0	0	0
26									
27	**Total Rate Base**	$ 165,939,204	$ 85,618,047	$ 57,431,984	$ 28,186,063	$ 80,321,158	$ 47,735,732	$ 14,764,087	$17,821,339
28									
29									

Arizona American Water Company
Test Year Ended December 31, 2008
Adjusted Test Year Income Statement

Summary of Schedule C-1s

Line No.		Total Water & Wastewater Districts	Total Water Districts	Anthem Water	Sun City Water	Total Wastewater Districts	Anthem/Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
1	**Revenues**								
2	Water Revenues	$ 36,431,261	$ 16,209,541	7,084,338	9,125,203	$ 20,221,720	$ 8,634,567	5,933,970	5,653,183
3	Other Revenues	440,836	430,548	272,650	157,898	10,288	2,556	6,411	1,321
4									
5	**Total Revenue**	$ 36,872,097	$ 16,640,089	$ 7,356,987	$ 9,283,101	$ 20,232,008	$ 8,637,123	$ 5,940,381	$ 5,654,504
6	**Operating Expenses**								
7	Labor	$ 4,536,323	$ 1,979,757	754,087	1,225,670	2,556,566	1,335,278	454,529	766,759
8	Purchased Water	635,959	625,435	625,435	(0)	10,524	3,368	-	7,156
9	Fuel & Power	3,662,199	2,982,219	1,259,637	1,722,582	679,980	278,664	15,804	385,512
10	Chemicals	850,329	140,389	103,351	37,037	709,941	303,374	4,885	401,682
11	Waste Disposal	3,604,776	1,933	1,933	-	3,602,843	199,095	3,300,475	103,272
12	Management Fees	5,918,164	2,667,400	1,158,078	1,509,322	3,250,764	1,528,005	933,155	789,604
13	Group Insurance	1,368,577	563,722	209,326	354,396	804,855	396,599	141,193	267,064
14	Pensions	804,763	357,243	105,808	251,435	447,520	221,640	75,595	150,285
15	Regulatory Expense	314,192	139,776	64,489	75,286	174,416	80,939	49,683	43,794
16	Insurance Other Than Group	365,816	164,808	71,553	93,255	201,008	94,566	57,656	48,786
17	Customer Accounting	930,274	418,450	183,101	235,348	511,824	242,170	145,686	123,968
18	Rents	257,271	93,842	33,826	60,016	163,429	84,483	40,868	38,079
19	General Office Expense	319,180	138,590	60,044	78,546	180,590	85,697	44,944	49,950
20	Miscellaneous	1,411,549	529,384	229,300	300,084	882,165	534,489	104,503	243,174
21	Maintenance Expense	1,239,761	793,404	140,803	652,601	446,357	246,204	61,533	138,620
22	Depreciation & Amortization	9,715,205	3,965,598	2,399,893	1,565,706	5,749,607	3,830,808	679,999	1,238,799
23	General Taxes-Property Taxes	1,033,345	444,085	288,011	156,074	589,260	296,804	157,456	135,000
24	General Taxes-Other	311,122	129,794	34,882	94,912	181,327	87,538	34,880	58,909
25	Income Taxes	(2,078,506)	(796,789)	(806,535)	9,746	(1,281,716)	(1,020,813)	(310,869)	49,967
26									
27	**Total Operating Expenses**	$ 35,200,301	$ 15,339,039	$ 6,917,023	$ 8,422,016	$ 19,861,262	$ 8,828,909	$ 5,991,974	$ 5,040,379
28	**Utility Operating Income**	$ 1,671,796	$ 1,301,050	$ 439,964	$ 861,085	$ 370,746	$ (191,785)	$ (51,593)	$ 614,124
29	**Other Income & Deductions**								
30	Other Income & Deductions	-	-	-	-	-	-	-	-
31	Interest Expense	4,978,176	2,568,541	1,722,960	845,582	2,409,635	1,432,072	442,923	534,640
32	Other Expense	71,945	32,427	14,079	18,348	39,518	18,575	11,344	9,599
33	Gain/Loss Sale of Fixed Assets	(16)	(7)	(3)	(4)	(9)	(4)	(3)	(2)
34	**Total Other Income & Deductions**	$ (5,050,137)	$ (2,600,975)	$ (1,737,042)	$ (863,934)	$ (2,449,162)	$ (1,450,651)	$ (454,270)	$ (544,241)
35	**Net Profit (Loss)**	$ (3,378,341)	$ (1,299,926)	$ (1,297,077)	$ (2,849)	$ (2,078,415)	$ (1,642,436)	$ (505,862)	$ 69,883
36									
37									

ARIZONA AMERICAN WATER COMPANY **EXHIBIT TMB - 2**
Docket Nos. W-01303A-09-___; SW-01303A-09-____ **Page 1 of 1**
Rate Case Expense

Lewis & Roca - Legal Representation	$ 230,000
Bente Villadsen - Cost of Equity	$ 65,000
Paul Herbert - Rate design & consolidation	$ 65,000
Compliance - Anthem rate tiers study	$ 15,000
Shared Services - Rates Direct Charge for Case Support	$ 75,000
Required Public Notices :	
-Required Initial Public Notice Letter (81,176 customers)	$ 50,329
-Required Rate Consolidation Notice Letter (81,176 + 73,012 customers)	$ 95,597
-Required Newspaper Publish of Initial Public Notice	$ 10,000
-Required Newspaper Publish ACC Public Comment Meetings	$ 10,000
Company Sponsored Community Meetings on the Rate Case / Consolidation	
-Facility rental related fees	$ 3,500
-Postcard invitation to meetings	$ 40,000
-Newspaper publish meetings	$ 4,000
Case Production:	
-External duplicating costs, binders, tabs, etc	$ 15,000
	$ 678,425

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM/AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
PAUL G. TOWNSLEY
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
July 2, 2009

DIRECT TESTIMONY
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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Paul G. Townsley testifies that:

Arizona-American's current financial condition is poor. The Company has taken a number of important steps to reduce expenses and other drags on its earnings, and timely and adequate rate relief from the Commission are necessary.

There are benefits of the Fourth Amendment to the Agreement for Anthem Water/Wastewater Infrastructure to our customers. Accordingly, Arizona-American's request to include the March 31, 2008, refund of Advances in Aid of Construction to Del Webb/Pulte in the rate base for our Anthem Water District and our Anthem Wastewater District is appropriate.

Arizona-American's Achievement Incentive Pay benefits our customers.

There are long-term benefits to our customers by consolidating Arizona-American districts for ratemaking purposes. Arizona-American supports consolidation of its districts but needs to insure that the consolidation process does not cause further financial harm to Arizona-American through delays in this case.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Paul G. Townsley. My business address is 19820 N. 7th St. Suite 201, Phoenix, AZ 85024.

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

A. I am the President of Arizona-American Water Company, New Mexico-American Water Company and Hawaii-American Water Company, which are subsidiaries of American Water Works Company, Inc. ("American Water").

Q. PLEASE DESCRIBE ARIZONA-AMERICAN WATER COMPANY AND ITS BUSINESS.

A. Arizona-American Water Company ("Arizona-American" or "Company") is a wholly-owned subsidiary of American Water. Arizona-American is a public service corporation engaged in providing water and wastewater utility service in portions of Maricopa, Mohave, and Santa Cruz Counties. Arizona-American is Arizona's largest investor-owned water and wastewater utility, serving approximately 100,000 water customers and 50,000 sewer customers in the state. To serve its water customers, Arizona-American owns, operates and maintains potable water production, treatment, storage, transmission, and distribution facilities. To serve its wastewater customers, Arizona-American owns, operates, and maintains collection and treatment facilities. Arizona-American also provides treated effluent to customers for irrigation and other uses for water re-use through purple distribution pipes.

Q. WHAT ARE YOUR RESPONSIBILITIES AS THE PRESIDENT OF ARIZONA-AMERICAN?

A. As President, I am responsible for maintaining Arizona-American's financial health; enhancing the operating efficiency and reliability of the business; and for assuring that all functions (e.g. planning, engineering, construction, production, distribution, customer service, accounting, regulatory and human resources) are carried out in compliance with local, state, and federal laws and regulations, and standards of good business practice. I am also ultimately responsible for assuring that we meet our customers' needs.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science degree in Mechanical Engineering from the United States Merchant Marine Academy in 1980.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I have been employed by American Water since 2002 as President of its Western Region and/or various state regulated affiliates. Prior to that, I was employed by Citizens Utilities Company in a variety of positions spanning twenty years, including Vice President, Citizens Water Resources; Vice President, Arizona Energy; Vice President, Arizona Electric; and Vice President, Mohave Sector.

Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?

A. I am a registered Professional Engineer in the states of Arizona and Hawaii.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE REGULATORY COMMISSIONS?

A. Yes. I have testified before the Arizona Corporation Commission ("Commission") on numerous occasions. I have also testified before the California Public Utilities Commission, the New Mexico Public Regulatory Commission, the Hawaii Public Utilities Commission, and the Illinois Commerce Commission.

II PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please see the executive summary of my direct testimony.

III ARIZONA-AMERICAN'S FINANCIAL CONDITION

Q. WHAT IS ARIZONA-AMERICAN'S CURRENT FINANCIAL CONDITION?

A. Arizona-American's operating districts have under-earned for several years, and Arizona-American, as a whole, has lost over $31 million since American Water purchased the water and wastewater assets of Citizens Utilities in 2002. This unfortunate trend continues. Arizona-American had a net loss of $1.8 million in 2008, which was an improvement over its $4.6 million loss in 2007. However, I expect that Arizona-American's losses will continue through at least 2009, until new rates are implemented in the Company's currently pending 2007 test year rate case affecting seven of its districts. The Commission is already aware of Arizona-American's poor financial condition. For example, in Decision No. 69730 (July 30, 2007), the Commission evaluated Arizona-American's "Times Interest Earned Ratio", or "TIER" and stated that "TIER represents the number of times earnings will cover interest expense on short-term and long-term debt.... A TIER of less than 1.0 is not sustainable in the long-term ...."[1] The Commission further concluded that Arizona-American's TIER was only 0.44 at the end of 2006, meaning that Arizona-American cannot be a viable long-term water utility unless it can improve its TIER. So far, despite many actions taken, TIER has not improved. Arizona-American's TIER was just 0.52 at December 31, 2008.

Q. WHAT FACTORS CONTRIBUTED TO ARIZONA-AMERICAN'S CURRENT FINANCIAL CONDITION?

[1] Decision No. 69730, at 3, ln. 18-21.

A. Arizona-American's current financial condition can be attributed to at least three factors. First, in Decision No. 65453 (December 12, 2002), the Commission imposed a moratorium on filing rate case applications from January 2003 until January 2006. This largely prevented Arizona-American from transferring capital investments into rate base and from recovering increased operating expenses.

Second, Decision No. 63584 (April 24, 2001) included a provision that assets purchased from Citizens Utilities would not be immediately included in rate base, but would instead be amortized into rate base over a period ranging from six and one-half years to ten years. This was accomplished by imputing regulatory Advances in Aid of Construction ("imputed regulatory AIACs") and regulatory Contributions in Aid of Construction ("imputed regulatory CIACs"). Despite the resulting delay in recognizing these assets, Arizona-American had agreed to this condition with Commission Staff, including an agreed upon one-year rate moratorium. The Commission-imposed three-year moratorium meant that Arizona-American could only begin to recover these assets after the moratorium expired, new rate cases were filed, and the Commission approved recovery. The first case to approve recovery of any portion of the amortization was Decision No. 69440, dated May 1, 2007, for the Mohave Water and Wastewater Districts. To date, Arizona-American has been authorized rate recovery of only $44 million of imputed regulatory AIACs out of a total of $113.4 million of imputed regulatory AIACs.

Third, the nature of historic test years in Arizona automatically causes a lag between the date a company expends capital and the date that a company starts to earn a return on that capital. This is a particular issue for companies like Arizona-American that must invest to meet the needs of their customers in faster growing areas like the Phoenix metropolitan area and Mohave County. In one of our fastest growing districts, Agua Fria Water, current rates, excluding ACRM surcharges, are based on a 2001 test year.

Q. HAS THE COMMISSION AUTHORIZED SOME MECHANISMS TO PROVIDE ARIZONA-AMERICAN RATE RELIEF?

A. Yes, and I would be remiss if I didn't acknowledge how the Commission has helped Arizona water utilities, including Arizona-American. The most significant assistance has been the availability of the Commission's Arsenic Cost Recovery Mechanism ("ACRM") and the lifting of the three-year moratorium as it applied to Arizona-American's Paradise Valley Water District. In Decision No. 68310 (November 14, 2005), the Commission authorized Arizona-American to use ACRMs for its Havasu Water, Agua Fria Water, and Sun City West Water districts. Then, in Decision No. 68858 (July 28, 2006), the Commission authorized Arizona-American to use an ACRM for its Paradise Valley Water District. The ACRMs have allowed Arizona-American to begin recovering $60.3 million in arsenic treatment investments, without the usual regulatory lag and the need to file rate cases. Without these ACRMs, Arizona-American's financial condition would be that much worse. The Commission has also helped Arizona-American by approving innovative financing proposals for fire-flow projects in its Paradise Valley Water District and its White Tanks regional surface water treatment facility in its Agua Fria Water District.[2]

Q. WHAT ARE THE CONSEQUENCES OF ARIZONA-AMERICAN'S POOR FINANCIAL CONDITION?

A. Arizona-American could not have made all the necessary capital investment in Arizona without American Water's willingness to infuse new equity and make long-term borrowing at a very attractive rate to Arizona-American. I don't know how much longer Arizona-American's access to capital from or through its parent will continue if Arizona-American continues to under-earn as compared to its peer subsidiaries. Without

[2] Decision No. 68858, dated July 28, 2006; Decision No. 69914, dated September 27, 2007.

American Water's financial commitment to Arizona-American, Arizona-American could face the threat of financial restructuring if its financial condition does not improve soon. Arizona-American is already facing capital restrictions such that only the White Tanks Water Treatment Plant and an enterprise-wide business systems transformation project are being funded by American Water. For all other projects, Arizona-American must now rely on its own internally-generated funds.

Q. WHY IS TIMELY AND ADEQUATE RELIEF FROM THE COMMISSION IN THIS CASE CRITICAL TO ARIZONA-AMERICAN'S LONG-TERM FINANCIAL HEALTH?

A. In order to be a financially viable and stable water and wastewater utility to our customers and investors, Arizona-American must make a reasonable return on and return of the investment made by our shareholder. Currently, only $164.8 million of Arizona-American's investment is in rate base. In other words, although our customers in Arizona are enjoying the benefit of $354.5 million worth of Arizona-American's permanent capital investment, they are only paying for approximately 46% of the assets. In this case, we are seeking to put an additional $55.6 million of our capital investment in rate base.

It is also important that the Commission timely approve the requested rate relief. The last two Arizona-American rate cases (Docket Nos. WS-01303A-06-0403 and WS-01303A-06-0491) experienced prolonged delays during the Commission-approval process, resulting in approximately $3.7 million lost in revenue. The revenue lost from these two delays can never be recovered by Arizona-American. Given the magnitude of the rate relief sought in this case, while operating losses are expected to continue in 2009, Arizona-American cannot bear any delays in obtaining timely Commission approval of the rate increases requested in this application.

Q. WHAT STEPS HAS ARIZONA-AMERICAN TAKEN TO PREVENT FURTHER DETERIORATION OF ITS FINANCIAL CONDITION?

A. First, Arizona-American has not paid a dividend to its parent, American Water since 2003. This has helped slow the erosion of Arizona-America's equity balance, but comes at the expense of our shareholder.

Second, despite Arizona-American's failure to pay dividends, or even to generate positive earnings, American Water has up until recently still been willing to infuse new equity to offset the equity ratio erosions caused by these continuing losses and the need to issue new debt to fund capital projects. American Water infused $35 million of equity in 2006, $15 million more in 2007, and another $20.2 million in 2008. The goal of these equity infusions was to maintain Arizona-American's equity ratio within the Commission's 40% to 45% target.[3] There are no further planned equity investments from American Water.

Third, Arizona-American will also continue to provide quality water and wastewater services to our customers, but we must minimize operating losses by carefully managing operating expenses and eliminating any discretionary projects that do not have a Commission-approved funding mechanism.

Fourth and finally, this rate application seeks timely and adequate rate relief. It is a critical part of our strategy to restore Arizona-American's long-term financial health.

Q. HAS ARIZONA-AMERICAN TAKEN OTHER STEPS TO PREVENT FURTHER DETERIORATION OF ITS FINANCIAL CONDITION?

A. Yes. Arizona-American has cut its planned capital expenditures over the next five years by almost fifty percent. Over $92.5 million of specific Company-funded capital projects

[3] Decision No. 68858, dated July 28, 2006

have been either deferred or eliminated, which represents a 46% reduction from Arizona-American's previous capital plan. In addition, almost $3 million of recurring project capital funding has been deferred or eliminated in 2009 and 2010, which represents a 10% reduction in capital from Arizona-American's most recent plan consistent with a reliance solely on our internally-generated funds.

Q. WHAT ELSE IS ARIZONA-AMERICAN DOING TO REDUCE COSTS?

A. For 2009 and beyond, Arizona-American has reduced staff positions by 25, which represent $1.1 million in gross salary dollar savings. These position reductions come from the deferral or elimination of planned positions, the consolidation of existing positions as vacancies occur, and the elimination of certain existing positions. Management has also examined all costs in the business and has reduced its budget for controllable costs compared to its previous plan including a variety of measures including reductions in office expenses, reductions in telecommunication expenses, reductions in training and travel expenses, elimination of all business-development costs, reductions or deferral of certain maintenance expenses, and other items.

Q. HOW ELSE CAN ARIZONA-AMERICAN PREVENT FURTHER DETERIORATION OF ITS FINANCIAL CONDITION?

A. As noted above, rate relief is critical. The current rate application seeks timely and adequate rate relief. This is the most critical part of our strategy to restore Arizona-American's long-term financial health.

IV <u>PULTE POST TEST YEAR TRUE-UP PAYMENT</u>

Q. PLEASE DESCRIBE THE FOURTH AMENDMENT TO THE AGREEMENT FOR ANTHEM WATER/WASTEWATER INFRASTRUCTURE?

A. The Fourth Amendment, entered into by Arizona-American and Pulte Homes, Inc. ("Pulte"), provides rate relief for Arizona-American's Anthem customers in this rate case and future rate cases. Under the Agreement for Anthem Water/Wastewater Infrastructure ("Anthem Agreement"), Arizona-American is contractually obliged to refund $30,813,221 of the Advance in Aid of Construction ("Anthem Refund") to Pulte at build-out of the Anthem community, which occurred in September of 2007. After extensive negotiations requested by the Commission in the last Anthem rate case (Docket No. WS-01303A-06-0403), Arizona-American and Pulte agreed to enter into the Fourth Amendment, which permanently reduces the amount of the Anthem Refund by $1.5 million and deferred the remaining amount of the Anthem Refund into two interest-free, installment payments - 75% of the refund due on March 31, 2008, and the remaining 25% due on March 31, 2010.

Q. HOW DOES THE FOURTH AMENDMENT BENEFIT THE ANTHEM WATER AND WASTEWATER CUSTOMERS?

A. The Fourth Amendment reduces revenue requirements for Anthem Water and Wastewater in this case by approximately $1.1 million. Part of this savings to Anthem customers is a result of Pulte's willingness to reduce the amount of Anthem Refund owed by $1.5 million. This permanent reduction is being treated as additional Contributions in Aid of Construction from Pulte to pay down the cost of the Anthem infrastructure, and has the effect of reducing Anthem's rate base by $1.5 million in this rate case. Pulte also agreed to defer until March 31, 2010, without interest, $6,742,041 of the Anthem Refund that would otherwise have been due in late 2007. Arizona-American, therefore, will not seek recovery of $6,742,041 in this rate case as a direct result of the Fourth Amendment.

Q. DOES ARIZONA-AMERICAN SEEK RECOVERY OF THE MARCH 31, 2008, REFUND IN THIS CASE?

A. Yes, the payment occurred early in the test year. It is appropriate to include the March 31, 2008, Anthem Refund to Pulte in rate base. The capital investment associated with the refund has been providing service to the Anthem residents since 1998.

V ACHIEVEMENT INCENTIVE PAY ("AIP")

Q. PLEASE DESCRIBE THE REASONS WHY ARIZONA-AMERICAN IS PROVIDING AN AIP?

A. To attract and retain high quality personnel, Arizona-American needs to insure that the "total compensation" offered to its employees is competitive with other companies. Total compensation is a combination of key items including base salary, incentive pay, pension, 401k, group insurance and some other lesser benefit items. The total value of all of these items makes up the total compensation. Adjusting any one of these components will require an offsetting adjustment in another component to maintain the value of the total compensation offered to our employees. When used properly, incentive pay helps to align the employees' work activities with the goals of the Company and its customers in a way that straight salary dollars cannot achieve as effectively. A well-designed incentive-pay plan can pull people together, direct them to achieve the goal you want them to achieve, and helps us better compete in a competitive labor environment.

Q. DO ARIZONA-AMERICAN CUSTOMERS BENEFIT FROM A WELL-DESIGNED INCENTIVE PAY PLAN?

A. Yes, for the following reasons. Being able to attract and retain qualified employees to manage and operate Arizona-American operations is certainly in the best interest of the Arizona-American customers. However, even more importantly, the AIP is designed to encourage and reward exactly the Company results and employee behaviors that matter to these customers.

Q. PLEASE DESCRIBE ARIZONA-AMERICAN'S AIP PLAN THAT SUPPORTED AIP PAYMENTS DURING THE TEST YEAR 2008.

A. All full-time management, professional and technical employees of Arizona-American who were employees as of December 31, 2007, or retired during the AIP plan year, were eligible to participate in the AIP. Payments for the 2007 AIP plan occurred in the test year 2008. The AIP is designed to award participants for the performance results they attain during the plan year. There are three performance components: financial, operational, and individual.

Q. WHAT ARE THE FINANCIAL COMPONENT MEASURES?

A. Operating income is the key financial measure. Targets are set for both Arizona-American and American Water. We believe that this measure is the most critical gauge of our business success and is consistent with other affiliated business units. Operating income is essentially the profit generated before any interest income or expense, AFUDC and income taxes.

Q. HOW DOES THE FINANCIAL COMPONENT BENEFIT CUSTOMERS?

A. Operating income relates to the portion of the financial statements which are most closely linked to the majority of the employees and is a critical precursor to key external items such as Net Income and Cash Flow. These external measures are used to evaluate the financial health of not only Arizona-American, but its parent American Water. Consistently meeting these projections is a critical part of Arizona-American's ability to encourage more investment from American Water to fund capital projects that benefit our customers.

Q. WHAT ARE THE OPERATIONAL COMPONENTS INCLUDED IN THE AIP?

A. The Operational component includes three parts: (1) Customer Service, (2) Environmental Compliance and (3) Health and Safety.

Q. PLEASE DESCRIBE EACH PART OF THE OPERATIONAL COMPONENT.

A. Under the Customer Service measure, we are striving on an annual basis for:

1. Favorable results in our regular customer satisfaction survey; and
2. Favorable results in our customer service quality study.

For the Environmental measures, our annual goal is no public notification or customer advisories in violation of drinking water or wastewater regulations. Again, customers are the obvious beneficiaries. For the Health and Safety measure, our annual goal is meeting specified targets for Lost Workday Case Rate which is a nationally used metric for injuries that result in time away from work. In this case, customers benefit from well-trained, careful employees operating in a safe, well-maintained workplace.

Q. WHAT IS THE INDIVIDUAL COMPONENT?

A. The Individual component is based on the overall performance rating for the employee as provided by the employee's supervisor in the employee's annual review.

Q. HOW DO THE PERFORMANCE RATINGS SUPPORT ARIZONA-AMERICAN'S PERFORMANCE?

A. Each employee works with his or her supervisor at the beginning of the plan year to determine their individual performance objectives. These individual performance objectives align employees' activities with Arizona-American's performance objectives. At the end of the year, each employee's performance is rated against their individual performance objectives.

Q. HOW DO PERFORMANCE RATINGS BENEFIT CUSTOMERS?

A. Many of the individual performance objectives are directly related to improved customer service. Others relate to improving employee skills, such as teamwork and problem solving. Overall, the objectives support Arizona-American's overall performance, which directly relates to the customer benefit that I just discussed.

Q. HOW ARE THE THREE AIP COMPONENTS (FINANCIAL, OPERATIONAL, AND INDIVIDUAL) WEIGHTED IN DETERMINING AN EMPLOYEE'S AWARD?

A. One of our key incentive principles is that participants should be measured on performance they can directly influence. Therefore, different employee classes have different component weightings. For example, senior employees can more directly influence financial goals, so the financial category is more heavily weighted for these employees. Other employees whose roles are more operationally focused have the operational category more heavily weighted.

Q. WHAT ARE THE AIP EXPENSES FOR THE TEST YEAR?

A. In 2008, Arizona-American employees earned $475,900 in AIP as part of our employees' total compensation package.

VI <u>DISTRICT CONSOLIDATION FOR RATEMAKING PURPOSES</u>

Q. IN ARIZONA AMERICAN WATER'S MOST RECENT RATE CASE (DOCKET 08-227) THERE WAS DISCUSSION REGARDING DISTRICT CONSOLIDATION FOR RATEMAKING PURPOSES. WHAT WAS THE OUTCOME OF THOSE DISCUSSIONS?

A. No final decision has been made as of this date by the Commission in that case regarding rate consolidation or other issues. As further discussed in Mr. Broderick's direct testimony, the Company, Commission Staff and RUCO concluded that since Docket Nos.

W-01303A-08-0227 and SW-01303A-08-0227 ("Docket 08-227") contained only a part of the Company's water and wastewater systems, because all customers had not earlier received notice that such an important issue was under consideration, and the parties were simply unable to devote the time and attention required at that time for such an important issue, that case was probably not the best vehicle for implementing rate consolidation. Staff witness Mr. Elijah Abinah also made some important points in his testimony and during his cross-examination in the case. It appeared that many of the participants in the case wanted to evaluate the issue further and to have it presented to the Commission again in an upcoming case. In his direct testimony, Mr. Broderick also discusses possible next steps and implications of rate consolidation.

Q. IN GENERAL, DO YOU BELIEVE THAT RATE CONSOLIDATION IS IMPORTANT FOR WATER AND WASTEWATER UTILITIES IN ARIZONA?

A. Yes. There are a number of reasons that I believe consolidation to be important. These include improved rate case efficiency, improved ability to make needed capital investments in smaller districts without imposing burdensome rate increases, improved ability to acquire small troubled water systems, improved ability to implement Best Management Practices ("BMPs") for water conservation, improved ability to fund and manage low-income programs for customers, and a desire to bring the tariff structure of water and wastewater utilities more in line with those of other regulated utilities in Arizona. These all lead me to strongly support consolidation from a philosophical basis.

Rate consolidation of water and wastewater utilities is a topic being addressed by a number of public utility commissions throughout the country. Historically, water and wastewater company districts in Arizona have tended to have separately filed tariffs for each district based on the unique history of each district and because each district is likely to be physically disconnected from other districts. Yet this historic approach overlooks

important aspects of how multi-district water companies operate and has created consequences that if left unchecked can cause customer harm in the long term.

While it is true that the physical distribution infrastructure (piping, wells, tanks, etc.) of each of our water districts is in most cases separate from other districts, the water supply (the underground water source or the surface water source) is clearly not separate between districts. So, in this important sense, our districts are connected. Other major utilities, including electric utilities (Arizona Public Service and Tucson Electric Power), natural gas utilities (Southwest Gas and Unisource) and telephone utilities (Qwest), tend to have unified tariff structures across Arizona (or in some cases a few separate tariff structures) even though they serve many different communities. Their physical distribution infrastructures rely on common supply (electric power plants, natural gas transmission lines, or backbone communication networks) not unlike our common water supplies, so the justification as to why water companies should be on unique tariffs for each district, and the other utility segments not being on unique district-based tariffs based only on physical infrastructure, is not compelling.

Q. TURNING SPECIFICALLY TO ARIZONA-AMERICAN, HOW COULD RATE CONSOLIDATION BENEFIT ARIZONA-AMERICAN CUSTOMERS?

A. There are many challenges and problems associated with having numerous rate-making districts within Arizona-American. One challenge of having multiple rate-making districts (Arizona-American has 13) is that it is more costly to prepare and prosecute rate cases for all parties involved. Currently, Arizona-American is required to file an application with separate costs identified and tariffs established for each district, and the Commission is required to issue separate findings, separate rate-base schedules, separate cost-of-service studies, and separate sets of tariffs, for each district. This is not efficient. Commission Staff and RUCO also have larger workloads due to their involvement in

multiple district rate cases rather than participating in fewer rate cases with consolidated districts. Rate consolidation could address those inefficiencies and duplicative costs by using our respective resources more effectively.

Rate consolidation would also benefit customers by enabling Arizona-American to establish a single water conservation program across all of its districts. This single program, administered centrally, would allow Arizona-American to implement BMPs identified by the Arizona Department of Water Resources in all of its districts regardless of whether they are located within an Active Management Area ("AMA") or not, and regardless of whether their source of water is groundwater, surface water, or a combination of the two. Since water conservation, water re-use, and implementation of BMPs are so important here in the arid southwest, rate consolidation could provide important tools and resources to increase our effectiveness in these areas.

Rate consolidation would also benefit customers by allowing for the establishment of a state-wide low-income program. This would reduce administrative costs and permit low-income assistance to flow to vulnerable customers in our neediest communities. It simply makes more sense than having programs in only certain districts or having multiple programs in multiple districts.

Rate consolidation would also help address the relative imbalance of district-based capital needs and their relative number of customers. Small districts tend to face disproportionally larger rate increases due to necessary capital investments which lack economies of scale as compared to larger districts. Rate consolidation would lessen the rate shock otherwise associated with capital investments made in small districts.

Q. CAN YOU PROVIDE ANY EXAMPLES OF SMALLER DISTRICTS BEARING DISPROPORTIONATELY LARGER RATE INCREASES DUE TO CAPITAL INVESTMENTS?

Let me provide a couple of examples within Arizona-American. In our Mohave Wastewater District, Arizona-American's customers are potentially facing a large rate increase because of the severely needed multi-million dollar Wishing Well Wastewater Treatment Plant upgrade and expansion. If this investment had been spread across a larger customer base, the per-customer rate increase would be much lower.

In our Tubac Water District, an arsenic treatment facility needed to comply with EPA requirements will probably cost over $2 million and could lead to a very large rate increase, just for this one item. If – as we now anticipate - federal ARRA (American Recovery and Reinvestment Act of 2009) funds are obtained from WIFA and applied to the project, the capital cost to be recoverable in rates will still be about $1 million. Spreading investment costs among a larger number of customers typically provides for lower cost increases on a per-customer basis. This would lead to greater rate stability in the smaller districts, but potentially among larger districts as well.

Q. ARE THERE ANY OTHER CONSEQUENCES OF OPERATING MULTIPLE WATER DISTRICTS?

Yes. Multiple rate-making districts inhibit a company's ability to take on small troubled water systems. Many of these systems today are not meeting state and federal standards and do not have the financial, technical, and managerial capability to do so. In most cases, if a larger water or wastewater utility were to acquire one or more of these systems, significant capital investments would be needed to bring them up to current standards. However, because these necessary capital improvements would be borne by only the customers in those small systems, the resulting rate increases would be extremely high.

This leads to inevitable customer opposition and likely disappointing results at the Commission. As a consequence, the acquisition is not made, the system remains inadequate, and its customers are at risk.

Q. CAN YOU PROVIDE AN EXAMPLE OF AN ACQUISITION THAT WAS NOT MADE BECAUSE OF THE CURRENT MULTI-DISTRICT MODEL?

Yes. Sabrosa Water is a small troubled water system located near Arizona-American's Anthem Water District. The owner of Sabrosa Water walked away from the system and the State of Arizona was faced with the unenviable task of cleaning up the legal and financial mess left by the owner. Arizona-American operated this system for a number of years on behalf of the Arizona Corporation Commission and made hundreds of thousands of dollars in investments to the system to enable it to deliver water more reliably. Other custodial operators of Sabrosa Water after Arizona-American may have also made investments. However, the system still requires much investment to bring it up to current standards.

If Arizona-American were to acquire Sabrosa Water and make the hundreds of thousands of dollars in necessary capital investments, customer rates for the few hundred accounts there would increase by well over 100%. On the other hand, if Sabrosa were consolidated into Arizona-American's other water districts, statewide rates would only have to go up a small amount to recover the necessary investments in the Sabrosa Water system.

Sabrosa Water is far from the only small troubled water system in this State. The Commission is aware of many other systems that are candidates for acquisition, but haven't been taken on because of the issues I have described above (along with

disappointing overall returns on Arizona investments). Rate consolidation would certainly encourage larger well-run utilities to address these small troubled systems.

Rate consolidation as a public policy matter should be debated, but my strong personal opinion is that the old multiple-district tariff model does not work as well as it could, will not allow Arizona to address the numerous small troubled systems that exist in the state, tends to retard administrative efficiency for water utilities and the Commission, sub-optimizes the deployment of water conservation programs and low income customer programs, and will perpetuate the current climate of higher customer costs and/or insufficient investments in smaller water and wastewater districts.

Q. HOW DO YOU ANSWER CONCERNS FROM COMMUNITIES THAT WILL TEND TO SEE A LARGER RATE INCREASE IN THE SHORT TERM IF DISTRICTS ARE CONSOLIDATED FOR RATE-MAKING PURPOSES?

A. This, of course, is the thorniest aspect of rate consolidation. At the time rates are consolidated there will be districts in our Company in which customers will see a bigger change in their bills than in other districts. This could be because of the relative size of the customer base in different districts. Or it could be because the facilities that serve customers in one district are older and therefore cost less when they were installed many years ago, than newer facilities in another district. This, though, is only a snapshot of the situation at this moment in time. Over a period of years, all facilities will need to be replaced or upgraded as they wear out or as new regulations come into effect. When these new facilities are installed, they will inevitably be more expensive than the ones they replace. Over time, districts that have older and less costly plant will see it replaced with newer and more costly plant. Without consolidated rates, the burden for these new more costly facilities will fall only on the customers in that district, the implication being higher rates and possible rate shock. In other words, just because a particular district has

lower rates ***today*** does not mean that those rates will remain lower in the ***future***. Rate consolidation tends to spread out the cost of new facilities and replacement facilities over larger groups of users, reduces the relative size of rate increases, and mitigates the risk of rate shock. This benefits all users over the long term and is one reason that many other states have moved to consolidate water and sewer rates among larger groups of customers.

Q. DO YOU AGREE WITH THE RATE CONSOLIDATION CRITERIA THAT STAFF WITNESS ELIJAH ABINAH PROPOSED IN HIS TESTIMONY IN DOCKET 08-227?

A. Yes. Mr. Abinah proposed that a number of criteria should be considered when evaluating rate consolidation. These include public policy, public health and safety, price shock/mitigation, proximity, community of interest, other jurisdictions, and economies of scale/rate case expenses. While these are not necessarily the only criteria to be evaluated, I agree that they are a good starting point for consideration in this case.

Q. WHAT ARE THE NEXT STEPS FOR CONSOLIDATION?

A. As further discussed in Mr. Broderick's testimony, we need clear Commission guidance on consolidation in the final order in Docket No. 08-227 in order to move forward constructively. A policy statement is critical to informing customers, especially those that would experience rate increases under consolidation, that the overall long-term benefits of consolidation are significant. Provided that the Commission provides adequate and timely guidance, the Company intends to file an initial, complete, state-wide rate consolidation proposal in October or November 2009. The revenue requirement embodied in that proposal would be the amount approved in 08-227 for the districts in that case, plus the Company's requested revenue requirement for the districts in this new

case. In other words, the proposal for state-wide rate consolidation would be revenue neutral for Arizona-American. We envision a separate required public notice of the proposed consolidated rates to all of Arizona-American's customers shortly after the October/November 2009 filing. In regards to whether separate procedural dates should be established for considering rate consolidation, it may be useful to treat rate consolidation as a separate phase distinct from the revenue requirement phase in this rate case.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS CASE?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
JOSEPH E. GROSS, P.E.
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
JOSEPH E. GROSS, P.E.
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Mr. Gross testifies regarding the following capital improvement projects included in the proposed rate base in Schedule B-2 Adjustments LJG-5: the replacement and rehabilitation of certain wells in Sun City, the headworks of the Anthem Wastewater Treatment Plant, and the Verrado WRF Phase 2 Expansion.

In Sun City, the well projects include the abandonment and replacement of Sun City Well 5.1 and the rehabilitation of Sun City Well 6.4. Due to excessive sand and high nitrates, Sun City Well 5.1 had been out of service since January 2007. The Company replaced the well within close proximity to the original well. Due to favorable construction bids for the equipment phase, the project was completed under budget and placed in service on May 27, 2009, at a cost of $1,587,149.

Sun City Well 6.4 was taken out of service in 1997 due to the large volume of sand it produced. The rehabilitation of this well was successful, producing about 800 gpm with very little sand. The well was placed back in service during the test year on December 31, 2008; however, the work order was not closed to Utility Plant in Service until February 2009. Therefore, the additional post test year capital expense should be added to test year end amounts for Utility Plant in Service. The total cost of the new additions to Well 6.4 was $502,625.

The headworks of the Anthem Wastewater Treatment Plant has a screening step to remove larger particles prior to reaching the bioreactor membrane treatment process. Larger particles, if not removed, reduce the life of the membranes thereby increasing costs of operation and maintenance. Membranes have a 20-year life for rate-making purposes and the life of membranes will be much less than 20-years absent the head works project. This project improves the process by augmenting the existing screens to remove finer particles. This improvement was placed in service December 31, 2008; however, by the end of the test year, only $1,918,925 of the total cost of $2,524,948 had been moved to Utility Plant in Service. The remaining invoices were received within the first four months of 2009 and added project costs of $606,023.

The Verrado WRF plant expansion went into service October 31, 2007. The total project cost was $12,650,000. Arizona-American expects a true-up payment in the amount of $1,415,610 to occur in late 2010. Even though this is a post test year event, this future contribution has been reflected by the Company as a proposed reduction to rate base as an additional means of mitigating the rate increase requested herein.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Joseph E. Gross, my business address is 19820 N. 7th Street, Suite 201, Phoenix, Arizona, and my telephone number is 623-445-2401.

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

A. I am employed by American Water Works Service Company as Engineering Director for the states of Arizona, New Mexico and Hawaii.

Q. PLEASE BRIEFLY OUTLINE YOUR RESPONSIBILITIES IN ARIZONA AS THE ENGINEERING DIRECTOR.

A. I am responsible for the planning, programming, and implementation of Arizona-American Water's capital improvement program; planning for the five-year capital program, providing input to the budgeting process, then providing oversight of the design and construction contracts to ensure compliance with assigned budget and schedule.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science degree in Civil Engineering from the United States Military Academy; and a Master of Science degree in Geodetic Science from The Ohio State University.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I joined Arizona-American in October 2004. I was previously employed by the City of Scottsdale for fourteen years in the positions of Capital Project Management Director,

Water Campus Project Director, and Water Resources Director. Before that, I had extensive field-level and executive-level experience in the US Army Corps of Engineers, including large projects located in the United States, Iran, and Saudi Arabia. Among other responsibilities, I supervised the Corps' extensive flood-control projects in the Phoenix metropolitan area from 1979 to 1982.

Q. ARE YOU A LICENSED PROFESSIONAL ENGINEER?

A. Yes, I am a licensed Professional Engineer in the states of Arizona and Pennsylvania.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes, on a number of occasions.

II PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please refer to the Executive Summary, which precedes my testimony.

III MAJOR UTILITY PROJECTS

Q. WHAT CAPITAL IMPROVEMENT PROJECTS ARE YOU SUPPORTING FOR RATE RECOVERY PURPOSES IN THIS CASE?

A. The projects included in the proposed rate base in Schedule B-2 Adjustments LJG-5 are the replacement and rehabilitation of certain wells in Sun City, the headworks of the Anthem Wastewater Treatment Plant, and the Verrado WRF Phase 2 Expansion.

Q. PLEASE DESCRIBE THE WORK ON THE SUN CITY WELLS.

A. About 70% of the wells in the Sun City district are more than forty years old. A Well Field Analysis was completed for Arizona-American in 2003 to assess the condition of the Sun City wells and to recommend remedial actions. Sun City Well 6.4, formerly known as Sun City Well 4B, and Sun City Well 5.1 were two of the wells in the study needing priority remedial action.

Q. PLEASE DESCRIBE THE SUN CITY WELL 5.1 REPLACEMENT PROJECT.

A. Sun City Well 5.1, drilled in 1948, was ranked as a top priority for replacement in the district. The well has been repaired over the years; however, due to excessive sand and high nitrates, the well had been out of service since January 2007. Excessive sand causes significant wear to the pump in a short period of time making the well costly to maintain. The high nitrates (19.2 mg/L) are due, in part, to the well's shallow screened interval. A video log of the well from January 4, 2007, also showed the casing to be in poor condition.

The 2003 Well Field Analysis recommended abandonment and replacement of Sun City Well 5.1, among others. The permanent loss of this well's capacity would have an adverse impact on the ability of Arizona-American to deliver water to the existing customers of the Sun City community. Therefore, the Company has replaced the well within close proximity to the original well.

Q. WHAT WAS THE COST OF THIS WELL REPLACEMENT?

A. Due to favorable construction bids for the equipment phase, the project was completed under budget. The new well was placed in service on May 27, 2009, at a cost of $1,587,149.

Q. PLEASE DESCRIBE THE REHABILITATION OF SUN CITY WELL 6.4.

A. Sun City Well 6.4 was originally drilled in 1950 with a 20 inch casing. The well was taken out of service in 1997 due to the large volume of sand it produced. The original casing had severe erosion of the perforations and other damage which allowed sand to freely enter. The 2003 Well Field Analysis recommended replacement of the well, but further examination concluded that rehabilitation would be more cost effective. Also, emerging concerns about water supply for existing Sun City customers made rehabilitation the most appropriate solution in order to place the well back in service quickly.

The rehabilitation project consisted of brushing and bailing the original casing followed by the installation of a new 16 inch liner inside the original liner. The annular space was filled with gravel. The new liner was perforated to minimize sand production. The rehabilitation was successful, producing about 800gpm with very little sand being drawn in. The well was placed back in service during the test year on December 31, 2008; however, the work order was not closed to Utility Plant in Service until February 2009. Therefore, as explained in the Direct Testimony of Linda Gutowski, the additional post test year capital expense should be added to test year end amounts for Utility Plant in Service.

Q. WHAT WAS THE TOTAL COST OF THIS WELL REHABILITATION?

A. The total cost of the new additions to Well # 6.4 was $502,625.

Q. PLEASE DESCRIBE THE ANTHEM WASTEWATER HEADWORKS PROJECT.

A. The head works of the Anthem Wastewater Treatment Plant has a screening step to remove larger particles prior to reaching the bioreactor membrane treatment process.

Larger particles, if not removed, reduce the life of the membranes thereby increasing costs of operation and maintenance. Membranes have a 20-year life for rate-making purposes and the life of membranes will be much less than 20-years absent the head works project. This project improves the process by augmenting the existing screens to remove finer particles.

When the Anthem Wastewater Treatment Plant originally began operation, the headworks had two 2 millimeter screens, but they greatly limited flow and caused peaks to bypass the screens. The subsequent replacement of the 2mm screens with 6mm screens solved the flow problem, but allowed more hair and other fibrous material to pass reducing the life of the bioreactor membranes. A better solution was needed to meet the hydraulic requirements while protecting the membranes.

The most cost effective solution was determined to be finer screens with more effective cleaning systems downstream from the present 6mm screens. Hycor units with 1mm rotating drum screens were selected. The Hycor units are well suited for use downstream of the 6mm filter and since they are sized for peak flows, there is no need for bypassing. This improvement was placed in service December 31, 2008.

Q. WHY IS THIS PARTIALLY A POST-TEST YEAR PROJECT?

A. As explained in the Direct Testimony of Linda Gutowski, by the end of the test year, only $1,918,925 of the total cost of $2,524,948 had been moved to Utility Plant in Service. The remaining invoices were received within the first four months of 2009 and added project costs of $606,023.

Q. PLEASE DESCRIBE THE VERRADO WRF PHASE 2 EXPANSION.

A. The plant expansion went into service October 31, 2007. The total project cost was $12,650,000. In February 2008, Pulte Homes paid $2,275,890 as a contribution offset against hookup fees for common facilities to serve their proposed development, Sienna (aka Tesota) Hills. The agreement also calls for a true-up payment to occur at 80% of WRF capacity or April 3, 2011, whichever is earlier. As noted in the Direct Testimony of Ms. Linda Gutowski, Arizona-American now expects this true-up payment in the amount of $1,415,610 to occur in late 2010. Even though this is a post test year event, this future contribution has been reflected by the Company as a proposed reduction to rate base in Anthem/Agua Fria Wastewater Schedule B-2 Adjustment LJG-5 as an additional means of mitigating the rate increase requested herein.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, and I look forward to working with Commission Staff engineers as they prepare for and conduct their field audit of the projects I discussed herein.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
BRADLEY J. COLE
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
BRADLEY J. COLE
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Mr. Cole first testifies regarding the various water and wastewater districts that are part of this rate case filing.

The Anthem Water District serves approximately 8,678 customers in an unincorporated area north of Phoenix. The Anthem Water District is part of an integrated water/wastewater system comprised of a Central Arizona Project ("CAP") raw-water pumping station, a nine-mile pipeline that brings CAP water to the Anthem community, a combined water and wastewater treatment plant, booster stations and reservoirs, a wastewater lift station, a network of water and wastewater distribution and collection facilities, and an extensive reuse-water distribution system for landscape and turf-irrigation purposes throughout the Anthem community.

The Sun City Water District is Arizona-American's second largest water district, serving approximately 23,000 customers. The system covers roughly 18 square miles of territory, including all of Sun City and Youngtown, as well as small portions of the cities of Peoria and Surprise. Water is produced from 22 active local wells, chlorinated, and then distributed via seven booster stations to customers.

Mr. Cole also describes service in the Anthem/Agua Fria Wastewater District. In the Anthem community, the Company provides wastewater collection and treatment service for approximately 8,034 customers. As stated earlier, the Anthem system is an integrated water/wastewater system with a combined water and wastewater treatment plant. The Anthem Wastewater Treatment Plant is an activated sludge, tertiary-treatment plant (membrane bioreactor) that treats the wastewater from the Anthem community. A master-planned wastewater collection system sends waste streams by gravity to the Northeast Agua Fria Lift Station No. 1, where it is pumped for treatment to Arizona-American's Northwest Valley Regional Water Reclamation Facility ("NWVRWRF"). The NWVRWRF is a 5.0 MGD wastewater treatment plant, located in unincorporated Maricopa County, which also treats wastewater flows for the Company's Sun City West Wastewater customers. For Russell Ranch, wastewater flows through a collection system by gravity to a Company-owned wastewater treatment plant. The Russell Ranch Water Reclamation Facility is a wastewater treatment plant with a design capacity of 60,000 gallons per day. Wastewater collected from the Verrado community flows by gravity through a collection system to the Verrado Water Reclamation Facility ("Verrado WRF"). The Verrado WRF has the capacity to collect and treat 830,000 gallons-per-day (gpd) using a conventional activated sludge, biological nutrient removal process.

The Sun City Wastewater District is located in the northwest portion of the Phoenix metropolitan area and provides wastewater service to the communities of Sun City, Youngtown, portions of the City of Surprise, and the City of Peoria. The district includes a wastewater collection system with seven lift stations and a metering station. Arizona-American collects the wastewater and then delivers it through a regional collection system for treatment at the Tolleson Wastewater Treatment Plant.

The Sun City West Wastewater District is also located in the northwest portion of the Phoenix metropolitan area and provides wastewater service for the community of Sun City West. The District includes a wastewater collection system with a single lift station. The wastewater is collected by gravity and then lifted, or boosted, for treatment at Arizona-American's NWVRWRF.

Mr. Cole then testifies regarding the infrastructure in the Sun City Water District that he recommends including as part of the infrastructure improvement surcharge. The infrastructure

includes replacement mains, replacement meters, replacement pumps, motors, electrical and control equipment at Sun City booster stations. The Company has identified certain segments of water main in the Sun City Water District that have a higher frequency, or concentration, of failure rates than the rest of the water district and seeks to include the costs of these replacements as part of the surcharge, as well as the cost of repairs for other segments that may need work. Mr. Cole also discusses the Sun City Water District main replacement program and the booster replacement program, the cost of which the Company also seeks to include as part of the infrastructure improvement surcharge.

Mr. Cole next testifies regarding the Tank Maintenance Program in the Sun City Water District. In 2009, the Company procured the services of Tank Industry Consultants to perform inspections on thirteen of its fourteen Sun City water storage tanks. This included a careful study of the tanks' interior, exterior, foundation(s) and accessories. As a result of these inspections, Arizona-American has planned a 14-year maintenance schedule.

Mr. Cole describes the Company's plan to reduce water loss in the Sun City Water District below 10% in compliance with Decision No. 70351. Mr. Cole explains that much of the increase in water loss resulted from an open valve at an interconnection to a neighboring municipal utility, which was subsequently closed. The Plan includes numerous measures to achieve water loss of 10 percent or less in the Sun City Water District.

In the final portions of his testimony, Mr. Cole discusses the agreement with Tolleson for wastewater treatment and the rate components in that agreement. Mr. Cole also describes the benefits of this Agreement as opposed to the Company building its own treatment plant.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Bradley J. Cole. My business address is 15626 North Del Webb Boulevard, Sun City, Arizona. 85351. My business phone is 623-815-3136.

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

A. I am employed by Arizona-American Water Company ("Arizona-American" or the "Company") and I am the Director of Operations for the Central Division, which includes the Sun City Water and Wastewater Districts, Sun City West Water and Wastewater Districts and Agua Fria Water and Wastewater Districts.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE COMPANY.

A. I am responsible for water treatment, wastewater treatment, customer service, water distribution, and wastewater-collection operations.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Master of Science in Business Administration from California Lutheran University in 2002. I received my Bachelor of Science in Business Administration from the University of La Verne in 1998. I have also completed various water-related technical courses that include water treatment, wastewater treatment, water distribution system operations and maintenance, water quality protection and cross-connection control and water and wastewater management.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I have been employed by Arizona-American for approximately four and one-half years and in my present capacity as the Director of Operations for Central Division for the past two years. As the Director of Operations, I oversee and manage Arizona-American's water and wastewater services in the Sun City, Sun City West, and Agua Fria Districts. Prior to becoming the Director of Operations, I was employed as the General Manager of Arizona-American's Eastern Division for a period of almost two years, and my responsibilities included overseeing the water and wastewater operations in the communities of Tubac, Paradise Valley, Anthem, Bullhead City, and Lake Havasu. Prior to becoming the General Manager of Arizona-American's Eastern Division, I held the role of Arizona Production Manager overseeing Arizona-American's water and wastewater treatment plants in the communities of Sun City, Paradise Valley, and Anthem.

Prior to my employment with Arizona-American, I was employed for nearly 15 years by California-American Water Company ("California-American"). Like Arizona-American, California-American is a subsidiary of American Water. At California-American, I held various positions that included Operations Manager, Operations Supervisor, Distribution Clerk, Utility Worker and Laborer.

Q. DO YOU HAVE ANY PROFESSIONAL AFFILIATIONS?

A. Yes. I am an active member of the American Water Works Association (#424352) and a member of the Arizona Water and Pollution Control Association (#5776).

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I sponsored testimony and testified in Arizona-American's Anthem/Agua Fria water and wastewater rate case (Docket No. WS-01303A-06-0405), Arizona-American's

Mohave Water and Wastewater rate case (Docket No. WS-01303A-06-0014), Arizona-American's Sun City Water rate case (Docket No. W-01303A-07-0209) and Arizona-American's Agua Fria Water, Sun City West Water, Havasu Water, Mohave Water and Wastewater, Paradise Valley Water and Tubac Water Districts (Docket Nos. W-01303A-08-0227 and SW-01303A-08-0227).

II PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please see the executive summary of my direct testimony.

III WATER AND WASTEWATER DISTRICTS

A ANTHEM WATER DISTRICT

Q. PLEASE DESCRIBE THE ANTHEM WATER DISTRICT.

A. The Anthem Water District serves approximately 8,678 customers in an unincorporated area north of Phoenix. The Anthem Water District is part of an integrated water/wastewater system comprised of a Central Arizona Project ("CAP") raw-water pumping station, a nine-mile pipeline that brings CAP water to the Anthem community, a combined water and wastewater treatment plant, booster stations and reservoirs, a wastewater lift station, a network of water and wastewater distribution and collection facilities, and an extensive reuse-water distribution system for landscape and turf-irrigation purposes throughout the Anthem community.

1 WATER PRODUCTION, TREATMENT AND DISTRIBUTION SYSTEM

Q. PLEASE DESCRIBE ANTHEM WATER DISTRICT'S WATER PRODUCTION, TREATMENT AND DISTRIBUTION SYSTEM.

A. The Anthem Water Campus ("Campus") is a combined water and wastewater treatment plant. The initial infrastructure at the Campus was constructed in 1999 and uses state-of-the-art membrane-treatment technology for both water and wastewater treatment. Specifically, the Anthem Water Treatment Plant ("Anthem WTP") uses membrane-filtration technology to treat raw surface water from the CAP for drinking and other potable uses by our Anthem customers and an extensive reuse-water distribution system for landscape and turf-irrigation purposes throughout the Anthem community.

In accordance with the Agreement for Anthem Water/Wastewater Infrastructure between the Del Webb Corporation and Arizona-American ("Anthem Agreement"), Arizona-American is entitled to a maximum of 7,900 acre-feet of water annually from the Ak-Chin Indian Community pursuant to a 100-year lease agreement between the Ak-Chin Indian Community and Del Webb Corporation (now Pulte Home Corporation) ("Del Webb"). The Ak-Chin water supply is a renewable source of water provided from the Colorado River through the Central Arizona Project and is the primary source of water supply for Anthem. As discussed in the direct testimony of Mr. Buls, Arizona-American is seeking the assignment of the water lease from Del Webb.

2 OTHER ANTHEM WATER SUPPLIES

Q. IS ALL OF ANTHEM'S POTABLE WATER SUPPLIED FROM THE ANTHEM WATER TREATMENT PLANT?

A. No. Since Anthem must obtain all of its water supply from the Ak-Chin Indian Community and Anthem is distant from the CAP canal, the physical source of the Ak-Chin water, Arizona-American has adopted a water-supply plan designed to provide system reliability and water use efficiency that would not be possible with a single treatment facility.

Q. WHAT ARE THE DRIVERS OF ARIZONA-AMERICAN'S WATER-SUPPLY STRATEGY?

A. There are two drivers. First, Arizona-American's strategy recognizes that a single connection to the CAP canal with a single treatment facility presents an unacceptable risk of long-term loss of water supply and a complete water system outage. Second, Arizona-American's strategy recognizes that all water delivered to the project site should be put to initial beneficial use and that all sewage generated should be reclaimed and reused.

Q. BASED ON THESE DRIVERS, WHAT WATER-SUPPLY STRATEGY DID ARIZONA-AMERICAN ADOPT?

A. Arizona-American adopted a three-pronged strategy designed to mitigate the risk of water system outage and promote the efficient use of water. One, water is delivered to Anthem and treated via Arizona-American's raw water pipeline and treatment plant. Two, the Anthem water system has been interconnected with the City of Phoenix water system, making potable water available through two additional points on the CAP system and from two additional water treatment plants owned by the City of Phoenix. Three, Arizona-American has permitted a recharge facility and drilled recovery wells to allow use of sewage effluent and Ak-Chin water that cannot be put to beneficial use at the time it is generated. Additionally, the recovery wells can provide supplemental supply if either the Arizona-American Treatment Plant or the Phoenix interconnection is out of service, mitigating significantly the impact on the Anthem community due to the loss of either facility.

Q. PLEASE DESCRIBE THE INTERCONNECTION WITH THE CITY OF PHOENIX.

A. The City of Phoenix interconnection was installed in 2005. The City of Phoenix interconnection is a pipeline connecting the City of Phoenix's water-distribution system

to the Anthem distribution system. Through the interconnection, the City of Phoenix can deliver treated CAP water to Anthem from either its Union Hills Water Treatment Plant or the Lake Pleasant Water Treatment Plant. Pursuant to a contract with the City of Phoenix, an average flow of 2.5 MGD (peak flow of 5.0 MGD) of potable water is available to the Anthem community from the interconnection. The potable-water line from the City of Phoenix is connected to the Anthem WTP Zone 2 distribution line. The Zone 2 line feeds water to Pressure Zone 2 and the Upper Reservoir, where the water can be pumped to Zone 3 or Zone 4. Additionally, water can be conveyed to Pressure Zone 1 via pressure reducing valves from Zone 2, if necessary.

Q. WHAT IS THE PURPOSE OF THE RECOVERY WELLS?

A. The recovery wells allow the maximum beneficial use of surface water supplies by allowing water to be used at times other than when it is produced. For instance, during rainy periods, effluent production may exceed irrigation needs. With a traditional system, this valuable resource would be discharged and lost. At Anthem, the water is placed in a recharge project and the resulting effluent credits are later recovered from the recovery wells, thereby reducing the overall water demand for the community. Additionally, should either source of treated surface water be unavailable, effluent recharge credits or Ak-Chin water recharge credits can be pumped from the recovery wells, significantly reducing the impact of a treatment plant outage on the community.

Q. DOES THE ANTHEM WATER SYSTEM REQUIRE COSTLY FACILITIES TO REMOVE ARSENIC?

A. No. Arsenic is typically found only in groundwater supplies. The Ak-Chin Water, the water supplied through the Phoenix interconnection, and the water from Wells Nos. 2 and 3, all satisfy the new federal arsenic standard.

B SUN CITY WATER DISTRICT

Q. PLEASE DESCRIBE THE SUN CITY WATER DISTRICT.

A. The Sun City Water District is Arizona-American's second largest water district, serving approximately 23,000 customers. The system covers roughly 18 square miles of territory, including all of Sun City and Youngtown, as well as small portions of the cities of Peoria and Surprise. Water is produced from 22 active local wells, chlorinated, and then distributed via seven booster stations to customers.

The system was originally two separate systems: the Sun City system and the Youngtown system. The Sun City system dates back to 1960 and was Citizens Utilities' first Arizona water utility. In 1995, Citizens Utilities purchased the Youngtown system from the Town of Youngtown and subsequently interconnected it with the Sun City system. Arizona-American purchased the Sun City District from Citizens Utilities in 2002.

C ANTHEM/AGUA FRIA WASTEWATER DISTRICT

Q. PLEASE DESCRIBE THE COMPANY'S WASTEWATER SERVICE IN ANTHEM.

A. In the Anthem community, the Company provides wastewater collection and treatment service for approximately 8,034 customers. As stated earlier, the Anthem system is an integrated water/wastewater system with a combined water and wastewater treatment plant.

Q. PLEASE DESCRIBE THE ANTHEM WASTEWATER TREATMENT PLANT AND COLLECTION SYSTEM.

A. The Anthem Wastewater Treatment Plant ("Anthem WWTP") is an activated sludge, tertiary-treatment plant (membrane bioreactor) that treats the wastewater from the Anthem community. The Anthem WWTP removes organic and suspended material from the waste stream to meet ADEQ requirements for unrestricted use. The recycled water is disinfected before being used for irrigation or recharged into the groundwater aquifer.

Q. PLEASE DESCRIBE SERVICE IN THE REMAINING AREAS OF THE ANTHEM/AGUA FRIA WASTEWATER DISTRICT.

A. The Company also provides wastewater collection and treatment service for our customers living in the Northeast Agua Fria, Russell Ranch, and Verrado service areas.

1 <u>Northeast Agua Fria Wastewater Treatment (Northwest Valley Regional Water Reclamation Facility)</u>

Q. HOW IS WASTEWATER FROM THE NORTHEAST AGUA FRIA AREA TREATED?

A. A master-planned wastewater collection system sends waste streams by gravity to the Northeast Agua Fria Lift Station No. 1, where it is pumped for treatment to Arizona-American's Northwest Valley Regional Water Reclamation Facility ("NWVRWRF"). The NWVRWRF is a 5.0 MGD wastewater treatment plant, located in unincorporated Maricopa County, which also treats wastewater flows for our Sun City West Wastewater customers.

Arizona-American operates an aquifer recharge and recovery system to allow for beneficial reuse of reclaimed water from the NWVRWRF.

2 <u>Russell Ranch Wastewater Treatment</u>

Q. HOW IS WASTEWATER FROM RUSSELL RANCH TREATED?

A. Wastewater flows through a collection system by gravity to a Company-owned wastewater treatment plant. The Russell Ranch Water Reclamation Facility is a wastewater treatment plant with a design capacity of 60,000 gallons per day. The treatment process includes influent pumping, coarse screening, equalization, biological nutrient removal (nitrification/de-nitrification) using an activated sludge system with clarification, and hypochlorite disinfection, followed by de-chlorination for removal of any chlorine residual. Effluent is recharged to the subsurface via two recharge basins adjacent to the treatment plant. Biosolids are transported to the Company's Verrado treatment plant for solids handling.

3 Verrado Wastewater Treatment

Q. HOW IS WASTEWATER TREATED IN THE VERRADO COMMUNITY?

A. Wastewater collected from the Verrado community flows by gravity through a collection system to the Verrado Water Reclamation Facility ("Verrado WRF"). The Verrado WRF has the capacity to collect and treat 830,000 gallons-per-day (gpd) using a conventional activated sludge, biological nutrient removal process. The treatment process consists of screening, grit removal, nitrification and de-nitrification, clarification, post clarification filtration, and liquid chlorine disinfection. Pretreatment structures include an in-channel step screen, grit chamber, and influent equalization tank. Secondary treatment structures include two aerobic basins, two anoxic basins, and two clarifiers, all of which operate in parallel. Solids handling consists of an aerobic digester and belt filter press. Dewatered sludge is disposed of off-site at an approved landfill. Tertiary treatment structures include four 10 micron disc filter units, two chlorine contact chambers, and disinfection via liquid chlorine. Reclaimed water is reused by the Verrado Community via an extensive reuse irrigation system which provides golf course irrigation and other reclaimed water needs. In addition there is an Aquifer Recharge Facility one mile northwest of the Verrado WRF

which utilizes two vadose zone wells for aquifer recharge. By utilizing reclaimed water, we are able to mitigate groundwater use to irrigate the community's golf courses.

The Verrado WRF recently underwent an expansion and was converted from a sequencing batch reactor process (SBR) to a conventional activated sludge process with biological nutrient removal, otherwise known as the Modified Ludzack Ettinger (MLE) process. The benefits to the expansion include an increase in facility capacity from 0.45MGD to 0.83MGD which will accommodate future growth in the Verrado Community. The conversion of processes promotes increased clarity and contaminant removal in the finished water (effluent).

D SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS

Q. PLEASE DESCRIBE ARIZONA-AMERICAN'S SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS.

A. The Sun City Wastewater District is located in the northwest portion of the Phoenix metropolitan area, Maricopa County, and provides wastewater service to the communities of Sun City, Youngtown, portions of the City of Surprise, and the City of Peoria. The district includes a wastewater collection system with seven lift stations and a metering station. Arizona-American collects the wastewater and then delivers it through a regional collection system for treatment at the Tolleson Wastewater Treatment Plant ("Tolleson WWTP").

The Sun City West Wastewater District is also located in the northwest portion of the Phoenix metropolitan area, Maricopa County and provides wastewater service for the

community of Sun City West. The District includes a wastewater collection system with a single lift station, located at the corner of Bell Road and El Mirage Road. The wastewater is collected by gravity and then lifted, or boosted, for treatment at Arizona-American's Northwest Valley Regional Water Reclamation Facility at 11102 W. Rose Garden Lane.

IV SUN CITY WATER INFRASTRUCTURE IMPROVEMENT SURCHARGE

Q. PLEASE DESCRIBE THE INFRASTRUCTURE IMPROVEMENT SURCHARGE RECOMMENDED FOR THE SUN CITY WATER DISTRICT.

A. The Sun City Water District is nearly 50 years in age and is the oldest district in the current filing. Because of its age, we have seen and expect to continue to see assets reach a certain point in their life cycle where significant levels of replacement capital will need to be invested.

In his direct testimony, Mr. Buls describes the Infrastructure Improvement Surcharge mechanism proposed in this rate case. This type of surcharge has been identified by NARUC as a best regulatory practice.

As proposed, the Infrastructure Improvement Surcharge would be limited to replacement of existing assets. The most common types of assets covered by similar infrastructure improvement programs are replacement mains, hydrants, meters, services, tanks and booster stations.

Q. WHAT TYPE OF IMPROVEMENTS ARE YOU RECOMMENDING FOR THE SURCHARGE FOR THE SUN CITY WATER DISTRICT?

A. In the Sun City Water District, I am recommending that replacement mains, replacement meters, replacement pumps, motors, electrical and control equipment at Sun City booster stations be included.

Q. PLEASE DESCRIBE THE MAIN REPLACEMENT PROGRAM IN THE SUN CITY WATER DISTRICT.

A. As indicated above, the Sun City Water District system is approaching 50 years in age. Because of its age, we can expect to see an increase in the frequency of the number of water main failures from year to year.

Over the past three years, the Sun City Water District has experienced 23 water main breaks. The Company has identified a couple of segments of water main in the Sun City Water District that have a higher frequency, or concentration, of failure rates than the rest of the water district. The segments listed below are planned projects that will seek to eliminate the frequent failures on those segments of water mains.

Segment 1 – Sun City Boulevard, 103rd Avenue to 107th Avenue – this project proposes to replace 2,557 linear feet of 8-inch asbestos cement pipe with 8-inch PVC Class 200 pipe. The estimated cost for this segment of main replacement is $304,259.

Segment 2 – 105th Avenue, Alabama Avenue to Desert Hills Drive – this project proposes to replace 2,097 linear feet of 6-inch asbestos cement pipe with 6-inch PVC Class 200 pipe. The estimated cost for this segment of main replacement is $249,474.

The total estimated cost for these two segments over the next two years is approximately $553,733.

In addition to these two planned large segment replacements, Arizona-American regularly replaces sections of water mains when they break due to the fact that they cannot be repaired. On average, the estimated annual cost of those replacements is approximately $54,802 per year.

Q. PLEASE DESCRIBE THE METER REPLACEMENT PROGRAM IN THE SUN CITY WATER DISTRICT.

A. Arizona-American has a periodic meter change-out program that replaces meters aged 15 years and older in its Sun City Water District. Based on our internal testing and industry publications, we recognize that meters tend to under register water sales as they age. A new or replacement meter improves accuracy of reported water consumption. This is an ongoing activity and 1/15th, or 6.67%, of all meters in the Sun City service area are scheduled to be replaced each year under a 15-year replacement timetable. Under this program, the oldest meters in the Sun City Water District will be changed out first. At the conclusion of the initial 15-year period, each meter will be replaced on an ongoing basis when their age reaches 15 years old. In addition, manual read meters are being replaced by automated radio read meters at the time of their change out. The utilization of automated radio read meters will improve billing accuracy and reduce the amount of time required to read each meter each month.

Q. WHAT IS THE ESTIMATED COST OF THE PERIODIC METER CHANGEOUT PROGRAM?

A. At current labor rates and material costs, it is estimated that the Sun City Water District will need approximately $245,788 per year to replace 1/15th or 6.67% of its water meters. It is anticipated that this amount would be reconciled and adjusted in subsequent rate cases for inflationary factors.

Q: PLEASE DESCRIBE THE BOOSTER STATION REPLACEMENT PROGRAM FOR THE SUN CITY WATER DISTRICT.

A: The Sun City Water District distribution system delivers more than 4.3 billion gallons of water each year to its metered customers. Every gallon of water that is delivered must be pumped and the district's booster stations serve that purpose.

Each booster station, or water plant, in the Sun City Water District includes a network of pumps, motors, associated electrical equipment, instrumentation and controls. Because of the age of the water system, the sheer volume of water pumped at each facility and the extreme weather conditions in Arizona, the Company regularly replaces this equipment when it fails or when it cannot be repaired.

On average, Arizona-American has incurred annual costs of approximately $97,390 to replace critical equipment at its booster stations necessary to deliver water to its customers.

V <u>SUN CITY TANK MAINTENANCE</u>

Q. PLEASE DESCRIBE THE INSPECTIONS PERFORMED ON THE STORAGE TANKS IN THE SUN CITY WATER DISTRICT.

A. In 2009, the Sun City Water District procured the services of Tank Industry Consultants ("TIC") to perform inspections on thirteen of its fourteen Sun City water storage tanks. The newest tank, which is less than 5 years old, was not included in this inspection activity. TIC is a professional engineering firm specializing in the design, specification, and evaluation of storage tanks. TIC has offices located throughout the United States and is a national leader in this type of activity.

The scope of services performed by TIC included the performance of a careful study of the tanks' interior, exterior, foundation(s) and accessories with a NACE-certified inspector. The resulting reports provided to Arizona-American by TIC included a detailed analysis of each tank's condition, recommended maintenance activities, suggested schedule of repairs, and an engineer's estimate of the cost to perform those repairs. The reports also included the signature and seal of a Certified Professional Engineer registered in the State of Arizona.

The following activities were noted in the TIC inspection reports:

1. Observations of site conditions, including observations of site access, general site security, site maintenance and foundation deficiencies.

2. Observations of tank exterior conditions, including observations of dimensions of all manholes, vents, condition of exterior coating thickness, coating adhesion and metal corrosion, and baseline dimensions for comparison.

3. Observation of tank interior conditions, including observations of condition of coating thickness, coating adhesion, metal corrosion, and observation of any debris, and baseline conditions for comparison.

4. Recommendations based on all observations, including recommendations on site maintenance procedures and security, life of the interior and exterior coatings and metals, coating rehabilitation methods and rehabilitation schedules and tank rigging equipment repair and replacement.

The total cost for the 2009 inspection activities performed by TIC was $48,196.

Q. WHAT IS THE PLAN FOR TANK MAINTENANCE IN THE SUN CITY WATER DISTRICT?

A. The 2009 TIC inspection reports included an aggressive 7-year schedule for recommended repairs and painting of the Sun City water tanks. The TIC schedule placed those tanks needing the most immediate attention first and those with lesser urgency toward the end of the schedule. Arizona-American modified the TIC schedule to spread out the recommended costs over a 14-year period to coincide with its own internal philosophy to maintain each tank every 14 years. This revised schedule will lessen the impact to both the customer and the Company.

Arizona-American's 14-year schedule was adjusted with a three-percent CPI adjustor to account for anticipated inflationary price increases for services, labor and materials. The Arizona-American tank maintenance plan in the Sun City Water District is to perform the engineer recommended tasks resulting from the 2009 inspections. The total anticipated costs for the 14-year tank maintenance plan is estimated to be $5,070,624. As noted in the direct testimony of Sheryl Hubbard, the tank maintenance reserve account recommended in this case should include an annual revenue stream of $445,000. It is anticipated that this reserve account would be available for review and adjustment when necessary in subsequent Sun City Water District rate cases.

VI SUN CITY NON-REVENUE WATER PROGRAM

Q. PLEASE DESCRIBE THE AMOUNT OF NON-ACCOUNT WATER FOR THE SUN CITY DISTRICT IN 2008.

A. In 2008, the percentage of "non account water" for the Sun City Water District was 10.95%. Non-account water increased from 8.3% in 2007 to 10.95% in 2008. The primary reason for the increase in 2008 was an open valve at an interconnection to a neighboring municipal utility, which was subsequently closed following the discovery during an inspection. Unfortunately, Arizona-American is unable to quantify the amount of water that may have left the water system through that interconnection.

Q. ARE YOU FAMILIAR WITH THE REQUIREMENT IN DECISION NO. 70351 RELATING TO WATER LOSS?

A. Yes. Decision No. 70351 (May 16, 2008) requires the Company to prepare a plan to reduce water loss to less than 10% for the Sun City Water District or alternatively to prepare an analysis of why it is not feasible to reduce water loss to 10% or less.

Q. WHAT IS THE COMPANY'S PLAN TO REDUCE WATER LOSS TO BELOW 10%?

A. In compliance with Decision No. 70351, attached as Exhibit BJC-1 is the Company's plan to reduce non-account water to below 10% with a plan target date for achieving this reduction of calendar year 2009.

VII TOLLESON AGREEMENT

Q. YOU DISCUSSED THE TOLLESON WWTP PREVIOUSLY; IS THERE AN AGREEMENT THAT COVERS ARIZONA-AMERICAN'S RIGHTS AND OBLIGATIONS IN RELATION TO THE TOLLESON WWTP?

A. Yes. Following Arizona-American's acquisition of the Arizona water and wastewater utility properties owned by Citizens Utilities Company ("Citizens") in 2002, Arizona-American assumed all of Citizens' rights and obligations under the terms of a Sewage Treatment and Transportation Agreement dated June 21, 1985 ("Tolleson Agreement"). The Tolleson Agreement has been amended three times, with the third amendment occurring on April 22, 2003.

Q. HOW DOES THE TOLLESON AGREEMENT DELINEATE DIFFERENT COSTS?

A. Under the terms of the amended Tolleson Agreement, Arizona-American is responsible for separate types of payments to the City of Tolleson. Rate Component One is a fixed annual "usufructory" or user charge related to bond financing issued by the City of Tolleson to pay the original plant additions Tolleson made in order to receive and treat wastewater flows from Sun City. Rate Component Two is a monthly operation & maintenance ("O&M") charge based on the Company's proportionate share of the actual O&M costs based on actual flows. Rate Component Three is a $20,000 monthly payment for replacement and contingencies reserve up to an aggregate annual balance of $200,000. Rate Component Four is a capital construction charge to address capital-improvement projects and facilities additions identified in a June 2001 Wastewater Treatment Plant Infrastructure Assessment Phase I Study performed for Tolleson by Brown and Caldwell Environmental Engineers and Consultants.

Q. PLEASE DESCRIBE RATE COMPONENT THREE IN MORE DETAIL.

A. Rate Component Three is a contingencies and reserve account. The City of Tolleson uses this account to make smaller capital improvements and emergency replacements. An example would be if a pump motor burned out and the City had to replace it.

Q. HOW IS ARIZONA-AMERICAN BILLED FOR RATE COMPONENT THREE?

A. Each month, the City of Tolleson bills Arizona-American for Rate Component Three along with the Rate Component Two O&M costs associated with in its regular monthly billing process.

Q. IS THERE A LIMIT TO HOW MUCH THE CITY OF TOLLESON CAN BILL ARIZONA-AMERICAN FOR RATE COMPONENT THREE?

A. Yes. Per the Tolleson Agreement, Arizona-American must maintain an aggregate contingencies and reserve balance of $200,000 with the City of Tolleson. What this means is, at any moment in time, the City of Tolleson cannot have more than $200,000 of Arizona-American's money in their contingencies and reserve account. Also, no single billing for this activity can exceed more than $20,000 in a single month. It should also be noted that, prior to April 2003, Rate Component Four did not exists. An amendment to the Agreement created Rate Component Four. As a consequence, projects that are now considered Rate Component Four were, prior to April 2003, considered Rate Component Three projects.

Q. HAS THE COMPANY REVISED ITS ACCOUNTING FOR RATE COMPONENT THREE COSTS SINCE THE LAST RATE CASE?

A. Yes. It was determined that charges applicable to the Rate Component Three – Reserve and Contingency costs were inadvertently charged to expense. Between 2002 and the middle of 2008, Arizona-American expensed approximately $631,107 of its Rate

Component Three charges that routinely appeared on its monthly invoices from the City of Tolleson. Since the middle of 2008, all new Rate Component Three charges appearing on its monthly invoices from the City of Tolleson have been accounted for as a regulatory asset. This rate case filing will seek to include these Rate Component Three charges as a regulatory asset in this proceeding.

Q. HOW ARE THESE TOLLESON RATE COMPONENTS REFLECTED IN THE COMPANY'S RATE REQUEST IN THIS PROCEEDING?

A. Please refer to the direct testimony of Sandra Murrey for the rate base treatment and the direct testimony of Sheryl Hubbard for the operating income treatment of these rate components.

Q. WOULD IT MAKE SENSE FOR ARIZONA-AMERICAN TO BUILD ITS OWN TREATMENT FACILITY?

A. No. First, Arizona-American is obligated to secure treatment under the terms of the Tolleson Agreement. Second, construction of a wastewater treatment facility would require the Company to secure a location for a wastewater treatment facility. Securing a large parcel of land in the Sun Cities area would be extremely difficult to locate and expensive. Third, the regulatory requirements for construction of a new facility are numerous and burdensome. Fourth and finally, the cost of construction of new facilities continues to increase. Exhibit B of the Third Amendment to the Tolleson Agreement shows that Arizona-American's estimated cost for capital improvements is $9,878,400. Even if Arizona-American could acquire the land and secure all necessary approvals, the construction costs alone for a 5.2 million gallon-per-day plant would almost certainly exceed $10,000,000.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

NON-REVENUE WATER PROGRAM

Plan

The efficient production, distribution and operation of Arizona-American water systems are critical to the success and leadership position of the Company. Minimization of non-revenue water is a key component of success. Arizona-American employs water auditing as a routine business practice using a method that has clearly defined terms and meaningful performance indicators. The Non-revenue Water ("NRW") program assists the Company in identifying where water losses are occurring and also expresses, by volume and percentage, how much water is lost.

NRW is defined as all water produced minus all water sold. The difference between water produced and sold is NRW. The Commission uses a similar formula but calls its calculation "Non Account Water".

The Sun City water system is comprised of nearly 23,000 water customers being served through more than 306 miles of water mains. Our experience with acoustic leak detection, as well as a 1995 study by the City of Phoenix, tells us that nearly all leaks in our service areas rise to the surface and are physically detected very quickly. Because water tends to rise to surface quickly in the Sun City service area, our immediate focus on resolving the NRW variances is concentrated on production reporting and billing accuracy.

Non-revenue Water Program

The NRW program was supplemented in April 2009 with the launch of a NRW Committee whose purpose is to solve NRW variances. This Committee is made up of 10 supervisory and managerial persons with the experience and knowledge to investigate and resolve water loss issues.

Below are the Arizona-American Water NRW formula and component definitions.

The Formula:

Operand	Description	Acronym
+	Net System Delivery	(NSD)
-	Net Water Sales	(NWS)
=	Non-revenue Water	(NRW)
-	Authorized Unbilled Consumption	(AUB)
=	Actual Water Losses	(AWL)
-	Measured Leaks/Tank Overflows	(LTO)
=	Unaccounted-for-water	(UFW)

Our primary focus is to reduce the variance between net system delivery (NSD) and net water sales (NWS) as non-revenue water (NRW) to a level below ten percent. Although there are many uses that are authorized and unbilled (AUB), *i.e.* main flushing, fire fighting, water re-used back in the treatment process, etc., we believe those components below the NRW line are not significant enough to be our primary focus at this time. Because there are no apparent leaks in the distribution system, we believe our concerted focus on accuracy of system delivery and sales values will provide the most and best results.

Arizona-American is committed to implementing best management practices to minimize and reduce lost and unaccounted for water. Our effort is being driven not only by the emphasis on water conservation, but also for economic reasons. Some of the components of unaccounted-for water (UFW) include meter inaccuracies, undocumented main flushing, undocumented unmetered water use, and undocumented water leakage. Past and present programs have addressed the areas of meter accuracy and unmetered water use. The following paragraphs detail the Company's planned activities to mitigate water loss in its Sun City water system.

Production Meter Testing

Arizona-American has reinstated its program to test and calibrate each production meter in its Sun City service area on an annual basis. The first component of any good NRW program is to be certain that you are reporting the amount of water you are producing correctly, and our concentrated efforts in this area to test and calibrate production meters and identify meters that require repair or replacement is the foundation upon which further efforts are built. Arizona-American has completed its testing in 2009 and found several meters with errors in accuracy.

Of significant note, four of the production meters were either repaired or replaced because their test results provided an accuracy rating of more than 108% fast. Two of these production meters provided test results at 119% and 128%. Theoretically speaking, if I were to adjust these four meters back down to 100% and subtract their difference against the reported 2008 production, this could account for several percentage points of the total NRW variance.

Periodic Sales Meter Change-Outs

Arizona-American has a periodic meter change-out program that replaces meters aged 15 years and older in its Sun City water service area. Based on our internal testing and industry publications, we recognize that meters tend to under register water sales as they age. A new or replacement meter improves accuracy of reported water consumption. This is an ongoing activity and $1/15^{th}$, or 6.67%, of all meters in the Sun City service area are scheduled to be replaced each year under a 15-year replacement timetable. Under this program, the oldest meters in the Sun City water district will be changed out first. At the conclusion of the initial 15-year period, each meter will be replaced on an ongoing basis when their age reaches 15 years old. In addition, manual read meters are being replaced by automated radio read meters at the time of their change out.

Large Sales Meter Testing

Each year, Arizona-American will test all customer sales meters sized 3-inch and larger in its Sun City service area beginning in the second quarter of 2009. Since inaccuracies in these large meters could create a large component of under-reporting of sales, these sales meters will have annual testing and recalibration, rather than being included in the 15-year replacement timetable for smaller meters.

Automatic Meter Reading

Automatic Meter Reading ("AMR") is the remote collection of consumption data from customers' water meters using telephony, radio frequency, power-line and satellite communication. Arizona-American began implementation of a new AMR program in 2008 in which its meters replaced under the periodic meter change-out program and other meters needing replacement (i.e. stuck and damaged meters) are replaced with meters with AMR transmitters installed in them. The program's goal is to ensure 100% accuracy of each meter read, and to increase the productivity of the meter reading work force.

Arizona-American historically used direct read meters that required each water meter to be manually read by a meter reader each month. Under this program, Arizona-American will upgrade to new encoder (AMR) meters with radio frequency technology that are read with a vehicle-mounted automatic data collection system, allowing the Company to increase its meter read accuracy and efficiency, reductions in estimated bills and administrative adjustments, and a decrease in the number of special reads (repeat visits). The AMR program should also increase consumption accuracy which directly affects the NWS component of the NRW calculation. The program was launched in 2008, and in 2009, 1,548 meters are planned to be replaced with the AMR style of meter.

Minimize Well Flushing to Waste

For a variety of operational reasons, water from our groundwater wells is pumped to waste for a period of time before it is directed into the distribution system for delivery to our customers. In 2008, our well flushing procedure was changed to reduce the time water was flushed to waste in an effort to improve water conservation and authorized unbilled consumption (AUB). This change will increase the amount of water that is produced that can be delivered to customers.

Employee Incentive Program

Recognizing that employees are the Company's "eyes and ears" to our systems and our customers, Arizona-American initiated the following program to reduce water loss, prevent unnecessary repairs, and promote system security. The Recovered Water Incentive Program was designed to encourage employees to identify and report incidents of water theft or water loss. Employees are encouraged to question contractors or others working in areas served by Arizona American Water and who might be taking water from hydrants or other unmetered locations. While employees are encouraged to be inquisitive, they are told to not put themselves in a situation where their personal safety is at risk.

Program Specifics: Up to four $25 gift certificates are awarded each month to employees who find and report incidents of water theft, tampering or vandalism involving Arizona American Water equipment (including meters) or facilities, or illegal or undocumented services or hook-ups. If an employee reports an unauthorized customer hook-up to a hydrant or an inactive account with consumption, he/she is eligible to receive a $25 gift card.

Internal Data Consistency

Customer billing issues may also affect non revenue water. Company employees are working to ensure that internal data sources are used consistently and those inconsistencies are researched and corrected. This generally involves verifying meter sizes, verifying the application of the correct tariff, verifying the number of meter dials coded in the billing system, and verifying that the correct district / system ID / meter route fields are used. For example, if a meter has more reading dials than is coded into the billing system, then the meter reader could under-read the meter. If the customer account is coded to a tariff for an incorrect geographic area or is coded to an incorrect district /system ID / meter route, this can result in water sales attributed to one district while water production is attributed to another district, thereby causing an understatement of NRW in the former district and an overstatement of NRW in the latter district. This is an on-going activity being enhanced through additional system reporting which more easily highlights inconsistencies.

Acoustic Leak Detection

Our previous efforts to detect and mitigate water leaks have included water audits including two leak detection surveys employing mobile acoustic technology. One investigation included a leak survey completed in December 2000 in the Sun City service area. This survey identified 9 leaks out of 669 points investigated. The 9 leaks consisted of a hydrant valve not shut-off completely; loose fittings inside meter boxes; some water services which required repair; and a leaking main line valve. The leak survey consultant's final conclusion was that this system had little potential for water loss through leakage at that time. There was also a Sun City service area leak survey completed in February 1993, which identified 21 leaks out of 1780 points investigated. That investigation report concluded that undetected leaks were not a significant area for improvement to the distribution system efficiency at that time.

Permanent leak detection technology could be useful in the future to maintain low lost and unaccounted for water ("UFW") percentages. This would be especially relevant as the cost of water increases or as the level of UFW increases as the systems age. Arizona American has researched the use of one type of permanent leak detection technology – MLOG – when we made the decision to convert to AMR meters. The MLOG technology consists of an array of intelligent sensors that detect water leaks in the water distribution system. These wireless devices tie into the local AMR network and record vibration (leak) levels at the same time every night. By analyzing changes in relative vibration levels, technicians can locate areas that leaks might be occurring. While individual devices are not particularly expensive, the deployment of a large array of them in a distribution system can become costly. Because past acoustic leak detection surveys has shown very few leaks, and because most leaks surface and are detected quickly, we feel that the best use of our resources at this time are to concentrate on better accounting for water through meter testing and replacement, and identifying and accounting for other unmetered uses. In the mean time, we continue to monitor this technology including its current application at Pennsylvania American Water which was experiencing NRW levels in excess of 25%.

Plan Summary

At present, all of our Sun City production meters have undergone testing and/or calibration or replacement. Presently, all large customer meters, 3-inch and above are going through testing and/or calibration. Concurrently, water sales data is being analyzed to identify and correct any variances or inconsistencies. Field personnel and supervisory staff are analyzing drawings to determine potential spots in the distribution system that are interconnected to other water service providers (inter-connects) to ensure that they are closed or metered. In addition, billing queries are being run with exception criteria to validate that accounts are being billed correctly and that the sales are attributed to the correct water district.

Supervisory staff is reviewing construction projects which occurred over the last five years to ensure that all projects are correctly metered and set up in the billing system. Arizona American staff is also verifying that all "in plant" usages are correctly metered and accounted for. The Arizona American Water NRW Committee is reviewing as-built water distribution system plans to evaluate whether there are additional unmetered inter-connections with neighboring water providers. Based on this exercise, we recently identified an open inter-connect with a neighboring municipal water utility which has subsequently been closed. While we have not quantified the volume of water, we believe the inter-connect was open during all of 2008 and has the potential to be a large contributor to our non account water loss for 2008.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-_____
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-_____

DIRECT TESTIMONY
OF
JOHN (JAKE) LENDERKING
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
JOHN (JAKE) LENDERKING
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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Executive Summary

Mr. Lenderking first testifies regarding water conservation in the Anthem Water District. In compliance with Decision No. 70372, Arizona-American has implemented six Best Management Practices ("BMPs"), and the BMPs chosen are from Categories 1, 3, 4, and 7.

In Category 1, the public awareness, local and/or regional messaging program BMP is implemented. Since 2000, Arizona-American has been a partner in the "Water-Use It Wisely" media campaign. In fact, Arizona-American was the first private water provider to become a Water-Use It Wisely partner.

In Category 3, Arizona-American has implemented two BMPs. These include the residential audit program and the residential interior retrofit program. In the residential audit program BMP, Arizona-American makes available water conservation home audit kits to all of its water customers free of charge. These kits are offered to customers through bill inserts and the Company's SAVEH2OARIZONA website. For the residential interior retrofit program BMP, Arizona-American makes available water conservation retrofit kits to all of its water customers free of charge. These kits also are offered to the Company's customers through bill inserts and the Company's SAVEH2OARIZONA website.

In Category 4, the Company has implemented two BMPs: the meter repair and/or replacement program BMP and the comprehensive water system audit program BMP. In the meter repair and/or replacement program, Arizona-American repairs and/or replaces water meters as meters fail to perform and schedules meters to be replaced after 15 years of use. In the comprehensive water system audit program BMP, Arizona-American performs multiple tasks. Arizona-American continuously monitors the production and distribution system for any abnormal reading that would indicate a leak or break. Also, under this BMP, all production meters are checked for accuracy each year and calibrated or replaced as necessary. Arizona-American has two standing committees which regularly evaluate the water system.

Finally, in Category 7, the evaluation of new and emerging technologies is implemented. In this BMP, American Water has been analyzing and continues to analyze the combination of two technologies, acoustic leak detection and automatic meter reading, together, to monitor systems leaks.

Mr. Lenderking also testifies regarding water conservation in the Sun City Water District. Arizona-American implemented a number of conservation BMPs in the Sun City district. They include a regional messaging program, adult education and training, residential audit program, interior retrofit program, and a meter replacement program.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is John Carroll (Jake) Lenderking. My business address is 19820 N. 7th Street, Suite 201, Phoenix, Arizona 85024, and my telephone number is 623-445-2410.

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

A. I am employed by Arizona-American Water Company ("Arizona-American") as its Water Resources Manager.

Q. PLEASE BRIEFLY OUTLINE YOUR RESPONSIBILITIES AS ARIZONA-AMERICAN'S WATER RESOURCES MANAGER.

A. I am responsible for all water resource activities including: Arizona Department of Water Resources ("ADWR") annual reports, water resource planning, water resource allocation, permitting, and attending and participating in regional water policy forums. I also oversee all Arizona-American water conservation activities in the State.

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science degree from Arizona State University in Environmental Resource Management with a concentration in Watershed Ecology.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I joined Arizona-American in 2007. Before joining Arizona-American, I was employed by the City of Phoenix in its Water Conservation office, where I worked on the City's demand management plan, a plan that is still under development. I also oversaw the implementation of the city's retrofit and audit program, where we visited single-family

homes, performed water audits, and replaced older inefficient plumbing fixtures with new efficient ones. Before I joined the City of Phoenix, I was employed by ADWR as part of its Phoenix Active Management Area ("AMA") section. At the time I left ADWR, I was responsible for the regulation and permitting of all recharge activities in the Phoenix AMA.

Q. ARE YOU A MEMBER OF ANY ASSOCIATIONS?

A. I am a member of Colorado River Water Users Association and the Arizona Hydrological Society.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes, once in an Arizona-American rate case last year.

II PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please see the executive summary of my direct testimony.

III WATER CONSERVATION IN ANTHEM

Q. IN THE LAST RATE CASE FOR THE ANTHEM DISTRICT THE COMMISSION ORDERED SOME ACTIONS IN THE AREA OF WATER CONSERVATION. COULD YOU DESCRIBE THAT ORDER?

A. Yes, in Arizona Corporation Commission Decision No. 70372 (June 13, 2008), the Commission ordered that Arizona-American demonstrate to the Commission that, prior to receiving its next rate increase for the Anthem water system, that the Anthem water system has implemented at least six (6) Modified Non-Per Capita Conservation Program Water Conservation Measures (also known as Best Management Practices ["BMPs"]) for the Phoenix Active Management Area, as defined by the Arizona Department of Water

Resources, and that of the BMPs chosen by Arizona-American, at least one (1) but no more than three (3) are from Categories 1, 2, and 3 (Public Awareness/Public Relations; Conservation Education and Training; and Outreach Services).

Q. IN YOUR DESCRIPTION ABOVE YOU MENTIONED BMPS FOR THE PHOENIX ACTIVE MANAGEMENT AREA. COULD YOU DESCRIBE THE ARIZONA DEPARTMENT OF WATER RESOURCES ("ADWR") PROGRAM WHICH ESTABLISHES THESE BMPS?

A. Yes, the ADWR program is known as the Modified Non-Per Capita Conservation Program ("MNPCCP"). ADWR modified the Third Management Plan to mandate that all large municipal providers that are not designated as having an assured water supply will be regulated under the modified MNPCCP. The modification requires large municipal providers regulated under the MNPCCP to implement up to ten water conservation measures or BMPs from a list of measures included in the program depending upon the number of connections. All municipal providers regulated under the MNPCCP must have a public education program. Additionally there are three tiers that a district will fall into, each tier containing more conservation requirements than the previous one. The first tier is for districts that have up to 5,000 connections, the second is for districts with 5,001 to 30,000 connections, and the third tier is for districts with over 30,000 connections. The tiers require one, five, and ten conservation measures respectively. Anthem has 8,605 connections as of December 2008 as reported in the annual report to the Commission.

The BMPs are grouped into seven categories:

1 Public awareness
2 Education and training
3 Outreach services

4 Physical system evaluation and improvement
5 Ordinances, conditions of service, and tariffs
6 Rebates and incentives
7 Research and innovation

Q. HAS THE ANTHEM DISTRICT IMPLEMENTED BMPS IN COMPLIANCE WITH DECISION NO. 70372?

A. Yes, the Anthem district has implemented six BMPs from the appropriate categories.

Q. PLEASE DESCRIBE THESE BMPs.

A. In Category 1, one BMP is implemented. In Category 3, two BMPs are implemented. In Category 4, two BMPs are implemented; and in Category 7, one BMP is implemented.

Q. PLEASE DESCRIBE THE CATEGORY 1 BMP.

A. In Category 1, the public awareness, local and/or regional messaging program BMP is implemented. Since 2000, Arizona-American has been a partner in the "Water-Use It Wisely" media campaign. In fact, Arizona-American was the first private water provider to become a Water-Use It Wisely partner. Water-Use It Wisely is the nation's most comprehensive water conservation community awareness campaign. Arizona-American provides financial support to the campaign along with participation in the many Water-Use It Wisely sponsored events. Arizona-American employees also participate at the quarterly partner meetings to help guide the program. This campaign allows Arizona-American to maximize its effect by combining with many of the other cities and towns around the state to bring a bigger, broader conservation message to our customers. This campaign has proven to be a great asset to the Arizona-American conservation program. In 2009, the Water-Use It Wisely partners created a new campaign, with multiple paths in which to reach people. Specific details of the campaign are included in Exhibit JCL-1.

Q. WHAT ARE THE CATEGORY 3 BMPs THAT ARIZONA-AMERICAN HAS IMPLEMENTED?

A. In Category 3, outreach services, the residential audit program and the residential interior retrofit program BMPs are implemented. In the residential audit program BMP, Arizona-American makes available water conservation home audit kits to all of our water customers free of charge. These kits are offered to our customers through bill inserts and our SAVEH2OARIZONA website. The kits include many conservation tools and step-by- step instructions on their use to assist customers in making their homes water efficient. Among the kit contents are toilet dye tablets, drip gauges, meter flow bags, conservation tip wheel, meter reading instructions, landscape watering guideline cards and a landscape watering by the numbers booklet.

In the residential interior retrofit program BMP, Arizona-American makes available water conservation retrofit kits to all of our water customers free of charge. These kits are offered to our customers through bill inserts and our SAVEH2OARIZONA website. The kits include many valuable conservation devices, tools, and instructions on their use to assist customers in saving water and money. Among the kit contents are toilet dye tablets, low flow bathroom sink aerators, low flow kitchen sink aerators, low flow showerheads, an outdoor hose nozzle, teflon tape for showerhead installation, and landscape watering guideline cards.

Q. WHICH CATEGORY 4 BMPs HAS ARIZONA-AMERICAN IMPLEMENTED?

A. In Category 4, physical system evaluation and improvement, the meter repair and/or replacement program BMP and the comprehensive water system audit program BMP are implemented. In the meter repair and/or replacement program, Arizona-American repairs and/or replaces water meters. Currently, the meter repairs and/or replacements

occur as meters fail to perform. Additionally, Arizona-American schedules meters to be replaced after 15 years of use. Arizona-American keeps a detailed database in regards to when a meter was put into service and when and if there has been any issues with the meter. Arizona-American uses this database to determine when a meter has been in service for over 15 years and schedules the replacement of the meter. In 2008, Arizona-American began replacing all meters with Automatic Read Meters. These meters will improve accuracy and greatly reduce the amount of time it takes to read meters.

In the comprehensive water system audit program BMP, Arizona-American performs multiple tasks. Arizona-American continuously monitors the production and distribution system for any abnormal reading that would indicate a leak or break. Also, under this BMP, all production meters are checked for accuracy each year and calibrated or replaced as necessary. Arizona-American has two standing committees which regularly evaluate the water system. There is both the operations committee and the administrative committee. The operations committee is a bottom-up approach to system water auditing. It focuses on the physical system, items such as potential leaks, status of interconnects, and meter failures. The administrative committee utilizes a top down approach to system water auditing with a focus on tracking sales, production, and credits.

This comprehensive water system audit program works to systematically narrow the vast range of potential water loss avenues within a large distribution network. Quickly pinpointing and correcting the source of water loss in a distribution network is key to the success of water conservation efforts. Proactively identifying and eliminating causes of water loss through these programs enables unidentified water loss investigations to be focused on a smaller universe which in turn provides for quicker identification and

remediation. Timely detection, response, and remediation are the central outcomes of the comprehensive water system audit program.

Q. FINALLY, PLEASE DESCRIBE THE CATEGORY 7 BMP.

A. In Category 7, research and innovation, the evaluation of new and emerging technologies BMP is implemented. In this BMP, American Water has been analyzing and continues to analyze the combination of two technologies, acoustic leak detection and automatic meter reading, together, to monitor for system leaks.

American Water's pilot programs use a fixed-network leak detection system that is centered around an acoustic sensor, the first version is called MLOG. An MLOG sensor is a waterproof, battery-powered data logger that is permanently installed near a water service meter and records vibrations, stores vibration data, and transmits the data via radio signals to a server that processes the data to record a daily minimum system noise. The network of sensors reveals a noise pattern over days and months and identifies atypical noise that might indicate a leak.

Q. BASED ON THE IMPLEMENTATION OF THESE BMPs, IS ARIZONA-AMERICAN ALREADY IN COMPLIANCE WITH THE REQUIREMENT IN DECISION NO. 70372?

A. Yes, it is.

Q. IS THE COST OF ANTHEM'S CONSERVATION PROGRAM INCLUDED IN THE COMPANY'S RATE REQUEST?

A. Yes, in Adjustment SLH-10.

IV <u>WATER CONSERVATION IN SUN CITY</u>

Q. HAS CONSERVATION BEEN IMPLEMENTED IN THE SUN CITY DISTRICT?

Yes, Arizona American has had a conservation program in Sun City for many years. Commission Decision No. 60172 authorized spending for conservation in Sun City and its costs have been included in Adjustment SLH-10.

Q. COULD YOU PLEASE DESCRIBE THE CONSERVATION PROGRAM FOR SUN CITY WATER DISTRICT?

Yes. Arizona-American implemented a number of conservation BMPs in the Sun City district. They include a regional messaging program, adult education and training, residential audit program, interior retrofit program, and a meter replacement program.

The Sun City Water District has 22,935 connections and under the ADWR MNPCCP program 5 BMPs must be implemented. The five conservation measures listed above are in the MNPCCP, and the conservation measures listed above are synonymous with the BMP names.

Q. PLEASE DESCRIBE THE CATEGORIES WHICH THE SUN CITY CONSERVATION PROGRAM BMPS FIT INTO.

The regional messaging program is in Category 1: Public Awareness/Public relations. Adult education is in Category 2: Conservation Education and Training. The residential audit and the interior retrofit program are in Category 3: Outreach Services, and the meter replacement program is in Category 4: Physical System Evaluation and Improvement.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
CHRISTOPHER C. BULS
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

TESTIMONY
OF
CHRISTOPHER C. BULS
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
DATED JULY 2, 2009

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EXECUTIVE SUMMARY

Mr. Buls supports the implementation of an infrastructure improvement surcharge in the Sun City Water District and a pro forma adjustment for certain assurance fees related to transferring the Anthem water lease from Del Webb to Arizona-American Water Company.

Sun City Water has the oldest infrastructure of any of Arizona-American Water Company's, and the infrastructure is at point in the asset life cycle where significant levels of replacement capital will begin to be invested. The qualifying assets would be limited to replacements of existing assets, including replacement mains, hydrants, meters (including AMR replacements), services, tanks and booster stations.

If rate consolidation is approved, Mr. Buls would recommend that this surcharge be spread across all of the Company's water customers rather than just the Sun City Water customers and that eligibility be expanded to include qualifying assets in all water districts rather than limiting it only to Sun City.

Mr. Buls also testifies that Arizona-American is currently seeking an assignment of the Ak-Chin Community water lease from Del Webb. Mr. Buls explains the reasons for the use of a letter of credit in relation to the assignment of the lease and supports the pro forma adjustment for the assurance fees relating to the transfer of the lease.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Christopher C. Buls. My business address is 19820 N. 7th Street, Suite 201, Phoenix, Arizona 85024

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

A. I am employed by American Water Works Service Company as Vice President of Finance.

Q. PLEASE DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS VICE PRESIDENT OF FINANCE.

A. In my capacity as Vice President of Finance, I direct the Financial Planning and Analysis, Rates & Regulatory, and Financial Controls and Compliance activities for the regulated subsidiaries in Arizona, New Mexico and Hawaii. I also have indirect management responsibility for the accounting services provided to these states. These services are supplied by personnel in the American Water Shared Services Center in Cherry Hill, New Jersey.

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Arts degree in Chemistry from Indiana University – Bloomington in 1982 and a Master of Business Administration with a concentration in Finance also from Indiana University – Bloomington in 1987. Additionally, I have been a Certified Management Accountant since 1991.

Q. PLEASE OUTLINE YOUR BUSINESS EXPERIENCE.

A. Upon graduating from Indiana University in 1987, I joined Kidder, Peabody as a Registered Representative. In August 1988, I accepted employment with Air Products and Chemicals where I held numerous positions of increasing responsibility including

Financial Analyst, Plant Controller, Business Controller and various Financial Planning and Accounting Management positions at both a corporate and segment level. In 2001, I joined the Engineered Materials division of Cytec Industries as the Operations Controller, where I was responsible for Planning, Budgeting and Accounting for six manufacturing locations across the United States. In 2004, I joined American Water as the Vice President of Finance for the southeast states, and early in 2007, I transferred into the same role with similar responsibility for the western states.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY TO THIS COMMISSION?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. Please see the executive summary of my direct testimony.

II AN INFRASTRUCTURE IMPROVEMENT SURCHARGE IS A PROVEN MEANS OF FACILITATING PLANNED INFRASTRUCTURE REPLACEMENT BY WATER UTILITIES.

Q. BRIEFLY DESCRIBE WHAT YOU MEAN BY AN "INFRASTRUCTURE IMPROVEMENT SURCHARGE" FOR THE SUN CITY WATER DISTRICT.

A. An infrastructure improvement surcharge is intended to provide a utility with a return on and of select, qualifying investments made between rate cases. It would be an additional charge added to the customer's regular bill.

Q. ARE THERE OTHER JURISDICTIONS WHERE THIS IS ALREADY IN PLACE?

A. Yes. There are a number of states where these types of charges are part of the regulatory framework; these programs go by different names in different states including DSIC, ISRIS, and other acronyms. I had hands-on experience with a DSIC while working at

Pennsylvania American Water and have consulted with the Rates Director in our Central States who works with similar surcharges in Illinois, Indiana, Missouri and Ohio. Additionally, California-American Water also recently received approval for infrastructure surcharges. Finally, this type of mechanism has been identified by NARUC as a best regulatory practice for water utilities.

Q. WHY ARE YOU RECOMENDING THIS FOR SUN CITY WATER?

A. Sun City Water has the oldest infrastructure of any of Arizona-American Water Company's ("Arizona-American" or "Company") districts. Because of its age, the infrastructure in this district is at a point in the asset life cycle where significant levels of replacement capital will begin to be invested. The need for replacement capital in Sun City is highlighted by the leak repair data we have collected over the last few years. With this need in mind, we are planning capital investment in that district to address the issue. This type of surcharge has successfully facilitated necessary infrastructure replacement in other jurisdictions.

Q. WHAT PROJECTS SHOULD BE COVERED UNDER THIS SURCHARGE?

A. A general description of the types of assets covered in this program is provided below. Mr. Cole provides more specific information on details of the projects in his direct testimony.

Q. HOW WOULD THIS MECHANISM WORK?

A. First, one key goal is making sure it is simple for the Company to administer, the staff to review and our customers to understand. There are several components to the overall program, including:

1. Defining which assets qualify for the surcharge.
2. Calculating and filing the surcharge.

3. Billing our customers for the surcharge.

4. Identifying appropriate controls.

Q. WHAT ASSETS WOULD BE COVERED UNDER THIS SURCHARGE?

A. These are improvement surcharges, so the qualifying assets would be limited to replacements of existing assets. The most common types of assets covered by other infrastructure improvement programs are replacement mains, hydrants, meters (including AMR replacements), services, tanks and booster stations. Additionally, infrastructure relocations which are not reimbursed are often included. I believe these are the appropriate groups for inclusion in Arizona-American's program in the Sun City Water District as well.

Q. HOW WOULD THIS SURCHARGE BE CALCULATED?

A. Twice per year, the Company would analyze the qualifying assets placed in service. All of the calculations would be based on factors from the most recently completed rate case. These factors include, but are not limited to, depreciation rates, allowed ROE, cost of debt, capital structure and revenue gross-up factors. Based on the estimated service life and depreciation rates from the last case, the Company would calculate the depreciation expense attributable to these assets. Additionally, the Company would calculate the appropriate return on these assets based on the authorized return approved in this case or a subsequent case, if applicable. The total amount of the surcharge would be the return on and of these qualifying assets based on the revenue gross-up factor from this rate case or a subsequent case, if applicable. Simultaneous with implementation of new rates from any subsequent general rate case evidenced by a decision from the Commission, a revised surcharge would be calculated removing qualifying assets included in the rate base of that general rate case from the surcharge calculation. The revised surcharge would incorporate changes in depreciation rates, return on rate base, and the revenue conversion factor from

the recently-completed case. Changes in general operating expenses, either positive or negative, would not generally be considered in these surcharge calculations.

Q. HOW WOULD THE COMPANY FILE THIS SURCHARGE WITH THE COMMISSION?

A. The Company would file the proposed surcharge request with the Commission after completing the appropriate analysis. The Commission Staff would then have thirty days to review the filing, issue a brief report and recommended order, which would be followed by a Commission vote at the next Open Meeting. It is important to note that this review is intended to check mechanics and compliance with the controls, it is not intended to be a full prudency review; the more in-depth controls will be discussed later in my testimony. If Staff does identify an issue, both parties would work together to resolve the issue and once resolved, the Commission would vote on the surcharge.

Q. HOW WOULD ARIZONA-AMERICAN COMMUNICATE THIS SURCHARGE TO THE CUSTOMER?

A. The Company would provide an overview of the program to the customer annually via a bill insert. This insert would provide an easy to understand explanation of how the program works and a brief description of the qualifying assets placed in service during the previous year. Additionally, included with the first bill after any changes to the surcharge, the Company would notify the customers of the percentage change in the surcharge and the additional investment made during the proceeding period. Finally, the Company would provide a more in-depth discussion of the entire process and assets placed in service on the Arizona-American website.

Q. HOW WOULD THESE SURCHARGES BE BILLED TO THE CUSTOMER?

A. The total amount of the surcharge would be calculated as a percentage of the base revenue requirement from the last general rate case. This single percentage would then be applied to the entire base bill for all customers. Any required taxes or fees normally added to the base rate amount would also be added to the new amounts as well. Special surcharges such as ACRM amounts would not be included in the calculation. This amount would be disclosed on a separate line of the bill as an Infrastructure Improvement Surcharge with the single percentage clearly visible.

Q. WHAT CONTROLS DOES THE COMPANY PROPOSE REGARDING THESE SURCHARGES?

A. There are several controls utilized in other jurisdictions that would be appropriate for use in Arizona. The first and most important control is that all of these assets placed in service subsequent to the previous rate case would be subject to the normal prudency review in the following rate case. These assets would be reviewed in similar fashion to any assets placed in service as part of a general rate case. A second control is that the Company proposes a limit of 10% in additional revenue generated from these surcharges. For example, if the Company was granted an annual revenue requirement of $10 million in the previous case, the amount of the surcharge could never be greater than $1 million or 10%. For amounts greater than 10%, the Company would need to file a general rate case. At the conclusion of a general rate case, the rate would be reset as described previously in the calculation section. Finally, the Company would prepare an annual earnings test and would be allowed only to obtain a surcharge increase for the return allowed on rate base.

Q. HOW WOULD THIS IMPACT THE REVENUE REQUIREMENT IN THIS CASE?

A. This would have no impact on the revenue requirement in the current case as it would be based on investment subsequent to the investment in the proposed rate base. Once implemented, the rate increase effect on Sun City water customers is difficult to project as the impact could be significantly reduced if the rate consolidation plans under consideration are implemented.

Q. HOW WOULD YOU MODIFY THIS PROPOSAL IF RATE CONSOLIDATION IS APPROVED?

A. If rate consolidation is approved, I would recommend that this surcharge be spread across all of the Company's water customers rather than just the Sun City Water customers. This would result in a significant reduction in the surcharge amount to our Sun City customers. I would also recommend that eligibility be expanded to include qualifying assets in all water districts rather than limiting it only to Sun City.

III <u>THE ANTHEM WATER LEASE IS A CRITICAL COMPONENT OF THE LONG TERM VIABILITY OF THE ANTHEM WATER SYSTEM</u>.

Q. PLEASE PROVIDE BACKGROUND ON HOW THIS LEASE ORIGINATED?

A. As the developer for the Anthem community, Del Webb had an obligation to provide an assured source of water sufficient for the community. Anthem's location has virtually no viable ground water supply. Consequently, Del Webb contracted with the Ak-Chin Indian Community to lease water rights. The water rights included in this lease provide virtually all the water for the Anthem community.

Q. HOW IS ARIZONA-AMERICAN CURRENTLY UTILIZING THESE WATER RIGHTS?

A. Arizona-American currently relies on this lease for virtually all the water provided to Anthem. Arizona-American reimburses Del Webb for the cost of water purchased for Anthem under this water rights lease. As part of the original agreement between Citizens Utilities and Del Webb, Del Webb is required to assign the lease rights to the Company upon achievement of certain milestones, subject to the consent of the Ak-Chin Community and the U.S. Department of Interior.

Q. HAVE THESE MILESTONES BEEN MET?

A. Yes. These milestones have been met.

Q. WHY HASN'T THE LEASE BEEN TRANSFERRED IF THE MILESTONES HAVE BEEN MET?

A. The Ak-Chin Community must approve the assignment of the lease. There have been two sticking points with its approval. First, the proposed assignment by Del Webb to the Company represents the assignment of only a portion of the overall lease, with Del Webb retaining the balance of the lease. This will effectively bifurcate one lease agreement into two lease agreements, and the Ak-Chin Community has not yet indicated that it is willing to bifurcate the lease. Second, the Ak-Chin Community needs to review and approve the financial viability of the new lessee, Arizona-American.

Q. REGARDING THE FIRST ISSUE, HAS DEL WEBB BEEN SUCCESSFUL IN SPLITTING THE LEASE?

A. The three parties need to work out both of the issues prior to the partial assignment of the lease to the Company. However, recent discussions between the parties appear to

indicate a willingness on the part of the Ak-Chin Community to consider splitting the lease.

Q. REGARDING THE SECOND ISSUE, HAS THE AK-CHIN COMMUNTY REVIEWED ARIZONA-AMERICAN AS THE NEW LESSEE?

A. Yes. We met with representatives from the Ak-Chin Community and provided financial statements on both Arizona-American Water and our parent, American Water Works, Inc.

Q. HAS ARIZONA-AMERICAN BEEN APPROVED AS THE NEW LESSEE?

A. No. The Ak-Chin Community informed us that, because of the Company's on-going losses and weak financial position, they would not be willing to consent to the partial assignment of the lease to the Company without additional assurance of the Company's ability to pay the on-going expenses.

Q. WHAT ADDITIONAL ASSURANCE IS THE COMPANY PROPOSING?

A. The Company is proposing the purchase of a letter of credit ("LC") for an amount equal to the next year's payment. The Company would agree to annually renew this LC at least three months prior to the expiration of the existing LC until such time as the Company meets certain predetermined financial milestones. Once these milestones are met, the Company would no longer need to maintain an LC.

Q. ARE THESE FEES KNOWN AND MEASURABLE?

A. Yes. We know these rights need to be assigned to insure the long-term viability of the Anthem system. We also know that the Ak-Chin Community will not agree to an assignment without additional financial security. In discussing this situation with representatives from our American Water Capital Corp. affiliate, we believe the LC proposal represents the lowest cost option available which is why we have included it.

American Water Capital Corp. maintains banking relationships with a consortium of large banks and regularly utilizes these banks for LCs under similar circumstances. Consequently, these fees are measurable.

Q. SHOULD THESE FEES BE INCLUDED AS A PRO-FORMA EXPENSE ADJUSTMENT?

A. Yes. The fees are known and measurable, represent the least cost method to move forward and will enable us continued access to the water needed by the community. This expense is reflected in the cost of purchased water adjustment, which is SLH-5.

Q. ARE YOU CERTAIN THE AK-CHIN COMMUNITY WILL AGREE TO THIS PROPOSAL?

A. No. We are not certain they will agree to this option; however, we do know that we will need to do something to provide additional assurance and believe this represents the lowest cost option.

Q. HOW MUCH WOULD THESE ASSURANCE FEES COST?

A. Based on utilizing our current banking relationships, the rate for these fees is 35 basis points on the total plus an application fee of between $250 and $500. Our current water purchase price is $83 per acre foot, and Anthem has the right to 7,900 acre feet annually. This results in an annual commitment of $655,700. Consequently, these fees would be $2,795 per year.

Q. HAS ARIZONA-AMERICAN CONSIDERED OTHER OPTIONS TO OBTAIN WATER RIGHTS?

A. Yes, but no other good options exist. Leasing water rights at this time would require an initial payment well in excess of $8 million dollars plus the annual purchased water charges would be at, or exceed, the current water charges. Even with the modest charge

for the additional financial assurance provided by the proposed LC, the current lease provides real savings for our customers versus attempting to obtain new rights.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT AND ITS SUN CITY WATER DISTRICT.	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT, ITS SUN CITY WASTEWATER DISTRICT AND ITS SUN CITY WEST WASTEWATER DISTRICT.	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
SHERYL L. HUBBARD
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Sheryl L. Hubbard testifies as follows:

Sponsored Schedules

Ms. Hubbard sponsors the following schedules for each district in the case:

- Schedule A-2 – Arizona American Summary of Results of Operations
- Schedule A-4 – Arizona American Construction Expenditures and Gross Utility Plant in Service
- Schedule A-5 – Arizona American Summary Statements of Cash Flows
- Schedule C-1 – Arizona American Adjusted Test Year Income Statement
- Schedule C-2 – Arizona American Income Statement Pro Forma Adjustments
- Schedule C-3 – Arizona American Computation of Gross Revenue Conversion Factor
- Schedule E-3 – Comparative Statement of Changes in Financial Position
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- Schedule F-1 – Projected Income Statements
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Operating Income Adjustments

Ms. Hubbard sponsors the following adjustments to operating income:

- Adjustment SLH-1 – Annualize Payroll and Payroll Tax Expense
- Adjustment SLH-2 – Annualize Pension Expense
- Adjustment SLH-3 – Annualize 401K Expense
- Adjustment SLH-4 – Annualize Insurance Expense
- Adjustment SLH-5 - Annualize Purchased Water
- Adjustment SLH-6 – Remove CAP Revenue and Expense
- Adjustment SLH-7 – Annualize Waste Disposal Expense
- Adjustment SLH-8 – Water Testing Expense
- Adjustment SLH-9 – Specialist on Industrial Pre-Treatment
- Adjustment SLH-10 – Adjust Conservation Expenses
- Adjustment SLH-11 – Tank Maintenance Accrual
- Adjustment SLH-12 – Annualize Property Taxes
- Adjustment SLH-13 – Remove Other Income and Deductions
- Adjustment SLH-14 – Annualize OPEBs
- Adjustment SLH-15 – Interest Synchronization
- Adjustment SLH-16 – Federal and State Income Taxes

Additional Subject Matter

Ms. Hubbard also supports the following requests by Arizona American:

- Allocation of the Northwest Valley Regional Treatment Facility plant investment and operating expenses between Sun City West Wastewater district and the Anthem/Agua Fria Wastewater district; and

- Arizona American's request for a tank maintenance reserve to fund tank maintenance expenditures.

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Sheryl L. Hubbard. My business address is 19820 N. 7th Street, Suite 201, Phoenix, Arizona 85024.

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

A. I am employed by Arizona American Water Company ("Arizona American") as a Manager, Rates & Regulation.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR ARIZONA AMERICAN.

A. My primary responsibilities are to prepare, coordinate and manage rate applications and other regulatory filings consistent with the applicable regulatory agency's filing requirements. I also administer tariffs and support rate case-related public outreach.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I have 30 years of experience in public utility accounting and regulation; 18 years employed by the Michigan Public Service Commission ("Michigan Commission") as an auditor/audit manager as well as a Commissioner's Assistant. During my employment with the Michigan Commission, my responsibilities included preparing revenue requirement calculations for water, steam and electric utilities. After my employment with the Michigan Commission, I was employed by the Arizona Corporation Commission ("Commission") as the Chief of the Accounting and Rates section. Following my employment with the Commission, I joined Citizens Communications Company ("Citizens") as a Regulatory Accounting Manager in its Arizona Gas division. My responsibilities with Citizens included ensuring compliance with applicable state

statutes, regulatory rules and decisions, as well as preparation of rate cases and other regulatory filings with state regulatory agencies in Arizona and Colorado.

After my employment with Citizens, I joined Arizona Water Company as Manager of Rates and Regulatory Accounting. As the Manager of Rates and Regulatory Accounting, my responsibilities included monitoring regulatory actions taken by the Commission, ensuring compliance with decisions of the Commission, filing necessary tariffs, preparing rate cases and other regulatory filings for submission to the Commission, and appearing as a witness before the Commission.

I have been employed with Arizona American since March 2007.

I have a Masters in Business Administration from the University of Phoenix and my undergraduate degree, a Bachelor of Arts degree with a major in Accounting was obtained from Michigan State University. I am a licensed, certified public accountant in the states of Arizona and Michigan.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE REGULATORY COMMISSIONS?

A. Yes, I have testified before the Arizona Corporation Commission on numerous occasions. I have also testified before the Michigan Public Service Commission and the New Mexico Public Regulation Commission.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The scope and purpose of my testimony are set forth in my Executive Summary.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. Arizona American is requesting rate changes for the Anthem Water, Sun City Water, Anthem/Agua Fria Wastewater, Sun City Wastewater, and Sun City West Wastewater in

this proceeding. Each water and wastewater district has been assembled as a stand-alone filing complete with all standard filing requirement schedules. Whenever possible, schedules and adjustments will be discussed as applicable to the two water and three wastewater districts previously identified. In addition, a summary table is included detailing Arizona American's proposed adjusted operating income by district for Schedule C-1. Similarly, since most of the *pro forma* adjustments that I am proposing are premised upon the same underlying principles regardless of the district, the *pro forma* adjustments are discussed herein by adjustment number which correlates to the normalizing/annualizing adjustment. For any *pro forma* adjustments that do not apply to all five of the water and wastewater districts, the proposed adjustment will be discussed for the specific district or districts affected.

Q. DOES YOUR TESTIMONY INCORPORATE RECOMMENDATIONS OF OTHER COMPANY WITNESSES?

A. Yes, it does. I have incorporated recommendations or adjustments sponsored by Mr. Buls, Mr. Cole, Ms. Gutowski, Mr. Kiger, and Mr. Gross as *pro forma* adjustments to test year expenses when applicable.

III. SPONSORED SCHEDULES

Q. PLEASE IDENTIFY THE SCHEDULES YOU ARE SPONSORING.

A. I am sponsoring the following schedules for each of the two water and three wastewater districts:

- Schedule A-2 – Arizona American Summary of Results of Operations
- Schedule A-4 – Arizona American Construction Expenditures and Gross Utility Plant in Service
- Schedule A-5 – Arizona American Summary Statements of Cash Flows
- Schedule C-1 – Arizona American Adjusted Test Year Income Statement
- Schedule C-2 – Arizona American Income Statement Pro Forma Adjustments

- Schedule C-3 – Arizona American Computation of Gross Revenue Conversion Factor
- Schedule E-3 – Comparative Statement of Changes in Financial Position
- Schedule E-7 – Operating Statistics
- Schedule E-8 – Taxes Charged to Operations
- Schedule F-1 – Projected Income Statements
- Schedule F-2 – Projected Statements of Changes in Financial Position
- Schedule F-3 – Projected Construction Requirements
- Schedule F-4 – Assumptions Used in Rate Filing

IV. SUMMARY SCHEDULES

Q. PLEASE EXPLAIN SCHEDULE A-2?

A. Schedule A-2 titled "Summary Results of Operations" is provided for each of Arizona American's water and wastewater districts included in this application. Schedule A-2 summarizes operating history for the years 2006, 2007, and the test year 2008, as well as projected year 2009. The figures summarized for the test year are shown both unadjusted, as reflected in Arizona American's accounting records, and adjusted for known and measureable *pro forma* changes detailed in Schedule C-2 for each water and wastewater district in Arizona American's application.

Q. PLEASE EXPLAIN SCHEDULE A-4?

A. Schedule A-4 titled "Construction Expenditures and Gross Utility Plant in Service" presents the historical construction expenditures for the years 2006, 2007, and test year 2008, as well as three years of projected construction expenditures (2009, 2010, and 2011). This schedule also summarizes the annual net plant placed in service and the balances, both actual and projected, of gross utility plant in service for the same periods shown for construction expenditures. Mr. Gross provides direct testimony on test year and projected construction activities for this proceeding.

Q. PLEASE EXPLAIN SCHEDULE A-5?

A. Schedule A-5 titled "Summary Statements of Cash Flows" is a statement of cash flows detailing the changes in the cash accounts for years 2006, 2007, and test year 2008 as well as projected year 2009.

V. ADJUSTED OPERATING INCOME

Q. PLEASE EXPLAIN SCHEDULE C-1?

A. Schedule C-1 titled "Adjusted Test Year Income Statement" sets forth revenues and expenses and the resulting net income both on an historical unadjusted basis and an adjusted (including pro forma adjustments) basis. This schedule also contains a summary of the proposed revenue increase and the associated tax effects for which allowance is afforded by the revenue conversion factor.

Q. WHAT IS ARIZONA AMERICAN'S ADJUSTED OPERATING INCOME BY DISTRICT IN THIS PROCEEDING?

A. The following tables summarize Adjusted Operating Income for each water and wastewater district seeking rate increases in this proceeding:

Table 1 – Adjusted Test Year Operating Income

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
Adjusted TY Operating Income	$439,964	$861,085	$(191,785)	$(51,593)	$614,124

A OPERATING REVENUES

Q. WHAT OPERATING REVENUE ADJUSTMENT ARE YOU SPONSORING IN THIS PROCEEDING?

A. I am responsible for removing revenues from surcharges authorized by the Commission for recovery of Central Arizona Project ("CAP") water costs for the Sun City Water district in Adjustment SLH-6. Ms. Gutowski is Arizona American's witness for the remainder of the Operating Revenue values.

Q. WHY ARE YOU REMOVING CAP-SURCHARGE REVENUE?

A. The Commission has authorized mechanisms to recover deferred and ongoing CAP municipal and industrial charges ("M&I Charges") incurred by Arizona American for Sun City Water. These mechanisms enable Arizona American to retain its CAP allocations by providing cost recovery of the expenses associated with purchasing this renewable source of water that is a vital part of the long-term water supply for this district. CAP-surcharge revenues are removed from the calculation of adjusted test year revenue to enable Arizona American to continue the recovery of the changes in CAP-related charges through the Commission-authorized mechanism.

Q. WHAT IS THE MECHANISM AUTHORIZED BY THE COMMISSION FOR SUN CITY WATER DISTRICT?

A. In Decision No. 62293 (issued February 1, 2000), the Commission approved a Groundwater Savings Fee for the Sun City Water and Sun City West Water districts in conjunction with a request to recover deferred and on-going CAP capital charges not used or delivered to the Maricopa Water District Recharge Facility ("MWD"). The Commission's decision provided a surcharge mechanism to recover both deferred CAP capital charges and the on-going capital and delivery charges. The Sun City Water district has an allocation of 4,189 acre feet of water, of which 4,105 acre feet were

delivered to MWD during the test year (evaporation constitutes the difference between the allocation and delivery figures).

The approved mechanism for Sun City Water District provides for recovery of deferred CAP M&I charges of $872,160 over a five-year period beginning in February 2001 and a separate adjustable surcharge for the recovery of on-going CAP capital and delivery charges. As of January 31, 2006, Arizona American has fully recovered the deferred CAP capital charges; however, we continue to incur the ongoing capital and delivery charges.

Q. IS ARIZONA AMERICAN PROPOSING ANY REVISION TO THE GROUNDWATER SAVINGS FEE FOR SUN CITY WATER DISTRICT?

A. No. The mechanism as originally designed allows for increases and decreases in the cost of CAP water and provides an efficient procedure for billing customers for this cost without over or under recoveries. Accordingly, Arizona American is not seeking to modify this mechanism at this time. The Company will file a Groundwater Savings Fee application to revise the Groundwater Savings Fee in the near future to reflect current actual balances in its CAP balancing account and current CAP capital and delivery rates.

B OPERATING EXPENSES

Q. WHAT ARE ARIZONA AMERICAN'S REQUESTED TOTAL OPERATING EXPENSES BY DISTRICT?

A. The following tables summarize adjusted test year operating expenses for each district:

Table 2 – Adjusted Test Year Operating Expenses

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater
Adjusted TY Operating Expenses	$6,917,023	$8,422,016	$8,828,909	$5,991,974	$5,040,379

C PRO FORMA ADJUSTMENTS

Q. WHAT PRO FORMA ADJUSTMENTS TO THE HISTORICAL TEST YEAR ARE YOU SPONSORING?

A. Arizona American has identified known and measureable changes to the historical test year revenues and expenses for each of the categories listed below.

- Adjustment SLH-1 – Annualize Payroll and Payroll Tax Expense
- Adjustment SLH-2 – Annualize Pension Expense
- Adjustment SLH-3 – Annualize 401K Expense
- Adjustment SLH-4 – Annualize Group Insurance Expense
- Adjustment SLH-5 - Annualize Purchased Water
- Adjustment SLH-6 – Remove CAP Revenue and Expense
- Adjustment SLH-7 – Annualize Waste Disposal Expense
- Adjustment SLH-8 – Water Testing Expense
- Adjustment SLH-9 – Specialist on Industrial Pre-Treatment
- Adjustment SLH-10 – Adjust Conservation Expenses
- Adjustment SLH-11 – Tank Maintenance Accrual
- Adjustment SLH-12 – Annualize Property Taxes
- Adjustment SLH-13 – Remove Other Income and Deductions
- Adjustment SLH-14 – Annualize OPEB Expense
- Adjustment SLH-15 – Interest Synchronization

- Adjustment SLH-16 – Federal and State Income Taxes

Q. PLEASE EXPLAIN ADJUSTMENT SLH-1 – ANNUALIZE PAYROLL AND PAYROLL TAX EXPENSE?

A. Adjustment SLH-1 is a *pro forma* adjustment to annualize the latest known pay rates for employees of Arizona American and calculate the payroll tax expense associated with the change in payroll expense. The latest known rates, which became effective March 24, 2009, form the basis of the annualization adjustment, however, Arizona American will update this adjustment for the 2009 pay rates if the hearing schedule permits the inclusion of that rate increase.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-2 – ANNUALIZE PENSION EXPENSE?

A. Adjustment SLH-2 is a *pro forma* adjustment to annualize the increase in pension costs based on the 2009 funding liability. Employees of Arizona American hired before January 1, 2006, are eligible for a defined-benefit pension. Arizona American has 107 employees who are eligible for the defined benefit plan. Arizona American has experienced a significant increase in its annual pension funding obligation over the last few years as shown in the table below. This increase is due primarily to the crisis in the financial markets. Unfortunately, Arizona American does not anticipate a reduction in this expense in the near future.

Table 3 – Pension Costs

	2006	2007	2008
Total Pension Expense	$1,166,799	$1,013,709	$2,090,643

The cost to fund this increased pension liability for 2009 is reflected in *pro forma* Adjustment SLH-2 for each district.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-3 – ANNUALIZE 401K EXPENSE?

A. Adjustment SLH-3 is a *pro forma* adjustment that annualizes Arizona American's contribution to its employees' 401k retirement savings program. Employees of Arizona American hired after January 1, 2006 are only eligible for the Company's 401k plan. The defined contribution plan for Arizona American employees contains a provision for a fixed-percentage contribution of the employee's base pay as well as a matching contribution up to a pre-established percentage for employees that defer a portion of their compensation into the 401k retirement plan.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-4 – ANNUALIZE INSURANCE EXPENSE?

A. Adjustment SLH-4 is a *pro forma* adjustment to annualize the increase in group insurance expenses for Arizona American's water and wastewater districts. Group insurance includes premiums for life insurance, medical insurance, dental insurance, long-term disability insurance, short-term disability insurance, worker's compensation insurance and liability insurance. The 2009 group insurance costs were compiled and the increase in these expenses above the test year expense form the basis of this *pro forma* adjustment.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-5 – NORMALIZE PURCHASED WATER APPLICABLE TO ANTHEM WATER DISTRICT?

A. Adjustment SLH-5 is applicable only to the Anthem Water district. Water is purchased for customers in the Anthem district pursuant to an agreement between Del Webb (Pulte) and the Ak Chin Indian Community ("Ak Chin Agreement"). The Ak Chin Agreement contains a cost per acre foot that is subject to an annual adjustment based on a formula of

the change in the Consumer Price Index (CPI) during the prior three year period. Adjustment SLH-5 reflects the annualized cost of purchased water expense using the percentage change in the Consumer Price Index (CPI) from January 2006 to December 2008, as specified in the Ak Chin Agreement.

Adjustment SLH-5 also contains the letter of credit fee required to obtain assignment of the water lease rights from Del Webb (Pulte) to the Company as discussed in Mr. Buls testimony.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-6 – REMOVE CAP REVENUE AND EXPENSES?

A. Adjustment SLH-6 applies only to the Sun City Water district and is a *pro forma* adjustment to isolate Central Arizona Project ("CAP") surcharge revenues and purchased water costs to enable retention of the mechanisms that are currently in place to recover these charges. Sun City Water district currently has a mechanism in place, which I discussed in greater detail above in conjunction with Operating Revenues.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-7 – ANNUALIZE WASTE DISPOSAL EXPENSE?

A. Adjustment SLH-7 applies only to the Sun City Wastewater district and is a *pro forma* adjustment to annualize the test year waste disposal expense. Sun City Wastewater district contracts with the City of Tolleson for all of its waste disposal services. The agreement with the City of Tolleson consists of four separate rate components which are both capital and operating in nature. The Commission has approved how the rate components should be reflected in Sun City Wastewater's operating expenses.

In general, Rate Components 1, the principal and interest costs on the outstanding loan obligation, and Rate Component 2, the operations and maintenance expenses ("O&M"),

are included in the operating expenses of Sun City Wastewater. Rate Component 3, the Reserve and Contingency Fund and Rate Component 4, Capital Costs are deferred for recovery in a subsequent rate proceeding.

Q. ARE THERE KNOWN AND MEASUREABLE CHANGES IN THE O&M COSTS COMPONENT OF THE TOLLESON WASTE DISPOSAL ARRANGEMENT?

A. Yes. The O&M costs have a true-up component that is billed in June of each year. These true-up costs are known when the monthly invoice is received but are Arizona American is not billed until the following June. The annualized O&M costs are based upon the most recent 12-month period, May 2008 to April 2009, plus a known and measureable true-up payment.

Q. IS ARIZONA AMERICAN SEEKING TO BEGIN AMORTIZING DEFERRED CHARGES APPLICABLE TO RATE COMPONENTS THREE AND FOUR?

A. Yes. After completion of the last Sun City Wastewater rate proceeding it was determined that some Rate Component Three costs had been improperly charged to expense as discussed in Mr. Cole's testimony. During the test year in that case, $55,888 of Rate Component Three costs were included in operating expenses. The Company has amortized $4,657.32 per month ($55,888 / 12) of the deferred Rate Component Three reclassified costs since the effective date of the decision in that case. At the end of 2008, a deferred balance of $536,456 of the Rate Component Three - Reserve and Contingency Fund costs remain on the books of the Company. The balance is included in rate base as a component of the deferred debits which are the subject of Ms. Murrey's testimony. Arizona American is proposing an amortization period of ten years, or $53,646 per year based on language in the contract that specifies that only projects with lives of less than ten years in length will be billed as Rate Component 3.

The dechlorination upgrade, billed under Rate Component Four, was completed in June 2006. The completed costs associated with the upgrade to the dechlorination facility totaled $564,628. This balance is included in rate base as a component of the deferred debits which are the subject of Ms. Murrey's testimony. Arizona American is proposing to amortize these costs over 22 years at a rate of 4.54% or $25,626 per year.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-8 – WATER TESTING EXPENSE?

A. Adjustment SLH-8 is a *pro forma* adjustment to annualize water testing costs for known and measureable changes in the cost of water testing. Arizona American charges all of its water testing to corporate level expense accounts which are then allocated to the individual districts using the four-factor allocation methodology. This method does not properly assign the water testing costs to the individual districts, which necessitates the adjustment computed in Adjustment SLH-8. Known changes in costs per tests have been factored into the calculation of the adjusted test year water testing expense by district.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-9 – SPECIALIST ON INDUSTRIAL PRE-TREATMENT?

A. Adjustment SLH-9 is a *pro forma* adjustment to adjust for labor and labor related expenses to include an employee who was not captured in the test year labor and labor related expenses. The employee that performed this function during a portion of the test year was no longer employed by Arizona American at year end and, accordingly, was not included in the labor costs. This adjustment is necessary to include labor charges for the new employee that now performs this function.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-10 – ADJUST CONSERVATION EXPENSES?

A. Adjustment SLH-10 is a *pro forma* adjustment that applies to the Anthem Water and Sun City Water districts to adjust test year conservation expenses to the level approved by the

Commission in Decision Nos. 67093 (June 30, 2004) and 70372 (June 13, 2008). In Decision No. 67093, the Commission authorized $40,000 for conservation-targeted expenditures in the West Valley (including Agua Fria Water and Sun City West Water districts). In Decision No. 70372, the Commission approved Arizona American's request to include an additional $7,500 for conservation-targeted expenditures for Anthem Water. Using an allocation based upon customer count, the $47,500 was allocated among the West Valley districts and Anthem Water. Approval of the *pro forma* adjustment will enable Arizona American to continue activities that inform and educate customers about the need for conservation.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-11 – TANK MAINTENANCE ACCRUAL & AMORTIZATION?

A. Adjustment SLH-11 is a *pro forma* adjustment that applies only to the Sun City Water district. Arizona American is requesting an annual accrual of $445,000 to fund a tank maintenance program for its Sun City Water district. A tank maintenance reserve fund provides a vehicle to levelize costs of inspecting and maintaining storage tanks which is a benefit to Arizona American and its customers. Arizona American's proposed program covers a fourteen-year cycle which is discussed in greater detail by Mr. Cole. The amount of funds that Arizona American should begin collecting from its customers to cover the costs that Mr. Cole believes are needed to inspect and maintain the tanks in Sun City will be accrued to a reserve account and when inspection and tank painting invoices are received, the reserve will be reduced. A reserve accounting method protects customers by insuring that all funds collected are used to fund tank maintenance activities. Future reviews of the activities in the reserve account can be performed and adjustments to the accrual can be made in subsequent rate cases.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-12 – ANNUALIZE PROPERTY TAXES?

A. Adjustment SLH-12 is a *pro forma* adjustment to adjust the property taxes to the level based upon the adjusted test year revenue and also to compute a property tax factor to include in the gross revenue conversion factor calculation to provide for the property tax increases that will result from the revenue increases in this proceeding. The property tax factor was originally proposed by the Commission Staff and adopted by the Commission in Decision No. 70209, dated March 20, 2008 for Arizona American's Sun City Wastewater and Sun City West Wastewater districts.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-13 – REMOVE OTHER INCOME AND DEDUCTIONS?

A. Adjustment SLH-13 is a *pro forma* adjustment to remove items that are "below the line" or not related to the provision of water or wastewater service. This adjustment is necessary to exclude other revenue and expense items that are not included in the Company's cost of service to its customers.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-14 – ANNUALIZE OPEBS?

A. Adjustment SLH-14 is a *pro forma* adjustment to annualize Other Post-Employment Benefits (OPEBs) for cost increases above the test year amounts. Arizona American has experienced increasing funding obligations for its OPEB due to a severe deterioration in the financial markets. The OPEB costs in the test year are greater than prior years, but the Company does not anticipate a reduction in 2009 or beyond at this time and believes the proposed level is reasonable at this time.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-15 – INTEREST SYNCHRONIZATION?

A. Adjustment SLH-15 is a *pro forma* adjustment to synchronize the interest deduction that is a function of each district's rate base and weighted cost of debt and the interest deduction that is a component in the test year income tax calculation. For ratemaking purposes, a utility's revenue requirement reflects the recovery of interest expense based on the weighted cost of debt in the capital structure. It is this interest expense that needs to be used for the interest deduction when calculating the tax expense. An Interest Synchronization adjustment is necessary to match the rate base used in determining revenue requirements with the proportionate part of the total amount of debt and equity used to determine the cost of capital. The amount of interest expense that customers in each district contribute through their payment of water rates should be the same as the amount of interest expense deducted from revenues in calculating each district's tax expense. Synchronizing the interest deduction for ratemaking with the interest deduction for earnings purposes accomplishes this goal.

Q. PLEASE EXPLAIN ADJUSTMENT SLH-19 – FEDERAL AND STATE INCOME TAXES?

A. Adjustment SLH-15 is a *pro forma* adjustment that adjusts test year income taxes to reflect the federal and state income tax effects of the *pro forma* adjustments included on Schedule C-2.

Q. DO YOU HAVE ANY OTHER ADJUSTMENTS TO SCHEDULE C-2?

A. No, I do not.

Q. PLEASE EXPLAIN SCHEDULE C-3.

A. Schedule C-3 titled Computation of Gross Revenue Conversion Factor, details the calculation of a factor to apply to the income increase reflected on line 11 of Schedule A-1 to convert the income deficiency into a revenue deficiency, also referred to as grossing-up the income to account for taxes. The components of the calculation include the effective federal and state income tax rates, a property tax factor, and a bad debt expense factor.

VI. COMPANY'S FINANCIAL STATEMENTS

Q. THE COMMISSION'S STANDARD FILING REQUIREMENTS REQUIRE THAT AN APPLICANT FOR A RATE CHANGE INCLUDE FINANCIAL STATEMENTS AND STATISTICAL SCHEDULES WITH ITS APPLICATION. ARE YOU SPONSORING THE REQUIRED E-SERIES SCHEDULES?

A. Yes, in part. I will be sponsoring Schedules E-3, E-7, and E-8. All other E Schedules are being sponsored by other Company witnesses.

Q. WHAT IS INCLUDED IN THE E-SERIES SCHEDULES?

A. Schedule E-3 titled "Comparative Statements of Changes in Financial Position-Test Year Ended December 31, 2008" presents the sources and applications of funds by the districts for the years 2006, 2007, and 2008. Schedule E-7 titled "Operating Statistics-Test Year Ended December 31, 2008" presents the district's operating statistics for sales quantities and customers for the years 2006, 2007, and 2008. Schedule E-8 titled "Taxes Charged to Operations-Test Year Ended December 31, 2008" provides details regarding taxes incurred by the district for the years 2006, 2007, and 2008.

Q. WHAT ARE THE F-SERIES OF SCHEDULES?

A. I am also sponsoring the F-Series of schedules. Appendix F of the standard filing requirements is labeled "Projections and Forecasts". The data contained in the F-Series of schedules compares current results of operations to projected results based upon different assumptions. More specifically, Schedule F-1 titled "Projected Income Statements-Present and Proposed Rates" forecasts 2009 income using test year rates and proposed revenue from this proceeding. Schedule F-2 titled, "Projected Statement of Changes in Financial Position-Present and Proposed Rates" presents the sources and applications of funds by the districts for the test year and projected results using the same assumptions as Schedule F-1. Schedule F-3 titled "Projected Construction Requirements" shows the district's projected construction expenditures for the years 2009, 2010, and 2011. This schedule provides additional detail concerning the construction expenditures shown on Schedule A-4. Schedule F-4 titled "Assumptions Used in Developing Projections" provides a general description of the assumptions used in developing projections for 2009 concerning customer growth, customer water demand, changes in expenses, and construction requirements.

VII. ADDITIONAL SUBJECT MATTERS

A. NORTHWEST VALLEY REGIONAL TREATMENT FACILITY

Q. PLEASE DISCUSS HOW THE NORTHWEST VALLEY REGIONAL TREATMENT FACILITY'S PLANT INVESTMENT AND OPERATING COSTS ARE ALLOCATED.

A. The Northwest Valley Regional Treatment Facility ("NWVRTF") treats wastewater flows from the Sun City West Wastewater and Anthem / Agua Fria Wastewater districts. The Commission recognized that 68 percent of the plant's capacity was dedicated to Sun City West Wastewater while the remaining 32 percent of the capacity is used for Anthem / Agua Fria Wastewater (Decision 70209 at pp. 1-2 and Decision 70372 at p. 12). Based on these decisions, Arizona American has allocated 68 percent of the plant costs and

operating expenses of the NWVRTF to Sun City West Wastewater and 32 percent to Anthem / Agua Fria Wastewater.

Q. HAS ARIZONA AMERICAN INCLUDED OPERATING COST DETAILS APPLICABLE TO THE NWVRTF IN THE SCHEDULES FILED IN THIS CASE?

A. Yes. Schedule E-6 is a summary of the districts' operating income. Arizona American witness Mr. Kiger sponsors Schedule E-6 and his direct testimony details the identification of the schedules associated with the NWVRTF operating costs.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS CASE?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
SANDRA D. KENNEDY
PAUL NEWMAN
BOB STUMP

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT AND ITS SUN CITY WATER DISTRICT.	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT, ITS SUN CITY WASTEWATER DISTRICT AND ITS SUN CITY WEST WASTEWATER DISTRICT.	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
MILES H. KIGER
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
MILES H. KIGER
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Miles H. Kiger testifies as follows:

Sponsored Schedules

Mr. Kiger sponsors the following schedules for each district in the case:

- Schedule E-2 – Comparative Income Statements
- Schedule E-6 – Comparative Operating Income Statements
- Schedule E-6a – Comparative Operating Income Statements

And the following schedules for the Anthem/Agua Fria Wastewater district and the Sun City West Wastewater districts:

- Schedule E-6b – Comparative Operating Income Statements
- Schedule E-6c – Comparative Operating Income Statements

Operating Income Adjustments

Mr. Kiger sponsors the following NECESSARY adjustments to operating income:

- Adjustment MHK-1 – Annualize Power Expense
- Adjustment MHK-2 – Annualize Chemicals Expense
- Adjustment MHK-3 – Annualize Management Fees
- Adjustment MHK-4 – Adjust Mgmt. Fees for Other Expenses
- Adjustment MHK-5 – One-Time Service Company Charges
- Adjustment MHK-6 – Annualize Postage Increase
- Adjustment MHK-7 – Normalize Purchased Water for Cost Savings
- Adjustment MHK-8 – Amortize Rate Case Expense
- Adjustment MHK-9 – Line 21 Clean-up

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Miles H. Kiger and my business address is 19820 N. 7th Street, Suite 201, Phoenix, AZ 85024. My office phone number is 623-445-2492.

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

A. I am employed by American Water Works Service Company, Inc. ("American Water") as a Rate Analyst in Rates & Regulation.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR ARIZONA-AMERICAN.

A. As a rate analyst, my primary responsibilities are to prepare and support rate applications and other regulatory filings, as well as assist with public outreach activities and billing administration.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I was hired by American Water in August of 2007. In 2008 I prepared testimony, developed exhibits, and testified as a witness for Arizona American Water Company ("Arizona American" or "the Company") in a water rate case proceeding. I have prepared all the required schedules for Arsenic Cost Recovery Mechanism ("ACRM") applications in four water districts for Arizona-American Water Company. I also prepared water and sewer rate applications for Texas-American Water Company.

I received a Master of Science degree in Agricultural & Resource Economics from the University of Arizona in 2007 and both a B.S. and B.A. from the University of Massachusetts at Amherst in 2003.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes, I testified in the Company's rate case proceeding in May 2008.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The scope and purpose of my testimony are set forth in my Executive Summary.

Q. HOW IS YOUR TESTIMONY ORGANIZED FOR PURPOSES OF THIS PROCEEDING?

A. First I will briefly discuss the schedules I am sponsoring (E-2 and E-6 thru E-6c) and then the Operating Income Adjustments I performed (MHK-1 thru MHK-9). The *pro forma* adjustments will be discussed by category in relation to all the water and wastewater districts assembled in this case, because all of the *pro forma* adjustments that I propose are based on the same principles and utilize the same methods, regardless of the district. Whenever necessary, I will discuss district-specific issues in the context of a particular adjustment.

III. SPONSORED SCHEDULES (ALL DISTRICTS)

Q. PLEASE IDENTIFY THE SCHEDULES YOU ARE SPONSORING.

A. I am sponsoring the following schedules for each of the two water and four wastewater districts:

- Schedule E-2 – Comparative Income Statements

- Schedule E-6 – Comparative Operating Income Statements
- Schedule E-6a – Comparative Operating Income Statements
- Schedule E-6b – Comparative Operating Income Statements
- Schedule E-6c – Comparative Operating Income Statements

IV. COMPANY'S FINANCIAL STATEMENTS (ALL DISTRICTS)

Q. WHAT IS SCHEDULE E-2?

A. Schedule E-2 for each of Arizona-American's districts is titled "Comparative Income Statements". This schedule summarizes each district's unadjusted Income Statements as reflected in the Company's accounting records, and includes the district's allocated share of Corporate expenses for the test year (2008), as well as for the prior two years (2006 & 2007).

Q. WHAT IS SCHEDULE E-6?

A. Schedule E-6 is titled "Comparative Departmental Statements of Operating Income" and breaks down each district's operating income by sub-category, such as by customer class for revenue and operational function for O&M expenses, for the test year (2008) and two prior years (2006 & 2007). Similarly titled Schedule E-6a presents the same operating income figures, but by income statement line number instead of operational function. For the Sun City West Wastewater District and Anthem/Agua Fria Wastewater District, two additional schedules, E-6b and E-6c, (in the format of the E-6a schedule) are presented -- one shows the comparative summary without an allocation of the Northwest Valley Regional Treatment Facility ("NWVRTF") and another shows each district's allocation of the NWVRTF.

V. ADJUSTED OPERATING INCOME (ALL DISTRICTS)

A PRO FORMA ADJUSTMENTS (ALL DISTRICTS)

Q. WHAT PRO FORMA ADJUSTMENTS ARE YOU SPONSORING AS PART OF THIS CASE?

A. Below is a list of the pro forma adjustments I am sponsoring. These adjustments represent changes to the historical test year expenses detailed on Schedule C-2 for each of the categories listed below:

- Adjustment MHK-1 – Annualize Power Expense
- Adjustment MHK-2 – Annualize Chemicals Expense
- Adjustment MHK-3 – Annualize Management Fees
- Adjustment MHK-4 – Adjust Management Fees for Other Expenses
- Adjustment MHK-5 – One-Time Service Company Charges
- Adjustment MHK-6 – Annualize Postage Increase
- Adjustment MHK-7 – Normalize Purchased Water for Cost Savings
- Adjustment MHK-8 – Amortize Rate Case Expense
- Adjustment MHK-9 – Line 21 Clean-up

Q. WHAT IS ADJUSTMENT MHK-1 – ANNUALIZE POWER EXPENSE?

A. Adjustment MHK-1 is a *pro forma* adjustment to annualize the rate increases approved for Arizona Public Service Company ("APS") in 2008 and 2009 to-date. APS is the sole electric provider for the water and wastewater districts that are part of this case. The

Company has accounts billed under APS's rate schedules E-30, E-32 and E-221. These general rate schedules did not undergo any changes in 2008 or the first half of 2009. However, the power *pro forma* adjustment does reflect changes to some of APS's rate adjustors, including the increase in the Transmission Cost Adjustor (TCA) effective July 2008, the Interim Rate increase and the updated Renewable Energy Standard (RES) implemented in January 2009, and the decrease to the Power Supply Adjustor (PSA) effective February 2009. Table 1 below summarizes the adjusted test year Fuel & Power expenses for each of the districts.

TABLE 1 – Summary of Fuel & Power *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Fuel & Power *Pro Forma* Adjustment	$118,075	$178,526	($72,901)	($3,984)	$17,314	$237,030

The *pro forma* adjustment for Fuel & Power expense was calculated by simply annualizing the changes discussed in the preceding paragraph based on test year electricity consumption levels. In addition, all taxes and assessments associated with electricity bills were updated to their current levels for each district.

Q. ARE THERE ANY OTHER PENDING FUEL OR POWER COST INCREASES?

A. Possibly. APS currently has a general rate case pending at the Commission and, should new rates be approved, the Company's pro forma Fuel & Power expense would need to be modified accordingly later in this case.

Furthermore, although Anthem Water has two Southwest Gas Accounts, their bills are minimal relative to Anthem Water's total fuel and power expense. Also, Southwest Gas is not expected to file for a general rate increase in 2009. Therefore, there is no *pro forma* to the expense associated with these two Southwest Gas accounts.

Q. WHAT IS ADJUSTMENT MHK-2 – ANNUALIZE CHEMICALS EXPENSE?

A. Adjustment MHK-2 is a *pro forma* adjustment to annualize the effect of changes in the cost of chemicals used in water and wastewater treatment operations. The adjustment incorporates 2009 price levels that have been negotiated contractually by American Water's Supply Chain department that are known and measureable and in effect. Table 2 below summarizes the adjusted test year Chemicals expense.

TABLE 2 – Summary of Chemicals *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Chemicals *Pro Forma* Adjustment	$39,539	$7,556	$85,199	$682	$114,811	$247,787

The *pro forma* adjustment for Chemicals expense is calculated by using the test year chemical usage volumes and multiplying them by the 2009 price levels to generate the *pro forma* level of chemicals expense.

Q. WHAT IS ADJUSTMENT MHK-3 – ANNUALIZE MANAGEMENT FEES?

A. Adjustment MHK-3 is a *pro forma* adjustment to annualize the effect of the labor rate increase approved in March 2009, and new labor benefits funding requirements associated with the labor portion of management fees. I increased the test year labor portion of management fees by four percent to reflect average increases that were granted

in March 2009 at the Service Company level. I also increased the test year labor-related benefits portion of Management Fees by twenty-two percent to annualize the effect of new additional funding requirements for pension and other post-employment benefits. Table 3 below summarizes the adjusted test year Management Fees, which includes the adjustment for labor and labor-related benefits.

TABLE 3 – Summary of Management Fees Annualization *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Mgmt Fees Annualizaton *Pro Forma* Adjustment	$71,343	$92,981	$94,132	$57,487	$48,643	$364,586

Q. WHAT IS ADJUSTMENT MHK-4 – ADJUST MANAGEMENT FEES FOR OTHER EXPENSES?

A. Adjustment MHK-4 is a *pro forma* adjustment that annualizes the other expense increases that are a component of Management Fees. The Other Expense component of Management Fees refers to the general overhead, travel expenses, and miscellaneous purchases associated with Service Company employees' labor. The test year Other Expenses component of Management Fees increased by four percent to reflect an increase that is commensurate with the labor increase. Because the other expense component of Management Fees is correlated with management fee labor levels, it is reasonable to expect the other expense component to increase marginally as well.

TABLE 4 – Summary of Management Fees Other Expenses *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Mgmt Fees Other Expenses *Pro Forma* Adjustment	$15,954	$20,793	$21,050	$12,855	$10,878	$81,530

Q. WHAT IS ADJUSTMENT MHK-5 – ONE-TIME SERVICE COMPANY CHARGES?

A. Adjustment MHK-5 is a *pro forma* adjustment that removes charges from Management Fees that are one-time, non-recurring and not appropriate for calculating revenue requirements for this proceeding. Costs associated with corporate divestiture and non-recurring projects have been removed.

TABLE 5 – Summary of One-Time Service Co. *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
One-Time Service Co. *Pro Forma* Adjustment	($17,257)	($22,491)	($22,769)	($13,905)	($11,766)	($88,188)

Q. WHAT IS ADJUSTMENT MHK-6 – ANNUALIZE POSTAGE INCREASE?

A. Adjustment MHK-6 is a *pro forma* adjustment to annualize changes in the US first-class postage rate that occurred in May of 2008 and 2009. To begin, the test year postage

expense is annualized to a 2008 level that incorporates a pro-rated 2008 postage increase. This figure is then annualized to a 2009 level using the May 2009 postage increase to generate the adjusted test year postage expense.

TABLE 6 – Summary of Postage Annualization *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Postage Annualizaton *Pro Forma* Adjustment	$3,011	$3,925	$3,972	$2,426	$2,054	$15,388

Q. WHAT IS ADJUSTMENT MHK-7 – NORMALIZE PURCHASED WATER FOR COST SAVINGS?

A. Adjustment MHK-7 is a *pro forma* adjustment to normalize Purchased Water expense at the Company's Northwest Valley Regional Treatment Facility ("NWVRTF") due to cost saving measures undertaken at the facility that will reduce the quantity of purchased water required in the wastewater treatment process. This adjustment affects only the Anthem/Agua Fria Wastewater District and Sun City West Wastewater District. Actual Purchased Water expense at NWVRTF was analyzed from January 2008 thru April 2009 and the 7-month average from October 2008 to April 2009 (October 2008 was the first month the program was implemented) was used to annualize the effect of the significant cost saving measure.

TABLE 7 – Summary of Purchased Water Savings *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Purchased Water Savings *Pro Forma* Adjustment	-	-	($11,653)	-	($24,762)	($36,415)

Q. WHAT IS ADJUSTMENT MHK-8 – AMORTIZE RATE CASE EXPENSE?

A. Adjustment MHK-8 is a *pro forma* adjustment that quantifies each district's portion of total estimated rate case expense and then uses a three-year amortization period to generate an annual rate case expense amortization to be recovered in rates. For this case, each district receives a share of the total estimated rate case expense of $678,425 based on its 4- Factor allocation percentage calculated using inputs of the two water and four wastewater districts in this proceeding . The estimated unrecovered portion of Commission-approved rate case expenses from the last rate case is $149,119 assuming a rates-effective date for this case of September 2010, and also amortized over three years. Both of these figures are then summed to generate the proposed rate case expense amortization to be recovered in rates from the districts in this case. Mr. Broderick is sponsoring the Company's total estimated rate case expense.

TABLE 8 – Summary of Rate Case Expense Amortization *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
RC Expense Amortization *Pro Forma* Adjustment	($59,154)	$22,997	($18,793)	$15,846	$10,821	($24,283)

Q. WHAT IS ADJUSTMENT MHK-9 – LINE 21 CLEAN-UP?

A. Adjustment MHK-9 is a *pro forma* adjustment that removes expenses that would typically be disallowed for ratemaking purposes, such as charitable contributions, membership dues and other miscellaneous expenses that are normally not recoverable from customers.

TABLE 9 – Summary of Line 21 Clean-Up *Pro Forma* Adjustments

District	Anthem Water	Sun City Water	Anthem/ Agua Fria Wastewater	Sun City Wastewater	Sun City West Wastewater	Total
Line 21 Clean-Up *Pro Forma* Adjustment	($39,957)	($51,777)	($52,444)	($32,623)	($25,413)	($202,214)

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS CASE?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
SANDRA D. KENNEDY
PAUL NEWMAN
BOB STUMP

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT, AND SUN CITY WATER DISTRICT	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER DISTRICT, SUN CITY WASTEWATER DISTRICT, AND SUN CITY WEST WASTEWATER DISTRICT	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
LINDA J. GUTOWSKI
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
LINDA J. GUTOWSKI
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Linda J. Gutowski testifies as follows:

RATE BASE

Ms. Gutowski sponsors rate base Exhibits B-1 through B-6. Rate base for each district follows:

Table 1 – Summary of Rate Base

District	OCRB
Anthem Water	$57,431,984
Sun City Water	$28,186,063
Anthem / Agua Fria Wastewater	$47,435,732
Sun City Wastewater	$14,764,087
Sun City West Wastewater	$17,821,339
Total All Districts	**$165,939,204**

Individual Rate-Base Adjustments:

Anthem Water Rate-Base Adjustments. Adjustment LJG-6 adds $5,000,000 to rate base, and adds $116,667 in accumulated amortization, for the Phoenix Interconnection.

Sun City Water Rate-Base Adjustments. Adjustment LJG-5 adds Post-Test-Year Additions of $1,625,810 for Wells and deducts the Retirement of $463,964 for the Wells from Plant and Accumulated Depreciation.

Anthem / Agua Fria Wastewater Rate-Base Adjustments. Adjustment LJG-3 adds 32% of the Northwest Valley Regional Treatment Facility to Anthem / Agua Fria Wastewater District, as per the last Decision No. 70372. Adjustment LJG-5 is for Post Test Year Plant additions for the remaining costs of $606,023 for the Anthem Wastewater Plant Headworks project and to increase Contributions in Aid of Construction for a future contribution of $1,415,610 due from Pulte in 2010 for the Verrado Wastewater Reclamation Facility ("WRF").. Adjustment LJG-6 adds $611,466 to Accumulated Depreciation for the Verrado WRF with the reclassification of the accounts.

Sun City Wastewater Rate-Base Adjustments. No individual adjustments were necessary.

Sun City West Wastewater Rate-Base Adjustments. Adjustment LJG-3 adds 68% of the Northwest Valley Regional Treatment Facility to Sun City West Wastewater District, as per the last Decision No. 70209

Schedules B-3 and B-4. The Company has not submitted an RCND study and requests that Fair Value Rate Base be the same value as Original Cost Rate Base.

Schedule B-5 and B-6. Ms. Gutowski sponsors the Working Capital Calculation. Materials & Supplies are based on a 13-month average of the monthly balances and Prepayments are the ending test year balances for their portion of the Working Capital Calculation. The Cash Working Capital is determined by a lead / lag study based on the test year experience and is on Schedule B-6.

INCOME STATEMENT ADJUSTMENTS.

Ms Gutowski sponsors the following income-statement adjustments:

Adjustment LJG-1 removes unbilled revenues for each district.

Adjustment LJG-2 annualizes the rate increases granted during the test year, 2008, for Anthem Water, Sun City Water, Anthem / Agua Fria Wastewater, Sun City Wastewater, and Sun City West Wastewater.

Adjustment LJG-3 annualizes the year end number of customers as compared to the average number of customers during the test year. The adjustment annualizes the revenue as well as the expenses associated with providing service to more, or less, customers as the case may be.

Adjustment LJG-4 corrects intra district billing errors that occurred during the test year.

Adjustment LJG-5 annualizes depreciation expense based on year end plant balances times depreciation rates. The Company is requesting several new and/or changed depreciation rates, which will be discussed below.

H SCHEDULES

The H Schedules are sponsored by Ms. Gutowski. The Company is proposing across-the-board rate increases for both the basic service charges and the volumetric rates.

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Linda J. Gutowski. My business address is 19820 N. 7th Street, Suite 201, Phoenix, AZ 85024, and my business phone is 623-445-2496.

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

A. I am a Senior Rate Analyst for Arizona-American Water Company. Arizona-American Water Company ("Arizona-American" or "the Company") is a wholly-owned subsidiary of American Water.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE COMPANY.

A. I primarily prepare regulatory filings for Arizona-American.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I have a Bachelor of Arts degree in Economics from Susquehanna University. I studied accounting for two years at the Wharton School at the University of Pennsylvania. I have attended several utility seminars including the NARUC Rate Seminar, New Mexico State's Basics of Regulation and the Rate Making Process, Edison Electric Institute's Electric Rate Advanced Course, and Arthur Anderson's Advanced Regulatory Concepts School as well as many Company-sponsored training sessions.

I worked for American Water in New Jersey as a Staff Accountant and then as a Rate Analyst from 1973 to 1976. I left to work as a financial analyst for a consulting firm of environmental engineers, Betz Converse Murdoch, building water and wastewater plants from 1976 through 1982. I was employed by the Arizona Corporation Commission as an

auditor and a rate analyst from 1983 until 1986. I then worked for six years in the rate department at Arizona Public Service Company developing new rates and supporting regulatory filings. I returned to American Water in New Jersey as a rate analyst in 1993, and moved to Arizona-American's Phoenix Office in December of 2005.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I testified in May 2007, on behalf of Arizona-American in the Anthem Water and Anthem/Agua Fria Wastewater cases, Docket No. WS-01303A-06-0403. I also testified in the Sun City Water case, Docket No. W-01303A-07-0209 in January 2008. I testified in the 7 District case, Docket Nos. W-01303A-08-0227 and SW-01303A-08-0227 in March 2009. When I worked at the Commission, I testified concerning CC&N applications, fuel adjustor cases, and small rate cases. I have provided testimony before Commissions in Ohio, Maryland, and Missouri, and provided support for exhibits filed in 20 of the states in which Arizona-American or one of its regulated affiliates currently or formerly operates.

II SCOPE AND PURPOSE OF TESTIMONY

Q. WHAT IS THE SCOPE AND PURPOSE OF YOUR TESTIMONY?

A. The scope and purpose of my testimony are set forth in my Executive Summary.

III RATE BASE

Q. WHAT ARE ARIZONA-AMERICAN'S RATE BASE EXHIBITS?

A. Schedule B-1 contains Summary of the Fair Value Rate Base for each District. The Company has computed an Original Cost Rate Base and did not conduct a study to determine rate base based on reconstruction cost net of depreciation ("RCND"). Therefore, for purposes of this rate filing only, the Company will agree that the Commission may use its original cost rate base as its "fair value" rate base in setting new rates.

Schedule B-2 contains Original Cost Rate Base Pro Forma Adjustment Schedules. The first two pages for each District are the summary pages. These are followed by detailed pages by year for each district, updating plant additions, retirements, adjustments, and accumulated depreciation since the last rate case. Next are pages for the common plant and accumulated depreciation that are allocated to each District. These were built out from 2006, which is the test year for the most recent Sun City Water rate case, W-01303A-07-0209. These corporate allocation pages are the same in every district – just the four-factor allocation changes. Following these pages are individual exhibits of Rate Base Adjustments in the Schedule B-2s. Some of the rate base adjustments vary for each district and some of these are the same adjustment, although different amounts, in each district. For instance, Adjustment LJG-3 splits the Northwest Valley Regional Treatment Facility between Sun City West Wastewater District (68%) and Anthem / Agua Fria Wastewater District (32%).

Schedule B-3 is blank as it would be a summary of the RCND Rate Base, which we are not requesting in this application. Schedule B-4, which would provide detail for the RCND plant accounts is, therefore, also blank.

Schedule B-5 provides the Computation of Working Capital. I am supporting a new Lead/Lag Study that results in the Cash Working Capital amount and I am supporting the 13-month Average of Materials and Supplies Inventories and the Prepayments, all of which comprise the Working Capital. The Lead/Lag study took into consideration as many invoices as possible for each district, including the Northwest Valley Regional Treatment Facility expenses. I strived to include 85% to 100% of invoices for each expense. The hardest ones to achieve that high a percentage were Miscellaneous and Maintenance expense due to the large number of invoices for small dollar amounts. In the Anthem / Agua Fria District, for instance, I examined 1,434 invoices. The Revenue

Lag portion of the study uses the Average Daily Balance of Accounts Receivable for the Company and the Service Billing Lag portion uses the individual districts' meter reading dates and billing dates.

Q. COULD YOU SUMMARIZE RATE BASE BY DISTRICT?

A. Yes. The following table summarizes rate base for each district (from Schedule B-1):

Table 2 – Summary of Rate Base

District	OCRB
Anthem Water	$57,431,984
Sun City Water	$28,186,063
Anthem / Agua Fria Wastewater	$47,735,732
Sun City Wastewater	$14,764,087
Sun City West Wastewater	$17,821,339
Total All Districts	**$165,939,204**

Q. WHAT ARE THE COMMON RATE-BASE ADJUSTMENTS FOR THE DISTRICTS?

A. Ms. Sandra Murrey's testimony will cover the common rate base adjustments. Her SLM-1 adjusts Accumulated Depreciation for (Over) / Under Collections by comparing the books to a calculated depreciation expense each month. Her adjustment SLM-2 allocates the Corporate district's Plant and Accumulated Depreciation to the districts. She also sponsors SLM-7 to remove Deferred Debits from Rate Base and SLM-8 to decrease Contributions in Aid of Construction for amounts still in Construction Work in Progress.

Q. MR. BRODERICK SPONSORS TWO ADJUSTMENTS THAT ARE COMMON TO THE DISTRICTS THAT APPEAR ON SCHEDULE B-2. CAN YOU DESCRIBE THEM AND THEIR NUMBERING?

A. Adjustment TMB-9 is reserved for the Imputed Regulatory Contributions in Aid of Construction. These imputed contributions are being amortized over a 10-year period so the Company is using the remaining, unamortized balances as of December 31, 2008.

Adjustment TMB-10 is reserved to remove the Acquisition Adjustment arising from the purchase of Citizens Utilities. The Commission has not recognized the acquisition adjustment in rate base.

Q. WHAT ARE THE REMAINING ADJUSTMENTS TO SCHEDULE B-2 THAT YOU ARE SPONSORING?

A. These are individual adjustments particular to each district. I first discuss the water districts, and then the wastewater districts.

Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE ANTHEM WATER DISTRICT?

A. Adjustments LJG-3 through LJG-5 are left blank as these are not needed for this district. Adjustment LJG-6 adds the Phoenix Interconnection to Rate Base, as was approved in the last rate case, WS-01303A-06-0403. The adjustment is to add the $5,000,000 for the City of Phoenix Interconnect to Rate Base. The decision in the last rate case (Decision No. 70372, June 13, 2008), effective June 1, 2008, allows for $200,000 per year in amortization of the $5,000,000 Interconnection. The amortization of $116,667 represents the 7 months of the test year that the amortization was in effect.

Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE SUN CITY WATER DISTRICT?

A. Adjustments LJG-3, LJG-4, and LJG-6 are left blank as they are not needed for this district. Adjustment LJG-5 adds Post Test Year Plant Additions to Rate Base. Well # 5.1 was replaced and put into service at the end of May 2009 for a cost of $1,587,149. The retirement of $463,964 for the old Well # 5.1 was deducted from plant and from accumulated depreciation. Also, Well # 6.4 was rehabilitated and placed in service in December 2008, but the work order was not closed to Utility Plant in Service until

February 2009. Therefore, the additional dollars, although in service in the test year, need to be added to test year end amounts for Utility Plant in Service. The new additions to Well # 6.4 total $502,625. The total addition to Plant in Service net of the retirement is $1,625,810 and the offset to Accumulated Depreciation is a reduction of $(463,964). The adjustment to Rate Base is an increase of $2,089,773. The testimony of Mr. Joseph E. Gross discusses these projects.

Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE ANTHEM / AGUA FRIA WASTEWATER DISTRICT?

A. The first individual district adjustment, LJG-3, adds 32% of the Northwest Valley Regional Treatment Facility to Utility Plant in Service and to Accumulated Depreciation for a net increase in rate base of $3,284,561. The 32% factor is based on design capacity as approved in prior cases for Sun City West Wastewater and for Anthem / Agua Fria Wastewater.

Adjustment LJG-4 is left blank.

Adjustment LJG-5 makes two adjustments for Post Test Year Plant Additions. The first is to capture all costs associated with the Anthem Headworks project. The total cost of the project is $2,524,948. At the end of the test year, only $1,918,925 had been moved to Utility Plant in Service. The remaining invoices were received within the first 4 months of 2009 and added project costs of $606,023. The second adjustment for Post Test Year is an increase to Contributions in Aid of Construction for a true-up payment expected in 2010 from Pulte for a development near the Verrado Wastewater Reclamation Facility ("WRF"). The expected amount of the Contribution is $1,415,610.

Adjustment LJG-6 increases Accumulated Depreciation by $611,466 for the reclassification of the Verrado WRF Phase 1. The plant was put into account 398000,

Other Tangible Plant, in June 2004, rather than allocating some of the project to numerous other accounts. Reclassifying the plant to accounts 354400, 355500, 380200, 381000, 382000, and 396000 would result in the additional accumulated depreciation by taking the additions per month times the approved depreciation rates.

Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE SUN CITY WASTEWATER DISTRICT?

A. There are no individual rate base adjustments for Sun City Wastewater. Therefore, Adjustments LJG-3 through LJG-6 have been left blank.

Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE SUN CITY WEST WASTEWATER DISTRICT?

A. The first individual district adjustment, LJG-3, adds 68% of the Northwest Valley Regional Treatment Facility to Utility Plant in Service and to Accumulated Depreciation for a net increase in rate base for $6,979,691. The 68% factor is based on design capacity as approved in prior cases for Sun City West Wastewater and for Anthem / Agua Fria Wastewater. This amount is the reciprocal of what was added to Anthem / Agua Fria Wastewater to ensure that 100% of the costs are included in rate base between the two districts.

Q. PLEASE DESCRIBE THE FIGURES ON SCHEDULE B-5.

A. Schedule B-5 shows the Working Capital computation. Working Capital is usually made up of Cash Working Capital derived from a Lead/Lag study, a 13-Month Average of Inventories, and any Prepayments on the Balance Sheet. I calculated the 13-month average of the inventories, both plant material and chemicals, if applicable, and the prepayment balances from the balance sheet. While each of the water districts has its own inventory of chemicals, the plant and material inventory is more centralized and shared. The Sun City inventory serves Sun City Water, Sun City West Water, and Agua

Fria Water. I split the Sun City inventory to Sun City Water District based on Net Plant from the four factor allocation worksheet for the test year.

Q. CAN YOU SUMMARIZE MATERIALS AND SUPPLIES INVENTORIES AND PREPAYMENTS FOR EACH DISTRICT?

A. Yes. Please see the following table:

Table 3 – Material & Supplies Inventories and Prepayments by District

District	Mat'l & Supplies	Prepayments
Anthem Water	$55,281	$30,693
Sun City Water	$51,087	$118,894
Anthem / Agua Fria Wastewater	$2,495	$44,740
Sun City Wastewater	$597	$77,758
Sun City West Wastewater	$32,436	$52,988
Total	**$141,896**	**$325,073**

Q. CAN YOU PLEASE EXPLAIN HOW YOU PERFORMED THE LEAD/LAG STUDY, THE SUBJECT OF SCHEDULE B-6?

A. Yes. By category, invoices were examined to derive the Expense number of Lag Days. I examined the service period of the invoices and the pay date. I took the mid point of the service period and added the pay date less the ending service period to derive the Expense Lag Days. I examined 547 invoices in Anthem Water, 585 invoices in Sun City Water, 910 invoices in Anthem / Agua Fria Wastewater, 297 invoices in Sun City Wastewater, 237 invoices in Sun City West Wastewater, and 524 in Northwest Valley Regional Treatment Facility, for over 3,000 invoices. The Revenue Lag examines the average daily accounts receivable balances for the Company. A separate Service Lag and Billing Lag are derived from the records, by meter route, of the read period and the bill date. The Revenue Lags ranged from 45.6 to 46.1 days, and the difference is due to the scheduling of the meter routes in the various districts. The Net Lag Days were then applied to the pro forma adjusted test year expenses except for federal income taxes for which the pro forma including the proposed rate increase is used.

Q. PLEASE DESCRIBE THE RESULTS OF THE CASH WORKING CAPITAL LEAD/LAG STUDY BY DISTRICT.

A. See Table 4 below.

Table 4 – Cash Working Capital by District

District	Cash W/C
Anthem Water	$75,089
Sun City Water	$416,111
Anthem / Agua Fria Wastewater	$285,666
Sun City Wastewater	$129,827
Sun City West Wastewater	$229,465
Total	**$1,136,158**

IV ADJUSTED OPERATING REVENUE

Q. YOU HAVE MADE SEVERAL ADJUSTMENTS TO OPERATING REVENUE IN THIS CASE. WHAT ARE THE COMMON OPERATING-REVENUE ADJUSTMENTS FOR THE DISTRICTS?

A. Income Statement Pro Forma Adjustments, Schedule C-2, Adjustment LJG-1 removes Unbilled Revenue from the test year in every district. Unbilled Revenue is an estimate of the usage at the end of the year that has yet to be billed. For instance, those customers who get billed early in December have usage throughout December that will not be billed again until January. The number of days remaining in December that were not billed, times average daily revenue gives the journal-entry estimate of unbilled revenue.

Q. WHY WOULD YOU DELETE UNBILLED REVENUE FROM THE TEST YEAR?

A. We perform a bill analysis that looks at 12 bills for each customer, or less if the customer was new during the year. Then we annualize the number of customers by using year end number of customers less average number of customers. These extra customers are multiplied by average usage and billed at current rates as of the end of the test year.

Because we look at 12 bills and annualize, there is no need to add any unbilled revenue. The Test Year Adjusted Revenue dollars reflect 12 full bills.

Q. CAN YOU SUMMARIZE THE UNBILLED REVENUE ADJUSTMENT (LJG-1) BY DISTRICT?

A. Yes. Please see the following table.

Table 5 – Unbilled Revenue

District	LJG-1
Anthem Water	($27,138)
Sun City Water	$58,233
Anthem / Agua Fria Wastewater	($14,154)
Sun City Wastewater	$29,704
Sun City West Wastewater	$36,267
Total	**$82,912**

Q. WHAT OTHER REVENUE ADJUSTMENT IS COMMON TO ALL THE DISTRICTS?

A. Each one of the districts in this case received a rate increase during the test year. Schedule C-2, Adjustment LJG-2 annualizes the full effect of the following rate increases. Anthem Water received an annual rate increase of $2,642,533, or 38.48%, effective on June 4, 2008. Sun City Water received an annual rate increase of $1,907,202, or 24.81%, effective on June 1, 2008. Anthem / Agua Fria Wastewater received an annual rate increase of $1,654,474, or 26.96%, effective on June 4, 2008. Sun City Wastewater received an annual rate increase of $1,348,830, or 29.92%, effective on April 1, 2008. Sun City West Wastewater received an annual rate increase of $1,067,148, or 23.51%, effective on April 1, 2008.

Q. WHAT WERE THE TEST YEARS FOR EACH OF THESE RATE CASES?

A. The cases had a test year ending December 2005 for Anthem Water and all of the Wastewater cases. Only Sun City Water had a test year ending December 2006.

Q. WHAT IS THE ANNUALIZATION AMOUNT IN ADJUSTMENT LJG-2 TO SCHEDULE C-2?

A. See Table 6 below.

Table 6 – Annualization of Test Year Rate Increases

District	LJG-2
Anthem Water	$ 974,528
Sun City Water	$ 853,604
Anthem / Agua Fria Wastewater	$1,035,441
Sun City Wastewater	$ 415,302
Sun City West Wastewater	$ 230,789
Total	**$3,509,664**

These increases to revenue are included in the pro forma adjusted test year amount on Schedule C-2 and are part of amount to be used for comparison to proposed rates.

Q. DID YOU ANNUALIZE FOR THE TEST YEAR END NUMBER OF CUSTOMERS?

A. Yes, Adjustment LJG-3 on Schedule C-2 is the one used to annualize customer growth in every District. For Residential customer growth, we used 5/8" x ¾", 1", or 1-1/2" meter sizes, depending on the District. For Commercial customer growth, we used 5/8" x ¾", 1", 1-1/2", and 2", or Large meter sizes. We compared the average number of customers to the test year end number of customers by meter size to obtain the customer growth in bills. We took the average monthly gallons for each one of these class and meter sizes and multiplied by the customer growth in bills to get the growth in volume per bill. These factors by meter size were then billed out at the present rates times 12 months for each district. I used the Company's current rates as of the end of the test year to calculate customer annualizations. These figures are increased across-the-board for the proposed rates (see the calculations on the H-1 Schedules).

Q. DID YOU ALSO ADJUST OPERATING EXPENSES WHEN YOU ADJUSTED REVENUE FOR THE INCREASE OR DECREASE IN TEST-YEAR CUSTOMERS?

A. Yes. For the water districts, I adjusted Purchased Water, Fuel & Power, and Chemical expense based on the increase or decrease in volume of sales. For the wastewater districts, I adjusted Fuel & Power, Chemical Expense, and Waste Disposal Expense based on the increase or decrease in number of bills. I used bills rather than volume for the wastewater districts, because the wastewater districts use partial water volume for residential and small commercial, which would not be a good divisor on which to base cost. For both Water and Wastewater districts, I increased or decreased Postage Expense and Other Customer Accounting Expense based on the number of bills.

Q. CAN YOU SUMMARIZE ADJUSTMENT LJG-3 BY DISTRICT?

A. Yes. Please see the following table:

Table 7 – Customer Annualization, LJG-3

District	Resid Rev	Comm'l Rev	Total Rev	Oper Expense
Anthem Water	$42,241	$27,906	$70,147	$20,213
Sun City Water	$(12,267)	($6,947)	$(19,214)	$(4,304)
Anthem / Agua Fria Wastewater	$103,083	$5,527	$108,610	$14,560
Sun City Wastewater	($13,142)	$23,385	$10,243	($9,005)
Sun City West Wastewater	$14,243	$5,887	$20,130	$3,406
Total All Districts	**$134,158**	**$55,758**	**$189,916**	**$24,870**

Q. ARE THERE ANY OTHER REVENUE ADJUSTMENTS THAT ARE COMMON FOR ALL THE DISTRICTS?

A. Yes, Adjustment LJG-4 makes corrections for billing errors during the test year. A few bills had a rate schedule from one district attributed to another district's revenue. I

removed these bills from the bill analysis and removed their associated current revenue. Also, I removed prior period adjustments in the test year.

I added back $28,382 in revenue for Anthem Water District for a prior period credit adjustment that occurred during the test year as well as corrected three billing errors for $450. Sun City Water has no adjustments. I removed five billing errors in Anthem / Agua Fria Wastewater for $415. I removed $638 in Sun City Wastewater for two customers. I removed $3,855 for two customers in Sun City Wastewater.

V ADJUSTED INCOME STATEMENT

Q. DID YOU PREPARE ANY OF THE EXPENSE ADJUSTMENTS ON SCHEDULE C-2?

A. Yes. I prepared Income Statement Adjustment LJG-5 on Schedule C-2. This adjustment changes depreciation and amortization expense to reflect test year adjusted plant. The adjustment includes the addition of post test year plant and the reduction for the amortization of Contributions in Aid of Construction at a derived composite depreciation rate for each district. I am offering several adjustments to the rates as follows.

For Anthem Water and Sun City Water Districts, most of the Company's recommended changes to depreciation rates are made to reflect those recommendations made by Staff in the last case, WS-01303A-08-0227.

Table 10 – New Water Plant Account Depreciation Rates

Acct #	Plant Account Description	Anthem Water Current Rate	Sun City Current Rate	Company Proposed Rate
304500	Struct & Impr AG	0%	4.63%	3.99%
310100	Power Gen Eqpt Other	0%	4.42%	4.42%
311400	Pump Eqpt Hydraulic	0%	0%	4.42%
320100	WT Eqpt Non-media	4.0%	0%	7.06%
320200	WT Eqpt Filter Media	4.0%	0%	5.00%
331400	T&D Mains Grtr 18"	0%	1.53%	2.00%

340200	Comp & Periph Eqpt	4.55%	4.59%	10.00%
340300	Computer Software	0%	37.71%	25.00%
340330	Computer Software Other	0%	4.59%	25.00%
341100	Transp Eqpt Lght Duty	25.00%	25.00%	20.00%
341200	Transp Eqpt Heavy Duty	25.00%	25.00%	15.00%
341400	Transp Eqpt Other	4.14%	25.00%	16.67%
346300	Comm Eqpt Other	10.28%	4.93%	4.93%
347000	Misc Eqpt	0%	0%	6.19%

Q. DO YOU HAVE OTHER RECOMMENDATIONS FOR CHANGES TO WATER PLANT DEPRECIATION RATES OUTSIDE OF WHAT STAFF RECOMMENDED IN THE LAST CASE?

A. Yes, I have two additional recommendations for changes to water plant depreciation rates. The first is to Account 334100 Meters. I recommend 6.67% to reflect a 15-year replacement of meters. That is the Company's current policy, and it is the amount from a study on meter replacements done for the Company's prior rate case. That study is attached to my testimony as Exhibit LJG-1. The second recommendation is for a change to the rate for Account 339600 Other Plant and Equipment Comprehensive Planning Studies. I recommend 20% to reflect the fact that these studies are completed at least every 5 years. Please see the documents in Exhibit LJG-2, attached to my testimony. The Excel spreadsheet reflects the 5-year capital plan for Comprehensive Planning Studies by district. The Word document is the Company Policy and Procedure for capital asset management planning studies. Currently, the depreciation rate is 3.31%, or 30 years, to depreciate this account in Agua Fria Water, Paradise Valley Water, Mohave Water, and Havasu Water. The rate is 0% in Anthem Water, Sun City Water, and Sun City West Water districts. The current rate in the wastewater districts is 4.98%, or 20 years to depreciate in Anthem / Agua Fria, Sun City, and Sun City West Wastewater. Mohave Wastewater has a current rate of 0%.

Q. IS THE COMPANY RECOMMENDING NEW DEPRECIATION RATES FOR THE WASTEWATER DISTRICTS IN THIS CASE?

A. For Anthem / Agua Fria Wastewater, Sun City Wastewater, and Sun City West Wastewater Districts, all of the Company's recommended changes to depreciation rates are made to reflect those recommendations made by Staff in the last case, WS-01303A-08-0227.

Table 11 – New Wastewater Plant Account Depreciation Rates

Acct #	Wastewater Plant Account	Anthem Agua Fria WW	Sun City WW	Sun City West WW	Company Proposed
340200	Comp & Periph Eqpt	0%	0%	15.89%	10.00%
341100	Trans Eqpt Lt Duty	0%	0%	28.05%	20.00%
341200	Trans Eqpt Hvy Duty	25.00%	0%	0%	15.00%
341400	Trans Eqpt Other	25.00%	0%	0%	16.67%
355300	Pwr Gen Eqpt SSP	0%	3.33%	0%	3.33%
355500	Pwr Gen Eqpt RWTP	0%	3.33%	3.33%	5.00%
364000	Flow Measuring Devc	5.42%	5.00%	10.00%	10.00%
370000	Receiving Wells	5.42%	5.42%	5.42%	5.00%
380600	TD Equip Other Disp	8.40%	2.00%	5.00%	5.00%
390100	Computer Eqpt	0.00%	4.55%	4.55%	10.00%
391100	Transportation Eqpt	25.00%	25.00%	25.00%	20.00%
397000	Misc Eqpt	0.00%	5.10%	5.10%	5.10%

Q. IS THE COMPANY RECOMMENDING ANY CHANGES TO THE CORPORATE DIVISION DEPRECIATION RATES?

A. Yes. The Company is recommending the same depreciation rates that Staff suggested in the last rate case, WS-1303A-08-0227. With that change, the Corporate depreciation rates will be the same for every district. The table below lists the Company's proposed depreciation rates for the Corporate district.

Acct #	Plant Account	Current Rate	Proposed Rate
304620	Struct & Improv Leasehold	14.20%	14.28%
339600	Other P.E CPS	3.30%	20.00%
340100	Office Furniture & Eqpt	4.04%	3.87%
340200	Comp & Periph Eqpt	15.89%	10.00%
340300	Computer Software	37.71%	25.00%
340330	Comp Software Other	37.71%	25.00%
343000	Tools, Shop & Garage	3.61%	4.10%
346100	Comm Eqpt Non-Teleph	9.76%	8.25%

346200	Comm Eqpt Telephone	9.76%	8.25%
346300	Comm Eqpt Other	7.91%	5.35%

VI EFFECT OF PROPOSED TARIFF SCHEDULES

Q. CAN YOU BRIEFLY DESCRIBE THE H SCHEDULES YOU SPONSOR?

A. Yes. These schedules were prepared by me or under my direction. The Company uses all the historic billing information and factors for the 12 months ending December 2008 for each District. Schedule H-1 is a summary of the revenue billed under annualized present rates and the amount that would be generated by the proposed increase. I have added a section on this schedule to calculate the across-the-board increase for the Customer Annualization pro forma adjustment to the test year. Schedule H-2 is an analysis of revenue at present and proposed rates by class and meter size in dollar amount and percentage. The only rate schedules showing on this schedule are the ones for which we currently have customers. (The full rate schedules are shown on Schedule H-3). The H-2 Schedules have a column for the Test Year Revenue which was partially on an old rate and partially on a new rate for every district in this case. The average number of customers derived from the bill count is also shown by meter size and in total. (The median number of customers is shown at the bottom of each one of the named rate schedule tabs for the bill analysis in Schedule H-5). Schedule H-3 presents a comparison of present and proposed rates and shows the changes by basic service charges and by tariff blocks. It also contains every tariff rate for all rate schedules as well as Miscellaneous Fees. Schedule H-4 compares present and proposed rates and the percentage increase at various consumption levels. Because we are seeking an across-the-board increase for each district, all percentages are the same. Schedule H-5 is the bill count of the bills during the test year. The Average Number of Bills, Average Consumption per Bill per Month, the Median Number of Bills, and the Median Usage are shown on these pages.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

EXHIBIT LJG-1

Meter Replacement Study

Study of Retirement of Meters, Acct 334100, from 2004 to present
[Leaving out years 1 through 5 as an anomoly]

Agua Fria Water - Study of Retirement of Meters from 2004 to 2007

# of Customers in TY Ended 12/31/07		31,882	
Vintage Year	# of Meters	Vintage Yr Dep Rate	Weighted Avg Rate
8	1	12.5%	13%
11	18	9.1%	164%
12	25	8.3%	208%
13	36	7.7%	278%
14	1	7.1%	7%
15	32	6.7%	213%
54	25	1.9%	46%
	138		

Anthem Water - Study of Retirement of Meters from 2004 to 2007

# of Customers Year Ended 12/31/07		8,637	
Vintage Year	# of Meters	Vintage Yr Dep Rate	
8	16	12.5%	200%
13	0	7.7%	0%
	16		

Havasu Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		1,518	
Vintage Year	# of Meters		
13	9	7.7%	69%
15	31	6.7%	207%
16	10	6.3%	63%
54	3	1.9%	6%
	53		

Mohave Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		15,919	
Vintage Year	# of Meters		
9	2	11.1%	22%
10	1	10.0%	10%
15	287	6.7%	1913%
16	4	6.3%	25%
17	457	5.9%	2688%
18	438	5.6%	2433%
19	489	5.3%	2574%
20	179	5.0%	895%
21	121	4.8%	576%
	1,978		

Paradise Valley Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		4,740	
Vintage Year	# of Meters		
6	12	16.7%	203%
7	38	14.3%	543%
8	43	12.5%	538%
9	52	11.1%	578%
10	26	10.0%	260%
11	35	9.1%	318%
12	23	8.3%	192%
13	249	7.7%	1915%
14	210	7.1%	1500%
15	18	6.7%	120%
16	8	6.3%	50%
17	96	5.9%	565%
18	7	5.6%	39%
19	9	5.3%	47%
20	6	5.0%	30%
21	6	4.8%	29%
22	6	4.5%	27%
23	5	4.3%	22%
24	4	4.2%	17%
25	3	4.0%	12%
26	7	3.8%	27%
27	2	3.7%	7%
28	3	3.6%	11%
29	4	3.4%	14%
30	2	3.3%	7%
31	6	3.2%	19%
32	3	3.1%	9%
33	8	3.0%	24%
34	1	2.9%	3%
39	1	2.6%	3%
45	1	2.2%	2%
46	5	2.2%	11%
47	3	2.1%	6%
48	5	2.1%	10%
49	2	2.0%	4%
50	1	2.0%	2%
64	2	1.6%	3%
	912		

Sun City Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		23,014	
Vintage Year	# of Meters		
8	66	12.5%	825%
9	39	11.1%	433%
10	42	10.0%	420%
11	54	9.1%	491%
12	297	8.3%	2475%
13	5	7.7%	36%
14	20	7.1%	143%
15	13	6.7%	87%
16	6	6.3%	38%
17	18	5.9%	106%
18	8	5.6%	44%
19	16	5.3%	84%
20	18	5.0%	90%
21	14	4.8%	67%
22	1	4.5%	5%
23	5	4.3%	22%
24	1	4.2%	4%
25	2	4.0%	8%
26	26	3.8%	100%
27	120	3.7%	444%
54	1	1.9%	2%
	772		

Sun City West Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		15,422	
Vintage Year	# of Meters		
8	0.3	12.5%	4%
9	1.0	11.1%	11%
12	2.0	8.3%	17%
13	4.0	7.7%	31%
54	2.0	1.9%	4%
	9.3		

Tubac Water - Study of Retirement of Meters from 2004 to 2007

# of customers in TY Ended 12/31/07		535	
Vintage Year	# of Meters		
10	3.0	10.0%	30%
11	3.0	9.1%	27%
25	32.0	4.0%	128%
30	1.0	3.3%	3%
33	1.0	3.0%	3%
35	1.0	2.9%	3%
36	2.0	2.8%	6%
54	0.4	1.9%	1%
	43.4		

Total Mtrs Retired	3,921.43	Weighted Average Rate	25966%
Weighted Average Depreciation Rate for All Water Districts			6.6%

EXHIBIT LJG-2
Comprehensive Planning Studies Budget
Asset Planning Practice

Planning Budget AZ - 09 - 5 Yr BP

Inflation factor: ***2.50%***

Business Unit	District	Description	Task / Effort	2009	2010	2011	2012	2013	2014
2302	Paradise Valley Water	CPS	In house planning study with hydraulic model @ 1000 hrs	$61,000	$0	$0	$0	$0	$0
2302	Paradise Valley Water	CPS - 2014	In house planning study with hydraulic model @ 1500 hrs						$110,381
2302	**Paradise Valley Water**	**Total**		**$61,000**	**$0**	**$0**	**$0**	**$0**	**$110,381**
2361	Agua Fria Water	Well Integration Study (work order 428114)	Consultant fee contract amount	$127,000	$0	$0	$0	$0	$0
2361	Agua Fria Water	Well Integration Study (work order 428114)	In house staff costs	$23,000	$0	$0	$0	$0	$0
2361	Agua Fria Water	Well Integration Study (new work order)	Ongoing internal support to Ops - 525 hrs/yr after consultant completion	$0	$35,000	$0	$36,772	$0	$0
2361	Agua Fria Water	CPS Update - to include North East AF	In house study costs - 2000 hours	$0	$0	$138,375	$0	$0	$0
2361	Agua Fria Water	CPS 2014 Update - to include North East AF	In house study costs - 1500 hours						$110,381
2361	**Agua Fria Water**	**Total**		**$150,000**	**$35,000**	**$138,375**	**$36,772**	**$0**	**$110,381**
2362	Sun City Water	CPS	In house study costs - 2000 hours (500 hrs in 08 + 1500 hrs in 09)	$96,000	$0	$0	$0	$0	$0
2362	Sun City Water	CPS - 2014	In house study costs - 1500 hours						$110,381
2362	**Sun City Water**	**Total**		**$96,000**	**$0**	**$0**	**$0**	**$0**	**$110,381**
2363	Sun City Wastewater	CPS	In house study costs - 2000 hours	$0	$0	$0	$0	$145,380	$0
2363	**Sun City Wastewater**	**Total**		**$0**	**$0**	**$0**	**$0**	**$145,380**	**$0**
2364	Sun City West Water	CPS	In house study costs - 2000 hours	$65,000	$70,000	$0	$0	$0	$0
2364	Sun City West Water	CPS - 2014	In house study costs - 1500 hours						$110,381
2364	**Sun City West Water**	**Total**		**$65,000**	**$70,000**	**$0**	**$0**	**$0**	**$110,381**
2365	Sun City West Ww	Force Main Study	Scope of work definition for re-hab of force main (ageing asset)	$400	$0	$0	$0	$0	$0
2365	Sun City West Ww	CPS	In house study costs - 2000 hours	$0	$70,000	$82,000	$0	$0	$0
2365	**Sun City West Ww**	**Total**		**$400**	**$70,000**	**$82,000**	**$0**	**$0**	**$0**
2383	Anthem Water	CPS Update	In house study costs - 1500 hours	$0	$0	$0	$105,063	$0	$0
2383	**Anthem Water**	**Total**		**$0**	**$0**	**$0**	**$105,063**	**$0**	**$0**
2384	Anthem Ww	CPS Update	In house study costs - 1500 hours	$0	$0	$102,500	$0	$0	$0
2384	**Anthem Ww**	**Total**		**$0**	**$0**	**$102,500**	**$0**	**$0**	**$0**
2371	Mohave Water	CPS Update	In house study costs - 1500 hours	$0	$0	$0	$0	$107,689	$0
2371	**Mohave Water**	**Total**		**$0**	**$0**	**$0**	**$0**	**$107,689**	**$0**
2373	Havasu Water	CPS Update	In house study costs - 1500 hours	$0	$0	$0	$105,063	$0	$0
2373	**Havasu Water**	**Total**		**$0**	**$0**	**$0**	**$105,063**	**$0**	**$0**
2389	Tubac	Small System Planning Study	In house study costs - 750 hours	$0	$70,000	$0	$0	$0	$0
2389	**Tubac**	**Total**		**$0**	**$70,000**	**$0**	**$0**	**$0**	**$0**
	AZ	**Total**		**$372,400**	**$245,000**	**$322,875**	**$246,897**	**$253,069**	**$441,525**

Notes:

1 Consultant fees where applicable are based on expected lump sum contract
2 All in house staff costs are based on $40 per hour, with an additional 66% multiplier for various overheads.
3 All dollar values shown include inflation where applicable (inflation calculated from 2011 onwards)
4

Practice Name: **Capital Investment Management Asset Planning Practice**
Functional Area: **Operations Services - Engineering**
Practice Number:

PURPOSE

The objective of this practice is to ensure that American Water Works Company, Inc. and its regulated subsidiaries, including, for purposes of this practice, American Water Works Service Company, Inc. (together "American Water" or the "Company") implement asset planning programs that generate timely, sound, practical, and cost-effective capital project recommendations for inclusion in the regulated subsidiaries' capital investment plans. All regulated subsidiaries should comply fully with this practice.

APPLICABILITY

This practice supports the Company's Capital Investment Management (CIM) Policy by ensuring sound engineering planning is the primary driver for identifying specific capital project needs.

This practice also supports the Company's Regulated Asset Investment Strategy Guidance by ensuring that planning study capital project recommendations are aligned with the key mission and goals of the Company.

PRACTICE

American Water's capital investment program is comprised of three distinct phases – Planning, Budgeting, and Delivery as described in the Capital Investment Management Policy. This Practice focuses on the Planning phase.

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1. Asset Planning Program

A sound planning program is the first phase of a successful Capital Investment Management Program, the objective of which is to assure that capital investment decisions are made which efficiently deploy financial resources and minimize cost of service to the customer, while assuring that the Company continues to maintain regulatory compliance, keeps pace with growth and infrastructure renewal, and provides safe, reliable, efficient, and quality service. This practice outlines the standards and tools to achieve this goal.

The asset planning program shall be comprised primarily of comprehensive planning studies or small system planning studies for each operating system as appropriate, and

targeted planning studies where warranted. Identification and prioritization of planning study work will be accomplished through yearly Planning Program Reports.

It is understood that not all projects coming forward through the CIM process will be derived directly from a planning study. Therefore it is important that the planning group have input into the planning and resulting projects developed via other means such as developer funded projects or emerging need projects. This will ensure that all capital investment projects will be reviewed from a system-wide perspective and developed using consistent AW planning criteria.

Good data management and maintenance of planning tools are also an important part of the asset planning program. Easy accessibility to accurate system data allows for effective and efficient system evaluations.

Asset planning program activities shall be performed as described in this Practice.

2. State Planning Study Program

A program of long range planning work for each state will be developed annually in the Planning Program Report (PPR). The PPR will identify, budget and prioritize planning work to be completed over the next five to ten years.

The upcoming year's planning work as identified in the State PPR should be further detailed and used to prepare detailed budgets for Recurring Funding Project Line S – Engineering Studies.

A template and guidance document for the State PPR is provided in the document "Guidance Manual for Preparing the Annual Planning Program Report." This document provides one suggested format of a PPR. Other formats are acceptable provided they include the general content specified below.

2.1 Planning Program Report (PPR)

The State Planning Program Report represents the long range program of planning work to be completed over the next five to ten years. Planning needs identified on a system specific basis via the System Status Summaries as defined below, as well as other state-wide or value-added studies, are combined and prioritized in the State Planning Program Report (PPR). The State PPR should consist of the following information:

- State summary and recommended program
- State-wide and regional planning needs
- System Status Summaries with system-specific planning needs

The State PPR should be developed with input from the Operating Unit Executive Management and the Operations function. This input will assist in the identification of system performance issues and infrastructure needs as well as the identification and prioritization of planning needs.

2.1.a State Summary and Recommended Program:

An executive summary should be provided containing the following:

- State map with service area locations outlined and labeled
- General state information (total number of water and wastewater systems, total number of customers served)
- Planning Study Program Table, with brief introduction explaining reasoning behind most critical planning needs and prioritization methodology used.

The planning study program table will list the planning studies to be initiated over the next 5 to 10 years to address individual system planning needs as well as regional or state-wide planning studies or reports that are needed. Also included in this table will be study type, prioritization, approximate cost, estimated start year and duration. A spreadsheet template for reporting this information is provided in the guidance manual to assure consistent format for consolidation and corporate-wide reporting.

2.1.b State-wide and Regional Planning Needs:

State-wide and regional planning includes any planning studies or related work that addresses a specific topic or issue and that covers multiple water or wastewater systems across the state or a wide region (e.g. water conservation plans, non-revenue water studies, regulatory reports on water allocation or master plans, etc.). These studies need to be identified and prioritized along with individual system planning studies.

2.1.c System Status Summaries:

The identification of planning needs relies upon the engineering function having a thorough understanding of the condition and performance of all the systems under its jurisdiction. The purpose of the system status summary is to provide a concise assessment of the current status of the system in terms of its ability to provide adequate levels of service to its customers under current and anticipated conditions, and to determine the level and urgency of planning needed in the near-term and long-term future. Input from the operations function should be solicited to assist in the identification of system performance issues and infrastructure needs.

The system status summary should contain the following information:

- Brief synopsis of system (service area size and location, major facilities, etc.)
- Historic and projected (if available) demands (water) or flows (wastewater)
- Quantity of supplies (yields, allocations, etc.) and comparison with demands (water)
- Treatment capacity versus peak system loads (wastewater)
- Assessment of any current and/or future regulations that may impact system
- Any significant system performance issues
- Any major infrastructure issues and projects planned (reference prior planning study where relevant)
- Recommendations for future planning work to be performed

2.2 Identification of Planning Study Need and Prioritization

In order to effectively support the CIM process, every AW system, including recent acquisitions, should have relevant planning studies in place.

The need to perform a planning study will depend on factors such as system growth, water quality issues, regulatory requirements, condition and performance of existing infrastructure, regional opportunities, and the availability and relevance of prior planning studies. The level or type of planning will depend on the number, severity and extent of these factors and the relevance of recent planning work.

As general guidelines, systems that meet any of the criteria listed below are considered "flagged" and in need of a full CPS:

- Regulations or rate case submissions require a CPS or similar master plan to be completed.
- A CPS has never been completed for the system, or it has not been completed in the last 10 years with the following exceptions:
  - Systems acquired within the last 5 years, provided that a thorough acquisition study was done during the due diligence process which identified capital improvements that will maintain adequate levels of service until the next study. In such cases, postponing a full CPS may be beneficial to provide a gestation period that will allow for better understanding of system operations and the collection of reliable historic data. A CPS should then be scheduled after the appropriate data collection period.
  - Systems with a CPS completed over 10 years ago where there is no expected growth, no significant change in system operations, and only routine capital projects (e.g. RP projects such as main replacements) are anticipated over the next 5 years. For such systems, a CPS should be scheduled but given a low priority.
- For water systems: Demands are greater than 90% of supplies and/or production facilities and the system continues to grow. The specific criteria may vary if local/state regulatory agencies have more stringent requirements. (water)
- For wastewater systems: System peak hourly flows are greater then 90% of treatment plant hydraulic capacity, or three month average loads are greater than 85% of treatment capacity.
- The system has been experiencing significant growth through expansion or tuck-in acquisitions and this trend is expected to continue.
- System performance problems are chronic and on a large scale (e.g. frequent area-wide outages, water quality complaints, etc.) that cannot be addressed by a targeted study.
- There are significant existing or anticipated performance issues with deteriorating assets or regionalization issues.
- New regulations are anticipated to have a major impact on system compliance.

If not already completed and relevant, a CPS needs to be initiated for each flagged system within a reasonably short timeframe (within the next three years), and should be scheduled accordingly as resources allow. A CPS is considered relevant if it contains project recommendations to address the deficiencies noted in the criteria above, or if a targeted study addresses the deficiencies and the remaining project recommendations are still relevant. Flagged systems shall be identified through the annual State PPR.

Other less comprehensive planning may be appropriate to address the planning needs of a particular system identified in the system status summary. A discussion of the different types of planning studies to be considered is provided in Section 4 of this Practice.

Once planning needs are identified they should be prioritized and scheduled. A planning study prioritization tool is under development to assist in the identification of an appropriate planning study type as well as prioritization of planning study work across a State. Use of this tool is optional. The Summary section of the PPR should provide a

discussion of the methodology or reasoning supporting the prioritization of planning work.

2.3 State Planning Program Report Review and Approval

The State PPR should be reviewed and approved by the Operating Unit Engineering and Corporate Engineering functional groups.

The engineering function for each operating unit is responsible for updating the State PPR annually and submitting a copy to the AW Corporate Engineering. It should be completed before September of each year in order to provide timely input into the upcoming year's Recurring Funding Project Line S – Engineering Studies.

2.4 Recurring Funding Project Line S – Engineering Studies

Line S Recurring Funding Projects are an accumulation of engineering study work order projects that are budgeted and managed on a calendar year basis. It is through Line S Recurring Funding Projects that planning studies are managed and budgeted in the State Business Plan. The planning study program of work developed within the State PPR should be the primary source of planning projects included in Line S of the State Business Plan.

See the CIM Budgeting and Delivery Practice for additional information on Recurring Funding Projects and the review / approval process.

3. Planning Studies – General

Thorough, sound and timely asset planning is critical to assuring that our water and wastewater systems are capable of delivering safe, adequate, reliable service to our customers.

Planning studies are the primary means for evaluating asset condition and performance, projecting future needs, and identifying capital projects and/or programs which may be needed so that a system is able to meet the required levels of service. Planning studies also assess the system's capabilities to meet current and future regulatory requirements, growth opportunities, and operational needs. Projects that have been developed through the planning study process will have undergone thorough analysis of alternatives and review by key stakeholders.

The Comprehensive Planning Study remains the best method for providing a thorough system assessment and providing a strategic capital investment plan. However, other less comprehensive planning studies can be considered when appropriate to target a specific issue.

3.1 Engineering Criteria and Standard Methodologies

AW has established Engineering Standards to address a number of technical and planning areas associated with engineering assessment and design. These standards should be followed when evaluating existing facilities, when recommending new facilities, and in performing related engineering work.

All AW engineering criteria and standard methodologies as described herein should be followed by all internal engineering functions and external consultants who undertake in part or full any type of planning study to assure consistency is achieved in the planning process for all AW systems.

3.1.a Planning Criteria and Methodologies

AW has established standard engineering planning criteria for conducting water system analyses and determining system adequacy. Detailed information about water system planning criteria can be found in the 'Planning Criteria and Regulations – Engineering Standards Manual, Standard P-01'.

Engineering planning criteria for conducting wastewater system analyses and determining system adequacy are currently under development in the 'Planning Criteria for Wastewater Collection and Treatment Systems – Engineering Standards Manual'.

3.1.b Planning Study Guidance Manual

Details associated with the content of a water system CPS are contained in the Guidance Manual entitled: "CPS Recommended Format, Contents and Methodology." This manual contains in-depth coverage of system component analyses with standard templates to more easily facilitate analysis in accordance with AW standard methodology. Although designed for a full CPS, this document should also be used for targeted studies where the scope of such studies includes elements of a CPS, such as demand studies, distribution system analyses and production analyses. This will assure consistency in methodology and final report format and content.

Guidance manuals associated with the content of (a) wastewater system CPS's, and (b) Small System Planning Studies are under development.

3.2 Capital Project Recommendations and Prioritization

Each capital project recommended within a planning study shall include a concept level scope, cost, schedule, alternatives analysis (as appropriate), documentation and assignment to appropriate Asset and Purpose Codes. Asset Codes define what types of assets the project consist of, and Purpose Codes define why the assets are needed. Proposed project scope should be sufficiently developed to enable the project to be included in the company's business plans and associated enterprise software systems (e.g. Powerplant.)

Projects should be prioritized in accordance with the current Regulated Asset Investment Strategy Guidance. The project purpose codes correlate to the Asset Investment Strategy categories. An optional tool to aid in the prioritization of capital projects has been developed entitled the American Water System Project Prioritization Model. The model's criteria, used to rank the projects, are based on the Company's strategic goals outlined in the Regulated Asset Investment Strategy Guidance documents. This guidance is updated annually.

3.3 Participation, Review and Approval

Planning studies that recommend capital investment projects have a significant impact on the future operation and viability of the utility system under study and should therefore include participation by internal and external stakeholders affected by the planning study recommendations.

3.3.a Internal Stakeholders:

Affected internal stakeholders are identified by the Operating Unit Engineering Lead and may include representatives from the following functional groups:

- Water Quality and Environmental Management
- Field Operations
- Production & SCADA
- Maintenance
- Customer Service

- Operational Risk Management
- Government Affairs
- Business Development
- Construction / Project Delivery
- Rates
- Capital Program

Internal stakeholder participation and input should be solicited as often as possible through informal means throughout the progress of the planning study, but more formally through invitations to the kick-off meeting and the final draft review meeting. All affected functional groups / key stakeholders must be given the opportunity to review the final draft planning study before it is finalized in an effort to obtain comments, address outstanding issues and gain concurrence on recommendations. These internal stakeholders may choose to participate, delegate, or not participate in the planning study process. Evidence that this opportunity was provided should be documented and can be in the form of email routings, meeting minutes, draft review meeting sign-in sheets, and/or routing cover sheets with check-off boxes for names of the reviewers attached to the draft planning study document. A recommended signoff sheet for planning study review is provided in Appendix A. Election by stakeholders not to participate either actively or exhibited by non-response should also be documented.

3.3.b External Stakeholders:
Participation with external stakeholders such as regulatory agencies, local governments, fire departments, non-governmental organizations, and customer groups during the development of a planning study is strongly encouraged. This participation will help ensure that the findings of the planning study have considered the interests of these stakeholders.

3.3.c Operating Unit President and Corporate Engineering Function Concurrence:
Recommended capital investment projects will eventually come forward through the CIM process to receive approval from the Operating Unit and Corporate CIM and FSO committees. Therefore, final draft versions of any planning study recommending capital investment projects should be provided to the Operating Unit President or his/her designee as well as the Corporate Engineering Function prior to finalization. This will provide them with an opportunity to review and comment on capital investment projects prior to the projects entering the CIM process.

Concurrence of Operating Unit President or his/her designee should be obtained. Concurrence can be demonstrated either through documented communication or noted as part of the monthly CIM or FSO meeting. Concurrence of the Corporate Engineering Function should be obtained either through documented communication or noted as part of the monthly corporate FSO meeting. It is recommended that participation and input be solicited throughout the process of the planning study to gain consensus on the recommendations.

3.3.d Final Planning Study Signoff:
A formal sign-off process should be performed by the author(s) and supervisor when a planning study is completed. A cover sheet must be provided in the front of the planning study document with signatures of the following:

- Engineer/Primary Author (not consultant)
- Operating Unit Asset Planning Lead
- Operating Unit Engineering Lead

A recommended cover sheet is included in Appendix A. Those signing this document certify ownership and take responsibility for all content, including methodologies and

assumptions used in the analysis, accuracy of calculations and cost estimates, validity of recommendations, and consistency with AW practices and standards.

4. Planning Study Types

4.1 Comprehensive Planning Studies (CPSs)

A Comprehensive Planning Study (CPS) is a master plan that provides a list of prioritized major capital improvements for a system over a defined planning horizon of approximately fifteen to twenty years.

A CPS includes an assessment of present and future scenarios in the following essential areas:

Water	Wastewater
Customer and demand projections	Flow and load projections
Supply & treatment adequacy	Treatment adequacy
Pumping and storage adequacy	Flow equalization and pumping adequacy
Distribution system analysis including hydraulic modeling	Collection system analysis including hydraulic modeling

The development or updating of the hydraulic model for a system should be included within the scope and budget of the CPS if not addressed by other means.

4.2 Small System Planning Studies

A Small System Planning Study is a master plan, appropriate for systems with 500 customers or less, that provides a list of prioritized major capital improvements for a system over a defined planning horizon of approximately fifteen to twenty years. A small system planning study can cover one system or a group of systems in a single document. The analysis should include assessments of present and future scenarios for the same essential areas as a full CPS for larger systems; however, the level of detail can be significantly reduced and should be commensurate with the complexity of the system(s) and issues analyzed, the adequacy and quality of data available, and the magnitude of improvement projects developed. Guidelines for preparing small system planning studies are currently under development.

The development or updating of a hydraulic model for a small system is not required as part of a Small System Planning Study.

4.3 Targeted Planning Studies (TPSs)

A TPS is a more focused planning study than a CPS. It addresses a specific issue, such as a supply/demand study to assess adequacy of supplies, or a distribution system analysis to assess adequacy of a distribution piping network and associated storage and pumping facilities. A TPS is not a substitute for a CPS and is appropriate as an interim step only if no significant changes to the service area have occurred other than the issues to be targeted, and with the exception of new findings/recommendations brought forth from the TPS, the CPS is still considered relevant in providing an accurate assessment of the system and a sound capital improvement plan. The decision to

perform a TPS vs. a CPS is left to the discretion of the State Engineering Function, with consultation from the Corporate Engineering Function.

A TPS can also be considered as a phase within a CPS. This is particularly useful in managing CPSs for large systems over multiple years or in situations where resources are limiting. For example, a Supply/Demand Study could be performed for a system in the first year, and the results could be incorporated into a full CPS the following year.

A TPS can also provide preliminary or post investigatory work for a CPS to address a particular issue. Hydrogeologic studies, safe yield analyses, I & I studies, energy efficiency studies, non-revenue water studies and facility needs assessments are examples. Often such studies are needed for helping to determine the appropriate alternative or for validating assumptions in the CPS decision-making process. It is important that such studies are coordinated with the overall planning process approach so that relevant, timely results can be incorporated into alternatives analysis and the proper capital improvement recommendations are identified.

Some examples of TPSs would include:

- Supply/Demand Study
- Production Study
- Distribution System Study
- Regionalization Study
- Dam Inspection
- Condition Based Assessment of Distribution System
- I & I Study
- Water Conservation Study
- SCADA Master Plan
- Facility Plan or Facility Needs Assessment
- Hydrogeologic Study
- Feasibility Analysis
- Sewer System Management Plan
- Fire Flow Analysis
- Water Management Plan
- Surge Analysis
- Energy Efficiency Study
- Non-Revenue Water Study
- Safe Yield Analysis
- Rate Tariff Study
- Wastewater Process Model

Condition-Based Assessments deserve special attention. A CBA can be performed in conjunction with a CPS.

We need to address condition based assessment (CBA) needs and processes in the acknowledgement that the age of most systems are now reaching to 80-100 years. In my opinion, the CPSs process do not clearly address this real need. Most CPSs do not provide asset replacement project recommendations in a systematic way. In California, we have started dedicated studies addressing wells, tanks, pumps, buried assets, SCADA, Electrical system needs. The CBAs are appended to the CPS.

N

4.4 Acquisition Studies

An acquisition study is typically done prior to the purchase of a water or wastewater system as part of the due diligence process. The study assesses the condition and adequacy of system facilities and should identify capital improvements necessary to assure adequate levels of service to customers within the system's service area. For tuck-in acquisitions, it is important that these studies identify capital improvements needed to maintain existing levels of service to the host system as well.

Often times acquired systems are troubled systems with significant capital needs and a small customer base, so acquisition studies often focus mainly on critical, high priority improvements. Frequently timeframes are short and insufficient data is available to fully and accurately assess system performance and needs prior to the acquisition.

For these reasons acquisition studies should not be considered a substitute for a CPS. However, postponing a full CPS for a number of years after the acquisition may be beneficial to allow for better understanding of system operations and collection of reliable historic data. A CPS should then be scheduled after the appropriate data collection period.

5. Data Management and Planning Tools

The effectiveness and efficiency in implementing an asset planning program is dependent in large part on the accessibility of accurate system data and on the availability and accuracy of up-to-date tools such as distribution system hydraulic models. To this end, the operating unit engineering function must assure adequate data is being collected, maintained and reviewed, and proper planning tools are maintained and utilized so that accurate, complete, and timely system evaluations can be performed.

5.1 Data Management

Some of the important data necessary to perform adequate planning include:

- Historic customer usage data
- System delivery data
- Plant performance records
- Distribution system records (flow tests, main breaks, etc.)
- Facility inventories and inspections
- Previous engineering studies
- As-built drawings and distribution system maps
- SCADA records

While it is recognized that much of this information may be generated, stored, or maintained by other departments for other purposes, it is important that the Operating Unit Engineering Function provide input into data management decisions to assure this data is available for planning study use when needed.

A separate practice / user guide for the proper collection and storage of planning data for planning studies is under development.

5.2 Planning Tools

Various tools are used to evaluate systems and capital projects, including hydraulic models, GIS systems, and customized spreadsheet models (e.g. economic analysis model, project prioritization model.) These tools should be kept accurate, calibrated and up-to-date with current system information so they are available and ready to use when needed. Hydraulic models are particularly important, since they are used for short and long-term capital planning as well as water quality assessments, emergency response, and vulnerability and reliability studies. They are essential in performing effective system evaluations. A Users Guide is available for use with the project prioritization model. A practice to address the development and maintenance of hydraulic models is currently under development.

6. Planning Support for Developer Services & Emerging Need Projects

All capital investment projects should be reviewed within the context of an entire system both as the system exists now and in the future. Projects should undergo a thorough analysis of alternatives and review by key stakeholders prior to being recommended for approval. For most capital investment projects, this is done in a Planning Study. However, this is not always the case for developer services projects and emerging need projects due to the less predictable nature and typical short timeframes associated with these projects.

6.1 Developer Services / New Business

The operating unit engineering function should have in place a process that ensures new applications for service are reviewed in terms of the ability of the system to provide safe, adequate and reliable service to the proposed customers while assuring adequate levels of service to existing customers. To assure these goals are met, the following analyses should be performed:

- Permit Review – ensure that all regulating agency requirements are met.
- Capacity Review – ensure that there is available capacity in the existing system to support new demands associated with the project.
- Fire Flow Review – determination of needed fire flow.
- Operational/Hydraulics Analysis – ensure existing system operations and hydraulics (pressures, flows, water age, etc.) are not affected detrimentally by the addition of the new demands and that the required level of service including fire flow can be provided. This analysis is ideally suited for hydraulic modeling.

Any capital improvements necessary to provide adequate levels of service to new customers and maintain levels to existing customers should be identified, and results of these analyses should be documented and retained by the operating unit engineering and developer services/new business functions.

6.2 Emerging Need Projects

Prior to bringing forward a project through the CIM process that was not recommended in a planning study, the project should be evaluated by the operating unit engineering function to ensure that the project is reviewed in the context of the overall system and that there are not other feasible, more cost-effective alternatives. Where appropriate, analysis of the project using a hydraulic model should be performed.

Results of this evaluation should be in the form of a concise Technical Memorandum that would include a description of the problem and analysis undertaken, the recommended solution and cost, any evaluated alternatives, and appropriate sign-off. Project benefits should also be quantified. The technical memorandum should be included as an attachment to the project's justification within PowerPlant.

The TM should include: 1) description of the problem and need analysis; 2) evaluation of alternative solutions; 3) scope, cost and schedule for the recommended solution; and, 4) appropriate sign-offs by the operations and planning departments.

7. Document Maintenance, Security and Control

All documents generated from this Practice, including the planning program reports, planning studies, project prioritization models, and hydraulic models shall be considered

confidential internal documents. Any external distribution shall be in accordance with AW security procedures.

Each planning study issued externally should be provided a unique number for document tracking purposes. The engineering function for each operating unit is responsible for the proper tracking of CPS copies. Guidance on this process and a document control form is provided in Appendix B.

Final versions of all planning studies that recommend projects should be maintained on the Lotus Notes Planning Navigator in PDF format. Additionally, one hard copy of all CPS's and Small System Planning Studies should be sent to AW Corporate Engineering.

8. Supplementary Tools and Guidance

A number of tools and additional guidance are available as a supplement to this Practice. These are either in the form of a Lotus Notes database, or can be found as an attachment in a Lotus Notes database. The available Supplementary Tools and Guidance, their purpose, and their location, are identified below.

8.1 Lotus Notes Planning Navigator Database

PURPOSE: A directory to all Lotus Notes Planning databases
LOCATION: Server: APPDOM1/DOMSVR/AWWSC, Filename: awws\cim-v2\cimnavigv2.nsf

8.2 Lotus Notes Engineering Navigator Database

PURPOSE: A directory to all Lotus Notes Engineering databases
LOCATION: Server: APPDOM1/DOMSVR/AWWSC, Filename: awws\cim-v2\cimcaldrv2.nsf

8.3 Asset and Purpose Code Guidance

PURPOSE: Guidance for assigning Asset and Purpose codes to Funding Projects
LOCATION: CIM Reporting database - Supplementary Tools and Guidance view

ORGANIZATIONAL RESPONSIBILITIES

Asset Planning staff (corporate and operating unit) within the engineering function are responsible for assuring compliance with this Practice.

To the extent that internal resources allow, all planning work should be done by AW engineering staff. Corporate engineering should have right of first refusal for any planning work that cannot be met by operating unit planning staff. Similarly, corporate-wide planning initiatives should be met first with in-house resources, either operating unit or corporate, whenever possible.

Consultants are to be used only when the workload cannot be completed by in-house staff or the required expertise cannot be found within AW. The decision to use consultants should be made jointly by the operating Unit Asset Planning Manager, the operating Unit Engineering Director/Lead and the Engineering Manager – Corporate Planning. Consultants invited to bid on such work should be selected from an approved list of consultants qualified to perform planning work. This list will be reviewed and updated on a regular basis by a committee headed by the Engineering Manager – Corporate Planning with input from operating Unit Asset Planning Managers and operating Unit Engineering Directors/Leads.

REPORTING / METRICS

A listing of the reporting/metrics supporting this practice is presented below.

Implementation and Adoption Indicators:

- Number of systems for which a system status summary has been completed (target: 100% annually)
- Number of flagged systems with customer counts greater than 500 assessed by a comprehensive planning study within last 10 years (target: 50% within 3 years; 100% within 5 years)
- Number of flagged systems with customer counts of 500 or less assessed by a small system planning study within the last 10 years (target: 50% within 4 years; 100% within 6 years)

Process Performance Indicators:

- % of investment projects (IP projects) brought forward through the CIM process which were recommended by a planning study compared to total number of IP projects in CIM process. The type of planning study that recommended a project will be coded as part of the project justification. This will be measured through a PowerPlant report (under development).

REFERENCES

a. Capital Investment Management Policy, document no. _____
b. Asset Investment Strategy Guidance Document
c. Planning Data Practice (under development)
d. Hydraulic Model Practice (under development)
e. Project Prioritization Models
f. CPS Recommended Format, Contents and Methodology (i.e. CPS Guidance Manual)
g. Planning Criteria – Engineering Standards Manual, Standard P-01
h. Guidance Manual for Preparing the annual Planning Program Report (under development)
i. Planning Study Prioritization Model
j. Planning Criteria for Wastewater Collection and Treatment – Engineering Standards Manual' (under development)
k. Capital Investment Management Budgeting and Delivery Practice

DEFINITIONS

- CIM Process – Capital Investment Management process – the process through which the company's capital investment is governed and where expenditures for individual projects are authorized.
- Functional Sign Off (FSO) – Required for all IP and CS Funding Projects prior to the authorization for expenditure at any formal project stage (Preliminary, Implementation, or Direct). This is to assure that evaluation and sign off of the technical and functional aspects of the project has occurred.
- Water System – A service area with a unique PWSID number.

- Purpose Codes – codes used to identify the specific purpose of a particular investment project (e.g. regulatory compliance, growth, pipeline renewal, efficiency, etc.) as defined in the CIM Budgeting and Project Delivery Practice.
- Operating Unit – A geographic grouping of systems under a single management organization.
- Capital Investment Project / Capital Project- A project which results in the creation, modification, or replacement of assets financed by capital funds.
- PowerPlant: A capital budgeting, project, and asset management software which is integrated with American Water's Enterprise Resource Planning (ERP) software suite.
- Asset Investment Strategy Guidance: Annual guidance that provides strategic direction and forms the basis of agreed capital investment for American Water to maintain and improve its fixed asset base, meet its legal and regulatory obligations, and meet its strategic business objectives.
- Capital Investment Management (CIM) Committees: Committees at the Operating Unit and Corporate levels responsible for advising the approvers of individual projects and monitoring the overall progress of the capital program.
- Funding Project: The generic name for a capital project. There are four unique types of Funding Projects (IP, CS, RP, and DV). Funding Projects are created and budgeted at the district level.
- Investment Projects (IP): Unique, one-time capital projects having a definitive start and stop.
- Centrally Sponsored Projects (CS): Same as an IP; however, these are managed centrally by the Service Company with the costs charged directly to each Operating Unit rather than through a Service Company bill.
- Recurring Projects (RP): Capital projects which are routine in nature, are budgeted and managed on a calendar year basis, and typically consist on many smaller sub-projects.
- Line Item: The accumulation of all RPs of the same type rolled up to an Operating Unit level.
- Developer Funding Projects (DV): Similar to RP Projects, but with external advances (typically by a developer) in part or in whole, and subsequent refunds over a fixed time period.

REVIEW/UPDATE

This Practice will be reviewed one year after issuance and every three years thereafter. The document may be revised, if necessary, based upon the results of the review.

Practice Development Team: (Add / delete additional lines as needed.)

Operating Unit	Name	Title & Functional Area	Office Location (City, ST)	Role
Bus. Center	Gary Naumick	Sr. Director - Corporate Engineering (Corporate Engineering)	Mt. Laurel, NJ	Sponsor
Bus. Center	James Chelius	Manager, Engineering - Corporate Planning (Corporate Engineering)	Mt. Laurel, NJ	Lead
IL, IA, ALW	Alan Stuemke	Manager, Engineering - Asset & Capital Planning	Belleville, IL	Member
Other States	Sign up here			

Functional Reviewers:

Operating Unit	Name	Title & Functional Area	Office Location (City, ST)	Reviewed
Long Island	Rich Kern	Manager - Engineering	Long Island, NY	☐
NJ	Suzanne Chiavari	VP Engineering	Delran, NJ	☐
VA, MD, United Water VA	Mike Youshock	Sr. Project Manager	Hopewell, VA	☐
PA	Dave Kaufman	VP Engineering	Hershey, PA	☐
WV	Mark Sankoff	Director - Engineering	Charleston, WV	☐
OH	Doug Green	Manager - Engineering	Marion, OH	☐
KY	Lance Williams	Director - Engineering	Lexington, KY	☐
TN	Randy Taylor	Project Manager	Chattanooga, TN	☐
IN, MI	Stacy Hoffman	Director - Engineering	Greenwood, IN	☐
IL, IA, ALW	Jeff Kaiser	Director - Engineering	Belleville, IL	☐
MO, TX	Kevin Dunn	Director -Engineering	St. Louis, MO	☐
AZ, NM, HI	Joe Gross	Director -Engineering	Phoenix, AZ	☐
CA	Mark Schubert	Director -Engineering	Chula Vista, CA	☐

Approvers:

Operating Unit	Name	Title & Functional Area	Office Location (City, ST)	Approved
				☐
				☐
				☐
				☐
				☐

Original Adopted: _____

Revised Adopted: _____

Date of Last Review: _____

APPENDIX A

SIGNOFF FORMS FOR PLANNING STUDIES

State American Water
Xxx District
_____Meeting
6/29/2009

Check (x) if invited	Sign if in attendance	Job Title
☐		Production Manager
☐		Field Operations Manager
☐		Director of Environmental Mgmt and Compliance
☐		Engineering Director
☐		Service Delivery Manager
☐		Operational Risk Manager
☐		Developer Services Manager
☐		Business Development Manager
☐		Rates & Revenue Manager
☐		Corporate Planning Engineering Manager
☐		State President
☐		Corporate Senior Director of Engineering
☐		
☐		
☐		

Note : Double click on check box to select 'x'.

_____, _____**Region President**

Asset Planning

State Name American Water
Company Address

July 12, 2006

Re: State Name American Water
Comprehensive Planning Study – Water/Wastewater System

Dear Mr / Ms. _____:

Asset Planning is pleased to submit this Comprehensive Planning Study report for the State American Water's _____ district. The study was performed jointly by the ____Region Asset Planning Department and XXX Engineering. This study addresses all aspects of planning for this system, including the planning process, demand projections, source of supply, production and an analysis of the distribution system hydraulics. The report includes prioritized recommendations for capital improvements in a fifteen-year program.

We appreciate the cooperation and guidance provided by you and your staff during the course of this study.

Sincerely,

_____
Engineer – Asset Planning

_____
Asset Planning Manager

_____
Director – Engineering

American Water
1025 Laurel Oak Road
Voorhees, NJ 08043
USA
T +1 856 309 4586
F +1 856 782 3603
I www.amwater.com

APPENDIX B

ASSET PLANNING DOCUMENT CONTROL PROCEDURE

ASSET PLANNING DOCUMENT CONTROL PROCEDURES

All Asset Planning documents shall be considered confidential, and for security purposes, external distribution shall be in accordance with AW security procedures. For proper document tracking, each document copy should be provided a unique number and this number should be tracked in a database or spreadsheet along with the recipient of the document and the date of issuance. The Asset Planning Manager or Engineering Lead for each state is responsible for the proper tracking of document copies.

A Confidentially/Document Control form is included in this Appendix. Below is some guidance on how to complete the various sections of the Confidentiality/Document Control Form:

- **Issued To:** (include name, title and company/organization of individual to whom the report is issued.)
- **Date Issued:** (include date report is issued to recipient, not the date of the Study)
- **DCN#:** (document control number - a unique, sequential number for tracking purposes...see below)

The DCN was put in place for tracking reports. The number should be comprised of three parts separated by decimal points: The first four digits are the state and district. The second four numbers indicate the year and the number of the report in relation to other reports generated for the district. The third four numbers indicate the numbered copy, numbered consecutively as the report is issued.

For example, a CPS was issued for Jefferson City, Missouri in 2007. The state number and business district number are 17 and 12, respectively. Therefore, the first four digits of the DCN are 1712. Since this CPS was the first issued for Jefferson City in 2007, the second four digits are 0701. The remaining four digits are unique to the copy. The first report is numbered "1712.0701.0001," the second is numbered "1712.0701.0002", the third is numbered "1712.0701.0003," and so on. A tracking spreadsheet is provided in the Lotus Notes Planning Tools database to help Asset Planning Managers keep track of the distribution of copies.

XXX AMERICAN WATER
DISTRICT
(NAME OF REPORT)
COMPREHENSIVE PLANNING STUDY – DISTRICT NAME - DATE
CONFIDENTIAL

In accordance with the American Water Data Classification Policy, this document has been classified as **CONFIDENTIAL.** This is a controlled document and contains sensitive information intended solely for Company Use. Unauthorized disclosure could seriously and adversely impact Water System Security, the Company, its business partners, and/or its customers. Recipients of this document, whether transmitted by electronic or bound copy have a duty to protect this Confidential Information.

Issued To: _____

Date Issued: _____

DCN#: _____

Prepared by:
XXX AMERICAN WATER
ASSET PLANNING
DATE

APPENDIX C

GUIDANCE MANUAL

PLANNING PROGRAM REPORT

GUIDANCE MANUAL

PLANNING PROGRAM REPORT

(under development)

Introduction and Purpose
Each engineering function is responsible for having a full understanding of the condition and performance of all systems under its jurisdiction and for identifying, prioritizing and completing critical planning work for systems in need of planning. In order to accomplish these goals, a Planning Program Report (PPR) should be prepared annually, The State PPR represents the long range program of planning work to be completed over the next five to ten years. Planning needs identified on a system specific basis via the System Status Summaries as defined below, as well as other state-wide or value-added studies, are combined and prioritized in the State PPR.

Organization and Format
The Planning Program Report shall be organized as follows:

Section 1 State summary and recommended program
Section 2 State-wide or regional planning studies
Section 3 System Status Summaries (separate summary for each water and wastewater system)

A template for the document and a sample report can be found in the Lotus Notes Planning Tools database.

Description of Content:
The following section provides details on the content of each section of the report.

Section 1 State Summary and Recommended Program

This section provides an executive summary of the State PPR. It should contain the following:

- State map with service area locations outlined and labeled.
- General state information (total number of water and wastewater systems, total number of customers served)
- Planning Study Program Table, with brief introduction explaining reasoning behind most critical planning needs and prioritization methodology used.

The planning study program table lists the planning studies to be initiated over the next 5 to 10 years to address individual system planning needs as well as regional or state-wide planning studies or reports specified in Sections 2 and 3 below. Also included in this table will be study type, prioritization, approximate cost, estimated start year and duration. A template for the summary table is provided in the Lotus Notes Planning Tools database.

Section 2 State-wide or Regional Planning Studies

This section should include any planning studies or related work that addresses a specific topic or issue and that covers multiple water or wastewater systems across the state or a wide region. Examples include:

- water use or conservation studies or non-revenue water studies that assess all systems within a state
- regulatory reports on specific issues, such as adequacy of water allocation for all systems within the regulatory body's jurisdiction
- regionalization studies that evaluate options associated with sharing facilities (supplies, treatment, etc.) among several water or wastewater systems.
- energy efficiency studies (e.g. Cost savings associated with installing VFDs on pumps, utilization of storage in various systems for energy peak shaving, etc.)

The format and content of each recommended planning study in this section should be similar to that in the "Planning Recommendations" part of Section 3 below.

Section 3 System Status Summaries

A system status summary should be provided for each water and wastewater system. For each system, the following information should be provided:

1. System Description
    a. Size and location of the service area
    b. Number of customers served
    c. Description of major facilities and overall operation
2. Supply vs. Demand
    a. Discussion of average and maximum day demands – include any pending acquisitions or large new customers that could significantly impact demands.
    b. Discussion of sources of supply and capacity of production facilities – include any impending issues that have significant potential impact on supplies (State re-allocation, purveyor cutbacks, water quality degradation, etc.)
    c. Comparison of supply vs. demand (average and maximum day conditions)
    d. Graph showing historic and projected demands vs. supplies
3. System Status
    a. Regulatory Impacts
        1. Discussion of any current or future regulations that may require significant capital expenditures (e.g arsenic treatment, effects of groundwater rule, dam improvements to meet new standards, etc.)
    b. Performance Issues
        1. Discussion of any performance-related issues or problems that should be addressed through system analysis and possible capital projects (e.g. chronic low pressures during peak hour demands in large areas, water quality issues as seen through customer complaints or NOVs.)
    c. Infrastructure Issues

1. Discussion of any major issues regarding the condition or performance of major facilities that may warrant significant capital improvements (e.g. a major treatment plant upgrade due to poor facility condition, obsolete equipment or processes, etc.; major dam repairs due to age and deterioration)

4. Planning Recommendations

This section should include a summary of any recommendations for additional planning. A short description of the planning work should be provided along with the needs the study will address.

a. Each recommendation should be given a priority rating of high (immediate-3yrs), medium (within 3-6 years) or low (7+ years). The timing of planning work should coincide with the need. For example, if the system has been identified as a "flagged system" as defined in this Practice, a recommendation should be made to conduct a full CPS as soon as possible, and this should be rated as a high priority. If not a flagged system, but the supply vs. demand analysis indicates that a plant expansion may be needed in 15 years, a CPS should be scheduled such that there is adequate time to design, permit and construct the facilities and have them on-line in advance of the need, and such timing will dictate the priority rating of the associated planning work.

b. All ongoing and future planning work targeted for the specific system should be identified in this section. This may include CPSs, small system planning studies, targeted studies, and other planning studies. Some examples include:

    1. full CPS
    2. hydrogeologic or other type of groundwater study
    3. reservoir or streamflow safe yield analysis
    4. dam analysis (above routine inspection)
    5. hydraulic study or pressure surge analysis
    6. supply/demand update
    7. non-revenue water study (if not state-wide)
    8. conservation study (if not state-wide)

c. Recommendations should include an estimated cost for the study in current year dollars.

d. It is recognized that the status summary may discuss issues or problems that have already been analyzed and addressed in a recent planning study. The study may have already identified solutions and provided recommendations, and such projects are awaiting scheduling or pending budgetary approval. These situations should be identified so that the system is not identified as a flagged system, provided that the analysis and recommendations are still relevant.

5. Prior Planning Studies

a. List of recent planning studies and reports. Provide title, date completed, and systems included in study if not obvious by title. Summaries should be posted in the Lotus Notes Planning Reports database.

6. Capital Improvements Summary (optional)

   a. Provide a tabular summary of the status of all capital projects recommended in most recent planning study. Include title of project, estimated cost, and year completed or planned. This is useful in tracking the progress of recommendations. Over time Powerplant will provide this capability as recommended projects are loaded into the budget phase of Powerplant as part of the close of the CPS process.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
SANDRA D. KENNEDY
PAUL NEWMAN
BOB STUMP

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT AND SUN CITY WATER DISTRICT	DOCKET NO. W-01303A-09-
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER DISTRICT, SUN CITY WASTEWATER DISTRICT, AND SUN CITY WEST WASTEWATER DISTRICT	DOCKET NO. SW-01303A-09-

DIRECT TESTIMONY
OF
SANDRA L. MURREY
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
JULY 2, 2009

DIRECT TESTIMONY
OF
SANDRA L. MURREY
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Sandra L. Murrey testifies as follows:

RATE BASE

Common Rate-Base Adjustments

I sponsor these adjustments that appear on Schedule B-2, Original Cost Rate Base Pro Forma Schedule:

Adjustment SLM-1 adjusts for Accumulated Depreciation for (Over)/Under Depreciation from the last case to the end of the test year in this case.

Adjustment SLM-2 allocates the Common, or Corporate, Plant and Accumulated Depreciation to each of the districts based on the 4 Factor Allocations for 2008.

Adjustment SLM-7 removes the Deferred Debits that are not afforded rate treatment.

Adjustment SLM-8 decreases the Contributions in Aid of Construction balance for dollars associated with developer-funded projects that are still in Construction Work in Progress ("CWIP") and not included in rate base.

SPONSORED SCHEDULES.

Ms. Murrey sponsors the following schedules for each district in the case:

- Schedule E-1 – Comparative Balance Sheets
- Schedule E-5 – Detail of Plant in Service

I INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TELEPHONE NUMBER.

A. My name is Sandra L. Murrey. My business address is 19820 N. 7th Street, Suite 201, Phoenix, AZ 85024, and my business phone is 623-445-2490.

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

A. I am employed by Arizona-American Water Company ("Arizona-American" or "the Company") as a Rate Analyst.

Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE COMPANY.

A. My primary responsibility is to prepare regulatory filings for Arizona-American.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATION.

A. I joined Arizona-American in 2007 as a Regional Capital Compliance Analyst and was promoted to my current position in December of 2008. I have 18 years of experience working in the public utility industry, most of that time being employed with Wisconsin Electric Power Company ("WEPCo"). My responsibilities included financial reporting, pension analysis, unbilled revenue calculation, accounts payable and power marketing settlements. I progressed to Project Manager in the Federal Regulatory, Affairs and Policy Group where my responsibilities included monitoring WEPCo's tariffs to assure compliance with all federal/state decisions and rulings, tracking industry changes to determine company impact, as well as interactions with FERC, NERC, NAESB, and NARUC to assure WEPCo's position was fairly represented.

I have a Bachelor of Business Administration degree with a double major in Accounting and Real Estate from the University of Wisconsin – Milwaukee. I am a certified public accountant, licensed in the state of Wisconsin.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. No. I have not previously testified before this Commission.

II SCOPE AND PURPOSE OF TESTIMONY

Q. WHAT IS THE SCOPE AND PURPOSE OF YOUR TESTIMONY?

A. The scope and purpose of my testimony are set forth in my Executive Summary.

III RATE BASE (ALL DISTRICTS)

Q. PLEASE DESCRIBE THE RATE BASE ADJUSTMENTS SET FORTH ON SCHEDULE B-2 THAT YOU SPONSOR IN THIS CASE.

A. The first two adjustments I am sponsoring are Adjustment SLM-1 and Adjustment SLM-2. Adjustment SLM-1 adjusts Accumulated Depreciation for (Over)/Under Collections from comparing the books to a calculated depreciation expense each month, added to the allowed Accumulated Depreciation from the prior Order for each district. Adjustment SLM-2 allocates the Corporate district's Plant in Service and Accumulated Depreciation to each of the districts based on the 4 Factor Allocation. We use the number of General Metered Customers as a percent of total to allocate the Corporate Plant and Accumulated Depreciation.

Q. WHAT IS THE MAGNITUDE OF EACH OF THESE ADJUSTMENTS, SLM-1 AND SLM-2, BY DISTRICT?

A. Table 1 sets forth the Company's requested adjustments.

Table 1 – Common Rate Base Adjustments by District

Districts	SLM-1 A/D	SLM-2 Corp Allocn
Anthem Water	$ (131,572)	$ (26,237)
Sun City Water	$ (159,417)	$ (69,407)
Anthem / Agua Fria Wastewater	$ (67,019)	$ (38,246)
Sun City Wastewater	$ 79,536	$ (66,471)
Sun City West Wastewater	$ 27,624)	$ (45,297)
Total	**$ (306,096)**	**$ (245,658)**

Q. WHAT ARE THE NEXT RATE BASE ADJUSTMENTS THAT YOU ARE SPONSORING?

A. Adjustment SLM-7 removes Deferred Debits that are not eligible for inclusion in Rate Base. The test year value shown on line 24 of Schedule B-2 reflects the total of all deferred debit balances at the end of the test year for each district plus an allocation of the Corporate deferred debits reflected on the trial balance. This adjustment removes items that are not typically included in rate base.

Adjustment SLM-8 decreases the Contributions in Aid of Construction ("CIAC") balance associated with developer-funded projects that are still in CWIP at the end of the test year. Since these projects were not transferred from CWIP to Utility Plant in Service prior to December 31, 2008, they are not included in the Company's requested Rate Base, and accordingly, the contributions associated with these developer-funded projects should not be reflected as a reduction to the Company's Rate Base.

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSED ADJUSTMENTS TO REMOVE DEFERRED DEBITS AND CONTRIBUTIONS IN AID OF CONSTRUCTION ASSOCIATED WITH DEVELOPER-FUNDED CWIP FROM RATE BASE FOR THE TEST YEAR?

A. Table 2 sets forth the Company's proposed adjustments for Deferred Debits and CIACs:

Table 2 – Adjustments to Rate Base for Reduction of Deferred Debits and CIACs

Districts	Deferred Debits	Contributions
Anthem Water	$ (5,589,443)	$ 30,271
Sun City Water	$ (1,869,209)	$ 38,991
Anthem / Agua Fria Wastewater	$ (1,222,571)	$ 65,490
Sun City Wastewater	$ (1,797,743)	$ 3,743
Sun City West Wastewater	$ (4,006,472)	$ 0
Total	**$ (14,485,438)**	**$ 138,495**

IV COMPARATIVE STATEMENTS (ALL DISTRICTS)

Q. ARE YOU SPONSORING SOME OF THE E SCHEDULES?

A. Yes. I am sponsoring Schedule E-1, the Comparative Balance Sheet schedule for each district, and Schedule E-5, the Detail of Plant in Service schedule for each district.

Q. PLEASE DESCRIBE SCHEDULE E-1, THE COMPARATIVE BALANCE SHEET SCHEDULE?

A. Schedule E-1 consists of 2 pages. The Total Company Balance, Page 1 of Schedule E-1, displays Arizona-American's year end balances for the years 2006, 2007, and 2008 consistent with the Company's Trial Balance. Page 2 displays the same information contained on Page 1 but on a district-level basis. The Corporate Division is allocated to each district's trial balance based on each district's number of customers as a percentage of the total Arizona-American number of customers.

Q. PLEASE DISCUSS HOW SCHEDULE E-5 WAS PREPARED?

A. Schedule E-5 provides a detail of plant in service by NARUC subaccount. The district balances as well as that district's allocation of Corporate Division's plant is displayed. The first section displays district plant balances at December 31, 2007 and December 31, 2008 which are broken out by subaccount. The net change in plant from 2007 to 2008 is presented in the column labeled Additions, Retirements and Reclassifications. The lower section of the schedule shows similar detail of plant in service for the Corporate Division. The district is then assigned a portion of the Corporate Division's plant via an allocation factor based on number of customers per district. The ending balances on this schedule consist of the district's total and that district's corresponding common plant allocation.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES, Chairman
GARY PIERCE
BOB STUMP
PAUL NEWMAN
SANDRA D. KENNEDY

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER AND SUN CITY WATER DISTRICTS	DOCKET NO. W-01303A-09-____
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM / AGUA FRIA WASTEWATER, SUN CITY WASTEWATER AND SUN CITY WEST WASTEWATER DISTRICTS	DOCKET NO. SW-01303A-____

DIRECT TESTIMONY
OF
BENTE VILLADSEN
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JULY 2, 2009

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EXECUTIVE SUMMARY

Dr. Bente Villadsen, a Principal at *The Brattle Group*, files testimony on the cost of capital for Arizona-American Water Company's Anthem and Sun City water districts as well as for its Anthem /Agua Fria, Sun City and Sun City West wastewater districts.

Dr. Villadsen selects two benchmark samples, water utilities and gas local distribution companies ("LDC"). For the water sample, she primarily relies on a subsample that excluded Southwest Water which recently cut its dividend and also have announced it will restate part of its financials. Using two versions of the Discounted Cash Flow ("DCF") method and three versions of the Capital Asset Pricing Model ("CAPM"), she estimates the sample companies' after-tax weighted-average cost of capital. The after-tax weighted average cost of capital is the measure that companies most commonly use to evaluate investments and the measure recommended in standard financial textbooks. Textbooks, the academic literature as well as businesses weigh debt and equity by the market values in determining the after-tax weighted cost of capital.[1]

Having estimated the samples' after-tax weighted-average cost of capital for the samples, she determines the corresponding cost of equity for Arizona-American Water at its target of 45 percent equity. In undertaking her analysis, Dr. Villadsen notes that the overall cost of capital is constant within a broad middle range of capital structures although the distribution of costs and risks among debt and equity holders is not. Because the overall cost of capital is the same in a broad range of capital structures, there are no impacts on the rates customers pay from a higher or lower percentage of equity, so ratepayers are not affected by the choice of capital structure within a broad range. However, as Arizona-American Water's requested target of 45 percent equity is lower than the percentage equity among many utilities, its financial risk is higher and the return required by investors increases with the level of risk they carry, but this return is paid on a smaller amount of equity than is typical in the water industry. Therefore, the dollar amount paid

[1] For example, the Hamada article relied upon by Commission Staff in past proceedings uses market value capital structures.

by customers is the same as if the Company had a lower return on equity but a higher equity percentage.

Dr. Villadsen discusses the impact of the ongoing financial crisis on utilities' cost of capital and notes that while the yield on government issued bills and bonds is currently very low, the yield on investment-grade utility bonds is not. As utilities cannot raise debt (or equity) at the same rates as the government, it is necessary to take the yield on investment grade utility bonds into account in assessing the cost of capital for Arizona-American Water. Specifically, the yields on government bills and bonds have been driven artificially down by monetary policy and a flight to safety, so that the yields on these securities are not reflective of normal economic conditions. Consequently, Dr. Villadsen bases her CAPM models on a normalized risk-free rate which consists of the observed risk-free rate plus an adjustment for the increase in the spread between risk-free rates and investment grade utility bond yields. Further, equity investors have lost substantial value in capital markets over the past ¾ year and stock prices have been extremely volatile. As a result, investors risk aversion has increased and the premium they require to invest in stocks going forward has increased. Therefore, the risk premium associated with equity investments is currently higher than it has been in the recent past. Dr. Villadsen performs several sensitivity analyses on the impact hereof, but the requested return on equity is fully supported by her baseline analysis, which relies on a historical market risk premium. In other words, her recommended return on equity does not include the current higher risk premium making her recommendation more conservative.

In addition to the cost of capital estimation discussed above, Dr. Villadsen reviewed 20 recent decisions by the Arizona Corporation Commission to assess the reasonableness of Arizona-American Water's current request. When compared in terms of the overall return, the cost of equity requested by Arizona-American Water in this proceeding is comparable to that granted to other water and wastewater utilities in Arizona as adjusted using Arizona-American's targeted equity percentage.

Lastly, Dr. Villadsen notes that the water industry has seen substantial stock price drops in recent months, volatility in stock prices, and increased cost of debt. At the same time, the most commonly used measure of companies' systematic risk, the stock's beta, has remained high for water utilities. This indicates that capital markets continue to perceive water utilities as risky investments rather than safe havens. At the same time the water industry, including Arizona-American Water needs to invest substantial amounts in infrastructure to upgrade the distribution and transmission system as well as to develop new water resources. The industry also need to invest in wastewater collection and treatment. The needed infrastructure investment requires substantial external financing (i.e., new debt and equity) and access to capital requires that investors expect to earn their required return. Failure to provide adequate returns may discourage potential investors. While it may seem counterintuitive to increase the cost of capital during an economic recession, it is necessary to attract needed capital. Specifically, the increase in investment-grade utility bond yields and the decline in available equity capital show that investors are holding onto their funds and in order to attract investments, they will need to expect that they can earn a sufficient return on their investment that it is worth the risk. The June 2009 sale of American Water stock had been expected by the market for a long time and was priced at 80 percent of American Water's April 2008 Initial Public Offering price. The lower price means that everything else equal, investors expect to realize a higher return on their investment than they did a year ago. Thus, at the same income level as a year ago, it is consistent with an increased market risk premium.

Based on the evidence from the samples, Dr. Villadsen finds that Arizona-American Water's request for 12.25% return on equity is reasonable and fully supported by her analysis. The financial crisis has made the range of a reasonable return on equity wider and especially increased the upper bound on the range, so the requested return on equity is below the midpoint of the best range estimate of 11¾ percent to 13 percent.

I. INTRODUCTION AND SUMMARY

Q1. PLEASE STATE YOUR NAME AND ADDRESS FOR THE RECORD.

A1. My name is Bente Villadsen. My business address is *The Brattle Group*, 44 Brattle Street, Cambridge, MA 02138.

Q2. PLEASE DESCRIBE YOUR JOB AND EDUCATIONAL EXPERIENCE.

A2. I am a Principal of *The Brattle Group*, ("Brattle"), an economic, environmental and management consulting firm with offices in Cambridge, Washington, San Francisco, London, Brussels, and Madrid. My work concentrates on regulatory finance and accounting. I have previously prepared and presented cost-of-capital testimony before the Arizona Corporation Commission ("Commission"). I hold a B.S. and M.S. from University of Aarhus, Denmark and a Ph.D. from Yale University.

Q3. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A3. I have been asked by Arizona-American Water Company ("Arizona-American Water" or the "Company") to estimate the cost of equity for Arizona-American Water's water districts. The cost of equity is the return that the Commission should provide the Company an opportunity to earn on the portion of its rate base financed by equity.

To determine the cost of equity for Arizona-American Water, I first estimate the overall cost of capital for two samples (and a subsample) of regulated companies using several versions of the discounted cash flow ("DCF") and risk-positioning models. Second, I determine the cost of equity that the estimated overall cost of capital gives rise to at Arizona-American Water's requested capital structure consisting of 45 percent equity. Third, I evaluate the relative risk of Arizona-American Water and the sample companies to determine the recommended cost of equity for Arizona-American Water.

Q4. PLEASE SUMMARIZE ANY PARTS OF YOUR BACKGROUND AND EXPERIENCE THAT ARE PARTICULARLY RELEVANT TO YOUR TESTIMONY ON THESE MATTERS.

A4. Brattle's specialties include financial economics, regulatory economics, and the utility industry. I have worked extensively on cost of capital matters for electric, natural gas distribution, pipeline and water utilities in state, federal, and foreign jurisdictions. Additionally, I have significant experience in other areas of rate regulation, credit risk in the utilities industry, energy contracts, and accounting issues. I have filed expert testimony and appeared before regulatory commissions and arbitration tribunals as well as in federal court concerning cost of capital, accounting questions, and damage issues. I have previously filed cost of capital testimony before this Commission. Appendix A contains more information on my professional qualifications.

Q5. PLEASE SUMMARIZE YOUR APPROACH TO ESTIMATING THE COST OF CAPITAL FOR ARIZONA-AMERICAN WATER.

A5. To assess the cost of capital for Arizona-American Water, I select two benchmark samples, regulated water utilities and natural gas local distribution companies ("LDC"). These samples are selected to have risks characteristics comparable to those of Arizona-American Water. I also report results for a subsample of the water companies which are less likely to have unique issues that may affect the cost of capital estimates. I give greater weight to the results from the gas LDC sample and the water subsample than to the full water sample. For each sample, I estimate the sample companies' cost of equity using several versions of the DCF method and of the risk-positioning model. Based on data availability and the current state of the water and gas distribution industries I assign the most weight to the risk-positioning models.

Next, based on the cost-of-equity estimates for each company and its market costs of debt and preferred stock, I calculate each firm's overall cost of capital, i.e., its after-tax weighted-average cost of capital ("ATWACC"), using the company's market value capital structure. I then calculate the samples' average ATWACC and the cost of equity for a capital structure with 45 percent equity. Thus, I present the cost of equity that is consistent with the samples' market information and Arizona-American Water's

regulatory capital structure. (By "regulatory capital structure," I mean the capital structure that Arizona-American Water proposes in its application.)

Focusing on the overall cost of capital rather than its components avoids potential problems of inconsistency between the estimated cost of equity and the level of financial risk at the regulated company's capital structure.

Q6. ARE THERE ANY UNIQUE ISSUES IN ESTIMATING THE COST OF CAPITAL AT THIS POINT IN TIME?

A6. Yes. I discuss the effect of the credit crisis on the cost of capital in more detail in *Section III* below, but in general, the cost of capital is higher for all companies today than it was before the crisis. Unfortunately, the turmoil in the financial markets also affects the results of the estimation models so that estimating the cost of capital under current conditions is more difficult than it would normally be. Because of the unusual conditions prevailing today, I report the cost of capital from several sensitivity analyses in addition to a baseline result. These analyses are discussed further below.

Q7. USING YOUR BASELINE RESULTS, PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING ARIZONA-AMERICAN WATER'S COST OF EQUITY.

A7. Using the risk positioning models, the baseline cost of equity estimate for both the water subsample and the gas LDC sample is about 12½ percent at Arizona-American Water's regulatory capital structure. The result for the full water sample is higher at about 13 percent. However, it is more accurate to say that the estimated range for the water subsample is approximately 12 to 13 percent while the range for the gas LDC sample is narrower at about 12 to 12¾. The range for the full water sample is a bit higher at about 12½ to 13¾ percent. The DCF estimates for the water sample and subsample vary widely from approximately 11½ to 16½ percent while the gas LDC sample estimates are in a narrow range from 12 to 12¼ percent. Because the growth rates underlying the water sample's DCF estimates wary widely not only among companies but also among analysts, little weight is attached to the water sample's (or water subsample's) DCF estimates.

The sensitivity analyses that incorporate the impact of the current financial crisis on the cost of equity lead to higher cost of equity estimates. Thus, I believe 12¼ percent is a conservative estimate of the current cost of equity for Arizona-American water which is fully supported by all analyses. Therefore, in my opinion, Arizona-American Water's request for 12.25 percent return on equity is very reasonable.

Q8. WHY DO YOU NEED TO CONSIDER ARIZONA-AMERICAN WATER'S REGULATORY CAPITAL STRUCTURE?

A8. A firm's cost of equity is a function of both its business risk and its financial risk. The more leveraged a company is the higher its financial risk. Investors holding equity in companies with higher risk require a higher rate of return, so as a company adds debt, the cost of equity goes up at an ever increasing rate. The higher cost of equity offsets the lower cost of debt, so that the after-tax weighted-average overall cost of capital remains constant over a broad range of capital structures.

That is, the associated capital structure affects an estimated cost-of-equity estimate just as a life insurance applicant's age affects the required life-insurance premium. It is therefore necessary to calculate the cost of equity the sample companies would have had at Arizona-American Water's regulatory capital structure to report accurately the market evidence on the cost of equity.

Q9. HOW IS THE REST OF YOUR TESTIMONY ORGANIZED?

A9. The rest of my testimony is organized as follows:

Section II defines the cost of capital and discusses the principles that relate a company's cost of capital and its capital structure.

Section III discusses the impact on cost of capital of the current turmoil in financial markets and methods to estimate the relevant risk-free rate and market risk premium under current financial market conditions.

Section IV presents the methods used to estimate the cost of capital for the benchmark samples, and the associated numerical analyses. This section also explains the basis of my conclusions for the benchmark samples' returns on equity and overall costs of capital.

Section V summarizes the analysis and discusses the recommendation for Arizona-American Water.

Appendix A lists my qualifications.

Appendix B discusses in detail the selection procedure for each sample, and the methods used to derive the necessary capital structure market value information.

Appendix C details the risk-positioning method including the numerical analyses.

Appendix D details the DCF method, including the numerical analyses.

Appendix E discusses the impact of leverage on the cost of capital in more detail.

I repeat portions of my testimony in the appendices in order to give the reader the context of the issues before I present additional technical detail and further discussion.

II. THE COST OF CAPITAL AND RISK

A. The Cost of Capital and Risk

Q10. PLEASE FORMALLY DEFINE THE "COST OF CAPITAL."

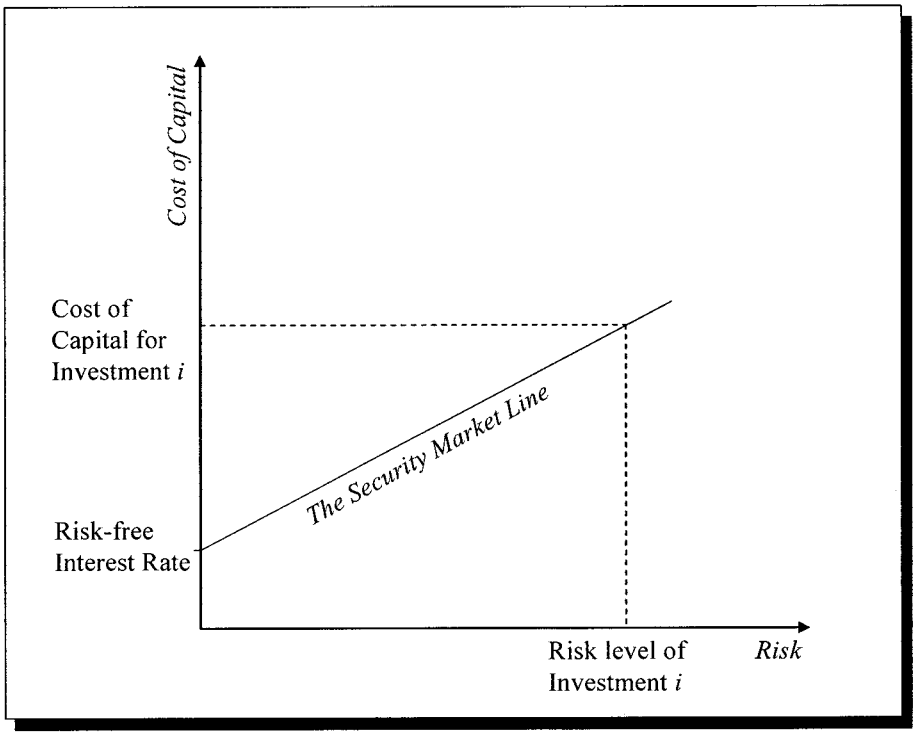
A10. The cost of capital is the expected rate of return in capital markets on alternative investments of equivalent risk. In other words, it is the rate of return investors require based on the risk-return alternatives available in competitive capital markets. The cost of

capital is a type of opportunity cost: it represents the rate of return that investors could expect to earn elsewhere without bearing more risk.[2]

The definition of the cost of capital recognizes a tradeoff between risk and return that is known as the "security market risk-return line," or "security market line" for short. This line is depicted in Figure 1. Figure 1 shows that the higher the risk, the higher the cost of capital. The risk depicted on the horizontal axis in Figure 1 is often measured by the security's beta, which measures the security's systematic risk in comparison to the market as a whole. The market as a whole has a beta of 1, so betas below one indicate a security with less systematic risk than the market whiles a beta above 1 indicate a security with higher systematic risk than the market. A version of Figure 1 applies for all investments. However, for different types of securities, the location of the line may depend on corporate and personal tax rates.

[2] "Expected" is used in the statistical sense: the mean of the distribution of possible outcomes. The terms "expect" and "expected" in this testimony, as in the definition of the cost of capital itself, refer to the probability-weighted average over all possible outcomes.

Figure 1: The Security Market Line



Q11. WHY IS THE COST OF CAPITAL RELEVANT IN RATE REGULATION?

A11. U.S. rate regulation accepts the "cost of capital" as the right expected rate of return on utility investment.[3] This practice is normally viewed as consistent with the U.S. Supreme Court's opinions in *Bluefield Waterworks & Improvement Co. v. Public Service Commission*, 262 U.S. 678 (1923), and *Federal Power Commission v. Hope Natural Gas*, 320 U.S. 591 (1944).

From an economic perspective, rate levels that give investors a fair opportunity to earn the cost of capital are the lowest levels that compensate investors for the risks they bear. Over the long run, an expected return above the cost of capital makes customers overpay for service. Regulatory authorities normally try to prevent such outcomes, unless there are offsetting benefits (e.g., from incentive regulation that reduces future costs). At the same time, an expected return below the cost of capital does a disservice not just to

investors but, importantly, to customers as well. In the long run, such a return denies the company the ability to attract capital, to maintain its financial integrity, and to expect a return commensurate with that of other enterprises characterized by commensurate risks and uncertainties.

More important for customers, however, are the economic issues an inadequate return raises for them. In the short run, deviations of the expected rate of return on the rate base from the cost of capital may seemingly create a "zero-sum game"-- investors gain if customers are overcharged, and customers gain if investors are shortchanged. But in fact, even in the short run, such action may adversely affect the utility's ability to provide stable and favorable rates because some potential efficiency investments may be delayed or because the company is forced to file more frequent rate cases. In the long run, inadequate returns are likely to cost customers – and society generally – far more than may be gained in the short run. Inadequate returns lead to inadequate investment, whether for maintenance or for new plant and equipment. The costs of an undercapitalized industry can be far greater than the short-run gains from shortfalls in the cost of capital. Moreover, in capital-intensive industries (such as the water industry),[4] systems that take a long time to decay cannot be fixed overnight. Thus, it is in the customers' interest not only to make sure that the return investors expect does not exceed the cost of capital, but also to make sure that it does not fall short of the cost of capital, either.

Of course, the cost of capital cannot be estimated with perfect certainty, and other aspects of the way the revenue requirement is set may mean investors expect to earn more or less than the cost of capital even if the allowed rate of return equals the cost of capital exactly. However, a commission that sets rates so investors expect to earn the cost of capital on average treats both customers and investors fairly, which is in the long-run interests of both groups.

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[3] An early paper that links the cost of capital as defined by financial economics with the correct expected rate of return for utilities is Stewart C. Myers, "Application of Finance Theory to Public Utility Rate Cases," *The Bell Journal of Economics and Management Science*, 3:58-97 (Spring 1972).

[4] Capital expenditures among water utilities have in the last several years exceeded 3 times income.

While it may seem counter-intuitive that the cost of capital has increased in a market where many companies and individuals have seen their income decline, it is important to keep two facts in mind. First, the cost of capital is an *expected* rate of return and thus a forward looking measure as opposed to a measure of the recent past. Therefore, low realized returns in, for example, 2008 do not necessarily reflect the *expected* rate of return. As market volatility and investors' risk aversion has increased, investors are likely to require a higher return for providing capital. Second, it the expected rate of return that is available in capital markets on alternative investments of equivalent risk, so a key question becomes what the return on alternative investments is. The yields on investment grade utility bonds, which are relatively low risk, have increased, so utility stock would expect a higher rate of return, too. Therefore, the cost of equity in today's financial markets is higher than it was before the financial crisis.

B. Business Risk and Financial Risk: Capital Structure and the Cost of Equity

Q12. WHAT IS THE DIFFERENCE BETWEEN BUSINESS RISK AND FINANCIAL RISK?

A12. Business risk is the risk of a company from its line of business if it used no debt financing. When a firm uses debt to finance its assets, the business risk of the assets is shared between the debt holders and the equity holders, but the equity holders bear more of the risk because debt holders have a prior claim on the company's cash flows. Equity holders are residual claimants, which simply mean that equity holders get paid last. In other words, the use of debt imposes financial risk on equity holders. The goal of selecting a sample is to choose companies whose business risk is judged to be comparable to the regulated company in the proceeding. As a result, differences in financial risk must be dealt explicitly.

Q13. PLEASE EXPLAIN WHY IT IS NECESSARY TO REPORT THE COST OF EQUITY ADJUSTED FOR CAPITAL STRUCTURE.

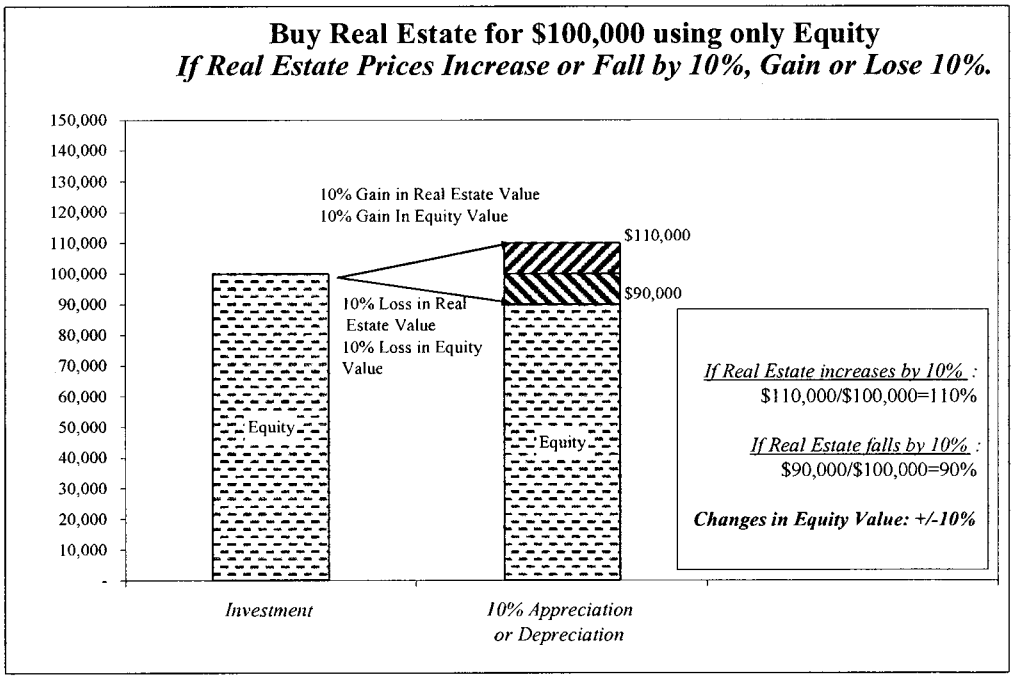
A13. Rate regulation in North America has traditionally focuses on the components of the rates.[5] In other words, the focus of cost-of-capital estimation is usually on determining the "right" cost of equity, and to a lesser degree on setting the allowed capital structure. While the overall cost of capital depends primarily on the company's line of business, the distribution of the cost of capital among debt and equity depends on their share in total revenues. Debt holders' claim is usually a fixed amount (except in situations of default) while equity holders are residual claimants, meaning that equity holders get paid last. In other words, the use of debt imposes financial risk on the equity holders. Because a company's financial risk depends on its capital structure, the risk shareholders carry increases with the leverage of the company. As shareholders expect to be compensated for increased risk, the required rate of return increases with the company's leverage. The increased risk is caused by the fact that debt has a senior claim on a specified portion of earnings and in bankruptcy on assets. As common equity is the most junior security, it gets what's left after everyone else has been paid. In other words, common equity holders carry all residual risk. However, as explained in more detail in Appendix E, the overall cost of capital is constant within a broad middle range of capital structures, although the distribution of costs and risks among debt and equity holders is not.

Q14. PLEASE PROVIDE AN EXAMPLE ON HOW DEBT ADDS RISK TO EQUITY.

A14. As a simple example, think of an investor who takes money out of his savings account and invests $100,000 in real estate. The future value of the real estate is uncertain. If the real estate market booms, he wins. If the real estate market goes down, he loses. Figure 2 below illustrates this.

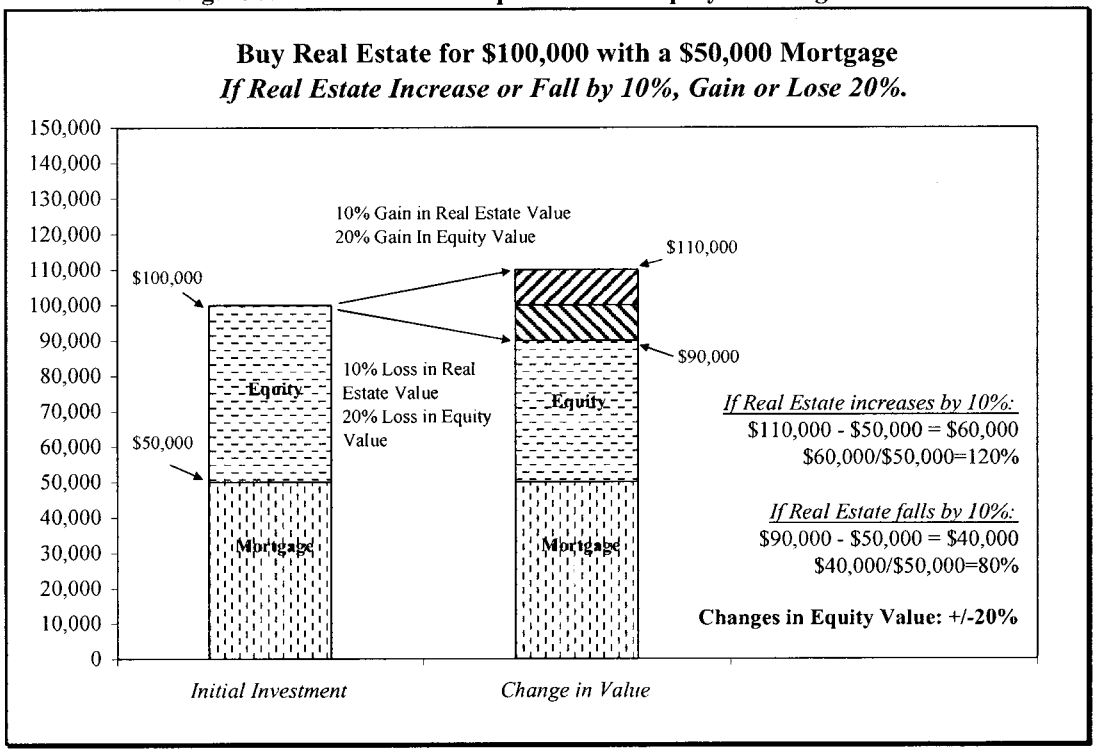
[5] An exception is the recent decision by the National Energy Board of Canada which in its RH-1-2008 decision, issued March 2009, determined the after-tax weighted average cost of capital rather than a return on equity and a capital structure.

Figure 2. Financial risk example – equity financing



In the scenario above, the investor financed his real estate purchase through 100 percent equity. Suppose instead that the investor had financed 50 percent of his real estate investment with a mortgage of $50,000. The mortgage lender does not expect to share in any benefits from increases in real estate values. Neither does the mortgage lender expect to share in any losses from falling real estate values. As a result, the investor carries the entire risk of fluctuating real estate prices. Figure 3 illustrates this effect.

Figure 3. Financial risk example - debt and equity financing



In Figure 3, where the investor financed his purchase through 50 percent equity and 50 percent debt, the variability in the investor's equity return is two times greater than that of Figure 2. The entire fluctuation of 10 percent from rising or falling real estate prices falls on the investor's $50,000 equity investment. The lesson from the example is obvious: debt adds risk to equity.

C. Implications for Analysis

Q15. PLEASE EXPLAIN THE IMPLICATIONS OF THE RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND THE COST OF EQUITY FOR RATE REGULATION.

A15. The risk equity holders carry, and therefore the cost of equity, depends on the capital structure. As illustrated in the example above, as leverage increases, the market risk increases and hence the required return on equity increases.

Q16. TO ASSESS THE MAGNITUDE OF FINANCIAL RISK FOR A RATE REGULATED COMPANY, SHOULD YOU USE THE MARKET-VALUE OR THE BOOK-VALUE CAPITAL STRUCTURE?

A16. The market-value capital structure is the relevant quantity for analyzing the cost-of-equity evidence, which is based on market information.[6]

Q17. PLEASE PROVIDE AN EXAMPLE THAT ILLUSTRATES WHY MARKET VALUES ARE RELEVANT.

A17. Suppose in the previous example that the investor has invested in real estate 10 years ago. Further assume that depreciation has reduced the book value of the real estate from $100,000 to $75,000 and assume the investor has paid off 40 percent of his $50,000 mortgage. Thus, the investor has a remaining mortgage of $30,000 (= 60% × $50,000). The book value of the investor's equity is therefore $45,000 (= $75,000 - $30,000).

What happens now if real estate prices rise or fall 20 percent? To answer that question, we need to know how real estate prices have developed over the past 10 years. If the market value of the real estate now is $200,000, then a 20-percent decrease in the price of real estate ($40,000) is almost equal to the investor's book value equity. However, his market value equity (or net worth) is equal to the value of the real estate minus what he owes on the mortgage. If we assume that the market value of the mortgage equals the unpaid balance ($30,000), then the investor's net worth is calculated as follows:

[6] The need to use market-value capital structures to analyze the effect of debt on the cost of equity has been recognized in the financial literature for a long time. For example, the initial reconciliation of the Modigliani-Miller theories of capital structure with the Capital Asset Pricing Model, in Robert S. Hamada, "Portfolio Analysis, Market Equilibrium and Corporate Finance," *The Journal of Finance* 24: 13-31 (March 1969) works with market-value capital structures. For a more recent presentation of the concept, see, for example, Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, New York: McGraw-Hill/Irwin 9th ed. (2008) ("Brealey, Myers, and Allen (2008)") pp. 530-533. Book values may be relevant for some issues, e.g., for covenants on individual bond issues, but as explained in the text, market values are the determinants of the impact of debt on the cost of equity.

Net Worth	=	Market Value of Real Estate	-	Remaining Mortgage
	=	$200,000	-	$30,000
	=	$170,000		

Therefore, the rate of return on equity due to a 20 percent decline in real estate prices is calculated as follows:

Table 1. Calculating the Rate of Return on Equity

Decline in Real Estate Value	$40,000
Market-Value Equity	$170,000
Rate of Return on Equity	- $40,000/$170,000 = -23.5%

Q18. PLEASE EXPLAIN THE IMPLICATIONS FOR RATE REGULATION AND YOUR TESTIMONY.

A18. Because the market risk, and therefore the cost of equity, depends on the market-value capital structures, one must base the estimation of the sample companies' cost of capital on market value capital structures. An approach that estimates the cost of equity for each of the sample firms without explicit consideration of the market value capital structure (i.e. the financial risk) underlying those costs risks material errors. The cost-of-equity estimates of the sample companies at their actual market-value capital structures are not necessarily reflected in the regulatory capital structure. Therefore, using book values could lead to an incorrect rate of return. I avoid this problem by calculating each sample company's ATWACC using its market value capital structure. I then use the sample companies' average overall cost of capital to determine the corresponding return on equity at Arizona-American Water's regulatory capital structure. This procedure ensures that the capital structure and the estimated cost of equity are consistent.

In my analyses, I estimate the cost of equity for each of the sample firms using traditional estimation methods (such as the DCF and Capital Asset Pricing Model ("CAPM")). For

each estimation method, I use each sample company's estimated cost of equity, market cost of debt and market-value capital structure to estimate along with Arizona-American Water's marginal tax rate to estimate each sample company's overall cost of capital. I then calculate the samples' average overall cost of capital for each estimation method. Finally, I determine the cost of equity that is associated with the estimated ATWACC at Arizona-American Water's regulated capital structure. Thus, the samples' overall cost-of-capital and that of Arizona-American Water is the same.

Q19. IS THE USE OF MARKET VALUES TO CALCULATE THE IMPACT OF CAPITAL STRUCTURE ON THE RISK OF EQUITY INCOMPATIBLE WITH USE OF A BOOK-VALUE RATE BASE FOR A REGULATED COMPANY?

A19. No. Investors buy stock at market prices and expect a reasonable return on their investment. Market-based cost-of-equity estimation methods, such as DCF or CAPM which are frequently used in rate regulation, recognize this and rely on market data. That is, the cost of capital is the fair rate of return on regulatory assets for both investors and customers. Most regulatory jurisdictions in the U.S. measure the rate base using the net book value of assets, not current replacement value or historical cost trended for inflation. But the jurisdictions still apply market-derived measures of the cost of equity to that net book value rate base.

The issue here is "what level of risk is reflected in that cost-of-equity estimate?" That risk level depends on the sample company's market-value capital structure, not its book-value capital structure. *That risk level would be different if the sample company's market-value capital structure exactly equaled its book-value capital structure, so the estimated cost of equity would be different, too.*

Q20. PLEASE SUM UP THE IMPLICATIONS OF THIS SECTION.

A20. The market risk, and therefore the cost of equity depends directly on the market-value capital structure of the company or asset in question. It therefore is impossible to validly compare the measured costs of equity of different companies without taking capital structure into account. Capital structure and the cost of equity are unbreakably linked,

and any effort to treat the two as separate and distinct questions violates both everyday experience (e.g., with home mortgages) and basic financial principles.

Q21. HOW SHOULD A COST-OF-CAPITAL ANALYST IMPLEMENT THIS PRINCIPLE?

A21. As discussed further in Appendix E, there has been a great deal of financial research on the effects of capital structure on the value of the firm. One of the key conclusions that result from the research is that no narrowly defined optimal capital structure exists within industries, although the typical range of capital structures does vary among industries. Instead, there is a relatively wide range of capital structures within any industry in which fine-tuning the debt ratio makes little or no difference to the value of the firm, and hence to its overall after-tax cost of capital.

Accordingly, analysts should treat the market-value weighted average of the cost of equity and the after-tax current cost of debt, or the "ATWACC" for short, as constant. Sample evidence should be analyzed to determine the sample's average ATWACC, which can be compared across different firms or industries. The economically appropriate cost of equity for a regulated firm is the quantity that, when applied to the regulatory capital structure, produces the same ATWACC. That value is the cost of equity that the sample would have had, estimation problems aside, if the sample's market-value capital structure had been equal to the regulatory capital structure in question.

Q22. HOW DO YOU CALCULATE THE COST OF EQUITY CONSISTENT WITH THE MARKET-DETERMINED ESTIMATE OF THE SAMPLE'S AVERAGE COST OF CAPITAL?

A22. For simplicity assume that all sample companies have only common stock and debt. Then the ATWACC is calculated as:

$$ATWACC = r_D \times (1 - T_C) \times D + r_E \times E \qquad \textbf{(1)}$$

where r_D is the market cost of debt, r_E is the market cost of equity, T_C is the marginal corporate income tax rate, D is the percent debt in the capital structure, and E is the

percent equity in capital structure. The cost of equity consistent with the overall cost-of-capital estimate (ATWACC), the market cost of debt and equity, the marginal corporate income tax rate and the amount of debt and equity in the capital structure can be determined by solving equation (1) for r_E.

Q23. WHY DOESN'T ARIZONA-AMERICAN WATER SIMPLY INCREASE ITS EQUITY RATIO SO THAT NO ADJUSTMENT IS NEEDED?

A23. First, as long as a utility operates within a broad middle range of capital structure the total capital costs are the same, so it is not clear why it would affect rates. Second, the current financial crisis has made it difficult or costly to raise capital and especially equity capital at a time when American Water is working towards an increase in its equity ratio. As stock prices, including that of American Water, have declined, the amount of equity capital that can be raised by increasing the number of shares by, for example, 10 percent declines. Therefore, it is at the moment not straightforward to increase the equity percentage significantly. Third, the higher return on equity at 45.15 percent equity than at 50 or 60 percent equity is not a reward for having a low equity ratio, but simply a mechanism to guarantee that the overall return on capital is similar for utilities with different capital structure. In summary, there is no harm to ratepayers because rates are affected by the total return rather than the return on equity, so it would be misguided to raise equity capital for the sole purpose of having an average capital structure.

Q24. CAN YOU PROVIDE AN EXAMPLE OF HOW THIS FORMULA IS USED TO DETERMINE THE COST OF EQUITY?

A24. Yes. Consider a company with a 40 percent marginal corporate income tax rate and a cost of debt equal to 6 percent. For simplicity, I assume there is no difference in the company's embedded cost of debt and the cost at which it currently can issue additional debt. Further, suppose that the ATWACC estimate based on a sample of companies with comparable business risk is 7.5 percent. If the company's capital structure has 50 percent debt and 50 percent equity, equation (1) above yields a cost-of-equity estimate of 11.4 percent. If the equity ratio is lower, for example 45 percent, the cost of equity would instead be 12.3 percent. Conversely, a higher equity ratio such as 55 percent would

imply a lower cost-of-equity estimate of 10.7 percent. Table 2 below summarizes these calculations as well as the dollar amount customers have to pay for financing costs.

Table 2. Example of the effect of capital structure on the estimated cost of equity.

Marginal tax rate	40%		
Cost of debt	6%		
Estimated ATWACC	7.50%		
Rate Base	$ 1,000,000		
Regulatory Equity Ratio	45%	50%	55%
Regulatory Debt Ratio	55%	50%	45%
Estimated ATWACC	7.50%	7.50%	7.50%
Cost-of-equity	12.3%	11.4%	10.7%
After Tax Cost of Financing[1)]	$ 75,000	$ 75,000	$ 75,000
Before Tax Cost of Financing[2)]	$ 125,000	$ 125,000	$ 125,000

[1)] Estimated ATWACC × Rate Base.
[2)] Estimated ATWACC × Rate Base / (1 - Tax Rate).

The important point of this example is that the overall cost of capital does not depend on the company's capital structure, as long as the capital structure is in a wide middle range of values. Therefore, the cost to customers does not depend on the capital structure either. A higher equity ratio simply means that a higher percentage return is paid to equity investors, but the fraction of the rate base to which this higher return applies is lower. The equity investors are compensated appropriately for the higher risk, but that has no effect on the overall cost borne by customers. As long as equity investors are correctly compensated for the risk of their investment, the only effect that a higher equity ratio has is on how the return is divided between debt holders and equity holders, and not on how much customers end up paying.

Q25. BUT IS IT NOT THE CASE THAT IF THE ALLOWED RATE OF RETURN ON EQUITY IS LOWER, THEN ALL ELSE EQUAL RATEPAYERS PAY LESS?

A25. Yes, for a given equity percentage. However, it comes at a cost: if the rate of return on equity appropriate for a capital structure with 55 percent equity were applied to a company whose equity ratio is 45 percent, the company's equity investors would not be appropriately compensated for the risk of their investment. In particular, in this situation

the expected return on equity would be set too low. Such a result would impair the company's ability to attract investors, since they can expect higher returns elsewhere for the same risk level. This may well have negative consequences for the utility's ability to sustain an appropriate level of investment. Ultimately, this translates into a lower quality of the services that the utility can provide to its customers. Alternatively, the company could reduce its equity percentage with possibly negative effects on the cost of debt or other credit factors.

Q26. ARE YOU AWARE THAT COMMISSION STAFF PREFERS A SPECIFIC METHDOLOGY AND THAT STAFF IN THE PAST HAS VIEWED THE ATWACC METHDOLOGY APPLIED TO MARKET VALUES AS NON-STANDARD?

A26. Yes. In past proceedings, Commission Staff has typically relied on two versions of the DCF methodology and two versions of the risk-positioning methodology. In addition, Staff has in the past taken differences between the sample's and Arizona-American Water's book-value capital structure into account. Thus, Commission Staff has in the past acknowledged that differences in capital structure needs to be considered as companies with less equity face higher financial risk and relied upon the so-called Hamada methodology to compensate Arizona-American Water for having higher financial risk that the sample companies.[7] However, the Hamada article that derives the Hamada methodology clearly uses market values[8] as do newer expositions of the results. It is also noteworthy that the National Energy Board of Canada in a recent decision granted an ATWACC rather than a return on equity stating that "the ATWACC approach better utilizes financial market information" and "market values reflect the level of financial risk that equity holders bear for the sample companies."[9] Thus, the National Energy Board and financial economists agree that market values are what determine the financial risk.

[7] See, for example, Direct Testimony of Pedro M. Chaves in Docket WS-01303A-06-0491 p. 12 and pp. 35-36.

[8] Robert S. Hamada, "Portfolio Analysis, Market Equilibrium and Corporate Finance," *The Journal of Finance* 24: 13-31 (March 1969).

[9] National Energy Board, RH-1-2008, p. 18 and p. 29.

III. IMPACT OF CURRENT ECONOMIC TURMOIL ON THE COST OF CAPITAL

Q27. WHAT DO YOU DISCUSS IN THIS SECTION?

A27. This section addresses the effect of the current economic situation on the cost of capital and modifications to my standard procedures that are necessary to estimate the cost of capital more accurately.

Q28. PLEASE SUMMARIZE THE EFFECT OF CURRENT ECONOMIC CONDITIONS ON THE COST OF CAPITAL.

A28. The ongoing economic situation in the U.S. as well as most of the rest of the world makes investments highly uncertain. Economic growth has slowed, and it is negative in many countries. Stock markets worldwide have lost substantial value over a short period of time. For example, the S&P 500 fell by about 30 percent over the five month period from the beginning of August 2008 to the end of December 2008. At the same time the volatility of the index and financial markets in general has increased dramatically. (See Figure 4 below.) The likely result of the increased uncertainty is that investors' risk aversion has increased, which, in turn, means that the cost of capital is higher today than in the recent past.

Q29. WHAT DO YOU MEAN BY THE TERM INVESTOR "RISK AVERSION"?

A29. Risk aversion is simply the recognition that investors dislike risk. A fundamental tenet of investing is that investors face a risk-return tradeoff in selecting from among the various investment options. Risk-averse investors can only be induced to accept more risk if the expected return is higher. When investors' risk aversion increases, the expected return (sometimes called the required return) increases for any level of risk.[10] In other words, the market risk premium, the premium required for an average risk stock, is higher today than it was in the recent past.

[10] The term "coefficient of risk aversion" is frequently used in academic articles in conjunction with an assumption regarding investors' utility functions. In this testimony, I am using the term in a more generic sense.

Q30. WHAT EVIDENCE DO YOU HAVE THAT INVESTORS' RISK AVERSION HAS INCREASED?

A30. A number of readily observable factors indicate an increase in investors' risk aversion. Unprecedented defaults in debt instruments that had previously been highly rated (AA or A), such as collateralized debt obligations and mortgage-backed securities, and the fall in value of most securities caused investors to seek investments that would preserve the value of their investments. As a result, there has been a "flight to safety" by investors seeking to maintain the value of their investments. In general, investors perceive bonds as less risky (safer) than equity and government bonds as safer than corporate bonds. As a result, the demand for bonds, particularly government debt, has increased substantially. In fact, at what *may* have been the height of the crisis, the demand for and hence the price of U.S. Treasury bills was so high that the yield (or return) on U.S. Treasury bills actually fell below zero![11] The flight to safety had two other results. First, the yield spread between corporate bonds and government bonds has increased dramatically. Although the yield spreads have declined somewhat from their highest levels, they remain high by historical standards as can be seen in Table 3 below. Therefore, using the current risk-free rate in the risk-positioning models will not accurately reflect the risk inherent in owning equity. Specifically, the ***increase*** in yield spread has to be taken into account.

[11] "Treasury Bills Trade at Negative Rates as Haven Demand Surges", by Daniel Kruger and Cordell Eddings, *Bloomberg*, December 9, 2008.

Table 3

Spreads between US Utility Bond (20 year maturity) and US Treasury Bond (20 year maturity)					
Periods	Bloomberg A-Rated Utility and Treasury	Bloomberg BBB-Rated Utility and Treasury	Moody's A-Rated Utility and Treasury	Moody's BBB-Rated Utility and Treasury	Notes
Period 1 - Average Apr-1991 - 2007	0.95	1.25	1.13	1.44	[a]
Period 2 - Average Aug-2008 - 2009	2.69	3.55	2.70	3.96	[b]
Period 3 - Average Apr-2009	2.39	3.61	2.53	3.98	[c]
Period 4 - Average 15-Day (April 27, 2009 to May 15, 2009)	2.19	3.41	2.39	3.69	[d]
Spread Increase between Periods 2 and 1	1.74	2.30	1.45	2.71	[e] = [b] - [a].
Spread Increase between Periods 3 and 1	1.43	2.36	1.28	2.73	[f] = [c] - [a].
Spread Increase between Periods 4 and 1	1.24	2.16	1.14	2.44	[g] = [d] - [a].

Source:
Spreads for the periods are calculated from Bloomberg and Moody's yield data.
Average monthly yields for the indices were retrieved from May 18, 2009.

Second, the stock market has plummeted in value as investors attempted to move out of investments considered risky to those of lower risk. Increased risk aversion translates into a requirement for an investment to provide a higher expected return for a given level of risk. Under such circumstances, prices of investments fall until investors can again expect to earn their (now higher) required rate of return. Of course, part of the fall in prices is the result of a fall in expected cash flows, but it is also the result of increased risk aversion as indicated by the differential decrease in investments of different risk.

Q31. HOW DIFFERENT IS THE OVERALL ECONOMIC ENVIRONMENT NOW COMPARED TO OTHER TIME PERIODS IN WHICH YOU HAVE TESTIFIED?

A31. We now live in a very different economic environment compared to one or two years ago. The U.S. and world economies are in a state of recession triggered by the deep financial crisis that emerged from the housing bubble and from financial institutions' use of sophisticated structures that concealed the true risk faced by the investors. Stock markets are down, market volatility and the spread on corporate debt is high, and for most firms it has become hard to gain access to external financing on reasonable terms.

More specifically, as Figure 4 below indicates, the S&P 500 index declined by approximately 35 percent between mid 2008 and May 2009. The average water utility

followed by *Value Line* saw its stock price decline by 15-20 percent over the past year, but Southwest Water's stock price was cut in half while, for example, California Water saw only a modest decline.[12]

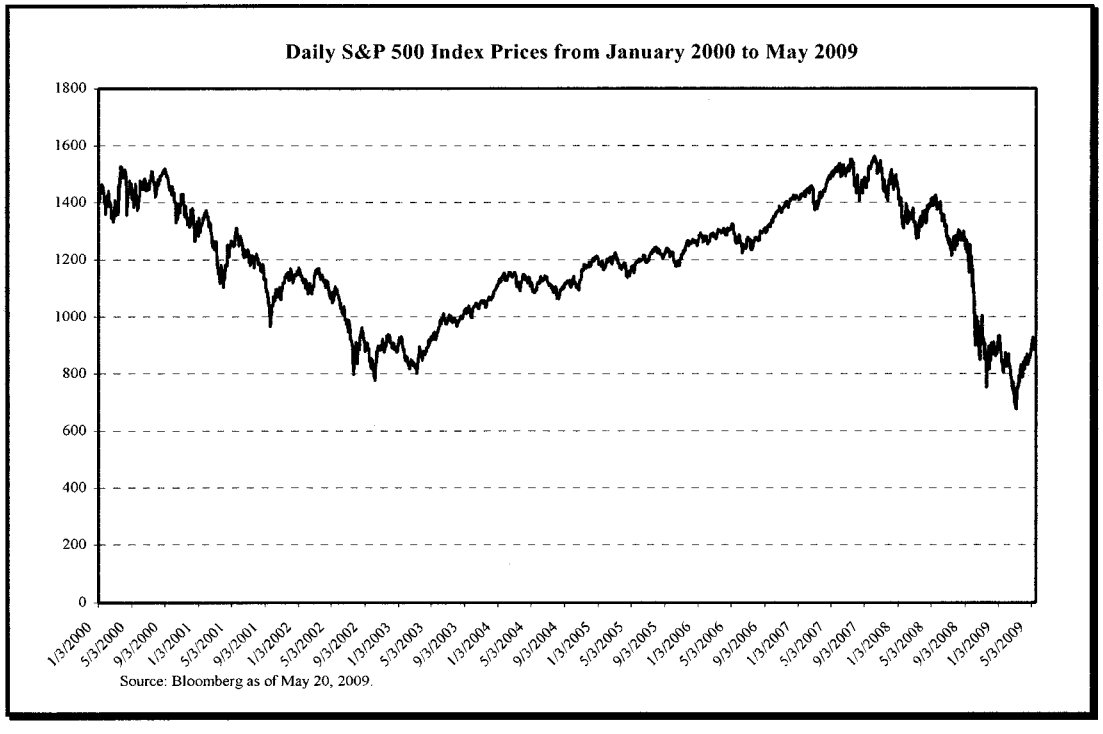


Figure 4

Figure 5 below displays the market volatility, measured by the Chicago Board Options Exchange ("CBOE") Volatility Index (also know as *VIX*), over the period beginning in 1998 through the first week of May 2009.[13]

[12] Southwest Water had as of May 15, 2009 not yet filed its 2008 form 10-K with the Securities and Exchange Commission and has recently cut dividend. Price information was obtained from Bloomberg.

[13] The *VIX* is a measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices.

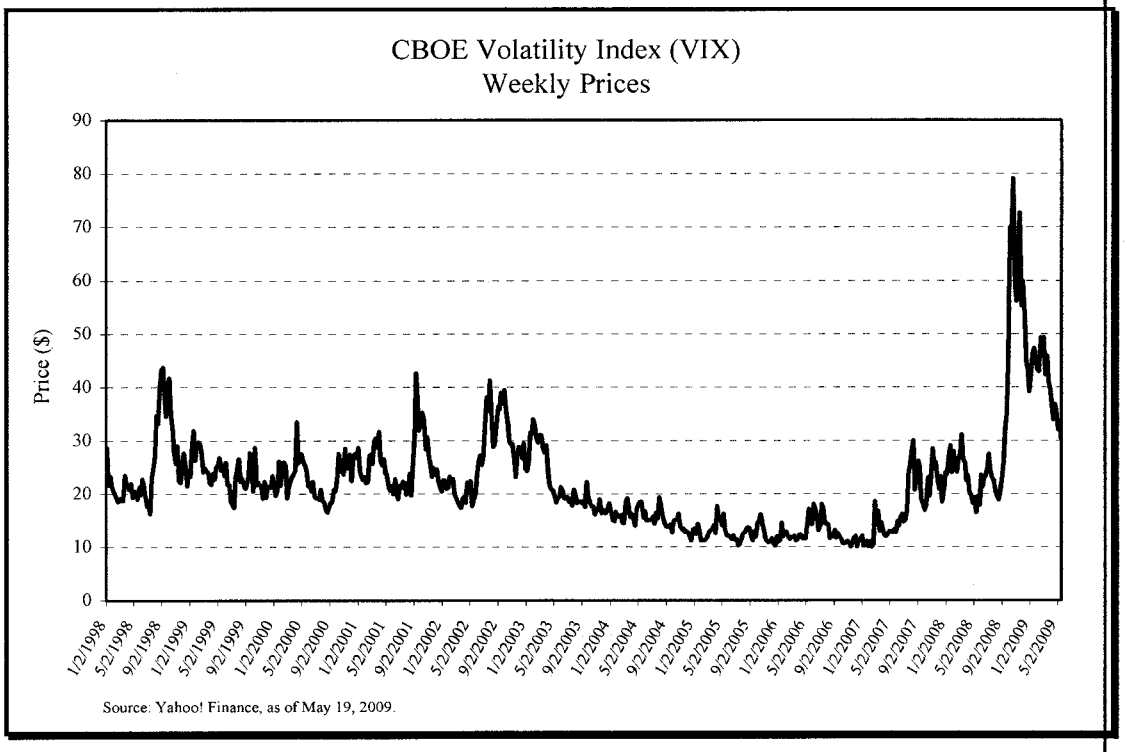


Figure 5

Until relatively recently, average volatility was in the 10-20 percent range, but it spiked 80 percent in late 2008. Although volatility has decreased somewhat over the last couple of months, it is still significantly higher than the average value for the first half of 2008 (prior to the crisis).

At the same time the Federal Reserve has cut interest rates and by now the yield on the Treasury bills is at extraordinarily low levels with yields close to zero. However, the lower yields on government debt have not translated into lower yields on corporate debt (including the yields on investment grade utility bonds). As Figure 6 shows, the spreads over Treasury bonds for long-term A and BBB utility debt remain at historically high levels. Figure 7 displays the yields on A and BBB-rated utility debt relative to government bond yields.

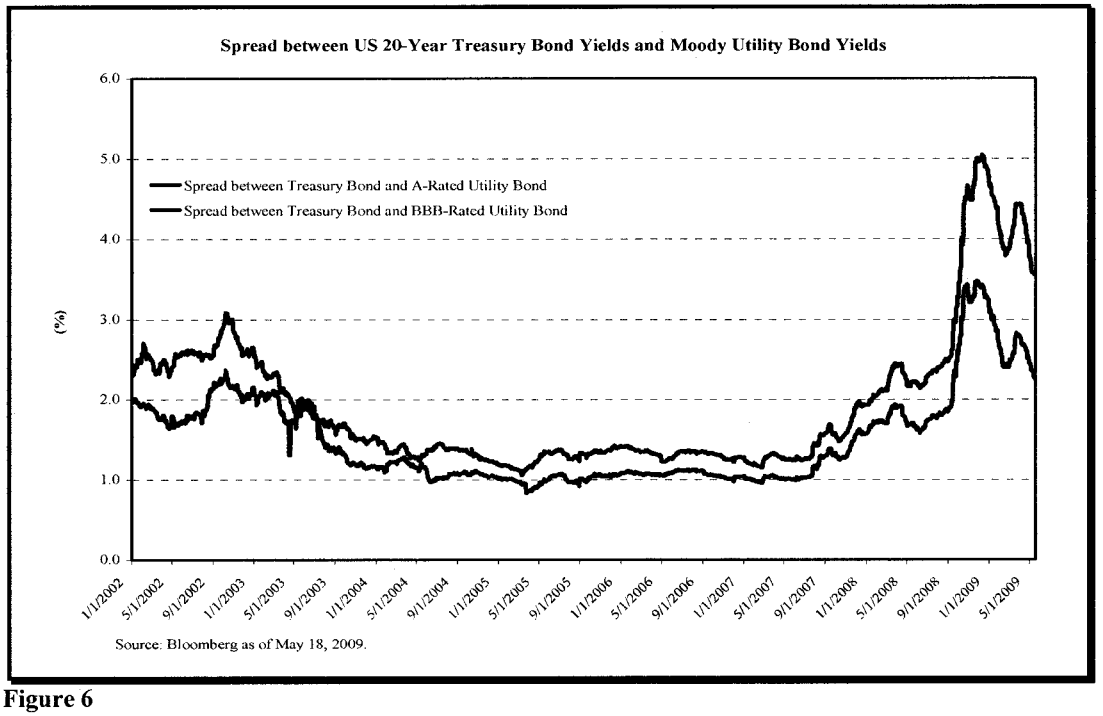


Figure 6

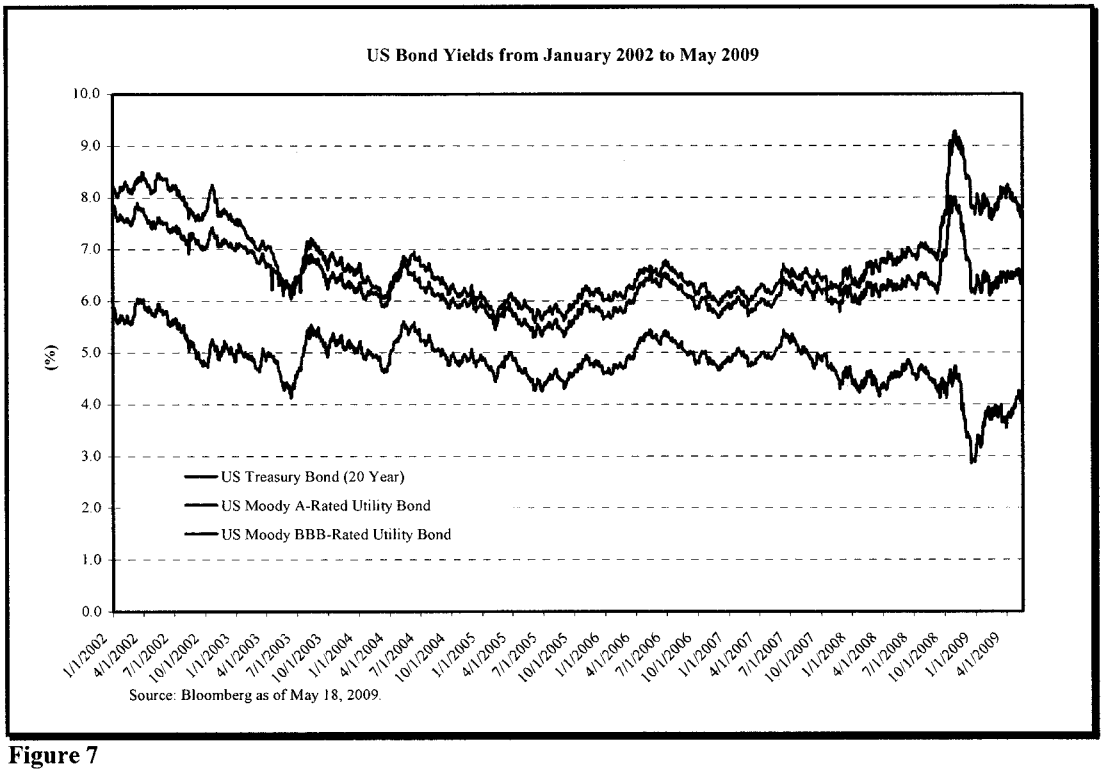


Figure 7

Q32. DO YOU HAVE ANY EVIDENCE ON HOW MUCH THE MARKET RISK PREMIUM ("MRP") HAS INCREASED?

A32. Yes. I have estimated the increase in MRP that is necessary for investors to earn an overall return that is no less than prior to the crisis. The result is that the MRP has increased by at least 1 percent over its level prior to the crisis.

Q33. HOW DID YOU ESTIMATE THE INCREASED MRP?

A33. The method I used to estimate the increased MRP is based upon the recognition that the sharp decrease in the average market price of equity has unexpectedly increased the level of financial risk in the stock market. Higher financial risk leads to a higher required rate of return on equity, so I compute the average capital structure of the stock market as measured by the S&P 500 before the crisis and after the crisis to measure the change in financial risk.

Q34. ONCE YOU ESTIMATE THE CAPITAL STRUCTURE OF THE MARKET AT TWO DIFFERENT TIMES, PLEASE OUTLINE THE STEPS YOU USED TO ESTIMATE THE CHANGE IN MRP.

A34. Once I estimated the average capital structure of the market, I estimated the average cost of equity for the market in August 2008 and calculated an ATWACC for the market using the cost of debt for an A rated company and a 35 percent marginal tax rate. The cost of equity for the market is simply the sum of the long-term risk-free rate and my 6.5 percent estimate of the MRP. I then calculated the ATWACC for the market using Equation 1 above. The next step was to determine how much the market ROE would change solely as a result of the change in financial risk stemming from the drop in market values assuming that the pre-crisis market ATWACC did not change. In the table below, I calculated the ROE corresponding to 60 percent equity instead of 70 or 75 percent equity. These values are roughly comparable to the capital structure of the S&P500 before the crisis and as of today.[14] As shown in the calculations in Table 4 below, the

[14] For example, in August of 2008, about the time the stock market began to decline dramatically, the average capital structure for the companies in the S&P500 was about 72.0 percent equity compared to about 59.3 percent in April 2009. In principle, the appropriate metric would be the average market value capital

estimated MRP increased by more than 1 percent, but this is likely to be lower than the actual increase in the *expected* MRP.

Table 4

Estimating Change in MRP for US Market Based on Data for 500 Companies in S&P 500 Index			
1. Inputs			
Parameters in CAPM:			Source and Notes:
MRP (pre-crisis)	6.5%	[a]	Dr. Villadsen's Tables and Workpapers.
Long-term risk-free rate (pre-crisis)	4.7%	[b]	Dr. Villadsen's Tables and Workpapers.
Parameters for ATWACC:			
Cost of debt for A-Rated Utility (pre-crisis)	6.59%	[c]	15-day average yield ending on 8/8/2008 for A-Rated Utility bond with 20 year maturity
Cost of debt for BBB-Rated Utility (pre-crisis)	7.06%	[d]	15-day average yield ending on 8/8/2008 for BBB-Rated Utility bond with 20 year maturity
Common Equity (pre-crisis)* [see legend below]	70.0%	[f]	Assumption based on actual calculations of S&P 500 data from Bloomberg as of May 20, 2009.
Debt (pre-crisis)	30.0%	[g]	= 1 - [f].
Common Equity (post-crisis)	60.0%	[h]	Assumption based on actual calculations of S&P 500 data from Bloomberg as of May 20, 2009.
Debt (post-crisis)	40.0%	[i]	= 1 - [h].
Tax Rate	35%	[j]	Assumption
2. Estimation Results:			
Step 1: Estimating Return on Equity using pre-crisis data			
ROE (pre-crisis)	11.2%	[k]	= [a] + [b].
Step 2: Estimating ATWACC using pre-crisis data			
ATWACC (pre-crisis)	9.1%	[l]	= (1 - [j]) x [g] x [c] + [f] x [k].
Step 3: Estimating Return on Equity for with Reduced Equity Share			
Assuming ATWACC constant			
(i) ROE - Using Cost of Debt for A-Rated Utility	12.4%	[m]	= {[l] - (1 - [j]) x [i] x [c])} / [h].
(ii) ROE - Using Cost of Debt for BBB-Rated Utility	12.2%	[n]	= {[l] - (1 - [j]) x [i] x [d])} / [h].
Step 4: Estimating MRP with Reduced Equity Share			
(i) MRP (post-crisis) - Using Cost of Debt for A-Rated Utility	7.65%	[o]	= [m] - [b].
(ii) MRP (post-crisis) - Using Cost of Debt for BBB-Rated Utility	7.45%	[p]	= [n] - [b].
Step 5: Estimating change in MRP due to Reduction in Equity Share			
(i) Change in MRP - Using Cost of Debt for A-Rated Utility	1.2%	[q]	= [o] - [a].
(ii) Change in MRP - Using Cost of Debt for BBB-Rated Utility	1.0%	[r]	= [p] - [a].
* If using 75.00% instead of 70.00% [f] for the common equity (pre-crisis) and following the same methodology from Step 1 to Step 5, one will retrieve the following results for changes in MRP: 1.73% [q] and 1.53% [r].			

structure of the S&P500 over the period used to estimate the MRP, i.e., 1926 to the present, but this is prohibitively time consuming to calculate.

Q35. WHY DO YOU BELIEVE THAT THE 1 PERCENT ESTIMATED INCREASE IN THE MRP IS LOWER THAN THE ACTUAL INCREASE?

A35. My calculation of the increase in the MRP assumes that the market ATWACC is constant, but the evidence indicates that the price of risk has increased substantially. Research indicates, for example, that the MRP is related to volatility in the stock market, which as shown in Figure 5 above has increased dramatically and currently is well above its pre-crisis level. A higher ATWACC would indicate an even greater increase in the estimated MRP than estimated in Table 4 above.

Q36. IS THE INCREASE IN INVESTORS' RISK AVERSION FROM CURRENT ECONOMIC CONDITIONS LIKELY TO BE A TEMPORARY OR PERMANENT CHANGE?

A36. It is likely that some of the increase in risk aversion stems from the chaotic market conditions and will be transitory in nature, but there is a strong possibility that there will also be a longer-term and perhaps permanent effect as market participants draw conclusions from the crisis on the fundamental risk-return characteristics of investment alternatives.

Q37. IF THE INCREASE IN THE COST OF CAPITAL IS LIKELY TO BE TEMPORARY, SHOULD THE COMMISSION STILL TAKE THE INCREASED COST OF CAPITAL INTO CONSIDERATION WHEN SETTING THE ALLOWED RETURN FOR THE COMPANY?

A37. Yes. I recommend that the Commission recognize the increased cost of capital. Although I believe that some of the increase in yield spread and in the MRP is likely to be temporary, it is very difficult to predict when the capital markets will return to more normal conditions, so it is difficult to predict when the market cost of risk will return to more normal levels. Even when market conditions are more normal, investors' risk aversion may remain higher well into the recovery period until their confidence fully returns. The federal government seems to recognize investors' fears, and it has signaled that it intends to overhaul the financial regulatory environment in order to restrict the

behavior by financial institutions that led to the current crisis. While the success or failure of those actions are unlikely to be observed in the short- to medium-term, in the long run these measures may help alleviate investors concerns. However, it could easily be years before investors regain the confidence prevailing prior to the current crisis. In fact, there may be a "permanent" adjustment in risk tolerance now that investors realize that severe economic conditions are still possible even with the increased tools to manage the economy available to government.

Q38. ARE NOT THE LOW REALIZED RETURNS ON THE MARKET INDEX RECENTLY A CLEAR INDICATION THAT MARKET PARTICIPANTS ARE WILLING TO ACCEPT A LOWER EXPECTED RETURN ON THEIR INVESTMENTS?

A38. Absolutely not. To the contrary – market values have been falling in order to allow an increase in the expected returns on investment. As risk aversion increases, expected returns must increase in order to induce investors to buy, so prices must fall. In other words, realized returns over the last few months are not indicative of investors' required rate of return. Investors have undoubtedly been disappointed recently. This process is well known to bond investors. As the general level of interest rates in the economy increases, the market price of a bond will decrease so that the yield-to-maturity will increase to the level required by the market. The same phenomenon occurs with equities as well. When the required return on investment increases, market prices must fall.

Q39. CAN YOU PROVIDE ANY FACTUAL EVIDENCE THAT THE CONDITIONS IN THE FINANCIAL MARKETS AND THE ECONOMY AS A WHOLE LIMIT THE ACCESS OF UTILITY COMPANIES TO THE FINANCIAL MARKETS?

A39. Yes. The increased yield spreads on utility debt compared to government debt impedes access because the cost of new utility debt is higher. For example, for investment grade debt issued in the fourth quarter of 2008, a recent EEI report shows the impact of the financial crisis on the electric utility industry. The average spread over Treasury bonds

for A-rated debt was 432 basis points, while the coupon rate was 6.96 percent.[15] For the BBB-rated debt these numbers are, respectively, 520 basis points and 8.45 percent.[16] Unfortunately, we do not have access to a similar data covering new issuances for earlier period(s). However, we can observe the change in the yield on utility sector fair market indices published by Bloomberg as well as the corresponding spreads. More specifically, the average A and BBB utility bond yields for 1991 through 2007 interval were, respectively, 6.98 percent and 7.28 percent, while the spreads over 20-year treasuries equaled 93 basis points and 123 basis points, respectively. For comparison, the average spread and yield for the fourth quarter of 2008 obtained from the same data indicates the yields of 7.38 percent and 7.99 percent for A and BBB-rated utilities, respectively; and spreads over 20-year Treasuries of 342 basis points and 402 basis points for A and BBB-rated utilities, respectively. These figures demonstrate not only the increased cost of new utility debt, but also the importance of maintaining strong credit ratings in current market conditions. Utilities with lower credit ratings face proportionally higher debt costs as a result of increased investor risk aversion.

Q40. HOW HAVE THESE CONDITIONS AFFECTED THE WATER INDUSTRY AND AMERICAN WATER?

A40. There is a substantial need for ongoing investment in water industry infrastructure. The EPA has recently updated the spending needs in the water industry from $275 billion to $334.8 billion over the next 20 years.[17] These expenditures are driven by the need for upgrades to the distribution and transmission system as well as by the need to develop new water resources Thus, infrastructure investment in the water industry will require substantial external financing (i.e., new debt and equity). Access to capital requires that investors expect to earn their required return. Failure to provide adequate returns may discourage potential investors.

[15] "The Financial Crisis and Its Impact On the Electric Utility Industry", prepared by Julie Cannell (J.M. Cannell, Inc) for *Edison Electric Institute*, February 2009, p.6.

[16] *Ibid.*

[17] Rudden Energy Strategies Report, May 26, 2009 p. 6.

Q41. ARE NOT WATER UTILITIES ATTRACTIVE INVESTMENTS IN TODAY'S CLIMATE BECAUSE THEY ARE SAFE AND STABLE?

A41. As noted above, the stock market has responded in a mixed way to water utility stocks, so the industry as a whole does not provide a safe haven for investors. This is true even for a fairly large, geographically diverse water utility such as American Water, which experienced a significant decrease in its stock price and a significant increase in its cost of debt over the past year. American Water Works' recent stock offering has been anticipated by the market for a while, so it is not surprising that American Water Works' stock price moved little on the actual sale. However, it is interesting to note that the offering was priced at 20 percent below the Initial Public Offering ("IPO") price in April 2008 and that the market value of American Water's shares dropped by approximately 14 percent over the same period.[18] Thus, American Water, like most companies in the U.S., has seen a substantial drop in its stock value over the past year. As the stock price declines, investors' expected return increases everything else equal. While American Water has too short a history for me to compare its expected earnings growth a year ago to that expected today, the average and median earnings growth in the water industry is currently very similar to that I found about a year ago.[19]

Further, American Water has issued non-secured notes recently at rates quite a bit above its historical debt cost. For example, its November 2008 offering had a 10 percent coupon, its February 2009 offering had an 8.25 percent coupon, and its May 2009 offering had a coupon of 7.21 percent. These issuances traded at a yield near the coupon for a while after issuance. While the rates are down from the height of the credit crisis, they are substantially higher than the embedded cost of debt and indicate that the cost of

[18] For price information, see American Water Works press releases, "American Water Prices Initial Public Offering," April 22, 2008 and "American Water Prices Commons Stock Offering," June 4, 2009. According to American Water's 2008 10-K p. 93, 160 million shares were outstanding as of year end 2008. Thus, at the IPO price of $21.50, the market value of the shares was $3,440 million. The June 2009 stock offering consisted of 11.5 million new shares and 14.5 million shares from RWE AG. At a price of $17.25 per share, the market value of the shares (160 million + 11.5 million) becomes $2,980 million for a drop of approximately 14%.

[19] See Table BV-5 and my Direct Testimony in Docket No. W-01303A-08-0227 (Table No. BV-5).

debt capital for American Water and hence New Mexico-American Water has increased substantially during the financial crisis.

In addition, a common measure of the systematic risk of companies, the so-called beta, has moved very little for water utilities and remains at about 80% of the overall market. As noted by Debra G. Coy in testimony before the California PUC,

> Water utilities have historically been viewed as low-risk, predictable, regulated monopolies, and they have attracted equity investors who appreciated those characteristics. Now, investors are more wary

And

> [i]nvestors have come to understand that 'low risk' water utilities in fact carry a variety of potential risks, the largest of which is their raising need to repair and replace aging infrastructure, resulting in high capex requirements, low depreciation rates, and negative free cash flow, along with the negative effects of regulatory lag on earnings.[20]

These facts indicate that investors in the water utility industry are exposed to substantial risks.

Q42. WHAT DO YOU CONCLUDE FROM THE EVIDENCE ON CURRENT ECONOMIC CONDITIONS?

A42. The cost of capital is much higher today than in the relatively recent past. Although some of the increase in the cost of equity capital will hopefully reverse when stable economic conditions return, it may be many years before investors regain the confidence in financial markets and the cost of equity capital returns to its pre-crisis level. Until economic conditions stabilize, it is critical that the major infrastructure investment necessary for regulated utilities not be hampered by inadequate allowed rates of return.

[20] Debra G. Coy, Testimony before the California PUC, p. 7.

As a result, the cost of capital that I estimated for Arizona-American Water shortly before the crisis in 2008 is below the cost of capital that is currently applicable.[21]

Q43. HOW DO YOU ADJUST YOUR COST OF CAPITAL ESTIMATION METHODS TO CORRECT FOR CURRENT ECONOMIC CONDITIONS?

A43. I make no adjustment to the DCF method because determining whether an adjustment is necessary and if so, what are the appropriate adjustments to the parameters of the DCF model, would be more difficult. Because the DCF results rely on analysts' growth forecasts, I need to know if and how they have incorporated the ongoing financial crisis to determine the appropriate adjustment to growth rates, if any. As financial analysts rarely disclose how they determine the growth rates they publish, I cannot know if an adjustment to the DCF model is warranted.

For the risk positioning method, I recognize the unusually large yield spread on utility debt by adding a "yield spread adjustment" to the current long-term risk-free rate. This has the effect of increasing the intercept of the Security Market Line displayed in Figure 1 above. I present results from the risk positioning model from keeping the MRP at 6.5 percent and by increasing the MRP by 1, 1.5 and 2 percent over the 6.5 percent. I believe that both adjustments are warranted, but Arizona-American's requested 12.25 percent return on equity is conservative as it ignores the in the MRP. Including the adjustment for the increased MRP would increase the estimated cost of equity. Specifically, if I rely on the water subsample and the gas LDC sample, a modest increase of one percent in the MRP, increases the estimate for the cost of equity by 50-75 basis points to no less than 12¾ percent. [See Tables 7 and 8 for details]

[21] In April 2008 (Docket No. W-01303A-08-0227), I estimated a cost of equity of 11¾ percent on 46.75% equity. The current cost of equity capital on 45.15% equity is necessarily higher than 11¾ percent.

Q44. WOULD YOU PLEASE ILLUSTRATE THE EFFECT ON THE SECURITY MARKET LINE ("SML") OF THE TWO ADJUSTMENTS THAT YOU PROPOSE TO USE?

A44. Yes. The total effect is best illustrated in two steps. The first step is to consider how the SML changes as an adjustment to the yield spread is added to the risk-free interest rate. This is shown in Figure 8 below.

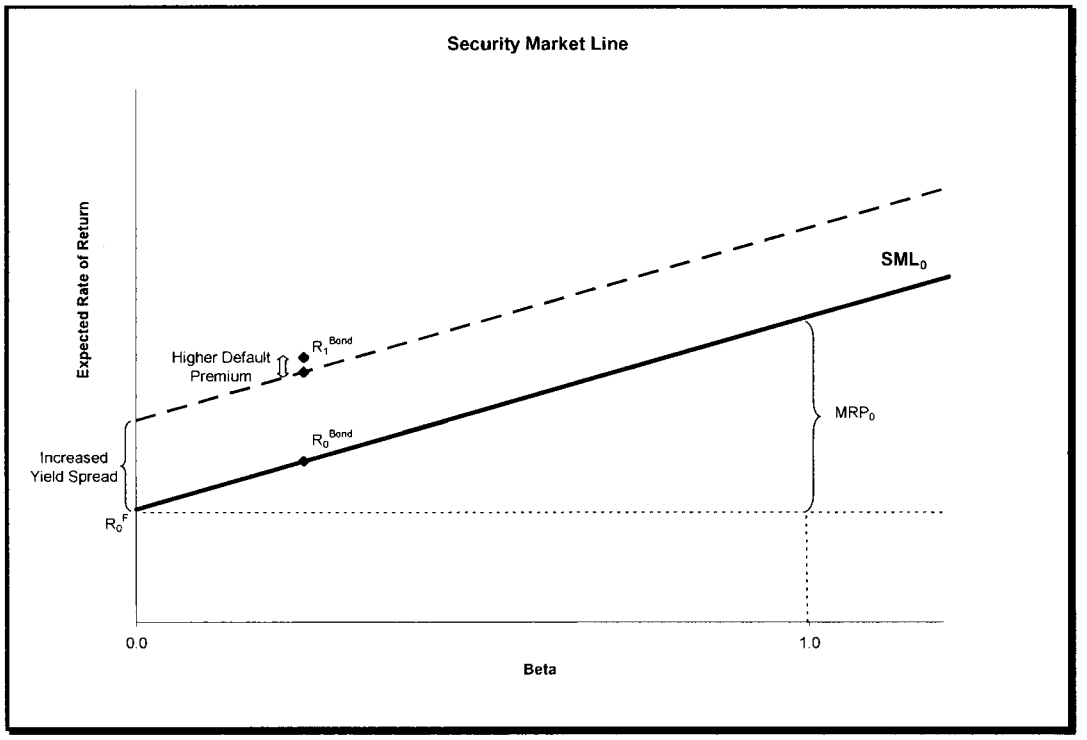


Figure 8

Figure 8 is a modification to Figure 1. Note that the beta of the market is always equal to 1.0 so the difference between the risk-free rate and the return on the market (beta = 1.0) is the market risk premium (MRP_0 in Figure 8). Recognizing the increased yield spread as an adjustment to the risk-free rate has the effect of moving the SML up without affecting the MRP. Note that I only consider the increase in the yield spread for A-rated utility bonds to avoid adding an increase in the default premium on BBB-rated utility bonds to the risk-free rate.

The effect of combining a yield spread adjustment and an increase in the MRP is illustrated in Figure 9 below.

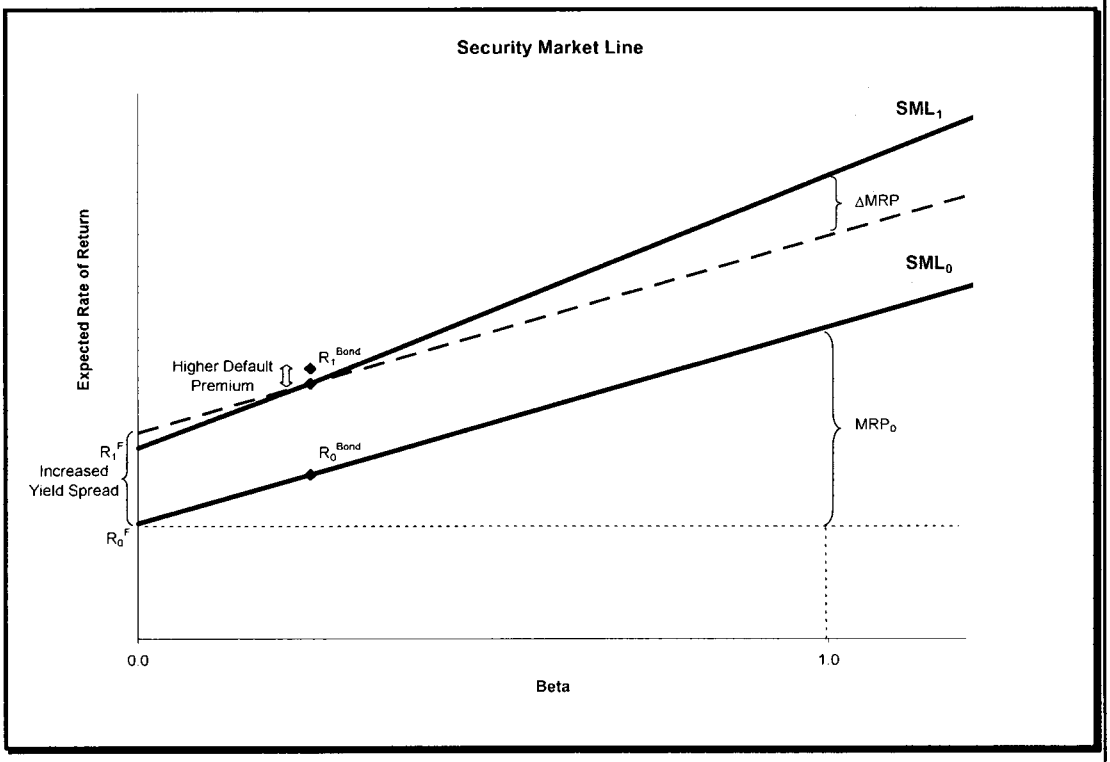


Figure 9

The effect of the MRP adder is to increase the slope of the SML. Note that the SML_1 is rotating through the estimated yield of the utility bond minus the estimate of the increase in default premium. Effectively, this step recognizes that there are three possible components to the increased yield spread: an increased default risk premium, an increased systematic risk premium and an increased premium over the risk-free rate not related to the other two categories. The default risk premium is the premium bond investors require to accept the risk that the bond issuer may default on interest payments and /or the repayment of the principal. The fact that the yield on lower rated bonds (e.g., BBB rated bonds) has increased more than the yield on higher rated bonds (e.g., AA or A rated bonds) indicates that investors are concerned about default risk. However, the increase in the default risk premium is likely to be small for highly (AA or A) rated utility bonds. The systematic risk premium bond investors receive is compensation for the risk they cannot diversify away. It is the bond's systematic risk in comparison to the

market as a whole and therefore measured by the so-called bond beta, which is similar to stock betas. A positive bond beta means that the intercept of the SML is lower than it would have been if there was no increase in the systematic risk premium in the increase in the yield spread. Bond betas are more difficult to estimate than stock betas because data are scarcer but bond betas are substantially lower than stock betas and .25 is likely to be in the upper range. The fraction of the increase that is not either an increase in the default risk premium or related to the bond beta is the unexplained increase.

IV. THE COST OF CAPITAL FOR THE BENCHMARK SAMPLES

Q45. HOW IS THIS SECTION OF YOUR TESTIMONY ORGANIZED?

A45. As noted in *Section I*, I estimate the cost of capital using two samples of comparable risk companies. This section first covers preliminary matters such as sample selection, market-value capital structure determination, and the sample companies' costs of debt. It then covers estimation of the cost of equity for the sample companies and the resulting estimates of the sample's overall after-tax cost of capital.

A. Preliminary Decisions

Q46. WHAT PRELIMINARY DECISIONS ARE NEEDED TO IMPLEMENT THE ABOVE PRINCIPLES?

A46. I must select the benchmark samples, calculate the sample companies' market-value capital structures, and determine the sample companies' market costs of debt and preferred equity.

1. The Samples: Water Utilities and Gas Local Distribution Companies

Q47. WHY DO YOU USE TWO SAMPLES?

A47. The overall cost of capital for a part of a company depends on the risk of the business in which the part is engaged, not on the overall risk of the parent company on a consolidated basis.

Estimating the cost of capital for Arizona-American Water's regulated assets is the subject of this proceeding. The ideal sample would be a number of companies that are publicly traded "pure plays" in the water production, storage, treatment, transmission, distribution and wastewater lines of business.[22] "Pure play" is an investment term referring to companies with operations only in one line of business. Publicly traded firms, firms whose shares are freely traded on stock exchanges, are ideal because the best way to infer the cost of capital is to examine evidence from capital markets on companies in the given line of business.

Therefore, for this case, a sample of companies whose operations are concentrated solely in the regulated portion of the water industry would be ideal. Unfortunately, the available sample of "water" utility companies in the U.S. is relatively small and has data deficiencies. See *Section IV.0.1* for a description of these deficiencies.

To select my sample of comparable water and gas LDC companies, I start with those companies that are listed as a water utility or natural gas utility in *Value Line*.[23] Usually, I would apply several selection criteria to delete companies with unusual circumstances that may bias the cost-of-capital estimation and companies whose risk characteristics differ from those of the filing entity. However, the application of such criteria would eliminate almost all the water utilities listed in *Value Line*. Therefore, I do not apply selection criteria to the water utility sample although I do apply my standard criteria to the gas LDC sample. Specifically, if I eliminate all water utilities with annual revenues below $300 million, less than 50 percent regulated revenues, lack of growth rates (from Bloomberg or *Value Line*), or lack of a bond rating, I would be left with at most three companies (American States Water, Aqua America and California Water Services). A three-company sample is simply too small to provide reliable results. Therefore, I keep all water utilities with data in my water utility sample, but I do report results for a subsample of companies that are more stable. Specifically, this sample excludes

[22] Most of the water utilities in *Value Line* have operations in the water as well as wastewater business.

[23] To select the samples I include both the Standard, the Small and Mid-Cap Editions of *Value Line Investment Survey* and *Value Line Investment Survey - Plus Edition.*

Southwest Water which recently cut dividends and as of May 25, 2009 had yet to file its 2008 form 10-K with the Securities and Exchange Commission.[24]

Q48. WHAT DO YOU DO TO OVERCOME THE WEAKNESSES OF THE WATER UTILITY SAMPLE?

A48. To overcome the weaknesses of the water sample, I select a second sample of regulated utilities: gas local distribution companies. Gas LDCs, like water utilities, are regulated by state regulatory bodies, have large distribution investments, and serve a mix of residential, industrial, and commercial customers.

One reason for using the gas LDC sample is to generate a sample of regulated companies whose primary source of revenues is in the regulated portion of the natural gas industry to provide a check for the results of the water sample. Therefore, I start with *Value Line*'s universe of natural gas utilities, and eliminate those companies whose percentage of assets attributed to regulated activities is less than 50 percent. In addition, I only include companies with an investment grade bond rating, no recent sizable mergers or acquisitions, no recent dividend cuts, and no other activity that could cause the estimation parameters to be biased. Additionally, I require the companies to have necessary data available. The final sample includes eleven companies. Additional details of the sample selection process for each sample and subsample are described below as well as in Appendix B.

Q49. IF THE BUSINESS RISK OF THE GAS LDC SAMPLE DIFFERS FROM THE WATER SAMPLE, CAN YOU STILL RELY ON THE COST OF EQUITY ESTIMATED FOR THE GAS LDC SAMPLE?

A49. Yes. If the business and financial risk of the two samples differ, then a cost-of-capital analyst can still make use of the information from the more reliable sample to evaluate the reliability of the estimates from the water sample. The inference would be based on information about the relative risk of the two industries. In this instance the business operations of water and gas LDC companies are similar, but the water companies tend to have a higher percentage of their assets and revenue subject to regulation.

[24] The only company followed by *Value Line* that I do not include is Sun Hydraulics. This company's main

Q50. PLEASE ELABORATE ON THE WAY TWO SAMPLES WITH DIFFERENT BUSINESS AND FINANCIAL RISKS CAN BE COMPARED.

A50. As mentioned above, the overall cost of capital for a part of a company depends on the risk of the business in which the part is engaged, not on the overall risk of the parent company on a consolidated basis. According to financial economics, the overall risk of a diversified company equals the market value weighted-average of the risks of its components.

Calculating the overall after-tax weighted average cost of capital for each sample company as described above allows the analyst to estimate the average overall cost of capital for the sample. The ATWACC captures both the business risk and the financial risk of the sample companies in one number. This allows comparison of the cost of capital between two samples on a much more informed basis. If the alternative (more reliable) sample is judged to have slightly different risk than the water sample, but the results show wide differences in the ATWACC estimates, the analyst should carefully consider the validity of the water sample estimates, whether they are materially higher or lower than the alternative sample's estimates. Of course, the alternative sample could be the source of the error, but that is less likely because the alternative sample has been selected precisely because of its expected reliability.

Q51. PLEASE COMPARE THE CHARACTERISTICS OF THE WATER UTILITY SAMPLE AND THE GAS LDC SAMPLE.

A51. The two samples differ primarily in that they operate in two different (regulated) industries, but they are relatively similar in terms of the percentage of revenues from regulated operations and the customers they serve. On average, both samples earn a large percentage of their revenue from regulated activities and serve a mix of residential, industrial, and other customers. In addition, both industries are characterized by large capital investment and both are operating a large distribution system. However, it appears that the gas LDC sample's systematic risk has been affected more by the financial crisis than has the water utility sample in the sense that while the measures of systematic risk,

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line of business is the production of industrial equipment, not the water utility business.

beta, has remained relatively constant for water utilities, it has dropped for gas LDC companies. It is difficult to determine whether the decline in gas LDC betas is due to the financial crisis or to industry specific factors as other utility sectors have not seen the same decline in beta estimates.[25] At the same time, the gas LDC has fewer of the data and estimation issues identified above for the water sample. Please refer to Appendix B for additional details on the two samples.

2. Market-Value Capital Structure

Q52. WHAT CAPITAL STRUCTURE INFORMATION DO YOU REQUIRE?

A52. For reasons discussed below and in Appendix E, explicit evaluation of the market-value capital structures of the sample companies is vital for a correct interpretation of the market evidence on the return on equity. This requires estimates of the market values of common equity, preferred equity and debt, and the current market costs of preferred equity and debt.

Q53. PLEASE DESCRIBE HOW YOU CALCULATE THE MARKET VALUES OF COMMON EQUITY, PREFERRED EQUITY AND DEBT.

A53. I estimate the capital structure for each sample company by estimating the market values of common equity, preferred equity and debt from the most recent publicly available data. The details are in Appendix B.

Briefly, the market value of common equity is the price per share times the number of shares outstanding. For the risk-positioning approach, I use the last 15 trading days of each year to calculate the market value of equity for the year. I then calculate the average capital structure over the corresponding five-year period used to estimate the "beta" risk measures for the sample companies. This procedure matches the estimated beta to the degree of financial risk present during its estimation period. In the DCF analyses, I use the average stock price over 15 trading days ending on the release date of the BEst

[25] According to *Value Line*, gas LDC companies have seen a larger decline in beta than has water utilities, electric utilities, or pipelines.

growth rate forecasts utilized.[26] I use 15 trading days to balance the need for a current stock price and avoiding that any one day unduly influences the results.

The market value of debt is estimated at its book value adjusted by the difference between the "estimated fair (market) value" and the "carrying cost" of long-term debt reported in each company's 10-K.[27] The market value of preferred stock for the samples is set equal to its book value.[28,29]

3. Market Costs of Debt and Preferred Equity

Q54. HOW DO YOU ESTIMATE THE CURRENT MARKET COST OF DEBT?

A54. The market cost of debt for each company is set equal to the fifteen-day average yield on an index of public utility bonds that have the same credit rating, as reported by Bloomberg. The DCF analyses use the current credit rating whereas the risk-positioning analyses use the current yield of a utility bond that corresponds to the five-year average debt rating of each company so as to match consistently the horizon of information used by *Value Line* to estimate each company's beta. Bond rating information was obtained from Bloomberg which reports Standard & Poor's bond ratings. I calculate the after-tax cost of debt using Arizona-American's estimated marginal income tax rate of 38.45 percent.

Q55. HOW DO YOU ESTIMATE THE MARKET COST OF PREFERRED EQUITY?

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[26] BEst is Bloomberg's name for its earnings growth rate information. BEst growth rate forecasts are as of May 18, 2009.

[27] The book value of debt from Bloomberg includes all interest-bearing financial obligations that are not current and includes capitalized leases and mandatory redeemable preferred and trust preferred securities in accordance with FASB 150 effective June 2003. See Bloomberg's definition of long-term debt for additional details.

[28] This is unlikely to affect the results as the average percentage of preferred is close to zero for both the water and gas LDC sample.

[29] Commission Staff has in the past used the book value capital structure as of a specific recent date as well as the stock price on a recent date. As financial risk is determined in financial markets, I rely on the market value capital structure. Further, to match the horizon over which the systematic risk is determined and the capital structure I use an average over the last five years. The reliance of a 1-day versus a 15-day stock price in the DCF model is unlikely to materially impact the results unless the 1-day price is influenced by unusual events on that specific day.

A55. For all sample companies, the preferred rating was assumed equal to the company's bond rating. The cost of a company's preferred equity was set equal to the yield on an index of preferred utility stock with the same rating. The data were obtained from the Mergent Bond Record.[30]

B. Cost-of-Equity Estimation Methods

Q56. HOW DO YOU ESTIMATE THE COST OF EQUITY FOR YOUR SAMPLE COMPANIES?

A56. Recall that the cost of capital is the expected rate of return in capital markets on alternative investments of equivalent risk. This definition leads me to address three key points in my estimation procedures. First, the cost of capital is an expected rate of return – it cannot be directly observed, but must be inferred from available evidence. Second, the cost of capital is determined in capital markets (such as the New York Stock Exchange). Therefore, capital market data provide the best evidence from which to draw inferences. Third, the cost of capital depends on the return offered by alternative investments of equivalent risk. Consequently, measures of risk that matter in capital markets are part of the evidence that I need to examine. The overall cost of capital that I estimate for the samples is the primary evidence I rely on to determine Arizona-American Water's overall cost of capital.

Q57. HOW DOES THE ABOVE DEFINITION HELP YOU ESTIMATE THE COST OF CAPITAL?

A57. The definition of the cost of capital recognizes a tradeoff between risk and expected return; this is the security market line plotted above in Figure 1 above. Cost-of-capital estimation methods usually take one of two approaches: (1) they establish the location of the security market line and estimate the relative risk of the security, which jointly determine the cost of capital, or (2) they try to identify a comparable-risk sample of companies and estimate the cost of capital directly. Looking at Figure 1, the first

[30] Published monthly, Mergent's Bond Record offers a comprehensive review of over 68,000 bond issues including coverage of corporate, government, municipal, industrial development/environmental control

approach focuses directly on the vertical axis, while the second focuses both on the security's position on the horizontal axis and on the position of the security market line.

The first type of approach is more direct, but ignores the wealth of information available on securities not thought to be of precisely comparable risk. The "discounted cash flow" or "DCF" model is an example. The second type of approach, sometimes known as "equity risk premium approach," requires an extra step – positioning the security market line. Using the second approach allows me to use information from all traded securities rather than just those included in my sample. The capital asset pricing model ("CAPM") is an example. While both approaches can work equally well if conditions are right, one may be preferable to the other under certain circumstances. In particular, approaches that rely on the entire security market line are less sensitive to deviations from the assumptions that underlie the model, all else equal. In this case, I examine both DCF and risk-positioning approach evidence for the water utility and gas LDC sample.

1. The Risk-Positioning Approach

Q58. PLEASE EXPLAIN THE RISK-POSITIONING METHOD.

A58. The risk-positioning method estimates the cost of equity as the sum of a current interest rate and a risk premium. It is therefore sometimes also known as the "risk premium" approach. This approach may sometimes be applied more or less formally. As an example of an informal application, an analyst may estimate the spread between interest rates and what is believed to be a reasonable estimate of the cost of capital at a specific time, and then apply that spread to current interest rates to get a current estimate of the cost of capital.

More formal applications of the risk-positioning approach take full advantage of the security market line depicted in Figure 1: they use information on a large number of traded securities to identify the security market line and derive the cost of capital for the individual security based on that security's relative risk. This reliance on the entire

revenue and international bonds, plus structured finance and equipment trust issues, medium-term notes, convertible issues, preferred stocks and commercial paper issues.

security market line makes the method less vulnerable to the kinds of problems that arise from using one stock at a time (such as the DCF method). The risk-positioning approach is widely used and underlies much of the current research published in academic journals on the nature, determinants and magnitude of the cost of capital. The most commonly used version of the formal risk-positioning models is the Capital Asset Pricing Model ("CAPM"). The equation for the CAPM is:

$$k_s = r_f + \beta_s \times MRP \quad (2)$$

where k is the cost of capital, r_F is the risk-free interest rate, MRP is the market risk premium, and β is the measure of relative risk.

Section I of Appendix C to this testimony provides more detail on the principles that underlie the risk-positioning approach. Section II of Appendix C provides the details of the risk-positioning approach empirical estimates I obtain.

Q59. HOW ARE THE "MORE FORMAL" APPLICATIONS OF THE RISK-POSITIONING APPROACH IMPLEMENTED?

A59. The first step is to specify the current values of the benchmarks that determine the security market line. The second is to determine the security's, or investment's, relative risk. The third is to specify exactly how the benchmarks combine to produce the security market line, so the company's cost of capital can be calculated based on its relative risk.

a) Security Market Line Benchmarks

Q60. WHAT BENCHMARKS ARE USED TO DETERMINE THE LOCATION OF THE SECURITY MARKET LINE?

A60. The essential benchmarks that determine the security market line are the risk-free interest rate and the premium that a security of average risk commands over the risk-free rate. This premium is commonly referred to as the "market risk premium" ("MRP"), i.e., the excess of the expected return on the average common stock over the risk-free interest rate. In the risk-positioning approach, the risk-free interest rate and MRP are common to all securities. A security-specific measure of relative risk (beta) is estimated separately and combined with the MRP to obtain the company-specific risk premium.

Q61. WHAT BENCHMARK DO YOU USE FOR THE MRP?

A61. For this proceeding I estimate only a long-term version of the risk-positioning model. This version of the risk-positioning model measures the market risk premium as the risk premium of average-risk common stocks over long-term Government bonds. I do not present result on a short-term version in this proceeding because monetary policy has driven the short-term risk-free rate to zero and at times even below zero.[31] I also report several sensitivity analyses that take into account the increase in the MRP as discussed above in *Section III.*

Q62. HOW DO YOU ESTIMATE THE BASELINE MRP?

A62. Appendix C summarizes academic and empirical research on the MRP. However, as discussed in the appendix, there is currently little consensus on the "best practice" for estimating the MRP even pre-crisis. (Note: this is not the same as saying that all practices are equally good). For example, the leading graduate textbook in corporate finance expresses the view that a range between 5 to 8 percent is reasonable for the U.S.[32] Morningstar data from 1926 to 2008, the longest period reported, show an MRP average premium of stocks of 7.9 percent over Treasury bills and 6.5 percent over long-term Government bonds. The publication reports a premium of stocks over bonds of 7.6 percent for the period 1947 to 2008.[33] At the same time, Dimson, Marsh and Stauton (2008) estimate the arithmetic market risk premium for the U.S. over the 1900 to 2007 period at 6.5 percent over bonds.[34] In a regulatory setting, the Surface Transportation Board ("STB") recently decided to rely on the CAPM when determining the cost of capital for major railroads in the U.S. As part of its methodology, the STB decided to rely on the long-term market risk premium reported by Morningstar/Ibbotson in its implementation of the CAPM.[35]

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[31] See, for example, "Treasury Bills Trade at Negative Rates as Haven Demand Surges", by Daniel Kruger and Cordell Eddings, *Bloomberg*, December 9, 2008.

[32] Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, McGraw-Hill, 9th edition, 2008, pp. 173-180.

[33] Morningstar, *Ibbotson SBBI Valuation Yearbook 2009*, Appendix A, Tables A-1 and A-3.

[34] Dimson, Marsh and Staunton, *Global Investment Returns Yearbook 2008*, p. 48.

[35] *STB Ex Parte No. 664*, Issued January 17, 2008, pp. 8-9.

My testimony considers both the historical evidence and the results of scholarly studies of the factors that affect the risk premium for average-risk stocks in order to estimate the benchmark risk premium investors currently expect.

Considering all the evidence, I conclude that S&P 500 stocks of average risk commanded 6.5 percent over the long-term Government rate prior to the financial crisis. This estimate is a relative conservative estimate of the historical average risk-premium in that it is equal to the figure reported over the longest period available and includes the unusual 2008 year. As discussed in *Section III* above, this figure has increased with the current market turmoil, so that the baseline of 6.5 percent likely underestimates the current MRP. However, I choose to use it as a benchmark to be conservative. I do, however, report sensitivity analyses that reflect an increase in the MRP I refer to models that use the 6.5 percent MRP as the baseline. The estimation of the MRP is discussed in greater detail in Appendix C.

Q63. HOW DO YOU DETERMINE THE RISK-FREE RATE YOU USE?

A63. First, I calculate the yield on long-term Government bonds over a recent 15-day period. Second, I determine the increase in the spread between the yield on A-rated utility bonds and long-term (20-year) Government bonds.[36] As of May 15, 2009 this spread stood at 219 to 239 basis points and had increased by 114 to 145 basis points over the period 1991 to 2007 if I look to Moody's data and by 124 to 174 basis points if I look to Bloomberg's data.[37] As 125 basis points is in the lower end of the range, I conservatively choose to add this to the current estimate of the long-term risk-free rate.

b) Relative Risk

Q64. WHAT MEASURE OF RELATIVE RISK DO YOU USE?

A64. I examine the "beta" of the stocks in question. Beta is a measure of the "systematic" risk of a stock — the extent to which a stock's value fluctuates more or less than average when the market fluctuates.

[36] I use the yield on A-rated utility bonds as they are less likely to include a default premium than are lower rated utility bonds.

[37] See Table 3 above and Workpaper #2 to Table No. BV-9, Panel B.

The basic idea behind beta is that risks that cannot be diversified away in large portfolios matter more than those that can be eliminated by diversification. Beta is a measure of the risks that cannot be eliminated by diversification. This concept is explored further in Appendix C.

Q65. WHAT DOES A PARTICULAR VALUE OF BETA MEAN?

A65. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes up or down by 10 percent on average when the market goes up or down by 10 percent. Stocks with betas above 1.0 exaggerate the swings in the market. A stock with a beta of 2.0 tends to fall 20 percent when the market falls 10 percent, for example. Stocks with betas below 1.0 understate the swings in the market. A stock with a beta of 0.5 tends to rise 5 percent when the market rises 10 percent.

Q66. HOW DO YOU ESTIMATE BETA?

A66. I use beta estimates reported in the *Value Line* for the sample companies.

c) Cost of Equity Capital Calculation

Q67. HOW DO YOU COMBINE THE PRECEDING STEPS TO ESTIMATE THE COST OF EQUITY?

A67. The most widely used approach to combine a risk measure with the benchmark market risk premium on common stocks to find a risk premium for a particular firm or industry is the Capital Asset Pricing Model. However, the CAPM is only one risk-positioning technique.

In addition to the CAPM, I rely on an empirical variety of the model. Empirical research has long shown that the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premia than predicted by the CAPM and high beta stocks tend to have lower risk premia than predicted. A number of variations on the original CAPM theory have been proposed to account for this finding.

This finding can be used directly to estimate the cost of capital, using beta to measure relative risk, without simultaneously relying on the CAPM. Here I examine results from both the CAPM and a version of the security market line based on the empirical finding

that risk premia are related to beta, but are not as sensitive to beta as the CAPM predicts, to convert the betas into a risk premium. I refer to this latter model as the "ECAPM," where ECAPM stands for Empirical Capital Asset Pricing Model. The formula for the ECAPM is

$$k_s = r_f + \alpha + \beta_s \times (MRP - \alpha) \quad (3)$$

where as before k is the cost of capital, r_f is the risk-free interest rate, MRP is the market risk premium, β is the measure of relative risk, and α is the empirical adjustment factor.

Research supports values for α ranging from one to seven percent when using a short-term interest rate. I use benchmark values of α of 0.5 percent for the long-term risk-free rate as it is in the lower range of what empirical evidence support. I also conduct sensitivity tests for different values of α. For the long-term risk-free rate I use values for α of 0, 0.5 and 1.5 percent. See Appendix C for a more detailed discussion of the ECAPM model and Table C-1 for a summary of the empirical evidence on the size of the required adjustment.

Q68. WHY IS IT APPROPRIATE TO USE THE ECAPM MODEL?

A68. Empirical tests of the CAPM have repeatedly shown that an investment's return is related to systematic risk, but that the increase in return for an increase in risk is less than is predicted. The empirical tests have also shown that the theoretical intercept, as measured by the return on Treasury bills, is too low to fit the data. In other words, the empirical tests indicate that the slope of the CAPM is too steep and the intercept is too low. The empirical data support the ECAPM. The ECAPM recognizes the consistent empirical observation that the CAPM underestimates (overestimates) the cost of capital for low (high) beta stocks. The ECAPM corrects the predictions of the CAPM to more closely match the results of the empirical tests. Ignoring the results of CAPM tests would lead to an estimate of the cost of capital that is likely to be less accurate than is possible.

Q69. IS THE USE OF THE ECAPM EQUIVALENT TO ADJUSTING THE ESTIMATED BETAS FOR THE SAMPLE COMPANIES?

A69. No. Fundamentally, this is not an adjustment (increase) in beta. This can easily be seen by the fact that the expected return on high beta stocks is lower with the ECAPM than

when estimated by the CAPM. The ECAPM model is a recognition that the actual slope of the risk-return tradeoff is flatter than predicted and the intercept higher based upon repeated empirical tests of the model.[38] Even if the beta of the sample companies were estimated accurately, the CAPM would still underestimate the required return for low beta stocks. Even if the ECAPM were used, the costs of equity would be underestimated if the betas were underestimated.

2. Discounted Cash Flow Method

Q70. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW APPROACH.

A70. The DCF model takes the first approach to cost-of-capital estimation, i.e., to attempt to estimate the cost of capital in one step. The method assumes that the market price of a stock is equal to the present value of the dividends that its owners expect to receive over the life of the company. The method also assumes that this present value can be calculated by the standard formula for the present value of a cash flow stream:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_T}{(1+k)^T} \qquad (4)$$

where "P" is the market price of the stock; "D_t" is the dividend cash flow expected at the end of period t (i.e., subscript period 1, 2, 3 or T in the equation); "k" is the cost of capital; and "T" is the last period in which a dividend cash flow is to be received. The formula just says that the stock price is equal to the sum of the expected future dividends, each discounted for the time and risk between now and the time the dividend is expected to be received.

Most DCF applications go even further, and make very strong (i.e., unrealistic) assumptions that yield a simplification of the standard formula, which then can be rearranged to estimate the cost of capital. Specifically, if investors expect a dividend

[38] Many investment firms make an adjustment to the beta. A commonly used adjustment is the Merrill Lynch adjustment, which adjusts betas 1/3 toward one. This type of adjustment is intended to compensate for sampling errors in the beta estimation, not for the empirical fact that CAPM tends to overestimate the sensitivity of the cost of capital to beta. See Appendix C for a more detailed explanation.

stream that will grow forever at a steady state, the market price of the stock will be given by a very simple formula,

$$P = \frac{D_1}{(k-g)} \quad \textbf{(5)}$$

where "D_1" is the dividend expected at the end of the first period, "g" is the perpetual growth rate, and "P" and "k" are the market price and the cost of capital, as before. Equation (5) is a simplified version of Equation (4) that can be solved to yield the well known "DCF formula" for the cost of capital:

$$\begin{aligned} k &= \frac{D_1}{P} + g \\ &= \frac{D_0 \times (1+g)}{P} + g \end{aligned} \quad \textbf{(6)}$$

where "D_0" is the current dividend, which investors expect to increase at rate g by the end of the next period, and the other symbols are defined as before. Equation (6) says that if Equation (5) holds, the cost of capital equals the expected dividend yield plus the (perpetual) expected future growth rate of dividends. I refer to this as the simple DCF model. Of course, the "simple" model is simple because it relies on very strong, unrealistic, assumptions.

Q71. CAN YOU ILLUSTRATE THE DCF MODEL?

A71. Yes. For simplicity, I will illustrate the method using annual data although most companies pay dividends quarterly, so that a quarterly model is more appropriate. If, on an annual basis, a company paid $2 in dividends, D_0, has a current stock price, P, of $30 and an estimated growth rate, g, of 5 percent per year, then the calculations in equations (5) and (6) above are as follows

Dividends next period: $D_1 = D_0 \times (1 + g) = \$2.00 \times (1 + 5\%) = \$2.10$

Dividend Yield: $D_1 / P = \$2.10 / \$30 = 7.0\%$

Cost of equity: $k = D_1 / P + g = 7.0\% + 5\% = 12\%$.

Q72. ARE THERE OTHER VERSIONS OF THE DCF MODELS BESIDES THE "SIMPLE" ONE?

A72. Yes. There are many variations on the DCF models that may rely on less strong (more realistic) assumptions in that they allow growth rates to vary over time. I consider a variant of the DCF model that uses the companies' individual growth rates during the first five years, converges to a perpetual growth rate in years 6-10 and then uses the GDP growth rate as the perpetual growth rate after year 10 for all companies. This is a variant of the "multi-stage" DCF method. The DCF models are described in detail in Section I of Appendix D. (Section II of Appendix D provides the details of my empirical DCF results.)

Q73. WHAT ARE THE MERITS OF THE DCF APPROACH?

A73. The DCF approach is conceptually sound if its assumptions are met, but can run into difficulty in practice because those assumptions are so strong, and hence so unlikely to correspond to reality. Two conditions are well known to be necessary for the DCF approach to yield a reliable estimate of the cost of capital: the variant of the present value formula that is used must actually match the variations in investor expectations for the dividend growth path; and the growth rate(s) used in that formula must match current investor expectations. Less frequently noted conditions may also create problems. (See Appendix D for details.)

Q74. WHAT IS THE MOST DIFFICULT PART OF IMPLEMENTATING THE DCF APPROACH?

A74. Finding the right growth rate(s) is the usual "hard part" of a DCF application. The original approach to estimation of the growth rate, g, relied on average historical growth rates in observable variables, such as dividends or earnings, or on the "sustainable growth" approach, which estimates g as the average book rate of return times the fraction of earnings retained within the firm. But it is highly unlikely that these historical averages over periods with widely varying rates of inflation and costs of capital will equal current growth rate expectations. This is particularly true for the water sample as many companies in the industry are growing fast, engaged in mergers, acquisitions or other restructuring activities.

Moreover, the constant growth rate DCF model requires that dividends and earnings grow at the same rate for companies that on average earn their cost of capital.[39] It is inconsistent with the theory on which the model is based to have different growth rates in earnings and dividends over the period when growth is assumed to be constant. If the growth in dividends and earnings were expected to vary over some number of years before settling down into a constant growth period, then it would be appropriate to estimate a multistage DCF model. In the multistage model, earnings and dividends can grow at different rates, but must grow at the same rate in the final, constant growth rate period. A difference between forecasted dividend and earnings rates therefore is a signal that the facts do not fit the assumptions of the simple DCF model.

Q75. HOW DO YOU ESTIMATE THE GROWTH RATES YOU USE IN YOUR DCF ANALYSIS?

A75. I use earnings growth rate forecasts from Bloomberg and *Value Line*. Analysts' forecasts are superior to using single variables in time series forecasts based upon historical data as has been documented and confirmed extensively in academic research. Please see Section I in Appendix D for a detailed discussion on this issue.

Q76. ARE YOU AWARE THAT SOME REGULATORY COMMISSIONS RELY ON BOTH HISTORICAL AND FORECAST GROWTH RATES IN THEIR IMPLEMENTATION OF THE DCF MODEL?

A76. Yes, but I do not believe that is the best way to estimate the growth rate for use in the DCF model for the following reasons. First, as mentioned above, the model requires that dividends and earnings grow at the same rate at some point in the future in order to apply the model. The data on historical growth rates do not confirm this condition. Second, analysts have access to historical information and include that information in their

[39] Why must the two growth rates be equal in a steady-growth DCF model? Think of earnings as divided between reinvestment, which funds future growth, and dividends. If dividends grow faster than earnings, there is less investment and slower growth each year. Sooner or later dividends will equal earnings. At that point, growth is zero because nothing is being reinvested (dividends are constant). If dividends grow slower than earnings, each year a bigger fraction of earnings are reinvested. That makes for ever faster growth. Both scenarios contradict the steady-growth assumption. So if you observe a company with different expectations for dividend and earnings growth, you know the company's stock price and its dividend growth forecast are inconsistent with the assumptions of the steady-growth DCF model.

forecast of earnings growth rates. In other words, using historical data provides no additional information than that captured in analyst forecasts. Data providers such as *Value Line* provide information on the going forward payout ratio as well as on other key financial parameters.

Q77. ARE YOU AWARE OF EVIDENCE THAT ANALYSTS'FORECAST OF EARNINGS GROWTH HAVE HISTORICALLY OVERESTIMATED EARNINGS AND DIVIDEND GROWTH?

A77. Yes. Although analyst forecasts have historically been too optimistic, this problem is less acute for regulated companies.[40] Further, according to a recent joint report by NASD and the NYSE,

> ... the SRO Rules have been effective in helping restore integrity to research by minimizing the influences of investment banking and promoting transparency of other potential conflicts of interest. Evidence also suggests that investors are benefiting from more balanced and accurate research to aid their investment decisions.[41]

In addition, the use of a two-stage DCF model, which substitutes the forecast growth of GDP, mitigates analyst optimism by substituting the GDP growth rate for the potentially optimistic (or pessimistic) earnings forecasts of analysts.

Q78. HOW WELL ARE THE CONSTANT-GROWTH RATE CONDITIONS NECESSARY FOR THE RELIABLE APPLICATION OF THE DCF LIKELY TO BE MET FOR THE SAMPLE COMPANIES AT PRESENT?

A78. The requisite conditions for the sample companies are not fully met at this time, particularly for the water sample. Of particular concern for this proceeding is the uncertainty about what investors truly expect the long-run outlook for the sample companies to be. The longest time period available for growth rate forecasts of which I am aware is five years. The long-run growth rate (i.e., the growth rate after the water

[40] See, for example, L.K.C. Chan, J. Karceski, and J. Lakonishok (2003), "The Level and Persistence of Growth Rates," *Journal of Finance* 58(2), pp. 643-684.

[41] Joint Report by NASD and NYSE on the Operation and Effectiveness of the Research Analyst Conflict of Interest Rules, December 2005, p. 44.

industry settles into a steady state, which may be beyond the next five years for this industry) drives the actual results one gets with the DCF model. Unfortunately, this implies that unless the company or industry in question is stable – so there is little doubt as to the growth rate investors expect – DCF results in practice can end up being driven by the subjective judgment of the analyst who performs the work.

Of the nine companies in the water sample, six do not have earnings forecasts from *Value Line* and three do not have *BEst* growth rates. As a result three companies have no forecasted earnings growth and two companies have only one analyst's estimate.[42] The average long-term earnings forecasts from vary from a low of -6.0 percent[43] to a high of 15 percent. The lack of sufficient number of analysts following the sample companies and the large variation in growth forecasts indicate that these forecasts are less reliable than ideal. The growth rates for gas LDC sample vary less from 2.1 to 6.6 percent, and are more consistent with the GDP growth forecast of 4.9 percent. Of the 11 companies in the gas LDC sample, one has only two analysts providing a forecast (one *Value Line* and one BEst). The two-stage DCF model adjusts for any overly optimistic (or pessimistic) growth rate forecasts by adjusting the 5-year growth rate forecasts of the analysts toward the long-term GDP growth rate in the years after year 5. See Appendix D, *Section I* for a discussion of the two-stage model.

The DCF growth rates, whether estimated from historical data or from analyst forecasts, have likely been affected by several factors: many mergers and acquisitions in the water industry in recent years, significant growth in many parts of the country, and a trend towards consolidation. The industry appears to be moving towards a larger degree of consolidation – at least among the privately held water utilities. The consolidation of the industry may well increase as the industry needs significant infrastructure investments to comply with EPA water purification rules, maintain or replace old infrastructure, and deal with increased threats towards the water systems.[44] The American Society of Civil Engineers estimated in 2009 that "drinking water systems face an annual shortfall of at

[42] See Table BV-5 for details.

[43] The negative 6 percent pertains to Southwest Water which recently cut dividends.

[44] See, for example, *Value Line*, Water Utility Industry, April 25, 2008.

least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations"[45] with a total investment need for drinking water and wastewater investments of $255 billion over the next five years.[46] Drinking water is mentioned as the second most important infrastructure concern for Arizona and the required investments is estimated at $9.12 billion for drinking water and at $4.57 billion for wastewater.[47] Coupled with the rising construction costs of utility infrastructure, this creates uncertainty about future conditions and diverging expectations. The uncertainty associated with these factors increases the industry's business risk. Additionally, environmental regulations impact the industry as standards for water quality evolve over time, and there is potential for new safety and security requirements in the future. The industry has no federal regulator (other than for environmental and health issues), and state public utility commissions regulate most investor owned water utilities. Different regulatory bodies may lead to differing regulatory requirements for companies operating in adjacent parts of the country. Taken together, these factors mean that it may be some time before the water industry settles into anything investors will see as a stable equilibrium necessary for the reliable application of the DCF model.

Such circumstances imply that a commission may often be faced with a wide range of DCF estimates, none of which can be well grounded in objective data on true long-run growth expectations, *because no such objective data now exist.* DCF for firms or industries in flux is *inherently* subjective with regard to the most important parameter, the long-run growth rate that drives the answer.

In short, the unavoidable questions about the DCF model's strong assumptions cause me to view the DCF method as *inherently* less reliable than the risk-positioning approach described above. This is particularly true for the water sample, because of the data problems discussed above. However, because the DCF method has been widely used in

[45] Report Card for America's Infrastructure, The American Society of Civil Engineers, 2009, p. 1.

[46] *Ibid.*, Executive Summary p. 7. According to the document, the investment shortfall is about $108.6 billion for the water industry over the next five years.

[47] *Ibid.*, Arizona. (http://www.infrastructurereportcard.org/state-page/arizona)

the past, I submit DCF evidence in this case. DCF estimates also serve as a check on the values provided by the risk-positioning methods.

In this proceeding, I give no weight to the water sample's DCF estimates, but use the gas LDC DCF estimates as a check on the reasonableness of my risk-positioning estimates. While the Commission Staff in the past has given weight to the water sample's DCF results, I respectfully submit that the high variability of these growth rates makes them very unreliable at this point in time. For example, a year ago, Southwest Water's growth rate from BEst was 9.7 percent, but it is now negative 6.0 percent and York Water had a growth rate of only .6 percent a year ago while it now has a growth rate of 7.0 percent.[48] Relying on historical growth rate does not make the water sample's DCF results reliable, because (1) the DCF method's strength is being forward looking and historical data violates this principle and (2) historical growth rates for the water industry vary as much as do forecasted growth rates. For example, Southwest Water's 5-year historical earnings growth was negative 2.5 percent while the company's 10-year historical earnings growth was 8.0 percent. A number of companies in the water industry, which has a relative small number of companies, are in flux and therefore their growth rates are very volatile. Therefore, even minor variations in methodology, timing, or sample composition drives the results which is not consistent with stable rate making.

C. THE SAMPLES AND RESULTS

1. The Water Utility Sample

Q79. EARLIER YOU SAID THAT THE SAMPLE OF WATER UTILITIES HAD SERIOUS DATA WEAKNESSES. PLEASE ELABORATE ON THESE WEAKNESSES.

A79. In attempting to apply the DCF model to the sample, six companies had no *Value Line* growth forecasts. The size of the companies in the water sample also makes cost-of-capital estimation difficult. Currently, only four companies have more than $500 million in market value of equity. More important, however, is the fact that the stock of these

companies trades relatively infrequently. Low trading volume causes concern because there may be a delay between the release of important information and the time that this information is reflected in prices. Such delay is well known to cause beta estimates to be statistically insignificant and possibly biased.

In addition to lack of data and the small size of the companies, there are firm-specific events that render the water utility sample less reliable than would be ideal. First, Aqua America (the largest of the companies) has gone through a large number of mergers and acquisitions in recent years. Normally, I would not include companies with significant merger or acquisition activity in a sample because the individual information about the progress of the proposed merger is so much more important for the determination of the company's stock price than day-to-day market fluctuations. In practice, beta estimates for such companies tend to be too low. The growth rates for such companies may also be affected. Second, Southwest Water Co. recently cut dividends and has delayed the issuance of its 2008 10-K. Dividend cuts are usually a sign of financial distress or unusual circumstances. I therefore report my results for both the full sample and for a subsample of companies that does not include Southwest Water Co.[49]

It is because of these weaknesses in the water sample that I also utilize a sample of natural gas LDCs. However, I believe the comparability of the water utilities and the gas LDC companies is lower than it has been in the recent past because the gas LDC sample's systematic risk measures have diverted not only from those of water utilities but also from those of other utilities. The selection procedure for this sample was summarized earlier and details are provided in Appendix B.

[48] Table No. BV- 5 uses data as of May 18, 2009 and my testimony in W-01303A-08-0227 used data as of February 7, 2008.

[49] Further, Southwest Water Co. has an unusual negative growth rate and a very high beta.

2. Risk-Positioning Cost-of-Capital Estimates

Q80. HOW IS THIS SECTION OF YOUR TESTIMONY ORGANIZED?

A80. This section first describes the input data used in the CAPM and ECAPM models, then reports the resulting cost-of-equity estimates for the samples. The second section of Appendix C details the empirical analysis.

a) Interest Rate Estimate

Q81. HOW DID YOU DETERMINE THE EXPECTED RISK-FREE INTEREST RATE?

A81. I reviewed current constant maturity U.S. Government bond yield data available from the St. Louis Federal Reserve Bank. For the period April 27 to May 15, 2009, the average yield on long-term government bonds was 4.10 percent. To that figure I added 125 basis points in the baseline case as an adjustment for the increase in yield spread.[50] I note that in the sensitivity analyses, I reduce the adjustment for yield spread by 25 basis points for each 1 percent increase in the MRP. This intends to take into account the fact that bond betas may be positive and .25 is a conservative estimate hereof - - i.e., bond betas are likely to be lower, so that a .25 percent adjustment is in the upper end of the needed adjustment.

b) Betas and the Market Risk Premium

Q82. WHAT BETA ESTIMATES DID YOU USE IN YOUR ANALYSIS FOR THE SAMPLES?

A82. I rely upon the most recent betas estimated by *Value Line* for both the water sample and for the gas LDC sample.

Q83. ARE THE BETA VALUES REPORTED BY *VALUE LINE* ADJUSTED BETAS?

A83. Yes. *Value Line* reports betas that are adjusted towards one. For this proceeding, I reverse the *Value Line* adjustment for water utilities. This is intended to ensure my

[50] See Table No. BV-9.

estimates for the water sample are conservative.[51] *Value Line* and many investment firms adjust the estimated betas. This type of adjustment is intended to compensate for sampling errors in the beta estimation, not for the empirical fact that the CAPM tends to overestimate the sensitivity of the cost of capital to beta. For this proceeding I use unadjusted betas as I have previously for water and wastewater utilities and as reported *Value Line* estimates for the gas LDC sample.

Q84. PLEASE SUMMARIZE THE BETA ESTIMATES YOU RELY ON.

A84. After reversing the *Value Line* adjustment procedure, the average estimated *Value Line* beta for the water sample is about 0.70. The average of the *Value Line* betas for the gas LDC sample is about 0.68. These beta estimates are reported in Workpaper #1 to Tables No. BV-10 and BV-21.[52]

Q85. PLEASE EXPLAIN THE METHOD TO ADJUST FOR DIFFERENCES IN CAPITAL STRUCTURE.

A85. Starting with the ATWACC, the cost of equity for any capital structure within a broad range of capital structures can be determined by the following formula:

$$\text{Return on equity} = \frac{\text{ATWACC} - \text{Return on debt} \times \%\ \text{debt in capital structure} \times (1 - \text{tax rate})}{\%\ \text{equity in capital structure}}$$

This is the calculation that is displayed in Tables No. BV-12 and BV-23.[53] The tables display the result of converting the sample average ATWACC to a return on equity for a specific capital structure. It is straightforward to use this method to determine the cost of equity consistent with the capital structure.

[51] In some prior proceedings I also reversed the gas LDC companies' beta estimates, but the sharp decline in these betas and the divergence from water utility betas indicate that unadjusted betas are too conservative as a measure of water utility risk.

[52] The beta estimates for both the water sample and the gas LDC sample are about .15 lower than the estimates relied upon in my most recent testimony before this Commission in Docket No. W-01303A-08-0227.

[53] For companies that have preferred equity, an additional term equal to (Return on preferred equity × % preferred in capital structure) is subtracted from the numerator of this fraction.

c) Risk-Positioning Results

Q86. WHAT ARE THE COST-OF-EQUITY ESTIMATES DERIVED FROM THE RISK-POSITIONING APPROACH FOR THE WATER AND GAS LDC SAMPLE?

A86. Using the long-term interest rate in the two risk-positioning models (CAPM and ECAPM), with two values of the ECAPM parameter (0.5% and 1.5%), I obtain three estimates of each sample company's cost of equity (Tables No. BV-10 for the water sample and subsample and BV-21 for the gas LDC sample). The cost-of-equity estimates are combined with the estimates of the company's cost of debt and preferred to calculate the company's ATWACC (Tables No. BV-11 and BV-22). Tables No. BV-12 and BV-23 combine the sample average ATWACC with Arizona-American Water's capital structure, cost of debt, and tax rate to obtain the cost of equity at Arizona-American Water's 45 percent equity. Panel A of Table No. BV-12 shows the cost of equity and ATWACC value for all water sample companies, while Panel B shows the results for the subsample of companies without Southwest Water that recently cut dividend and whose revenue from regulated water utility activities constitute a lower percentage than for other companies. Similar results for the gas LDC sample are shown in Table No. BV-23. The baseline cost-of-equity results are summarized below in Table 5 for the water sample and subsample and in Table 6 for the gas LDC sample.

Table 5: Baseline Cost-of-Equity Estimates for the Water Sample and Subsample

Regulatory Capital Structure:	*45.2% Equity / 0.0% Preferred / 54.8% Debt*				*Tax Rate: 38.6%*
	METHODS				
	RISK POSITIONING (using Long-Term Risk-Free Rate)			DCF	
Water Sample	CAPM	α = 0.5%	α = 1.5%	Simple	Multi-stage
Cost of Equity	12.8%	13.0%	13.5%	16.5%	11.6%
Average ATWACC	8.0%	8.1%	8.3%	9.6%	7.4%
Sub-Sample					
Cost of Equity	12.3%	12.6%	13.1%	16.5%	11.6%
Average ATWACC	7.8%	7.9%	8.1%	9.6%	7.4%

Risk Positioning Security Market Line Parameters:		Multi-Stage DCF Parameter:	
Long-Term			
Risk Free Rate Estimate:	5.35% (4.1% plus 1.25%)	GDP Growth Estimate:	4.9%
Estimated MRP:	6.5% .		

Table 6: Baseline Cost-of-Equity Estimates for the Gas LDC Sample

Regulatory Capital Structure:	*45.2% Equity / 0.0% Preferred / 54.8% Debt*				*Tax Rate: 38.6%*
	METHODS				
	RISK POSITIONING (using Long-Term Risk-Free Rate)			DCF	
Gas LDC Sample*	CAPM	α = 0.5%	α = 1.5%	Simple	Multi-stage
Cost of Equity	12.2%	12.5%	12.9%	12.2%	12.1%
Average ATWACC	7.7%	7.8%	8.0%	7.7%	7.7%

Risk Positioning Security Market Line Parameters:			
Long-Term			
Risk Free Rate Estimate:	5.4%	GDP Growth	
Estimated MRP:	6.5%	Estimate:	4.9%

Varying the MRP / risk-free rate over the range 6.5 percent / 5.35 percent to 8.5 percent / 4.85 percent, I obtain the estimated displayed in Tables 7-A, 7-B and 8 below.

Table 7-A: Summary RoE by Adjusting Long-Term Risk-Free Rate and MRP

Estimated Return on Equity	Baseline [1]	Sensitivity Test 1 [2]	Sensitivity Test 2 [3]	Sensitivity Test 3 [4]
CAPM	12.8%	13.5%	13.8%	14.1%
ECAPM (α = 0.5%)	13.0%	13.7%	14.0%	14.4%
ECAPM (α = 1.5%)	13.5%	14.1%	14.5%	14.8%

Sources and Notes:
[1]: Long-term risk-free rate is 4.1% plus 1.25%,
MRP is 6.50%
[2]: Long-term risk-free rate is 4.1% plus 1.00%,
MRP is 6.50% plus 1.00%.
[3]: Long-term risk-free rate is 4.1% plus 0.875% basis points,
MRP is 6.50% plus 1.50%.
[4]: Long-term risk-free rate is 4.1% plus 0.75%,
MRP is 6.50% plus 2.00%.

Table 7-B. Water Subsample: Summary of ROE by Adjusting Long-Term Risk-Free Rate and MRP

Estimated Return on Equity	Baseline [1]	Sensitivity Test 1 [2]	Sensitivity Test 2 [3]	Sensitivity Test 3 [4]
CAPM	12.3%	12.9%	13.2%	13.5%
ECAPM (α = 0.5%)	12.6%	13.2%	13.5%	13.8%
ECAPM (α = 1.5%)	13.1%	13.7%	14.0%	14.3%

Sources and Notes:
[1]: Long-term risk-free rate is 4.1% plus 1.25%,
MRP is 6.50%
[2]: Long-term risk-free rate is 4.1% plus 1.00%,
MRP is 6.50% plus 1.00%.
[3]: Long-term risk-free rate is 4.1% plus 0.875% basis points,
MRP is 6.50% plus 1.50%.
[4]: Long-term risk-free rate is 4.1% plus 0.75%,
MRP is 6.50% plus 2.00%.

Table 8: Gas LDC Sample: Summary of ROE by Adjusting Long-Term Risk-Free Rate and MRP

Estimated Return on Equity	Baseline [1]	Sensitivity Test 1 [2]	Sensitivity Test 2 [3]	Sensitivity Test 3 [4]
CAPM	12.2%	12.8%	13.1%	13.4%
ECAPM (α = 0.5%)	12.5%	13.1%	13.4%	13.6%
ECAPM (α = 1.5%)	12.9%	13.5%	13.8%	14.1%

Sources and Notes:
[1]: Long-term risk-free rate is 4.1 plus 1.25%
MRP is 6.50%.
[2]: Long-term risk-free rate is 4.1% plus 1.00%,
MRP is 6.50% plus 1.00%.
[3]: Long-term risk-free rate is 4.1% plus 0.875% basis points,
MRP is 6.50% plus 1.50%.
[4]: Long-term risk-free rate is 4.1% plus 0.75%,
MRP is 6.50% plus 2.00%.

Q87. PLEASE SUMMARIZE YOUR FINDINGS FROM THE RISK-POSITIONING MODEL.

A87. Focusing on the middle ECAPM (α = .50%) for the long-term risk-positioning model, I find that the water subsample's cost of equity of about 12.6 percent for the baseline case with a range of 12.3 to 13.1 percent. If a modest MRP adjustment of 1 percent is applied the midpoint estimate increases to 13.2 percent. Looking at the gas LDC sample, the midpoint for the baseline scenario is very similar at 12.5 percent with a range of 12.2 to

12.9 percent. However, it is more correct to say that the water subsample and the gas LDC sample indicate a baseline range of 12 to 13 percent. If I consider the modest adjustment of 1 percent to the MRP the upper bound increases to 13½ percent. I do not report results from the short-term model in this proceeding as the Treasury bill rate has been driven to zero. This is consistent with, for example, a recent decision by the Surface Transportation Board that decided to rely on the CAPM using 20-year Treasury bonds for the risk-free rate, 5-year weekly beta estimates, and Ibbotson's reported long-term market risk premium when determining railroads' cost of equity.[54]

The best point estimate for the risk positioning model for both the water subsample and the gas LDC sample is 12½ percent in the baseline case with a range of 12 to above 13 percent. I discuss the assessment of Arizona-American Water's cost of equity in the concluding section.

3. The DCF Cost-of-Capital Estimates

Q88. WHAT STEPS DO YOU TAKE IN YOUR DCF ANALYSES?

A88. Given the above discussion of DCF principles, the steps are to collect the data, estimate the sample companies' costs of equity at their current capital structures, and then to adjust the sample's estimates to Arizona-American Water's 45 percent equity ratio.

a) Growth Rates

Q89. WHAT GROWTH RATE INFORMATION DO YOU USE?

A89. For reasons discussed above and in Appendix D, historical growth rates today are not as relevant as forecasts of current investor expectations for these samples. I therefore use rates forecast by security analysts.

The ideal in a DCF application would be a detailed forecast of future dividends, year by year well into the future until a true steady state (constant) dividend growth rate was reached, based on a large sample of investment analysts' expectations. I know of no

[54] *STB Ex Parte No. 664*, Issued January 17, 2008.

source of such data. Dividends are ultimately paid from earnings, however, and earnings forecasts from a number of analysts are available for a few years. Investors do not expect dividends to grow in lockstep with earnings, but for companies for which the DCF approach can be used reliably (*i.e.*, for relatively stable companies whose prices do not include the option-like values described in Appendix D), they do expect dividends to track earnings over the long-run. Thus, use of earnings growth rates as a proxy for expectations of dividend growth rates is a common practice.

Accordingly, the first step in my DCF analysis is to examine a sample of investment analysts' forecast earnings growth rates from Bloomberg and *Value Line* to the degree such forecasts are available. The details are in Appendix D. At present, *Value Line* data run through a 2012-2014 horizon, representing an average of about four years from the current earning forecasts available for 2009. Bloomberg also provides a long-term earnings growth rate estimate. The longest-horizon forecasted growth rates from these sources underlie the simple DCF model (*i.e.*, the standard perpetual-growth model associated with the "DCF formula," dividend yield plus growth). Unfortunately, the longest growth forecast data only go out four to five years, which is too short a period to make the DCF model completely reliable.

b) Dividend and Price Inputs

Q90. WHAT VALUES DO YOU USE FOR DIVIDENDS AND STOCK PRICES?

A90. Dividends are either for the first or the second quarter of 2009, depending on the most recent dividend information available at the time of estimation for each company.[55] This dividend is grown at the estimated growth rate and divided by the price described below to estimate the dividend yield for the simple DCF model.

Stock prices are an average of closing stock prices for the 15-day trading period ending on the day the BEst forecast was obtained from Bloomberg. A 15-day stock price average is used to guard against anomalous price changes in any single day.

[55] The dividend information was obtained from Bloomberg.

c) DCF Results

Q91. WHAT ARE THE DCF ESTIMATES FOR THE SAMPLES?

A91. The data are used in the two versions of the DCF method to get sample company estimates at the sample company's capital structure. The resulting cost of equity at Arizona-American Water's 45 percent equity estimates are shown in Table 5 above. There is a very large difference between the simple and multi-stage DCF results for the water sample (16.5 versus 11.6 percent), confirming the conclusion drawn above that the water industry is not in a stable equilibrium. As a result, DCF results from the water sample are unreliable, and I therefore do not put any weight on them in arriving at my final estimate. However, for the gas LDC sample both DCF models yields very similar results (12.2 versus 12.1 percent, suggesting that the gas LDC sample is indeed more homogeneous than the water sample at this time. In addition, DCF estimates for the gas LDC sample are not too different from risk-positioning results, albeit on average lower than them. It is noteworthy that the DCF estimates have increased since I last filed testimony in this jurisdiction. This indicates that the cost of capital has increased for the gas LDC and water samples.

V. ARIZONA-AMERICAN WATER'S COST OF EQUITY

Q92. WHAT CONCLUSIONS DO YOU DRAW FROM THE ABOVE DATA REGARDING EACH SAMPLE'S COST OF EQUITY AT ARIZONA-AMERICAN WATER'S 45 PERCENT EQUITY RATIO?

A92. For the gas LDC sample, the estimated costs of equity from the risk-positioning model and from the DCF model are reasonably in line. For the water sample subsample, estimates vary significantly between different methods, and the DCF results are particularly variable. Although I do not rely upon the DCF model results for the water sample or subsample, I believe that DCF cost-of-capital estimates from the gas LDC sample provide a useful check on the risk-positioning results. The relative consistency of the multi-stage DCF and the risk-positioning cost-of-equity estimates for the gas LDC sample indicate that those estimates are reasonable.

Q93. DO YOU HAVE ANY COMMENTS REGARDING THE RESULTS OF THE RISK-POSITIONING MODELS?

A93. The estimated cost of equity displayed in Panel B of Table No. BV-12 compared to Table No. BV-23 is significantly higher on average for the water sample. The risk-positioning results are summarized above in Tables 5 and 6 with sensitivity analyses presented in Tables 7 and 8. The CAPM values deserve the least weight, because this method does not adjust for the empirical finding that the cost of capital is less sensitive to beta than predicted by the CAPM (which my testimony considers by using the ECAPM). Conversely, the ECAPM numbers deserve the most weight, because this method adjusts for the empirical findings. Based on the facts discussed in *Section III* as well as the increase in DCF estimates for both samples, it is clear that the cost of capital has increased over the last year. It is more difficult to assess exactly by how much. Therefore, I rely primarily on my baseline case which is a conservative estimate of the cost of capital for Arizona-American Water.

Q94. DID YOU CONSIDER ANY OTHER EVIDENCE IN DETERMINING WHETHER ARIZONA-AMERICAN'S REQUESTED RETURN ON EQUITY WAS REASONABLE?

A94. Yes. I reviewed recent water utility decisions from the Arizona Corporation Commission and compared the overall rates of return to that requested by Arizona-American Water. Specifically, I compared the overall rate of return allowed by the Commission to that requested by Arizona-American Water using two scenarios. Specifically, I compared the allowed rate of return at the time of the decision to that requested by Arizona-American today.

Q95. PLEASE EXPLAIN YOUR COMPARISON TO RECENT COMMISSION DECISIONS.

A95. I obtained data on 20 recent Arizona decisions on water and wastewater utilities.[56] The data is summarized in Table 9 below.

[56] The first 17 decisions were provided by Arizona-American and the last three were obtained from the Commission's website (E-dockets).

Table 9: Summary of Recent Commission Water and Wastewater Decisions

Company	Decision [1]	Date [2]	Common Equity [3]	Allowed Rate of Return on Equity [4]
Bella Vista Water Company	65350	11/1/2002	68.1%	9.1%
Clearwater Utilities	66782	2/13/2004	100.0%	9.1%
Arizona Water Company	66849	3/19/2004	66.2%	9.2%
Arizona-American Water Co. (Formerly Citizens)	67093	6/30/2004	39.9%	9.0%
Rio Rico Utilities	67279	10/5/2004	100.0%	8.7%
Las Quintas Serenas Water Co.	67455	1/4/2005	100.0%	8.1%
Forest Highlands	67983	7/18/2005	100.0%	8.1%
Pineview Water Co.	67989	7/18/2005	51.0%	8.9%
Chaparral City Water	68176	9/30/2005	58.8%	9.3%
Arizona Water Company	68302	11/14/2005	73.4%	9.1%
Arizona-American Water Co. (PV)	68858	7/28/2006	36.7%	10.4%
Black Mountain Sewer	69164	12/5/2006	100.0%	9.6%
Far West Water & Sewer Co.	69335	2/20/2007	56.0%	9.3%
Goodman Water Co.	69404	4/16/2007	100.0%	9.3%
Arizona-American Water Co. (Mohave W&WW)	69440	5/1/2007	40.0%	10.7%
Gold Canyon Sewer Company	69664	6/28/2007	100.0%	9.2%
Utility Source	70140	1/23/2008	100.0%	8.9%
Cordes Lakes Water Company	70710	2/17/2008	100.0%	10.0%
Arizona -American (Sun City Wastewater)	70209	3/20/2008	38.5%	10.6%
Arizona-American (Anthem)	70372	6/13/2008	39.2%	8.8%

Arizona-American Water's requested capital structure contains only 45.2 percent equity which is lower than that of any company in Table 9 other than Arizona-American Water itself. Therefore, Arizona-American Water has a higher level of financial risk and consequently its cost of equity capital is higher. As Arizona-American Water has less equity, a smaller fraction of its rate base gets an equity return while a larger fraction of the rate base gets a debt return. Henceforth, the weighted average cost of capital or overall return is not higher than that of other entities. Table 10 below shows the after-tax weighted-average cost of capital inherent in each decision listed in Table 9 using the cost of debt from the relevant decision. This figure is calculated in column [7]. Column [8] reports the corresponding cost of equity at Arizona-American Water's capital structure.

Table 10: Comparing Recent Commission Decisions at 45.15% Equity

Company	Decision	Common Equity	Allowed Rate of Return on Equity	Long-term Debt	Debt Cost	Implied ATWACC	Implied ROE at AZ-Am Equity %
Bella Vista Water Company	65350	68.1%	9.1%	31.9%	5.9%	7.4%	11.8%
Clearwater Utilities	66782	100.0%	9.1%	0.0%	n/a	9.1%	15.6%
Arizona Water Company [f]	66849	70.1%	9.2%	29.9%	8.5%	8.0%	13.2%
AZ-American Water Co. (Citizens)	67093	39.9%	9.0%	60.1%	4.8%	5.4%	7.3%
Rio Rico Utilities	67279	100.0%	8.7%	0.0%	n/a	8.7%	14.7%
Las Quintas Serenas Water Co.	67455	100.0%	8.1%	0.0%	n/a	8.1%	13.4%
Forest Highlands	67983	100.0%	8.1%	0.0%	n/a	8.1%	13.4%
Pineview Water Co.	67989	51.0%	8.9%	49.0%	5.4%	6.2%	9.1%
Chaparral City Water	68176	58.8%	9.3%	41.2%	5.1%	6.8%	10.4%
Arizona Water Company	68302	73.4%	9.1%	26.6%	8.4%	8.1%	13.3%
AZ-American Water Co. (PV)	68858	36.7%	10.4%	63.3%	5.4%	5.9%	8.6%
Black Mountain Sewer	69164	100.0%	9.6%	0.0%	n/a	9.6%	16.7%
Far West Water & Sewer Co.	69335	56.0%	9.3%	44.0%	5.8%	6.8%	10.5%
Goodman Water Co.	69404	100.0%	9.3%	0.0%	n/a	9.3%	16.0%
AZ-American Water Co. (Mohave)	69440	40.0%	10.7%	60.0%	5.7%	6.4%	9.6%
Gold Canyon Sewer Company	69664	100.0%	9.2%	0.0%	n/a	9.2%	15.8%
Utility Source	70140	100.0%	8.9%	0.0%	n/a	8.9%	15.2%
Cordes Lakes Water Company	70710	100.0%	10.0%	0.0%	n/a	10.0%	17.6%
AZ -American (Sun City Wastewater)	70209	38.5%	10.6%	61.5%	5.5%	6.2%	9.1%
AZ-American (Anthem)	70372	39.2%	8.8%	60.8%	5.4%	5.5%	7.6%
Average		73.6%	9.3%	26.4%	6.0%	7.7%	12.4%
Averge without AZ-Am		85.2%	9.1%	14.8%	6.5%	8.3%	13.8%
Average without AZ-Am and Companies with 100% Equity		62.9%	9.2%	37.1%	6.5%	7.2%	11.4%

As can be seen from Table 10 above, on an apples-to-apples comparison, the average return on equity allowed by the Commission at Arizona-American Water's targeted capital structure was 12.4 percent for all companies which is very comparable to the Company's current request. Excluding Arizona-American Water from the average increases the comparable cost of equity to 13.8 percent and an exclusion of both Arizona-American Water and companies that are 100 percent equity financed decreases the comparable cost of equity to 11.4 percent. However, the figures above do not consider the increase in the cost of debt that utilities face and therefore underestimate today's ATWACC and hence the implied cost of equity. As the comparable return allowed to water and wastewater utilities in Arizona in recent years is comparable to that requested by the Company, prior Commission decisions are consistent with Arizona-American Water's request in this proceeding.

Q96. BASED ON THE EVIDENCE WHAT IS YOUR CONCLUSION REGARDING ARIZONA-AMERICAN WATER'S REQUESTED 12.25 PERCENT RETURN ON EQUITY?

A96. Based on the results from my cost-of-capital estimation procedures, I conclude that 12.25 percent return on equity is very reasonable and a conservative request. It is included in both the risk positioning and DCF ranges and near the lower end of the water subsample and gas LDC sample's risk positioning estimates using the baseline scenario which relies on a lower MRP than what I believe currently prevail. It is also comparable to the overall returns the Commission has allowed other water and wastewater utilities to earn in the past. As a result, the empirical analysis of market data and the study of the Commission's past decisions indicate that the requested return on equity is consistent with both market data and past Commission decisions.

Q97. DOES THIS CONCLUDE YOUR TESTIMONY?

A97. Yes.

APPENDIX A

RESUME OF DR. BENTE VILLADSEN

Bente Villadsen's work concentrates in the areas of regulatory finance and accounting. Her recent work has focused cost of capital, credit issues in the utility industry as well the impact of regulatory initiatives such as energy efficiency and de-coupling. Other recent work has included damage estimation, accounting disclosure and principles including impairment testing, leases, mark-to-market accounting, accounting for hybrid securities, accounting for equity investments, cash flow estimation as well as overhead allocation. She has testified on cost of capital, accounting issues, and damages.

Dr. Villadsen holds a Ph.D. from Yale University's School of Management with a concentration in accounting. She has a joint degree in mathematics and economics (BS and MS) from University of Aarhus in Denmark. Prior to joining *The Brattle Group*, she was a Professor of Accounting at the University of Iowa, University of Michigan, and at Washington University in St. Louis where she taught financial and cost accounting. Dr. Villadsen also worked as a consultant for Risoe National Laboratories in Denmark.

REPRESENTATIVE EXPERIENCE

ENERGY AND PUBLIC UTILITY FINANCE

- Dr. Villadsen has filed several cost of capital testimonies and appeared at hearings for water and wastewater utilities in connection with rate hearings before state regulatory commissions. She has also filed testimony on cost of capital for electric utilities.

- She has considerable experience in estimating the cost of capital for major U.S. and Canadian utilities, pipelines, and railroads. The work has been used in connection with the companies' rate hearings before the Federal Energy Regulatory Commission, the Canadian National Energy Board, the Surface Transportation Board, and state and provincial regulatory bodies. The work has been performed for pipelines, integrated electric utilities, non-integrated electric utilities, gas distribution companies, water utilities, railroads and other parties.

- In connection with rate hearings for electric utilities, Dr. Villadsen has estimated the impact of power purchase agreements on the company's credit ratings and calculated appropriate compensation for utilities that sign such agreements to fulfill, for example, renewable energy requirements.

- Dr. Villadsen has been part of a team assessing the impact of conservation initiatives, energy efficiency, and decoupling of volumes and revenues on electric utilities financial

performance. Specifically, she has estimated the impact of specific regulatory proposals on the affected utilities earnings and cash flow.

- For a large integrated utility in the U.S., Dr. Villadsen participated in all aspects of the company's rate filing, including the company's cost of capital, incentive based rates, and certain regulatory accounting issues.

- Dr. Villadsen has been involved in several projects evaluating the impact of credit ratings on electric utilities. She was part of a team evaluating the impact of accounting fraud on an energy company's credit rating and assessing the company's credit rating but-for the accounting fraud.

- For a large electric utility, Dr. Villadsen modeled cash flows and analyzed its financing decisions to determine the degree to which the company was in financial distress as a consequence of long-term energy contracts.

- For a large electric utility without generation assets, Dr. Villadsen assisted in the assessment of the risk added from offering its customers a price protection plan and being the provider of last resort (POLR).

ACCOUNTING AND CORPORATE FINANCE

- On behalf of a taxpayer, Dr. Villadsen recently testified in federal court on the impact of discount rates on the economic value of alternative scenarios in a lease transaction.

- In an international arbitration matter, she testified on the allocation of corporate overhead costs and damages in the form of lost profit.

- Dr. Villadsen has provided expert reports and testimony on several accounting issues in international and domestic arbitrations or court proceedings. In a recent international arbitration, she testified on the proper application of US GAAP in determining shareholders' equity. Among other topics, she testified regarding impairment of long-lived assets, lease accounting, the equity method of accounting, and the measurement of investing activities.

- In a U.S. arbitration, she provided expert reports on the equity method of accounting, the classification of debt versus equity and the distinction between categories of liabilities in a contract dispute between two major oil companies.

- In U.S. District Court, Dr. Villadsen filed testimony regarding the information required to determine accounting income losses associated with a breach of contract and cash flow modeling.

- She has worked extensively on litigation matters involving the proper application of mark-to-market and derivative accounting in the energy industry. The work relates to the proper valuation of energy contracts, the application of accounting principles, and disclosure requirements regarding derivatives.

- Dr. Villadsen evaluated the accounting practices of a mortgage lender and the mortgage industry to assess the information available to the market and ESOP plan administrators prior to the company's filing for bankruptcy. A large part of the work consisted of comparing the company's and the industry's implementation of gain-of-sale accounting.

- Dr. Villadsen evaluated the performance of segments of regulated entities. She also reviewed and evaluated the methods used for overhead allocation.

- For a large multi-national company, Dr. Villadsen estimated the cost of capital for the company's segments. As part of the assignment, she evaluated the company's decision methods and assessed the country-specific investment risk of projects under consideration.

- She has worked on accounting issues in connection with several tax shelter cases. The focus of her work has been the application of accounting principles to evaluate intra-company transactions, the accounting treatment of security sales, and the classification of debt and equity instruments.

- Dr. Villadsen has modeled the cash flows of several companies to estimate the impact of specific (energy) contracts or to determine the impact of specific loans.

- She assisted in the estimation of net worth of individual segments for firms in the consumer product industry. Further, she built a model to analyze the segment's vulnerability to additional fixed costs and its risk of bankruptcy.

- For a large integrated oil company, Dr. Villadsen estimated the company's cost of capital and assisted in the analysis of the company's accounting and market performance.

- In connection with commercial litigation, Dr. Villadsen estimated the cost of capital for companies in the chemical industry and for companies in the cement industry.

RECENT PUBLICATIONS

"Understanding Debt Imputation Issues," (with Michael J. Vilbert and Joe Wharton and *The Brattle Group* listed as an author), *Edison Electric Institute*, June 2008.

"Building Sustainable Efficiency Businesses: Volume I – Approaches and Models," (with Joe Wharton and Peter Fox-Penner, and with "*The Brattle Group*" listed as author), *Edison Electric Institute*, forthcoming, Spring 2008.

"Measuring Return on Equity Correctly: Why current estimation models set allowed ROE too low," *Public Utilities Fortnightly*, August 2005 (with A. Lawrence Kolbe and Michael J. Vilbert).

"The Effect of Debt on the Cost of Equity in a Regulatory Setting," (with A. Lawrence Kolbe and Michael J. Vilbert, and with "*The Brattle Group*" listed as author), *Edison Electric Institute,* April 2005.

"Communication and Delegation in Collusive Agencies," *Journal of Accounting and Economics*, Vol. 19, 1995.

"Beta Distributed Market Shares in a Spatial Model with an Application to the Market for Audit Services" (with M. Hviid), *Review of Industrial Organization*, Vol. 10, 1995.

REPRESENTATIVE PRESENTATIONS

"Subprime Mortgage-Related Litigation: What to Look for and Where to Look," *Law Seminars International: Damages in Securities Litigation*, Boston, May 2008.

"Evaluating Alternative Business / Inventive Models," (with Joe Wharton). *EEI Workshop, Making a Business of Energy Efficiency: Sustainable Business Models for Utilities*, Washington DC, December 2007.

"Deferred Income Taxes and IRS's NOPR: Who should benefit?", *NASUCA Annual Meeting*, Anaheim, CA, November 2007.

"Current Issues in Cost of Capital," (with M.J. Vilbert). *EEI Electric Rates Advanced Course*, Madison, 2005.

"Issues for Cost of Capital Estimation," (with M.J. Vilbert). *EEI Cost of Capital Conference*, Chicago, 2004.

"Discussion of 'Are Performance Measures Other Than Price Important to CEO Incentives?'" *Annual Meeting of the American Accounting Association*, 2000.

"Contracting and Income Smoothing in an Infinite Agency Model: A Computational Approach," (with R.T. Boylan) *Business and Management Assurance Services Conference*, Austin 2000.

TESTIMONY

Rebuttal Expert Report, Deposition, and Oral Testimony re. the impact of alternative discount rate assumptions in tax litigation. United States Court of Federal Claims, Case No. 06-628 T, January, February, April 2009. (*Confidential*)

Direct Testimony, Rebuttal Testimony and Hearing Appearance on cost of capital before the New Mexico Public Regulation Commission on behalf of New Mexico-American Water in Docket No. 08-00134-UT, June 2008 and January 2009.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony and Hearing Appearance on cost of capital before the Arizona Corporation Commission on behalf of Arizona-American Water in Docket No. W-01303A-08-0227, April 2008, February 2009, March 2009.

Direct Testimony on cost of capital and carrying charge on damages, U.S. Department of Energy, Bonneville Power Administration, BPA Docket No. WP-07, March 2008.

Expert Report, Supplemental Expert Report, and Hearing Appearance on the allocation of corporate overhead and damages from lost profit. The International Centre for the Settlement of Investment Disputes, Case No. ARB/03/29, February, April, and June 2008 (*Confidential*).

Expert Report on accounting information needed to assess income. United States District Court for the District of Maryland (Baltimore Division), Civil No. 1:06cv02046-JFM, June 2007 (*Confidential*)

Expert Report, Rebuttal Expert Report, and Hearing Appearance regarding investing activities, impairment of assets, leases, shareholder' equity under U.S. GAAP and valuation. International Chamber of Commerce (ICC), Case No. 14144/CCO, May 2007, August 2007, September 2007. (Joint with Carlos Lapuerta, *Confidential*)

Direct Testimony, Rebuttal Testimony, and Hearing Appearance on cost of capital before the Arizona Corporation Commission on behalf of Arizona-American Water in Docket No. W-01303A-06-0491, July 2006, July 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, Supplemental Rejoinder Testimony and Hearing Appearance on cost of capital before the Arizona Corporation Commission on behalf of Arizona-American Water in Docket No. W-01303A-06-0403, June 2006, April 2007, May 2007.

Direct Testimony, Rebuttal Testimony, Rejoinder Testimony, and Hearing Appearance on cost of capital before the Arizona Corporation Commission on behalf of Arizona-American Water in Docket No. W-01303A-06-0014, January 2006, October 2006, November 2006.

Expert report, rebuttal expert report, and deposition on behalf of a major oil company regarding the equity method of accounting and classification of debt and equity, August 2004 and November 2004. (*Confidential*).

APPENDIX B

SELECTING THE WATER AND GAS LDC SAMPLES AND THE USE OF MARKET VALUES

I. SAMPLE SELECTION AND THE CHARACTERISTICS OF EACH SAMPLE

A. The Water Sample

Q1. How did you select your sample of water utilities?

A1. The goal was to create a sample of companies whose primary business is as a regulated water utility with business risk generally similar to that of Arizona-American Water. To construct this sample, I started with the universe of water utility companies listed by *Value Line Investment Survey - Plus Edition*. I then eliminated Sun Hydraulics because, although listed as a water utility, its operations consist mainly of producing industrial equipment.[1] I also eliminated American Water Works as it only started trading in 2008 and therefore insufficient data available for *Value Line* to estimate its beta or other key figures.[2]

Usually, I apply several additional selection criteria to eliminate companies with unique circumstances that may affect the cost of capital estimates. For example, I normally eliminate companies with annual revenues lower than $300 million in 2008,[3] no or low bond ratings, lack of growth estimates or Bloomberg data, and all companies with announced dividend cuts or that were involved in significant merger activity over the last five years (2004 to today). However, applying these procedures to the nine water utilities followed by *Value Line* would eliminate several companies from a sample that is already limited. I therefore try to balance stringent selection criteria against the need to have a reasonable sample size. This results in the use of all nine companies to form a full sample, as well as the use of eight companies to form a subsample. The nine regulated companies that form the full sample of water utilities are American States Water Co., Aqua America Inc., California Water Service Group, Connecticut Water Service Inc.,

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[1] According to the company's webpage (www.sunhydraulics.com), it develops and manufactures valves and manifolds. Bloomberg lists it as part of its "metal fabricate/hardware" industry group.

[2] See *Value Line Investment Survey*, American Water, April 24, 2009.

[3] Table No. BV-2 and its associated workpapers report the share of operating revenues from different lines of business in 2007 for these companies. (Table No. BV-1 provides an index to the other tables.)

Middlesex Water Co., Pennichuck Corp., SJW Corp., Southwest Water Co., and York Water Co. I eliminate Southwest Water from the subsample because the company recently cut dividend and as of May 25, 2009 had yet to file its 2008 10-K with the Securities and Exchange Commission ("SEC"). Therefore, its use may bias the cost of capital estimation.[4]

Q2. Why do you usually eliminate companies currently involved in a merger from your samples?

A2. The stock prices of companies involved in mergers are often more affected by news relating to the merger than by movements in the stock market. In other words, the stock price "decouples" from its normal relationship to the stock market (the economy) which is the basis upon which a company's relative risk is calculated. Instead the stock price of a merger candidate is more affected by the latest speculation on the terms and probability of the merger.

Q3. What are some of the water sample's data problems?

A3. First, of the nine water utilities with sufficient data for analysis that *Value Line* follows, four companies (Connecticut Water, Middlesex Water, Pennichuck, and York Water) have 2008 revenues below $100 million. The stocks of small companies frequently exhibit "thin trading" which means that their stock trades infrequently. Indeed, during the period January 2007 through June 3, 2009, two companies (Pennichuck Corp., and York Water Co.) traded an average of less than 20,000 shares per trading day with York Water trading less than 0.15 percent of its shares outstanding. By contrast, each of the gas LDC sample companies had an average trading volume of at least 160,000 shares per day, which in percentage terms represented more than 0.55 percent of shares outstanding for each company. Greater trading volume gives the expert more confidence in estimates relying on market data since there is less likelihood of a delay between the release of important information and the time that this information is reflected in prices.

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[4] For example, Southwest Water has a negative growth rate which could not be sustained forever and which would lead to a negative cost of capital. At the same time, *Value Line* estimates a beta above one for Southwest Water indicating a higher than average cost of capital.

Second, six companies lack long-term earnings forecasts from *Value Line*, and three companies lacks a BEst growth rate forecasts. In addition, the existing growth rates estimates are highly variable, ranging from a low of -6.0 percent to a high of 15 percent. Such highly variable growth rates are not indicative of an industry that is stable and cast doubt on the applicability of the DCF model to this industry at this time.

Third, individual companies in the sample have unique characteristics. For example, the "aggressive acquisition strategy" of Aqua America[5] has impacted the market perception and hence risk measures of the company. Similarly, Southwest Water's recent dividend cut and the fact that its 2008 financial report has yet to be issued due to mistakes in prior years' depreciation rates likely has impacted its stock price, growth rate, and systematic risk.[6]

These factors may all potentially affect the cost of equity estimates in ways not completely predictable. This is especially true for the DCF estimates which rely exclusively on current data, so that recent events impact the measurement 100 percent. Because of the data problems and the lack of a large number of publicly traded water utilities, I include all publicly traded companies with sufficient data in the full sample but also create a subsample without Southwest Water.

B. The Gas Local Distribution Companies Sample

Q4. How do you select your gas local distribution company sample?

A4. To select this sample, I started with the universe of publicly traded natural gas utilities covered by *Value Line Investment Survey – Plus Edition.*[7] This resulted in an initial group of 18 companies that are followed by *Value Line*. I then eliminated companies by applying additional selection criteria designed to eliminate companies with unique circumstances which may bias the cost of capital estimates.

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[5] *Value Line Investment Survey*, Water Utility Industry, April 24, 2009.

[6] *Value Line Investment Survey*, Southwest Water Co., April 24, 2009.

[7] *Value Line Investment Survey*, Plus Edition, March 13, 2009.

Q5. What are the selection criteria you applied?

A5. I eliminated all companies whose regulated assets are not greater than 50 percent of their total assets as reported in each company's 2008 10-K form, because one goal for this sample was for the companies to be primarily engaged in regulated activities. I also eliminated companies whose bond rating was less than BBB- as rated by S&P, and companies that had a large merger during the period May 2004 to May 2009.[8] Merger activity is obtained from Bloomberg, which provides a history of past acquisitions and divestitures for each company, and also the size of each transaction, if such information is available.[9] To guard against measurement bias caused by "thin trading,"[10] I also restricted the sample to companies with total operating revenues greater than $300 million in 2008.

Finally, I required that the companies have historical data available from Bloomberg and that they had no dividend cuts or restatement of financial statements in the past five years, since this can be signs of financial distress.

The final sample consists of eleven gas LDC companies: AGL Resources Inc., Atmos Energy Corp., Laclede Group Inc., New Jersey Resources, Nicor Inc., NiSource Inc., Northwest Natural Gas Co., Piedmont Natural Gas Co., South Jersey Industries Inc., Southwest Gas Corp., and WGL Holdings Inc.[11]

Q6. What companies did you eliminate before arriving at the final sample?

A6. First, I eliminated three companies for a combination of having no or a non-investment grade bond rating and revenues below $300 million (Chesapeake Utilities Corp., Energy

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[8] One company included in the sample (Atmos Energy Corp.) did undertake an acquisition in 2004. The merger was announced in June 2004 and completed October 1, 2004, so the announcement date is very close to the cut-off data. I therefore decided to keep the company in the sample. See, *Kansas City Business Journal,* "Atmos, TXU Gas will merge," June 17, 2004 and *Dallas Business Journal*, "Atmos, TXU close on gas transaction," October 1, 2004.

[9] For purposes of sample selection, a sizeable merger is defined to be one which would exceed 30 percent of the total capitalization of the company at the time of the merger announcement.

[10] As noted above, all the gas LDC companies that I include have traded in excess of 160,000 shares per day on average since 2007.

[11] NiSource is a relative new addition to *Value Line Investment Survey.*

West Inc., and RGC Resources Inc.), one company for not having a bond rating (UGI Corp.), and three companies were eliminated due to the lack of a bond rating or a below investment bond rating and for being primarily involved in the sale of propane or heating oil (Amerigas Partners LP, Ferrellgas Partners LP, and Star Gas Partners LP).

Q7. Please compare the characteristics of the water utility sample and the gas LDC sample.

A7. Both samples consist of companies with substantial capital investments in distribution facilities. Also, companies in both samples earn a large percentage of their revenue from regulated activities and serve a mix of residential, industrial, and other customers. The water subsample excludes Southwest Water which recently cut dividends and as of May 25, 2009 had yet to file its 2009 form 10-K. All nine companies in the water sample had at least 80 percent regulated assets. Among the gas LDC companies, only one company in the gas LDC sample had less than 2/3 of its assets devoted to regulated activities and the average percentage was about 85 percent. (See Tables No. BV-2 and Table No. BV-14).[12] All companies in the water utility sample and the gas LDC sample are regulated by one or more states.

Q8. What do you conclude from the comparison of the water utility and the gas LDC samples?

A8. Water and wastewater utilities like gas LDC companies are state regulated entities that invest in pipes, mains, and storage facilities. In addition, both industries face substantial infrastructure investments going forward, so aspects of their operations are very similar. However, gas LDC companies only rarely develop their commodity (gas), water utilities usually do. Looking at stock market perceptions, gas LDCs have seen their beta measure decline in recent months while water utilities generally have experienced little movement

[12] Water utilities often do not report the percentage of assets subject to regulatory activities, while gas LDCs do. Both measures are likely to be good indicators of the relative magnitude of regulated activities, which is relevant to gauge the risk of the entities. Therefore, Table No. BV-2 and its associated workpapers report the share of operating revenues from different lines of business in 2007 for water utilities while Table No. BV-13 reports the share of regulated assets for gas LDC companies. (Table No. BV-1 provides an index to the other tables.)

in their beta measure. Therefore, it appears that capital markets' viewed the two utility industries a bit differently during the financial crisis. I continue to believe that gas LDC companies constitute a good check on the estimates provided by the water utility sample.

II. MARKET VALUE CAPITAL STRUCTURE, COSTS OF DEBT & COSTS OF PREFERRED EQUITY

Q9. What capital structure information do you require?

A9. For reasons discussed in my written evidence and explained in detail in Appendix E, explicit evaluation of the market-value capital structures of the sample companies versus the capital structure used for rate making is vital for a correct interpretation of the market evidence. This requires estimates of the market values of common and preferred equity and debt, and the current market costs of preferred equity and debt.

Q10. How do you calculate the market-value capital structures of the sample companies?

A10. I estimate the capital structure for each company by estimating the market values of common equity, preferred equity and debt from publicly available data. The calculations are in Panels A to I of Table No. BV-3 and Panels A to K of Table No. BV-15 for the water and gas LDC sample, respectively.

The market value of equity is straightforward: the price per share times the number of shares outstanding. The market value of preferred equity is set equal to its book value because the portion of the capital structure financed with preferred equity is generally small. The market value of debt is estimated at the book value of debt reported by Bloomberg plus or minus the difference in the estimated fair (market) value and book value of long-term debt as reported in the companies' 10-Ks or annual reports.[13]

[13] See Panels A through I in Table No. BV-3 and Panels A through K in Table BV-15 for details. The adjustment relies on the difference between the companies' self-reported fair value of long-term debt and the carrying value of the same line items. This information was obtained from the sample companies' annual reports.

For purposes of assessing financial risk to common shareholders, I add an adjustment for short-term debt to the debt portion of the capital structure. This adjustment is used only for those companies whose short-term (current) liabilities exceed their short-term (current) assets. I add an amount equal to the minimum of the difference between short-term liabilities and short-term assets or the amount of short-term debt. The reason for this adjustment is to recognize that when current liabilities exceed current assets, a portion of the company's long-term assets are being financed, in effect, by short-term debt.

The market value capital structure is calculated to be consistent with the time period over which the cost of capital is estimated for each sample. The capital structure is determined over the historical period over which the relevant risk positioning parameters were determined and as of the date analysts provide forward looking growth forecasts. Therefore, Tables No. BV-3 and BV-15 report the market value capital structure at year end for the years ending 2004 – 2008. The output of each of these tables is the market equity-to-value, debt-to-value, and preferred equity-to-value ratios. The overall cost of capital calculation for the risk positioning estimates rely on the average of the market value capital structure computed for the years 2004 through 2008, as shown in Tables No. BV-4 and BV-16, respectively. The results in columns [1]-[3] are used in the DCF model calculations, while columns [4]-[6] are for the risk positioning models.

Q11. How do you estimate the current market cost of preferred equity?

A11. For companies with preferred equity, the cost of preferred equity for each company was set equal to the yield on an index of preferred stock as reported in the *Mergent Bond Record* corresponding to the S&P rating of that company's debt. The yields from *Mergent Bond Record* were as of April 2009. In general, the average amount of preferred equity in the sample companies' capital structures is very small and zero for most companies. No company in either sample has more than one percent preferred equity (see Tables BV-4 and BV-16).

Q12. How do you estimate the current market cost of debt?

A12. The market cost of debt for each company in the DCF analysis is the current yield reported by Bloomberg for a public utility company bond corresponding to the sample company's current debt rating as classified by S&P. The risk positioning analysis, on the other hand, uses the current yield of a utility bond that corresponds to the five-year average debt rating of each company so as to match consistently the horizon of information used by *Value Line* to estimate company betas. The current S&P debt ratings were obtained from Bloomberg.[14]

The yield on Moody's A-rated Utility bonds was 6.49 percent as of May 15, 2009, and 7.80 percent on Moody's BBB-rated Utility bonds. (See Panel A of Workpaper #2 to Table No. BV-11 for the yields on utility bonds and preferred stock by credit rating.) Based on information from the Company, the corporate tax rate was set at 38.45 percent. Calculation of the after-tax cost of debt uses the marginal tax rate 38.45 percent.

[14] Debt ratings were not available for Pennichuck Corp., SJW Corp, and Southwest Water Co.'s. I assumed a rating in the A category (A+, A, or A-), which is the same as that of all other water utilities in the sample.

APPENDIX C

RISK POSITIONING METHODOLOGY AND EMPIRICAL RESULTS

Q1. What is the purpose of this appendix?

A1. This appendix reviews the principles behind the risk positioning methodologies, describes the estimation of the parameters used in the models, and details the cost of capital estimates obtained from these methodologies. This appendix intentionally repeats portions of my direct testimony, because I want the reader to be able to have a full discussion of the issues addressed here, rather than having to continually turn back to the corresponding section of the testimony.

I. EQUITY RISK PREMIUM METHODOLOGY

Q2. How is this section of the appendix organized?

A2. It first reviews the basic nature of the equity risk premium approach. It then discusses the individual components of the model: the risk premium, the relative risk of the company or line of business in question, the appropriate interest rate, and the combination of these elements in a particular equity risk premium model.

A. THE BASIC EQUITY RISK PREMIUM MODEL

Q3. How does the equity risk premium model work?

A3. The equity risk premium approach estimates the cost of equity as the sum of a current interest rate and a risk premium. (It therefore is sometimes also known as the "risk premium" or the "risk positioning" approach.)

This approach may sometimes be applied informally. For example, an analyst or a commission may check the spread between interest rates and what is believed to be a reasonable estimate of the cost of capital at one time, and then apply that spread to changed interest rates to get a new estimate of the cost of capital at another time.

More formal applications of the equity risk premium method implement theoretical finance models of cost of capital. They use information on all securities to identify the security market line (Figure 1 in the body of the testimony) and derive the cost of capital

for the individual security based on that security's relative risk. This equity risk premium approach is widely used and underlies most of the current scholarly research on the nature, determinants and magnitude of the cost of capital.

Q4. How are "more formal applications" put into practice?

A4. The essential benchmarks that determine the security market line are the risk-free interest rate and the premium that a security of average risk commands over the risk-free rate. This premium is commonly referred to as the "market risk premium" ("MRP"), i.e., the excess of the expected return on the average common stock over the risk-free interest rate. In the equity risk premium approach the risk-free interest rate and MRP are common to all securities. A security-specific measure of relative risk (beta) is estimated separately and combined with the MRP to obtain the company-specific risk premium.

In principle, there may be more than one factor affecting the expected stock return, each with its own security-specific measure of relative risk and its own benchmark risk premium. For example, the "arbitrage pricing theory" and other "multi-factor" models have been proposed in the academic literature. These models estimate the cost of capital as the sum of a risk-free rate and several security-specific risk premia. However, none of these alternative models has emerged in practice as "the" improvement to use instead of the original, single-factor model. I use the traditional single-factor model in this testimony.

Accordingly, the required elements in my formal equity risk premium approach are the market risk premium, an objective measure of relative risk, the risk-free rate that corresponds to the measure of the market risk premium, and a specific method to combine these elements into an estimate of the cost of capital.

B. MARKET RISK PREMIUM

Q5. Why is a risk premium necessary?

A5. Experience (e.g., the ongoing financial crisis and the U.S. market's October Crash of 1987) demonstrates that shareholders, even well diversified shareholders, are exposed to

enormous risks. By investing in stocks instead of risk-free Government bills, investors subject themselves not only to the risk of earning a return well below what they expected in any year but also to the risk that they might lose much of their initial capital. This is why investors demand a risk premium.

Because short-term risk-free rates currently are influenced substantially by monetary policy, I estimate only a long-term version of the Capital Asset Pricing Model ("CAPM") for this proceeding. This version of the CAPM measures the market risk premium as the risk premium of average risk common stocks over the long-term risk-free rate. The use of the long-term version of the CAPM is consistent with the Commission Staff's past practice.[1]

Q6. Please discuss some of the issues involved in selecting the appropriate MRP.

A6. To determine the cost of capital in a regulatory proceeding, the MRP should be used with an estimate of the same interest rate used to calculate the MRP (i.e., the short-term Treasury bill rate or the long-term Government rate). For example, it would be inconsistent to utilize a short-term risk-free with an estimate of the MRP derived from comparisons to long-term interest rates. In addition, the appropriate measure of the MRP should be based upon the arithmetic mean not the geometric mean return.[2] The arithmetic mean is the simple average while the geometric mean is the compound rate of return between two periods.

Q7. How do you estimate the MRP?

A7. There is presently little consensus on "best practice" for estimating the MRP, which does not mean that each approach is equally valid. For example, the leading graduate textbook in corporate finance, after recommending use of the arithmetic average realized excess return on the market for many years (which for a while was noticeably over 9 percent), now reviews the current state of the research and expresses the view that the a range

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[1] See, for example, Direct Testimony of Pedro M. Chaves in Docket No. WS-01303A-06-0491, Schedule PMC-2.

[2] See, for example, Morningstar, *Ibbotson IBBS Valuation Yearbook 2009*, p. 59.

between 5 to 8 percent is reasonable for the U.S.[3] At the same time, Dimson, Marsh, and Staunton (2008) estimate that the average arithmetic risk premium of stocks *over bonds* in the U.S. was 6.5% for the period 1900 to 2007.[4] In a recent proceeding the Surface Transportation Board ("STB") decided to switch from a DCF model to the CAPM model when estimating the cost of equity for U.S. railroads. The STB further decided to rely on the arithmetic risk premium of stocks over long-term bonds as reported in Morningstar / Ibbotson (at the time 7.1 percent).[5]

My testimony considers both the historical evidence and the results of scholarly studies of the factors that affect the risk premium for average-risk stocks in order to estimate the benchmark risk premium investors currently expect. I consider the historical difference in returns between the Standard and Poor's 500 Index ("S&P 500") and the risk-free rate, recent academic literature on the MRP and the results of recent surveys to estimate the market risk premium.

Q8. Please summarize the recent literature on the MRP and the conclusions you draw from it.

A8. Some recent research based upon U.S. data challenges the conventional wisdom of using the arithmetic average historical excess returns to estimate the MRP. However, after reviewing the issues in the debate, I remain skeptical for several reasons that the market risk premium has declined in the U.S. as much as is claimed in some of the literature.

First, despite eye-catching claims like "equity risk premium as low as three percent,"[6] and "the death of the risk premium,"[7] not all recent research arrives at the same conclusion. In his presidential address to the American Finance Association in 2001,

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[3] Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, McGraw-Hill, 9th edition, 2008, pp. 173-180.

[4] Dimson, Marsh and Staunton, *Global Investment Returns Yearbook 2008*, p. 48.

[5] *STB Ex Parte No. 664*, Issued January 17, 2008, pp. 8-9.

[6] Claus, J. and J. Thomas, (2001), "Equity Risk Premium as Low as Three Percent: Evidence from Analysts' Earnings Forecasts for Domestic and International Stocks," *Journal of Finance* 56:1629-1666.

[7] Arnott, R. and R. Ryan, (2001), "The Death of the Risk Premium," *Journal of Portfolio Management* 27(3):61-84.

Professor Constantinides seeks to estimate the unconditional equity premium based on average historical stock returns.[8] (Note that this address was based upon evidence just before the major fall in market value.) He adjusts the average returns downward by the change in price-earnings ratio because he assumes no change in valuations in an unconditional state. His estimates for 1926 to 2000 and 1951 to 2000 are 8.0 percent and 6.0 percent, respectively, over the 3-month T-bill rate. In another published study in 2001, Professors Harris and Marston use the DCF method to estimate the market risk premium for the U.S. stocks.[9] Using analysts' forecasts to proxy for investors' expectation, they conclude that over the period 1982-1998 the MRP over the *long-term* risk-free rate is 7.14 percent. As yet another example, the paper by Drs. Ibbotson and Chen (2003) adopts a supply side approach to estimate the forward looking long-term sustainable equity returns and equity risk premium based upon economic fundamentals. Their equity risk premium over the *long-term* risk-free rate is estimated to be 3.97 percent in geometric terms and 5.90 percent on an arithmetic basis. They conclude their paper by stating that their estimate of the equity risk premium is "far closer to the historical premium than being zero or negative."[10]

Second, Professor Ivo Welch surveyed a large group of financial economists in 1998 and 1999. The average of the estimated MRP was 7.1 percent in Prof. Welch's first survey and 6.7 percent in his second survey which was based on a smaller number of individuals. A subsequent survey[11] by Prof. Welch reported only a 5.5 percent MRP.[12] In characterizing these results Prof. Welch notes that "[T]he equity premium consensus forecast of finance and economics professors seems to have dropped during the last 2 to 3

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[8] Constantinides, G.M. (2002), "Rational Asset Prices," *Journal of Finance* 57:1567-1591.

[9] Robert S. Harris and Felicia C. Marston, "The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts," *Journal of Applied Finance* 11 (1) 6-16, 2001.

[10] Ibbotson, R. and P. Chen (2003), "Stock Market Returns in the Long Run: Participating in the Real Economy," *Financial Analyst Journal*, 59(1):88-98. Cited figures are on p. 97.

[11] Ivo Welch (2000), "Views of Financial Economists on the Equity Premium and on Professional Controversies," *Journal of Business*, 73(4):501-537. The cited figures are in Table 2, p. 514.

[12] Ivo Welch (2001), "The Equity Premium Consensus Forecast Revisited," School of Management at Yale University working paper. The cited figure is in Table 2.

years, a period with low realized equity premia."[13] However, in the most recent survey,[14] conducted in December 2007, Prof. Welch finds that the average estimate has increased to about 5.7 percent.

The above quotation from Prof. Welch emphasizes the caution that must attend survey data even from knowledgeable survey participants: the outcome is likely to change quickly with changing market circumstances.

Third, some of the evidence for negative or close to zero market risk premium simply does not make sense. Despite the relatively high valuation levels, stock returns remain much more volatile than Treasury bond returns. I am not aware of any empirical or theoretical evidence showing that investors would rationally hold equities and not expect to earn a positive risk premium for bearing their higher risk.

Fourth, I am unaware of a convincing theory for why the future MRP should have substantially declined. At the height of the stock market bubble in the U.S., many claimed that the only way to justify the high stock prices would be if the MRP had declined dramatically,[15] but this argument was heard less frequently after the market declined substantially from its tech bubble high. All else equal, a high valuation ratio such as price-earnings ratio implies a low required rate of return, hence a low MRP. However, there is considerable debate about whether the high level of stock prices (despite the burst of the internet bubble from its high in the summer of 2000) represents the transition to a new economy or is simply an "irrational exuberance," which cannot be sustained for the long term. If the former case is true, then the MRP may have decreased permanently. Conversely, the long-run MRP may remain the same even if expected market returns in the short-term are smaller.

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[13] *Ibid*, p. 8.

[14] See Ivo Welch (2008), "The Consensus Estimate for the Equity Premium by Academic Financial Economists in December 2007," School of Management at Yale University working paper. The cited figure is in Table 2.

[15] See Robert D. Arnott and Peter L. Bernstein, "What Risk Premium is 'Normal'?," *Financial Analysts Journal* 58:64-85, for an example.

Another common argument for a lower expected MRP is that the U.S. experienced very remarkable growth in the 20th century that was not anticipated at the start of the century. As a result, the average realized excess return is overestimated meaning the standard method of estimating the MRP would be biased upward. However, one recent study by Professors Jorion and Goetzmann finds, under some simplifying assumptions, that the so-called "survivorship bias" is only 29 basis points.[16] Furthermore, "[I]f investors have overestimated the equity premium over the second half of the last century, Constantinides (2002) argues that 'we now have a bigger puzzle on our hands' Why have investors systematically biased their estimates over such a long horizon?"[17]

To sum up the above, I cite two passages from Profs. Mehra and Prescott's review of the theoretical literature on equity premium puzzle:[18]

> Even if the conditional equity premium given current market conditions is small, and there appears to be general consensus that it is, this in itself does not imply that it was obvious either that the historical premium was too high or that the equity premium has diminished.
>
> In the absence of this [knowledge of the future], and based on what we currently know, we can make the following claim: over the long horizon the equity premium is likely to be similar to what it has been in the past and the returns to investment in equity will continue to substantially dominate that in T-bills for investors with a long planning horizon.

Q9. Is there other scholarly support for the conclusion?

A9. Yes. Another line of research was pursued by Steven N. Kaplan and Richard S. Ruback. They estimate the market risk premium in their article, "The Valuation of Cash Flow

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[16] Jorion, P., and W. Goetzmann (1999), "Global Stock Markets in the Twentieth Century," *Journal of Finance* 54:953-980. Dimson, Marsh, and Staunton (2003) make a similar point when they comment on the equity risk premia for 16 countries based on returns between 1900 and 2001: "While the United States and the United Kingdom have indeed performed well, compared to other markets there is no indication that they are hugely out of line." p.4.

[17] Mehra, R., and E.C. Prescott (2003), "The Equity Premium in Retrospect," in *Handbook of the Economics of Finance*, Edited by G.M. Constantinides, M. Harris and R. Stulz, Elsevier B.V, p. 926

[18] *Ibid*, p. 926.

Forecasts: An Empirical Analysis."[19] Professors Kaplan and Ruback compare published cash flow forecasts for management buyouts and leveraged recapitalization over the 1983 to 1989 period against the actual market values that resulted from these transactions. One of their results is an estimate of the market risk premium over the long-term Treasury bond yield that is based on careful analysis of actual major investment decisions, not realized market returns. Their median estimate is 7.78 percent and their mean estimate is 7.97 percent.[20] This is considerably higher than my estimate of 6.5 percent. Even if the maturity premium of Treasury bonds over Treasury bills were only 1 percent, well below the best estimate of 1.5 percent the resulting estimate of the market risk premium over Treasury bills is higher than my estimate of 8.0 percent.

Q10. In addition to the scholarly articles and survey evidence you discussed in Section I of your Direct Testimony, what other evidence do you consider to estimate the MRP?

A10. I also consider the long-run realized equity premia reported in Morningstar's Ibbotson SBBI Valuation Yearbook 2009. The data provided cover the period 1926 through 2008. The results are discussed below.

Q11. What is the "long-run realized risk premium" in the U.S.?

A11. From 1926 to 2008, the full period reported, Morningstar's data show that the average premium of stocks over Treasury bills is 7.9 percent. I also examine the "post-War" period. The risk premium for 1947-2007 is 7.6 percent.[21] (I exclude 1946 because its economic statistics are heavily influenced by the War years; e.g., the end of price controls yielded an inflation rate of 18 percent. It is not really a "post-War" year, from an economic viewpoint.) These averages usually change slightly when another year of data is added to the Ibbotson series, but the effect of adding 2008 was far from trivial due to the ongoing financial turmoil. The average premium of stocks over the income returns on long-term Government bonds is 6.5 percent for the 1926 to 2008 period.

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[19] *Journal of Finance*, 50, September 1995, pp. 1059-1093.

[20] *Ibid*, p. 1082.

Prior to the economic crisis that started in the second half of 2008, there had been a great deal of academic research on the MRP. This research put practitioners in a dilemma: there was nothing close to a consensus about how the MRP should be estimated, but a general agreement in the academic community seemed to be emerging that the old approach of using the average realized return over long periods gave too high an answer. Realized returns were negative in 2008 and caused the observed long-term risk premium to fall, but it is highly likely that the MRP currently exceeds the average of realized returns because of increased risk aversion among investors.

Q12. Do you have any additional comments on your choice of the MRP?

A12. Yes. All of the debate discussed above has taken place before the current financial turmoil, ensuing economic downturn, and highly uncertain timing of recovery. As discussed at length in my direct testimony, the recent events in the financial markets have likely increased investors risk aversion. Therefore, there are strong reasons to expect that the current level of the MRP may in fact be significantly higher than what has been reported traditionally and higher than the base level MRP that I use in my testimony.

Q13. Have any of the prior academic studies shed any light on why the MRP would be higher under current circumstances?

A13. Yes. First and foremost, the standard consumption-based asset pricing theory suggests that, all else equal, higher risk aversion implies higher MRP.[22] To the extent that there has been an adverse shock to risk aversion of investors, the MRP is likely to have increased.

Second, the academic literature contains studies of the impact of recessions on investors' attitude towards risk. These studies find that the risk aversion and hence the risk premium required to hold equity rather than debt increases in economic downturns. Several articles suggest that the market risk premium is higher during times of recession. Constantinides (2008) studies a classical utility model where consumers are risk averse

[21] Morningstar, *Ibbotson SBBI Valuation Yearbook 2009*, Appendix A, Table A-3.

[22] See, for example, Mehra and Prescott (1985).

and also summarizes some of the empirical literature. Constantinides draws from empirical evidence that shows that consumers become risk averse in times of economic recession or downturn, and equity investments accentuate this risk.[23] (Increased risk aversion leads to a higher expected return for investors before they will invest.) Specifically, equities are pro-cyclical and decline in value when the probability of a job loss increases; thus, they fail to hedge against income shocks that are more likely to occur during recessions.[24] Consequently, investors require an added risk premium to hold equities during economic downturns:

> In economic recessions, investors are exposed to the double hazard of stock market losses and job loss. Investment in equities not only fails to hedge the risk of job loss but also accentuates its implications. Investors require a hefty equity premium in order to be induced to hold equities. This is the argument that I formalize below and address the predictability of asset returns and their unconditional moments.[25]

And

> The first implication of the theory is an explanation of the counter-cyclical behavior of the equity risk premium: the risk premium is highest in a recession because the stock is a poor hedge against the uninsurable income shocks, such as job loss, that are more likely to arrive during a recession.
>
> The second implication is an explanation of the unconditional equity premium puzzle: even though per capita consumption growth is poorly correlated with stocks returns, investors require a hefty premium to hold stocks over short-term bonds because stocks perform poorly in recessions, when the investor is most likely to be laid off.[26]

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[23] Constantinides, G. M., "Understanding the equity risk premium puzzle". In R. Mehra, ed., *Handbook of the Equity Risk Premium*, 2008, Elsevier, Amsterdam.

[24] Constantinides, G.M., and D. Duffie (1996), "Asset Pricing with Heterogeneous Consumers", *Journal of Political Economy*, Vol. 104 (2): 219-240.

[25] G.M. Constantinides (2008), "Understanding the equity risk premium puzzle." In R. Mehra, ed., *Handbook of the Equity Risk Premium*. Elsevier, Amsterdam.

[26] *Ibid*, p. 353.

Empirically, several authors have found that market volatility and the market risk premium are positively related. For example, Kim, Morley and Nelson (2004)[27] find that

> When the effects of volatility feedback are fully taken into account, the empirical evidence supports a significant positive relationship between stock market volatility and the equity premium.[28]

Additionally, in their article that won the annual Smith-Breeden Paper Award given by the American Finance Association and the *Journal of Finance*, Bansal and Yaron (2004) demonstrate that economic uncertainty plays an important role in explaining the MRP.[29] In particular, they show that uncertainty is priced in the market. In their model, higher uncertainty (measured in their paper by volatility of consumption) leads to higher conditional MRP. Another implication of the analysis in Bansal and Yaron (2004) is that even the unconditional MRP can increase if any of the following materialize: (i) investors become more risk-averse; (ii) shocks to economic uncertainty become more pronounced; (iii) periods of high economic uncertainty become longer lasting. To the extent that risk aversion has experienced an adverse shock, the MRP must have increased. Furthermore, perception of more severe shocks to economic uncertainty and slower decay of higher uncertainty periods are likely to cause an increase in the MRP even in the absence of any shock to the risk aversion parameter.

Gabaix (2009) provides an alternative explanation for a time-varying risk premium in his newly circulated working paper.[30] The argument is that the MRP is linked to the fear of rare but large "disasters". The time-varying nature of the severity of those disasters leads to time-varying risk premium. To the extent we are experiencing an economic downturn of a magnitude not seen since the times of the Great Depression, the argument presented

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[27] C-J. Kim, J.C. Morley and C.R. Nelson (2004), "Is There a Positive Relationship Between Stock Market Volatility and the Equity Premium," *Journal of Money, Credit and Banking*, Vol. 36.

[28] *Ibid.* p. 357. The authors rely on a statistical (Markov-switching) model of the ARCH type and data for the period 1926 to 2000 for their analysis.

[29] Bansal, R., and A. Yaron (2004), "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles", *Journal of Finance*, Vol. 59 (4): 1481-1509.

in this paper is supportive of the idea that the MRP is currently higher than it would be under more normal conditions.

The facts that financial markets are in turmoil and stock market volatility has increased dramatically mean that equity investors face increased uncertainty. Increased uncertainty leads investors to seek lower risk investments or to demand a higher expected rate of return before they are willing to invest their money. In part, this is an explanation of why market prices have fallen. The financial market distress means that the current MRP is *higher* than it would otherwise be. Dimson, Marsh, and Staunton (2008) appear to agree as they note

> Although credit spreads widened, credit fundamentals as measured by low default rates remained at historically strong levels. This may indicate higher defaults to come, an increase in risk aversion, a bigger premium for liquidity, or all three.[31]

As shown in Figure 5 in my direct testimony, the market volatility, measured by the Chicago Board Options Exchange ("CBOE") Volatility Index (also know as *VIX*), was until recently in the 10-20 percent range, but it spiked 80 percent in late 2008. Although volatility has decreased somewhat over the last couple of months, it is still significantly higher than the average value for the first half of 2008 (prior to the crisis). As investors' risk aversion also increases during times of financial distress, there can be little doubt that the MRP is currently higher than in the recent past.

Q14. What is your conclusion regarding the MRP?

A14. Estimation of the MRP remains controversial. There is no consensus on its value or even how to estimate it. Given a careful review of all of the information, I estimate the risk premium for average risk stocks to be 6.5 percent over long-term Government bonds prior to the crisis in the U.S. economy. At this time, an additional upward adjustment likely is warranted in recognition of the unsettled condition of the capital markets.

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[30] Gabaix, X. (2009), "Variable Rare Disasters: An Exactly Solved Framework for Ten Puzzles in Macro Finance", *Working Paper, New York University Stern School of Business* and *NBER.*

[31] Elroy Dimson, Paul Marsh, and Mike Staunton, 2008, *Global Investment Returns Yearbook 2008*, p. 25.

Therefore, I report the sensitivity of the results to an upward adjustment of 1, 1½ and 2 percent in Tables 7 and 8 of my direct testimony.

C. RELATIVE RISK

Q15. How do you measure relative risk?

A15. The risk measure I examine is the "beta" of the stocks in question. Beta is a measure of the "systematic" risk of a stock — the extent to which a stock's value fluctuates more or less than average when the market fluctuates. It is the most commonly used measure of risk in capital market theories.

Q16. Please explain beta in more detail.

A16. The basic idea behind beta is that risks that cannot be diversified away in large portfolios matter more than those that can be eliminated by diversification. Beta is a measure of the risks that cannot be eliminated by diversification.

Diversification is a vital concept in the study of risk and return. (Harry Markowitz won a Nobel Prize for work showing just how important it was.) Over the long run, the rate of return on the stock market has a very high standard deviation, on the order of 15 - 20 percent per year. But many individual stocks have much higher standard deviations than this. The stock market's standard deviation is "only" about 15 - 20 percent because when stocks are combined into portfolios, some of the risk of individual stocks is eliminated by diversification. Some stocks go up when others go down, and the average portfolio return — positive or negative — is usually less extreme than that of individual stocks within it.

In the limiting case, if the returns on individual stocks were completely uncorrelated with one another, the formation of a large portfolio of such stocks would eliminate risk entirely. That is, the market's long-run standard deviation would be not 15-20 percent per year, but virtually zero.

The fact that the market's actual annual standard deviation is so large means that, in practice, the returns on stocks are correlated with one another, and to a material degree. The reason is that many factors that make a particular stock go up or down also affect other stocks. Examples include the state of the economy, the balance of trade, and inflation. Thus some risk is "non-diversifiable". Single-factor equity risk premium models derive conditions in which all of these factors can be considered simultaneously, through their impact on the market portfolio. Other models derive somewhat less restrictive conditions under which several of them might be individually relevant.

Again, the basic idea behind all of these models is that risks that cannot be diversified away in large portfolios matter more than those that can be eliminated by diversification, because there are a large number of large portfolios whose managers actively seek the best risk-reward tradeoffs available. Of course, undiversified investors would like to get a premium for bearing diversifiable risk, but they cannot.

Q17. Why not?

A17. Well-diversified investors compete away any premium rates of return for diversifiable risk. Suppose a stock were priced especially low because it had especially high diversifiable risk. Then it would seem to be a bargain to well diversified investors. For example, suppose an industry is subject to active competition, so there is a large risk of loss of market share. Investors who held a portfolio of all companies in the industry would be immune to this risk, because the loss on one company's stock would be offset by a gain on another's stock. (Of course, the competition might make the whole industry more vulnerable to the business cycle, but the issue here is the diversifiable risk of shifts in market share among firms.)

If the shares were priced especially low because of the risk of a shift in market shares, investors who could hold shares of the whole industry would snap them up. Their buying would drive up the stocks' prices until the premium rates of return for diversifiable risk were eliminated. Since all investors pay the same price, even those who are not diversified can expect no premium for bearing diversifiable risk.

Of course, substantial non–diversifiable risk remains, as the ongoing financial turmoil and the October Crash of 1987 demonstrate. Even an investor who held a portfolio of all traded stocks could not diversify against that type of risk. Sensitivity to such market–wide movements is what beta measures. That type of sensitivity, whether considered in a single- or multi-factor model, determines the risk premium in the cost of equity.

Q18. What does a particular value of beta signify?

A18. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes up or down by 10 percent on average when the market goes up or down by 10 percent. Stocks with betas above 1.0 exaggerate the swings in the market: stocks with betas of 2.0 tend to fall 20 percent when the market falls 10 percent, for example. Stocks with betas below 1.0 are less volatile than the market. A stock with a beta of 0.5 will tend to rise 5 percent when the market rises 10 percent.

Q19. How is beta measured?

A19. The usual approach to calculating beta is a statistical comparison of the sensitivity of a stock's (or a portfolio's) return to the market's return. Many investment services report betas, including Merrill Lynch's quarterly Security Risk Evaluation, Bloomberg and the Value Line Investment Survey. Betas are not always calculated the same way, and therefore must be used with a degree of caution, but the basic point that a high beta indicates a risky stock has long been widely accepted by both financial theorists and investment professionals.

Q20. Are there circumstances when the "usual approach to calculating beta" should not be used?

A20. There are at least two cases where the standard estimate of beta should be viewed skeptically.

First, companies in serious financial distress seem to "decouple" from their normal sensitivity to the stock market. The stock prices of financially distressed companies tend to change based more on individual news about their particular circumstances than upon overall market movements. Thus, a risky stock could have a low estimated beta if the

company was in financial distress. Other circumstances that may cause a company's stock to decouple include an industry restructuring or major changes in a company's supply or output markets.

Second, similar circumstances seem to arise for companies "in play" during a merger or acquisition. Once again, the individual information about the progress of the proposed takeover is so much more important for that stock than day-to-day market fluctuations that, in practice, beta estimates for such companies seem to be too low.

Q21. How reliable is beta as a risk measure?

A21. Scholarly studies have long confirmed the importance of beta for a stock's required rate of return. It is widely regarded as the best single risk measure available. The merits of beta seemed to have been challenged by widely publicized work by Professors Eugene F. Fama and Kenneth R. French.[32] However, despite the early press reports of their work as signifying that "beta is dead," it turns out that beta is still a potentially important explanatory factor (albeit one of several) in their work. Thus, beta remains alive and well as the best single measure of relative risk.

D. INTEREST RATE ESTIMATE

Q22. What interest rates do your procedures require?

A22. Modern capital market theories of risk and return use the short-term risk-free rate of return as the starting benchmark. However, as the short-term risk-free rate has dropped to near-zero, the implementation becomes meaningless. Therefore, like many practitioners, I rely on the long-term risk-free rate. Specifically, I calculate the average yield on long-term Government bonds using a 15-day period ending May 15, 2009. To this figure I add 125 basis points to account for the substantial increase in the spread between investment-grade utility bond yields and government bond yields. Workpaper

[32] See for example, "The Capital Asset Pricing Model: Theory and Evidence", Eugene F. Fama and Kenneth R. French, *Journal of Economic Perspectives*, Volume 18, Summer 2004, pp. 25-46.

#1 to Table No. BV-9 provides data on the increase in the spread between utility and government bond yields.

Q23. Do you vary the risk-free rate in your sensitivity analyses?

A23. Yes. In the sensitivity analyses I decrease the risk-free rate by 25 basis points for each 100 basis points increase in the MRP. This is intended to take into account that bond betas may be positive so that part of the increase in the MRP is captured in the increase in yield spread. A bond beta measures the systematic risk of the bond relative to the market and is determined in the same manner as the stock beta. As .25 is in the high end of the likely bond beta, the adjustment is conservative.

E. COST OF CAPITAL MODELS

Q24. How do you combine the above components into an estimate of the cost of capital?

A24. By far the most widely used approach to estimation of the cost of capital is the "Capital Asset Pricing Model," and I do calculate CAPM estimates. However, the CAPM is only one equity risk premium approach technique, and I also use another.

Q25. Please start with the CAPM, by describing the model.

A25. As noted above, the modern models of capital market equilibrium express the cost of equity as the sum of a risk-free rate and a risk premium. The CAPM is the longest-standing and most widely used of these theories. The CAPM states that the cost of capital for investment s (e.g., a particular common stock) is given by the following equation:

$$k_s = r_f + \beta_s \times MRP \qquad \textbf{(C-1)}$$

where k_s is the cost of capital for investment s; r_f is the risk-free rate, β_s is the beta risk measure for the investment s; and MRP is the market risk premium.

The CAPM relies on the empirical fact that investors price risky securities to offer a higher expected rate of return than safe securities do. It says that the security market line

starts at the risk-free interest rate (that is, that the return on a zero-risk security, the y-axis intercept in Figure 1 in the body of my testimony, equals the risk-free interest rate). Further, it says that the risk premium over the risk-free rate equals the product of beta and the risk premium on a value-weighted portfolio of all investments, which by definition has average risk.

Q26. What other equity risk premium approach model do you use?

A26. Empirical research has long shown that the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premia than predicted by the CAPM and high-beta stocks tend to have lower risk premia than predicted. A number of variations on the original CAPM theory have been proposed to explain this finding. The difference between the CAPM and the type of relationship identified in the empirical studies is depicted in Figure BV-C1.

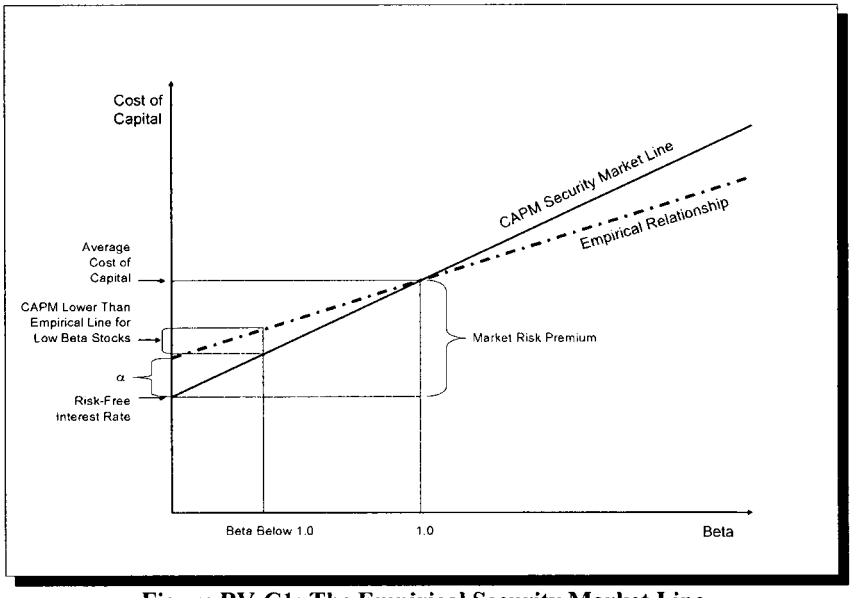

Figure BV-C1: The Empirical Security Market Line

The second model makes use of these empirical findings. It estimates the cost of capital with the equation,

$$k_s = r_f + \alpha + \beta_s \times (MRP - \alpha) \quad \textbf{(C-2)}$$

where α is the "alpha" of the risk-return line, a constant, and the other symbols are defined as above. I label this model the Empirical Capital Asset Pricing Model, or "ECAPM." For the short-term risk-free rate models, I set alpha equal to 1, 2, and 3 percent which are values somewhat lower than that estimated empirically. For low-beta stocks such as regulated utilities, the use of a lower value for alpha leads to a lower estimate of the cost of capital. For the long-term risk-free rate models, I set alpha equal to both 0.5 percent and 1.5 percent, but I rely more heavily on the 0.5 percent results. The use of a long-term risk-free rate incorporates some of the desired effect of using the ECAPM. That is, the long-term risk-free rate version of the Security Market Line has a higher intercept and a flatter slope than the short-term risk-free version which has been tested. Thus, it is likely that I do not need to make the same degree adjustment when I use the long-term risk-free rate. A summary of the empirical evidence on the magnitude of alpha is provided in Table No. BV-C1 at the end of the appendix.

II. EMPIRICAL EQUITY RISK PREMIUM RESULTS

Q27. How is this part of the appendix organized?

A27. This section presents the full details of my equity risk premium approach analyses, which are summarized in the body of my testimony. Details behind the estimates of the short-term and the long-term risk-free interest rates are discussed. Next, the beta estimates, and the estimates of the MRP I use in the models are addressed. Finally, this section reports the CAPM and ECAPM results for the sample's costs of equity, and then describes the results of adjusting for differences between the benchmark sample and Arizona-American's regulated capital structures.

A. RISK-FREE INTEREST RATE

Q28. How do you obtain estimates of the risk-free interest rates over the period the utility rates set here are to be in effect?

A28. I obtain these rates using data provided by Bloomberg. In particular, I use their reported government debt yields from the "constant maturity series". This information is displayed in Table No. BV-9.

Q29. What values do you use for the long-term risk-free interest rate?

A29. I use a baseline value of 5.35 percent for the long-term risk-free interest rate including the baseline adjustment for the increase in the spread between the yield on investment-grade utility bonds and government bonds. This value was determined as of May 15, 2009.

B. BETAS AND THE MARKET RISK PREMIUM

1. Beta Estimation Procedures

Q30. Which betas do you use in your risk positioning models?

A30. I obtained estimates from the *Value Line Investment Survey* for the sample companies.[33]

Q31. How does *Value Line* estimate the reported betas?

A31. *Value Line* estimates the reported betas using weekly data for a five year period. As a market index, *Value Line* uses the New York Stock Exchange. Also *Value Line* reports so-called adjusted betas, i.e. the betas reported by *Value Line* are calculated as follows:

$$\beta_{Value\ Line} = .67 \times \beta + 0.35 \qquad \textbf{(C-3)}$$

where β is the standard beta estimate. As a conservative measure of the systematic risk of the comparable water utilities, I reverse the adjustment for the water utility companies. I specifically choose to not reverse the estimates for the gas LDC sample as they are substantially below those of the water utility industry which is the focus of this

[33] For each sample I used the *Value Line* beta estimates most recently available. For the water sample, estimates are as of April 24, 2009, while for the gas LDC sample estimates are as of March 13, 2009.

proceeding. Also, the gas LDC companies do not suffer from the data issues as the water utility sample does.

Q32. Please summarize the beta estimates you rely on.

A32. The unadjusted *Value Line* adjustment betas range from .37 to 1.19 for the full water sample and from .37 to .97 for the water subsample. The gas LDC companies' betas fall in a much narrower range from .60 to .80. The beta estimates for individual sample companies are reported in Workpaper #1 to Tables No. BV-10 and BV-21, respectively.

2. Market Risk Premium Estimation

Q33. Given all of the evidence, what MRP do you use in your analysis?

A33. It is clear that market return information is volatile and difficult to interpret in the current environment, but my baseline estimate for the MRP is 6.5 percent. However, this figure does not take the ongoing financial turmoil into account, so I also report results for three alternative sensitivity analyses with an MRP of 7.5, 8.0, and 8.5 percent, respectively.

C. Cost Of Capital Estimates

Q34. Based on these data, what are the values you calculate for the overall cost of capital and the corresponding cost of equity for the samples?

A34. Tables No. BV-10 and BV-21 present the cost of equity results using the equity risk positioning methods at the sample companies' market value capital structures.

Q35. What does the water market data imply about the sample's cost of equity at the proposed 46.75 percent equity ratio for Arizona-American Water?

A35. The return on equity and the overall cost of capital for the various equity risk positioning methods are reported in Tables No. BV-12 and BV-23. ,

Q36. What are the implications of the risk positioning results for Arizona-American's estimated cost of equity?

A36. I discuss the implications of the risk positioning results for the two samples in the main body of my testimony.

Table BV-C1

EMPIRICAL EVIDENCE ON THE ALPHA FACTOR IN ECAPM*		
AUTHOR	RANGE OF ALPHA	PERIOD RELIED UPON
Black (1993)[1]	1% for betas 0 to 0.80	1931-1991
Black, Jensen and Scholes (1972)[2]	4.31%	1931-1965
Fama and McBeth (1972)	5.76%	1935-1968
Fama and French (1992)[3]	7.32%	1941-1990
Litzenberger and Ramaswamy (1979)[4]	5.32%	1936-1977
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 3.91%	1926-1978
Pettengill, Sundaram and Mathur (1995)[5]	4.6%	1936-1990

*The figures reported in this table are for the longest estimation period available and, when applicable, use the authors' recommended estimation technique. Many of the articles cited also estimate alpha for sub-periods and those alphas may vary.

[1]Black estimates alpha in a one step procedure rather than in an un-biased two-step procedure.

[2]Estimate a negative alpha for the subperiod 1931-39 which contain the depression years 1931-33 and 1937-39.

[3]Calculated using Ibbotson's data for the 30-day treasury yield.

[4]Relies on Lizenberger and Ramaswamy's before-tax estimation results. Comparable after-tax alpha estimate is 4.4%.

[5]Pettengill, Sundaram and Mathur rely on total returns for the period 1936 through 1990 and use 90-day treasuries. The 4.6% figure is calculated using auction averages 90-day treasuries back to 1941 as no other series were found this far back.

Sources:

Black, Fischer. 1993. Beta and Return. *The Journal of Portfolio Management* 20 (Fall): 8-18.

Black, F., Michael C. Jensen, and Myron Scholes. 1972. The Capital Asset Pricing Model: Some Empirical Tests, from Studies in the theory of Capital Markets. In *Studies in the Theory of Capital Markets*, edited by Michael C. Jensen, 79-121. New York: Praeger.

Fama, Eugene F. and James D. MacBeth. 1972. Risk, Returns and Equilibrium: Empirical Tests. *Journal of Political Economy* 81 (3): 607-636.

Fama, Eugene F. and Kenneth R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance* 47 (June): 427-465.

Fama, Eugene F. and Kenneth R. French. 2004. The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives* 18 (3): 25-46.

Litzenberger, Robert H. and Krishna Ramaswamy. 1979. The Effect of Personal Taxes and Dividends on Capital Asset Prices, Theory and Empirical Evidence. *Journal of Financial Economics* XX (June): 163-195.

Litzenberger, Robert H. and Krishna Ramaswamy and Howard Sosin. 1980. On the CAPM Approach to Estimation of a Public Utility's Cost of Equity Capital. *The Journal of Finance* 35 (2): 369-387.

Pettengill, Glenn N., Sridhar Sundaram and Ike Mathur. 1995. The Conditional Relation between Beta and Returns. *Journal of Financial and Quantitative Analysis* 30 (1): 101-116.

1

APPENDIX D

DISCOUNTED CASH FLOW METHODOLOGY:

DETAILED PRINCIPLES AND RESULTS

Q1. What is the purpose of this appendix?

A1. This appendix reviews the principles behind the discounted cash flow or "DCF" methodology and the details of the cost-of-capital estimates obtained from this methodology.

I. DISCOUNTED CASH FLOW METHODOLOGY PRINCIPLES

Q2. How is this section of the appendix organized?

A2. The first part discusses the general principles that underlie the DCF approach. The second portion describes the strengths and weaknesses of the DCF model and why it is generally less reliable for estimating the cost of capital for the sample companies at the present time than the risk positioning method discussed in Appendix C.

A. Simple And Multi-Stage Discounted Cash Flow Models

Q3. Please summarize the DCF model.

A3. The DCF model takes the first approach to cost-of-capital estimation discussed with Figure 1 in Section II-A of my direct testimony. That is, it attempts to measure the cost of equity in one step. The method assumes that the market price of a stock is equal to the present value of the dividends that its owners expect to receive. The method also assumes that this present value can be calculated by the standard formula for the present value of a cash flow stream:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_T}{(1+k)^T} \qquad \textbf{(D-1)}$$

where "P" is the market price of the stock; "D_t" is the dividend cash flow expected at the end of period t; "k" is the cost of capital; and "T" is the last period in which a dividend cash flow is to be received. The formula just says that the stock price is equal to the sum of the expected future dividends, each discounted for the time and risk between now and the time the dividend is expected to be received.

Most DCF applications go even further, and make very strong (*i.e.*, unrealistic) assumptions that yield a simplification of the standard formula, which then can be rearranged to estimate the cost of capital. Specifically, if investors expect a dividend stream that will grow forever at a steady rate, the market price of the stock will be given by a very simple formula,

$$P = \frac{D_1}{(k-g)} \qquad \textbf{(D-2)}$$

where "D_1" is the dividend expected at the end of the first period, "g" is the perpetual growth rate, and "P" and "k" are the market price and the cost of capital, as before. Equation D-2 is a simplified version of Equation D-1 that can be solved to yield the well known "DCF formula" for the cost of capital:

$$\begin{aligned} k &= \frac{D_1}{P} + g \\ &= \frac{D_0 \times (1+g)}{P} + g \end{aligned} \qquad \textbf{(D-3)}$$

where "D_0" is the current dividend, which investors expect to increase at rate g by the end of the next period, and the other symbols are defined as before. Equation D-3 says that if Equation D-2 holds, the cost of capital equals the expected dividend yield plus the (perpetual) expected future growth rate of dividends. I refer to this as the simple DCF model. Of course, the "simple" model is simple because it relies on very strong (*i.e.*, very unrealistic) assumptions.

Q4. Are there other versions of the DCF models besides the "simple" one?

A4. Yes. If Equation D-2 and its underlying assumptions do not hold, sometimes other variations of the general present value formula, Equation D-1, can be used to solve for k in ways that differ from Equation D-3. For example, if there is reason to believe that investors do *not* expect a steady growth rate forever, but rather have different growth rate forecasts in the near term (e.g., over the next five or ten years as compared with subsequent periods), these forecasts can be used to specify the early dividends in Equation D-1. Once the near-term dividends are specified, Equation D-2 can be used to

specify the share price value at the end of the near-term (e.g., at the end of five or ten years), and the resulting cash flow stream can be solved for the cost of capital using Equation D-1.

More formally, the "multistage" DCF approach solves the following equation for k:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \cdots + \frac{D_T + P_{TERM}}{(1+k)^T} \quad \textbf{(D-4)}$$

The terminal price, P_{TERM} is estimated as

$$P_{TERM} = \frac{D_{T+1}}{(k - g_{LR})} \quad \textbf{(D-5)}$$

where T is the last of the periods in which a near term dividend forecast is made and g_{LR} is the long-run growth rate. Thus, Equation D-4 defers adoption of the very strong perpetual growth assumptions that underlie Equation D-2 — and hence the simple DCF formula, Equation D-3 — for as long as possible, and instead relies on near term knowledge to improve the estimate of k. I examine both simple and multistage DCF results below.

Q5. Please describe the multi-stage DCF model you use.

A5. The multi-stage model I use is presented in Equations D-4 and D-5 above, and assumes that the long-term perpetual growth rate for all companies in the two samples is the forecast long-term growth rate of the GDP. This model allows growth rates to differ across companies during the first ten years before settling down to a single long-term growth rate. The growth rate for the first five years is the long-term growth rate derived from analysts' reports. After year five, the growth rate is assumed to converge linearly to the GDP growth rate. In other words, the growth rate in year 6 is adjusted by $1/6^{th}$ of the difference between each company's 5-year growth rate forecast and the GDP forecast. The growth rates in years 7 to 10 are adjusted by an additional $1/6^{th}$ so that the earning growth rate pattern converges on the long-term GDP growth rate forecast.

Q6. Why do you assume that the long-term growth rate of the sample companies will converge to the long-term growth rate of GDP?

A6. Recall that the DCF model assumes that dividends grow at a constant rate literally forever. If the growth rate of earnings (and therefore, dividends) were greater than (less than) the long-term growth rate of the economy, mathematically it would mean that the company (and the industry) would become an ever increasing (or decreasing) proportion of the economy. Therefore, the most logical assumption is that the company's earnings grow at the same rate as the economy on average over the long run.

Q7. What are the merits of the DCF model?

A7. The DCF approach is conceptually sound only if its assumptions are met. In actual practice one can run into difficulty because those assumptions are so strong, and hence so unlikely to correspond to reality. Two conditions are well-known to be necessary for the DCF approach to yield a reliable estimate of the cost of capital: the variant of the present value formula, Equation D-1, that is used must actually match the variations in investor expectations for the dividend growth path; and the growth rate(s) used in that formula must match current investor expectations. Less frequently noted conditions may also create problems.

The DCF model assumes that investors expect the cost of capital to be the same in all future years. Investors may not expect the cost of capital to be the same, which can bias the DCF estimate of the cost of capital in either direction.

The DCF model only works for companies for which the standard present value formula works. The standard formula does *not* work for companies that operate in industries or markets options (*e.g.*, puts and calls on common stocks), and so it will not work for companies whose stocks behave as options do. Option-pricing effects will be important for companies in financial distress, for example, which implies the DCF model will *understate* their cost of capital, all else equal.

In recent years even the most basic DCF assumption, that the market price of a stock in the absence of growth options is given by the standard present value formula (*i.e.*, by

Equation D-1 above), has been called into question by a literature on market volatility.[1] In any case, it is still too early to throw out the standard formula, if for no other reasons than that the evidence is still controversial and no one has offered a good replacement. But the evidence suggests that it must be viewed with more caution than financial analysts have traditionally applied. Simple models of stock prices may not be consistent with the available evidence on stock market volatility.

Q8. Normally DCF debates center on the right growth rate. What principles underlie that choice?

A8. Finding the right growth rate(s) is indeed the usual "hard part" of a DCF application. The original approach to estimation of g relied on average historical growth rates in observable variables, such as dividends or earnings, or on the "sustainable growth" approach, which estimates g as the average book rate of return times the fraction of earnings retained within the firm. But it is highly unlikely that historical averages over periods with widely varying rates of inflation, interest rates and costs of capital, such as in the relatively recent past, will equal current growth rate expectations.

A better approach is to use the growth rates currently expected by investment analysts, if an adequate sample of such rates is available. Analysts' forecasts are superior to time series forecasts based upon single variable historical data as has been documented and confirmed extensively in academic research.[2] If this approach is feasible and if the

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[1] See for example, Robert J. Shiller (1981), "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?," *The American Economic Review*, Vol. 71, No. 3, pp. 421-436. John Y. Campbell and Robert J. Shiller (1988), "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors," *The Review of Financial Studies*, Vol. 1, No. 3, pp. 195-228. Lucy F. Ackert and Brian F. Smith (1993), "Stock Price Volatility, Ordinary Dividends, and Other Cash Flows to Shareholders," *Journal of Finance*, Vol. 48, No. 1, pp. 1147-1160. Eugene F. Fama and Kenneth R. French (2001), "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?," *Journal of Financial Economics*, Vol. 60, pp. 3-43. Borja Larrain and Motohiro Yogo (2005), "Does Firm Value Move Too Much to be Justified by Subsequent Changes in Cash Flow?," Federal Reserve Bank of Boston, *Working Paper*, No. 05-18.

[2] Lawrence D. Brown and Michael S. Rozeff (1978), "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *Journal of Finance*, Vol. XXXIII, No. 1, pp. 1-16. J. Cragg and B.G. Malkiel (1982), *Expectations and the Structure of Share Prices*, National Bureau of Economic Research, University of Chicago Press. R.S. Harris (1986), "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," *Financial Management*, Spring Issue, pp. 58-67. J. H. Vander

person estimating the cost of capital is able to select the appropriate version of the DCF formula, the DCF method should yield a reasonable estimate of the cost of capital for companies not in financial distress and without material option-pricing effects (always subject to recent concerns about the applicability of the basic present value formula to stock prices as well as issues of optimism bias). However, for the DCF approach to work, the basic stable-growth assumption must become reasonable and the underlying stable-growth rate must become determinable *within the period for which forecasts are available.*

Q9. What is the so called "optimism bias" in the earnings growth rate forecasts of security analysts and what is its effect on the DCF analysis?

A9. Optimism bias is related to the observed tendency for analysts to forecast earnings growth rates that are higher than are actually achieved. This tendency to over estimate growth rates is perhaps related to incentives faced by analysts that provide rewards not strictly based upon the accuracy of the forecasts. To the extent optimism bias is present in the analysts' earnings forecasts, the cost-of-capital estimates from the DCF model would be too high.

Q10. Does optimism bias mean that the DCF estimates are completely unreliable?

A10. No. The effect of optimism bias is least likely to affect DCF estimates for large, rate regulated companies in relatively stable segments of an industry. Furthermore, the magnitude of the optimism bias (if any) for regulated companies is not clear. This issue is addressed in a paper by Chan, Karceski, and Lakonishok (2003)[3] who sort companies on the basis of the size of the I/B/E/S forecasts to test the level of optimism bias. Utilities constitute 25 percent of the companies in lowest quintile, and by one measure the level of optimism bias is 4 percent. However, the 4 percent figure does not represent the

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Weide and W. T. Carleton (1988), "Investor Growth Expectations: Analysts vs. History," *Journal of Portfolio Management*, spring, pp. 78-82. T. Lys and S. Sohn (1990), "The Association Between Revisions of Financial Analysts Earnings Forecasts and Security Price Changes," *Journal of Accounting and Economics*, vol 13, pp. 341-363.

[3] L. K.C. Chan, J. Karceski, and J. Lakonishok, 2003, "The Level and Persistence of Growth Rates," *Journal of Finance* 58(2):643-684.

complete characterization of the results in the paper. Table IX of the paper shows that the median I/B/E/S forecast for the first (lowest) quintile averages 6.0 percent. The realized "Income before Extraordinary Items" is 2.0 percent (implying a four percent upward bias in I/B/E/S forecasts), but the "Portfolio Income before Extraordinary Items" is 8.0 percent (implying a two percent downward bias in I/B/E/S forecasts).

The difference between the "Income before Extraordinary Items" and "Portfolio Income before Extraordinary Items" is whether individual firms or a portfolio are used in estimating the realized returns. The first is a simple average of all firms in the quintile while the second is a market value weighted-average. Although both measures of bias have their own drawbacks according to the authors,[4] the Portfolio Income measure gives more weight to the larger firms in the quintile such as regulated utilities. In addition, the paper demonstrates that "analysts' forecasts as well as investors' valuations reflect a wide-spread belief in the investment community that many firms can achieve streaks of high growth in earnings."[5] Therefore, it is not clear how severe the problem of optimism bias may be for regulated utilities or even whether there is a problem at all.

Finally, the two-stage DCF model also adjusts for any over optimistic (or pessimistic) growth rate forecasts by substituting the long-term GDP growth rate for the 5-year growth rate forecasts of the analysts in the years beginning in year 11. I linearly trend the 5-year forecast growth rate to the GDP forecast growth rate in years 6 to 10.

Q11. What about the reforms by the National Associate of Security Dealers (NASD) that were designed to reduce the conflicts of interest and pressures brought against security analysts? Have those reforms been generally successful?

A11. Yes. The conclusion from the Joint Report by NASD and the New York Stock Exchange ("NYSE") on the reforms states

> ... the SRO Rules have been effective in helping restore integrity to research by minimizing the influences of investment banking and

[4] Chan, Karceski, and Lakonishok, *op. cit.*, p. 675.

[5] Chan, Karceski, and Lakonishok, *op. cit.*, p. 663.

> promoting transparency of other potential conflicts of interest. Evidence also suggests that investors are benefiting from more balanced and accurate research to aid their investment decisions.[6]

The report does note additional reforms are advisable, but the situation is far different today than during the height of the tech bubble when analyst objectivity was clearly suspect.

B. CONCLUSIONS ABOUT DCF

Q12. Please sum up the implications of this part of the appendix.

A12. The unavoidable questions about the DCF model's strong assumptions — whether the basic present value formula works for stocks, whether option pricing effects are important for the company, whether the right variant of the basic formula has been found, and whether the true growth rate expectations have been identified — cause me to view the DCF method as *inherently* less reliable than equity risk premium approach, the other approach I use.

II. EMPIRICAL DCF RESULTS

Q13. How is this part of the appendix organized?

A13. This section presents the details of my DCF analyses for the water and gas LDC samples, which are summarized in my written testimony.

Implementation of the simple DCF models described above requires an estimate of the current price, the dividend, and near-term and long-run growth rate forecasts. The simple DCF model relies only on a single growth rate forecast, while the multistage DCF model employs both near-term individual company forecasts and long-run GDP growth rate forecasts. The remaining parts of this section describe each of these inputs in turn.

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[6] Joint Report by NASD and NYSE on the Operation and Effectiveness of the Research Analyst Conflict of Interest Rules, December 2005, p. 44.

A. PRELIMINARY MATTERS

Q14. In Appendix C you discuss estimating cost of capital and implied cost of equity using the risk positioning methodology. What, if anything, is different when you use the DCF method?

A14. The timing of the market value capital structure calculations is different in the DCF method than in the equity risk premium method. The equity risk premium method relies on the average capital structure over the five-year period *Value Line* uses to estimate beta while the DCF approach uses only current data, so the relevant market value capital structure measure is the most recent that can be calculated. This capital structure for the water sample companies is reported in columns [1]-[3] of Table No. BV-4, and for the gas LDC sample companies in columns [1]-[3] of Table No. BV-16.

B. GROWTH RATES

Q15. What growth rates do you use?

A15. For reasons discussed above, historical growth rates today are not useful as forecasts of current investor expectations for the water utility industry. I therefore use rates forecasted by security analysts.

The ideal in a DCF application would be a detailed forecast of future dividends, year by year well into the future, based on a large sample of investment analysts' expectations. I know of no source of such data. Dividends are ultimately paid from earnings, however, and earnings forecasts are available for a few years. Investors do not expect dividends to grow in lockstep with earnings, but for companies for which the DCF approach can be used reliably (*i.e.*, for relatively stable companies whose prices do not include the option-like values described previously), they do expect dividends to track earnings over the long-run. Thus, use of earnings growth rates as a proxy for expectations of dividend growth rates is a common practice.

Accordingly, the first step in my DCF analysis is to examine a sample of investment analysts' forecasted earnings growth rates. In particular, I utilize Bloomberg's BEst and

Value Line's forecasted earnings growth.[7] The projected earnings growth rates for the water sample companies are in Table No. BV-5, and those for the gas LDC sample companies are in Table No. BV-17. Column [1] reports Bloomberg's BEst analysts' forecasts of the long-term earnings growth for the sample companies. Column [2] reports the number of analysts that provided a forecast. Columns [3] and [4] report *Value Line's* forecasted earnings per share ("EPS") value for each company for 2009 and 2012-2014 respectively. Column [5] provides *Value Line's* implied long-term growth rate forecast, and column [6] provides a weighted average growth rate for each company across the two sources. (I treat the *Value Line* forecasts as though they overlap exactly with the forecasts from Bloomberg.) These growth rates underlie my simple and multistage DCF analyses.

In the simple DCF, I use the five-year average annual growth rate as the perpetual growth rate.[8] In the multistage model, I rely on the company-specific growth rate through the first quarter of 2014 and on the long-term GDP forecast from the second quarter of 2019 onwards. During the intervening five-year period, I assume the growth rate converges linearly towards the long-term GDP forecast.[9]

Q16. Do these growth rates correspond to the ideal you mentioned above?

A16. No. While forecasted growth rates are the quantity required in principle, the forecasts need to go far enough out into the future so that it is reasonable to believe that investors expect a stable growth path afterwards. As can be seen from Table No. BV-5 and Table No. BV-17, the growth rate forecasts vary widely from company to company. For example the BEst growth forecast for Southwest Water is negative percent while the BEst growth rate for SJW Corp. is 15 percent.[10] While the differences between BEst and *Value Line* forecasts are lower for the gas LDC sample, there is still significant

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[7] The BEst growth rates were downloaded from Bloomberg on May 18, 2009. *Value Line* estimates are from the most recent report available, dated April 24, 2009 for the water sample utilities, and March 13, 2009 for the gas LDCs.

[8] This growth rate is in column [6] of Table No. BV-5 (Table No. BV-17 for the gas LDC sample).

[9] I use the long-term U.S. GDP growth forecast from *Blue Chip Economic Indicators* (March 10, 2009).

[10] See Table No. BV-5.

variation.[11] Also, for some companies, the five-year growth rate forecasts are significantly above or below the long-term GDP growth rate forecast, indicating lack of stability in growth rates. Overall, the growth rates indicate that some companies and maybe the industries have yet to reach a stable equilibrium which is required for the correct application of the DCF method.

Q17. How well are the conditions needed for DCF reliability met at present?

A17. The requisite conditions for the sample companies are not fully met at this time; especially for the Water utility sample where the growth rates vary widely from company to company or across time.[12] Of particular concern for this proceeding is the uncertainty about what investors truly expect the long-run outlook for the sample companies to be. The longest time period available for growth rate forecasts of which I am aware is five years. The long-run growth rate (*i.e.*, the growth rate after the industry settles into a steady state, which is certainly *beyond* the next five years for water industry) drives the actual results one gets with the DCF model. Unfortunately, this implies that unless the company or industry in question is stable, so there is little doubt as to the growth rate investors expect. DCF results in practice can end up being driven by the subjective judgment of the analyst who performs the work.

This is a problem at present because it is hard to imagine that today's water industry would accurately be described as stable. There is great uncertainty about the costs required to undertake the large investments in infrastructure forecasted for the industry. Indeed, *Value Line* notes the need for investments aimed at replacing the aging infrastructure and complying with increasingly stringent water safety regulations, partially driven by increased fear of bioterrorism. The American Society of Civil Engineers recently estimated that that the drinking water and wastewater shortfall in infrastructure investments needs are $255 billion over the next five years while the expected spending (including the American Recovery and Reinvestment act) is $146.4

[11] See table No. BV-17.

[12] For example, in February 2008, the BEst estimate of York Water's growth rate was 0.6 percent whereas it now stands at 7.0 percent. See Table No. BV-5 in this filing as well as in Docket No. W-01303A-08-0227.

for a shortfall of about $108.6 billion.[13] The water industry also has seen a number of mergers and acquisitions, which affects the companies' earnings growth rate estimates. This is one reason why companies heavily involved in mergers and acquisitions are normally excluded from the sample. Taken together, these factors mean that it may be some time before the water industry settles into anything investors will see as a stable equilibrium.

Such circumstances imply that a regulator may often be faced with a wide range of DCF numbers, none of which can be well grounded in objective data on true long-run growth expectations, *because no such objective data now exist.* DCF for firms or industries in flux is *inherently* subjective with regard to a parameter (the long-run growth rate) that drives the answer one gets.

It is clear that much longer detailed growth rate forecasts than currently available from Bloomberg and *Value Line* would be needed to implement the DCF model in a completely reliable way for the water sample at this time; however, the general stability of the 5-year growth rate forecasts for the gas LDC sample indicates a higher degree of reliability than for the water sample at this time.

C. DIVIDEND AND PRICE INPUTS

Q18. What values do you use for dividends and stock prices?

A18. Dividends are the most recent recorded dividend payments as reported by Bloomberg. For most companies this is the first quarter 2009 dividend, but for some it is the 2nd quarter 2009. The most recent dividend is grown at the estimated growth rate and divided by the price described below to estimate the dividend yield for the simple and multistage DCF models.

Stock prices are the average of the closing stock prices for the 15 trading days ending on the day the BEst forecasts were released (May 18, 2009). Using these dates ensures that

[13] Report Card for America's Infrastructure, The American Society of Civil Engineers, 2009, p. 7.

the information in growth rates and stock prices are contemporaneous. I use a 15-day average as a compromise. Using a longer period would be inconsistent with the principles that underlie the DCF formula. The DCF approach assumes the stock price is the present value of future expected dividends. Stock prices six months or a year ago reflect expectations at that time, which are different from those that underlie the currently available growth forecasts. At the same time, use of an average over a brief period helps guard against a company's price on a particular day price being unduly influenced by mistaken information, differences in trading frequency, and the like.

The closing stock price is used because it is at least as good as any other measure of the day's outcome, and may be better for DCF purposes. In particular, if there were any single price during the day that would affect investors' decisions to buy or sell a stock, I would suspect that it would be each day's closing price, not the high or low during the day. The daily price changes reported in the financial pages, for example, are from close to close, not from high to high or from low to low.

D. COMPANY-SPECIFIC DCF COST-OF-CAPITAL ESTIMATES

Q19. What DCF estimates do these data yield?

A19. The cost-of-equity results for the simple and multistage DCF models are shown in Table No. BV-6 for the water utility sample and in Table No. BV-18 for the gas LDC sample. In both tables, Panel A reports the results for the simple DCF method while Panel B reports the results for the multistage DCF method using the long-term GDP growth rate as the perpetual growth rate.

Q20. What overall cost-of-capital estimates result from the DCF cost-of-equity estimates?

A20. The capital structure, DCF cost of equity, and cost of debt estimates are combined to obtain the overall after-tax weighted-average cost of capital for each sample company. These results are presented in Table No. BV-7 for the water sample and in Table No. BV-19 for the gas LDC sample. Again, Panel A relies on the simple DCF cost-of-equity results while Panel B relies on the multistage DCF cost-of-equity results.

Q21. What information do you report in Table No. BV-8 and in Table No. BV-20?

A21. These tables report, for each sample, the return on equity consistent with that sample's estimated overall after-tax weighted-average cost of capital and the proposed equity thickness of 46.75 percent for Arizona-American Water. For both the simple DCF and multistage DCF methods, the sample's average ATWACC is reported in column [1]. Column [6] reports the return on equity as if the sample companies' average market value capital structure had been that currently proposed for Arizona-American Water.

Q22. What are the implications of these results?

A22. The implication of these numbers is discussed in my direct testimony, along with the findings of the equity risk premium approach.

APPENDIX E

EFFECT OF DEBT ON THE COST OF EQUITY

Q1. What is the purpose of this Appendix?

A1. In this appendix, I provide details on the effects of debt on the cost of equity. First, I summarize a fairly large body of financial research on capital structure. Second, I provide an extended example to illustrate the effect of debt on the cost of equity.

I. AN OVERVIEW OF THE ECONOMIC LITERATURE

Q2. What is the focus of the economic literature on the effects of debt?

A2. The economic literature focuses on the effects of debt on the value of a firm. The standard way to recognize one of these effects, the impact of the fact that interest expense is tax-deductible, is to discount the all-equity after-tax operating cash flows generated by a firm or an investment project at a weighted average cost of capital, typically known in textbooks as the "WACC." The textbook WACC equals the *market*-value weighted average of the cost of equity and the *after-tax*, *current* cost of debt. However, rate regulation in North America has a legacy of working with another weighted-average cost of capital, the *book*-value weighted average of the cost of equity and the *before-tax*, *embedded* cost of debt. To distinguish the concepts, I refer to the after-tax weighted-average cost of capital as ATWACC.

Q3. How is this section of the appendix organized?

A3. It starts with the tax effects of debt. It then turns to other effects of debt.

A. TAX EFFECTS

Q4. What are the key findings in the literature regarding tax effects?

A4. Three seminal papers are vital for this literature. The first assumes no taxes and risk-free debt. The second adds corporate income taxes. The third adds personal income taxes.

1. Base Case: No Taxes, No Risk to High Debt Ratios

Q5. Please start by explaining the simplest case of the effect of debt on the value of a firm.

A5. The "base case," no taxes and no costs to excessive debt, was worked out in a classic 1958 paper by Franco Modigliani and Merton Miller, two economists who eventually won Nobel Prizes in part for their body of work on the effects of debt.[1] Their 1958 paper made what is in retrospect a very simple point: if there are no taxes and no risk to the use of excessive debt, use of debt will have no effect on a company's operating cash flows (i.e., the cash flows to investors as a group, debt plus equity combined). If the operating cash flows are the same regardless of whether the company finances mostly with debt or mostly with equity, then the value of the firm cannot be affected at all by the debt ratio. In cost-of-capital terms, this means the overall cost of capital is constant regardless of the debt ratio, too.

In the base case, issuing debt merely divides the cash flows into two pools, one for bondholders and one for shareholders. If the divided pools have different priorities in claims on the cash flows, the risks and costs of capital will differ for each pool. But the risk and overall cost of capital of the entire firm, the sum of the two pools, is constant regardless of the debt ratio. Thus,

$$r_1^* = r_{A1} \qquad \text{(E-1a)}$$

where r_1^* is the overall after-tax cost of capital at any particular capital structure and r_{A1} is the all-equity cost of capital for the firm. (The "1" subscripts distinguish the case where there are no taxes from subsequent equations that consider first corporate and then both corporate and personal taxes.) With no taxes and no risk to debt, the overall cost of capital does not change with capital structure.

This implies that the relationship of the overall cost of capital to the component costs of debt and equity is

[1] Franco Modigliani and Merton H. Miller (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, 48, pp. 261-297.

$$r_{E1} \times \left(\frac{E}{V}\right) + r_{D1} \times \left(\frac{D}{V}\right) = r_1^* \qquad \text{(E-1b)}$$

with the overall cost of capital (r^*) on the *right* side, as the *independent* variable, and the costs of equity (r_E) and debt (r_D) on the left side, as *dependent* variables determined by the overall cost of capital and by the capital structure (i.e., the shares of equity (E) and debt (D) in overall firm value ($V = E + D$) that the firm happens to choose. Note that if equation (E-1a) were correct, the equation that solved it for the cost of equity would be,

$$r_{E1} = r_1^* + (r_1^* - r_D) \times \left(\frac{D}{E}\right) \qquad \text{(E-1c)}$$

Note also that (D/E) gets exponentially higher in this equation as the debt-to-value ratio increases[2] i.e., the cost of equity increases exponentially with leverage.

2. Corporate Tax Deduction for Interest Expense

Q6. What happens when you add corporate taxes to the discussion?

A6. If corporate taxes exist with risk-free debt (and if only taxes at the corporate level matter, not taxes at the level of the investor's personal tax return), the initial conclusion changes. Debt at the corporate level reduces the company's tax liability by an amount equal to the marginal tax rate times the interest expense. All else equal, this will add value to the company because more of the operating cash flows will end up in the hands of investors as a group. That is, if only corporate taxes mattered, interest would add cash to the firm equal to the corporate tax rate times the interest expense. This increase in cash would increase the value of the firm, all else equal. In cost-of-capital terms, it would reduce the overall cost of capital.

How much the value of the firm would rise and *how far* the overall cost of capital would fall would depend in part on how often the company adjusts its capital structure, but this is a second-order effect in practice. (The biggest effect would be if companies could

[2] For example, at 20-80, 50-50, and 80-20 debt-equity ratios, (D/E) equals, respectively, (20/80) = 0.25, (50/50) = 1.0, and (80/20) = 4.0. The extra 30 percent of debt going from 20-80 to 50-50 has much less impact on (D/E) [i.e., by moving it from 0.25 to 1.0] than the extra 30 percent of debt going from 50-50

issue riskless perpetual debt, an assumption Profs. Modigliani and Miller explored in 1963, in the second seminal paper;[3] this assumption could *not* be true for a real company.) Prof. Robert A. Taggart provides a unified treatment of the main papers in this literature and shows how various cases relate to one another.[4] Perhaps the most useful set of benchmark equations for the case where only corporate taxes matter are:

$$r_2^* = r_{A2} - r_D \times t_C \times \left(\frac{D}{V}\right) \quad \text{(E-2a)}$$

$$r_2^* = r_{E2} \times \left(\frac{E}{V}\right) + r_D \times \left(\frac{D}{V}\right) \times (1 - t_C) \quad \text{(E-2b)}$$

which imply for the cost of equity,

$$r_{E2} = r_{A2} + (r_{A2} - r_D) \times \left(\frac{D}{E}\right) \quad \text{(E-2c)}$$

where the variables have the same meaning as before but the "2" subscripts indicate the case that considers corporate but not personal taxes.

Note that Equation (E-2a) implies that when only corporate taxes matter, the overall after-tax cost of capital declines steadily as more debt is added, until it reaches a minimum at 100 percent debt (i.e., when $D/V = 1.0$). Note also that Equation (E-2c) still implies an exponentially increasing cost of equity as more and more debt is added. In fact, except for the subscript, Equation (E-2c) looks just like Equation (E-1c). However, whether any value is added and whether the cost of capital changes at all also depends on the effect of taxes at the personal level.

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to 80-20 [i.e., by moving it from 1.0 to 4.0]. Since the cost of equity equals a constant risk premium times the debt-equity ratio, the cost of equity grows ever more rapidly as you add more and more debt.

[3] Franco Modigliani and Merton H. Miller (1963), "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review*, 53, pp. 433-443.

[4] Robert A. Taggart, Jr. (1991), "Consistent Valuation and Cost of Capital Expressions with Corporate and Personal Taxes," *Financial Management* 20, pp. 8-20.

3. Personal Tax Burden on Interest Expense

Q7. How do personal taxes affect the results?

A7. Ultimately, the purpose of investment is to provide income for consumption, so personal taxes affect investment returns. For example, in the U.S., municipal bonds have lower interest rates than corporate bonds because their income is taxed less heavily at the personal level. In general, capital appreciation on common stocks is taxed less heavily than interest on corporate bonds because (1) taxes on unrealized capital gains are deferred until the gains are realized, and (2) the capital gains tax rate is lower. Dividends are taxed less heavily than interest, also, under current tax law.[5] The effects of personal taxes on the cost of common equity are hard to measure, however, because common equity is so risky.

Professor Miller explored how personal taxes affect the overall cost of capital.[6] He found that personal tax effects could offset the effect of corporate taxes entirely.

Q8. Does the effect of personal taxes neutralize the effect of corporate taxes?

A8. The likelihood hereof would be increased if the current federal tax reductions on dividends and capital gains became permanent rather than expiring in 2010. However, personal taxes are important even if they do not make the corporate tax advantage on interest vanish entirely. Capital gains and dividend tax advantages definitely convey some personal tax advantage to equity, and even a partial personal advantage to equity reduces the corporate advantage to debt.

The Taggart paper explores the case of a partial offset, also. With personal taxes, the risk-free rate on the security market line is the after-personal-tax rate, which must be equal for risk-free debt and risk-free equity.[7] Therefore, the pre-personal-tax risk-free

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[5] The current maximum personal tax rate on dividend income was extended to the end of 2010 on May 17, 2006. It is uncertain what the rate on dividend come will be set at after that.

[6] Merton H. Miller (1977), "Debt and Taxes," *The Journal of Finance*, 32: 261-276, the third of the seminal papers mentioned earlier.

[7] As Prof. Taggart notes (his footnote 9), it is not necessary that a specific, risk-free equity security exist as long as one can be created synthetically, through a combination of long and short sales of traded assets. Such constructs are a common analytical tool in financial economics.

rate for equity will generally not be equal to the pre-personal-tax risk-free rate for debt. In particular, $r_{fE} = r_{fD} \times [(1-t_D)/(1-t_E)]$, where r_{fE} and r_{fD} are the risk-free costs of equity and debt and t_E and t_D are the personal tax rates for equity and debt, respectively. In terms of the cost of debt, the Taggart paper's results imply that a formal statement of these effects can be written as:[8]

$$r_3^* = r_{A3} - r_D \times t_N \times \left(\frac{D}{V}\right) \quad \text{(E-3a)}$$

$$= r_{E3} \times \left(\frac{E}{V}\right) + r_D \times \left(\frac{D}{V}\right) \times (1-t_C) \quad \text{(E-3b)}$$

which imply

$$r_{E3} = r_{A3} + \left[r_{A3} - r_D \times \left(\frac{1-t_D}{1-t_E}\right)\right] \times \left(\frac{D}{E}\right) \quad \text{(E-3c)}$$

Suppose, for example, that t_C = 35 percent, t_E = 7.7 percent and t_D = 40 percent. Then $[(1-t_D)/(1-t_E)] = 0.65 = (1-t_C)$. That condition corresponds to Miller's 1977 paper, in which the net personal tax advantage of equity fully offsets the net corporate tax advantage of debt. Note also that in that case, $t_N = 0$.[9] Therefore, if the personal tax advantage on equity fully offsets the corporate tax advantage on debt, Equation (E-3a) confirms that the overall after-tax cost of capital is a constant.

However, it is unlikely that the personal tax advantage of equity fully offsets the corporate tax advantage of debt. If taxes were all that mattered (i.e., if there were no other costs to debt), the overall after-corporate-tax cost of capital would still fall as debt was added, just not as fast.

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[8] The net all-tax effect of debt on the overall cost of capital, t_N, equals $\{[t_C+t_E-t_D-(t_C \times t_E)] / (1-t_E)\}$, where t_D is the personal tax rate on debt, as before. This measure of net tax effect is designed for use with the cost of debt in Equation (E-3a), which seems more useful in the present context. The Taggart paper works with a similar measure, but one which is designed for use with the cost of risk-free equity in the equivalent Taggart equation.

[9] In the above example, t_N = {[0.35+0.0770.4(0.35□0.077)] / (1.00.077)} = 0.0/0.923 = 0.

Finally, note that the overall after-tax cost of capital, Equation (E-3b), still uses the corporate tax rate even when personal taxes matter. Equations (E-2b) and (E-3b) both correspond to the usual formula for the ATWACC. Personal taxes affect the way the cost of equity changes with capital structure – Equation (E-3c) – but not the formula for the overall after-tax cost of capital given that cost of equity.

B. NON-TAX EFFECTS

Q9. Please describe the non-tax effects of debt.

A9. If debt is truly valuable, firms should use as much as possible, and competition should drive firms in a particular industry to the same, optimal capital structure for the industry. If debt is harmful on balance, firms should avoid it. Neither picture corresponds to what we actually see. A large economic literature has evolved to try to explain why.

Part of the answer clearly is the costs of excessive debt. Here the results cannot be reduced to equations, but they are no less real for that fact. As companies add too much debt, the costs come to outweigh the benefits. Too much debt reduces or eliminates financial flexibility, which cuts the firm's ability to take advantage of unexpected opportunities or weather unexpected difficulty. Use of debt rather than internal financing may be taken as a negative signal by the market.

Even if the company is generally healthy, more debt increases the risk that the company cannot use all of the interest tax shields in a bad year. As debt continues to grow, this problem grows and others may crop up. Management begins to worry about meeting debt payments instead of making good operating decisions. Suppliers are less willing to extend trade credit, and a liquidity shortage can translate into lower operating profits. Ultimately, the firm might have to go through the costs of bankruptcy and reorganization. Collectively, such factors are known as the costs of "financial distress."[10]

[10] See, for example, Section 18.3 of Brealey, Myers and Allen, 2006, *Principles of Corporate Finance*, 8th Edition, McGraw-Hill/Irwin, 2006.

The net tax advantage to debt, if positive, is affected by costs such as a growing risk that the firm might have to bear the costs of financial distress. First, the expected present value of these costs offsets the value added by the interest tax shield. Second, since the likelihood of financial distress is greater in bad times when other investments also do poorly, the possibility of financial distress will increase the risks investors bear. These effects increase the variability of the value of the firm. Thus, firms that use too much debt can end up with a higher overall cost of capital than those that use none.

Other parts of the answer include the signals companies send to investors by the decision to issue new securities, and by the type of securities they issue. Other threads of the literature explore cases where management acts against shareholder interests, or where management attempts to "time" the market by issuing specific securities under different conditions. For present purposes, the important point is that no theory, whether based on taxes or on some completely different issue, has emerged as "the" explanation for capital structure decisions by firms. Nonetheless, despite the lack of a single "best" theory, there is a great deal of relevant empirical research.

Q10. What does that research show?

A10. The research does not support the view that debt makes a material difference in the value of the firm, at least not once a modest amount of debt is in place. If debt were truly valuable, competitive firms should use as much debt as possible short of producing financial distress, and competitive firms that use less debt ought to be less profitable. The research shows exactly the opposite.

For example, Kester[11] found that firms in the same industry in both the U.S. and Japan do not band around a single, "optimal" capital structure, and the most profitable firms are the ones that use the *least* debt. This finding comes despite the fact that both countries at the time (unlike the U.S. currently) had fully "classical" tax systems, in which dividends are

[11] Carl Kester (1986), "Capital and Ownership Structure: A Comparison of United States and Japanese Manufacturing Concerns," *Financial Management*, 15:5-16.

taxed fully at both the corporate and personal level. Wald[12] confirms that high profitability implies low debt ratios in France, Germany, Japan, the U.K., and the U.S. Booth *et al.* find the same result for a sample of developing nations.[13] Fama and French[14] analyze over 2000 firms for 28 years (1965-1992, inclusive) and conclude, "Our tests thus produce no indication that debt has net tax benefits."[15] A paper by Graham[16] carefully analyzes the factors that might have led a firm not to take advantage of debt. It confirms that a large proportion of firms that ought to benefit substantially from use of additional debt, including large, profitable, liquid firms, appear not to use it "enough."

This research leaves us with only three options: either (1) apparently good, profit-generating managers are making major mistakes or deliberately acting against shareholder interests, (2) the benefits of the tax deduction on debt are less than they appear, or (3) the non-tax costs to use of debt offset the potential tax benefits. Only the first of these possibilities is consistent with the view that the tax deductibility of debt conveys a material cost advantage. Moreover, if the first explanation were interpreted to mean that otherwise good managers are acting against shareholder interests, either deliberately or by mistake, it would require the additional assumption that their competitors (and potential acquirers) let them get away with it.

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[12] John K. Wald (1999), "How Firm Characteristics Affect Capital Structure: An International Comparison," *Journal of Financial Research*, 22:161-167.

[13] Laurence Booth *et al.* (2001), "Capital Structures in Developing Countries," *The Journal of Finance* Vol. LVI, pp. 87-130, finds at p. 105 that "[o]verall, the strongest result is that profitable firms use less total debt. The strength of this result is striking ..."

[14] Eugene F. Fama and Kenneth R. French (1998), "Taxes, Financing Decisions and Firm Value," *The Journal of Finance*, 53:819-843.

[15] *Ibid.*, p. 841.

[16] John R. Graham (2000), "How Big Are the Tax Benefits of Debt," *The Journal of Finance*, 55:1901-1942.

Q11. Are there any explanations in the financial literature for this puzzle other than stupid or self-serving managers at the most profitable firms?

A11. Yes. For example, Stewart C. Myers, a leading expert on capital structure, made it the topic of his Presidential Address to the American Finance Association.[17] The poor performance of tax-based explanations for capital structure led him to propose an entirely different mechanism, the "pecking order" hypothesis. This hypothesis holds that the net tax benefits of debt (i.e., corporate tax advantage over personal tax disadvantage) are at most of a second order of importance relative to other factors that drive actual debt decisions.[18] Similarly, Baker and Wurgler (2002)[19] observe a strong and persistent impact that fluctuations in market value have on capital structure. They argue that this impact is not consistent with other theories. The authors suggest a new capital structure theory based on market timing -- capital structure is the cumulative outcome of attempts to time the equity market.[20] In this theory, there is no optimal capital structure, so market timing financing decisions just accumulate over time into the capital structure outcome. (Of course, this theory only makes sense if investors do not recognize what managers are doing.)

Q12. Do inter-firm differences within an industry explain the wide variations in capital structure across the firms in an industry?

A12. No. This view is contradicted by the empirical research. As mentioned before, it has long been found that the most profitable firms in an industry, i.e., those in the best position to take advantage of debt, use the least.[21] Graham (2000) carefully examines differences in firm characteristics as possible explanations for why firms use "too little"

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[17] Stewart C. Myers (1984), "The Capital Structure Puzzle," *The Journal of Finance*, 39: 575-592. See also S. C. Myers and N. S. Majluf (1984), "Corporate Financing Decisions When Firms Have Information Investors Do Not Have," *Journal of Financial Economics* 13:187-222.

[18] See also Stewart C. Myers (1989), "Still Searching for Optimal Capital Structure," *Are the Distinctions Between Debt and Equity Disappearing?,* R.W. Kopke and E. S. Rosengren, eds., Federal Reserve Bank of Boston.

[19] Malcolm Baker and Jeffrey Wurgler (2002), "Market Timing and Capital Structure," *The Journal of Finance* 57:1-32.

[20] *Ibid.*, p. 29.

[21] For example, Kester, *op. cit.* and Wald, *op. cit.*

debt and concludes that such differences are *not* the explanation: firms that ought to benefit substantially from more debt by all measurable criteria, if the net tax advantage of debt is truly valuable, voluntarily do not use it.[22]

Nor does the research support the view that firms are constantly trying to adjust their capital structures to optimal levels. Additional research on the pecking order hypothesis demonstrates that firms do not tend towards a target capital structure, or at least do not do so with any regularity, and that past studies that seemed to show the contrary actually lacked the power to distinguish whether the hypothesis was true or not.[23] In the words of the Shyam-Sunder - Myers paper p. 242, "If our sample companies did have well-defined optimal debt ratios, it seems that their managers were not much interested in getting there."

II. EXPANDING THE EXAMPLE FROM THE DIRECT TESTIMONY

Q13. What topics do you cover in this section?

A13. My direct testimony did not detail the impact of different starting points for the level of debt nor did it address income earned on the investment, interest expense, or taxes. This section covers these topics. First, it discusses how the level of debt affects the cost of equity. Second, it addresses the influence of income and interest on the investment. Third, it explains the impact of taxes on capital structure decisions. The final topic covered in this section is the combined consequence of tax and non-tax effects of debt.

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[22] While not contradicting Graham's finding that differences in firm characteristics do not explain capital structure differences, Nengjiu Ju, Robert Parrino, Allen M. Poteshman, and Michael S. Weisbach, "Horses and Rabbits? Trade-Off Theory and Optimal Capital Structure," *Journal of Financial and Quantitative Analysis*, June 2005, pp. 1-24, looks at the issue in a different manner. Their paper uses a dynamic rather than static model to analyze the tradeoff between the tax benefits of debt and the risk of financial distress. It finds that bankruptcy costs by themselves are enough to explain observed capital structures, once dynamic effects are considered. This means debt is not as valuable as suggested by the traditional static analysis (of the sort used by Graham).

[23] Lakshmi Shyam-Sunder and Stewart C. Myers (1999), "Testing static tradeoff against pecking order models of capital structure," *Journal of Financial Economics* 51:219-244.

A. DETAILS OF DIFFERENT LEVELS OF DEBT

Q14. Please repeat briefly the setup in the example discussed in the direct testimony.

A14. The example considered an investor who purchases $100,000 in real estate. The future value of the real estate is uncertain. Figures 2 and 3 in my direct testimony show how the return on equity to the investor differs if he finances the purchase with 100 percent equity, and if he finances it with 50 percent equity and 50 percent mortgage debt. The example illustrates the fact that debt adds risk to equity.

Q15. What happens if the investor finances the real estate purchase with different proportions of debt?

A15. The equity return becomes more variable when the mortgage percentage is a greater proportion of the initial price. Table E-1 below calculates the return on equity when real estate prices increase by 10 percent when mortgages are 0 percent, 30 percent, 50 percent, and 70 percent of the initial price.

Table E-1: The Impact of Leverage on the Return on Equity

	100% Equity	70% Equity	50% Equity	30% Equity
Debt	$0	$30,000	$50,000	$70,000
Original Equity Investment	$100,000	$70,000	$50,000	$30,000
Increase in Market Value of Equity	$10,000	$10,000	$10,000	$10,000
Return on Equity Investment	10%	14.3%	20%	33.3%

Note that going from 70 percent equity down to 50 percent equity increases the return on the equity investment by 5.7 percent while going from 50 percent equity to 30 percent equity increases the return on equity by 13.3 percent. This illustrates a general point; the rate of return on equity increases more quickly at higher levels of debt than at lower levels. Investors demand a higher equity rate of return to bear more risk and debt magnifies equity's risk at an ever increasing rate. Therefore, the required equity rate of

return goes up at an ever increasing rate as debt is added. This is not only basic finance theory, it is the everyday experience of anyone who buys a home. The bigger the mortgage, the more percentage risk the equity faces from changes in housing prices.

B. THE IMPACT OF INCOME AND INTEREST

Q16. How does earning income from the investment and paying interest on debt affect the results?

A16. In the following explanation, I ignore income taxes which I deal with in Section C below. Assume the investor is receiving income, e.g., rent, from the real estate. Specifically, assume the investor receives $500 per month in income after all non-interest expenses ($6,000 per year). Also, assume that the expected appreciation is 5 percent per year, so the expected market value is $105,000 after one year. Then the expected rate of return from the real estate with all equity financing is:

$$\text{Expected Return on Equity @ 0\% debt} = \frac{\text{Expected Net Income + Expected Appreciation}}{\text{Initial Investment}}$$

$$= \frac{\$6{,}000 + (\$105{,}000 - \$100{,}000)}{\$100{,}000}$$

$$= 11\%$$

Now suppose that the mortgage interest rate were 5 percent. Then at a mortgage equal to 50 percent, or $50,000, interest expense would be ($50,000 x 0.05), or $2,500. The expected equity rate of return would be:

$$\text{Expected Return on Equity @ 50\% debt} = \frac{\text{Expected (Net Income + Appreciation) – Int. Expense}}{\text{Initial } \textit{Equity} \text{ Investment}}$$

$$= \frac{\$6{,}000 + \$5{,}000 - \$2{,}500}{\$50{,}000}$$

$$= 17\%$$

Notice that the expected return on equity is higher as is the risk carried by equity.

Q17. Can you provide a more general illustration?

Yes. Figure E-1 uses these assumptions at different mortgage levels to plot both (i) the expected rate of return on the equity in the real estate, and (ii) the realized rate of return on that equity in a year if the real estate value increases by 10 percent more than the expected 5 percent rate (i.e., if the value increases by 15 percent) or by 10 percent less than expected (i.e., if it decreases by 5 percent).[24]

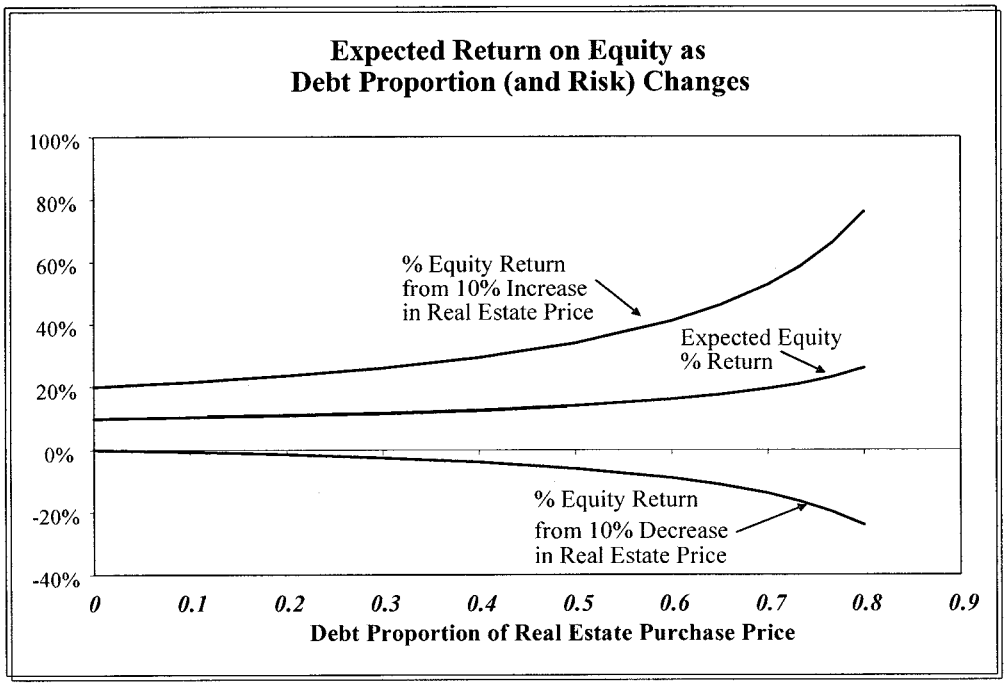

Figure E-1

The expected rate of return on equity increases at an increasing rate as the investor finances more and more of the real estate through loans (e.g., with a mortgage). Since equity bears all the risk of increases or decreases in real estate values (absent financial distress or bankruptcy), the amount of risk the buyer bears grows at an ever increasing rate as the mortgage percentage also increases.

[24] For simplicity, the figure assumes the debt's interest rate is independent of the debt proportion. This might not always be true, and in general would not be true for a corporation that issued debt. However, the general shape of the graphs remains the same.

Q18. What are the implications of this example?

A17. When a company uses debt to finance part an investment, the risk magnifies. For example, if an investor buys stocks "on margin" -- by borrowing part of the money used to buy the stock -- the expected rate of return will be higher as will the risks the investor carries. As an everyday example, imagine investing your retirement savings in a stock portfolio bought with as much margin as possible. If you were lucky, you could end up living very well in retirement. However, it is very risky and likely you would have lost substantial value over the past year. Specifically, your portfolio could decline by more than 100 percent of your initial investment. The same risk-magnifying effects happen when companies borrow to finance part of their investments.

C. THE EFFECT OF TAXES

Q19. What is the impact of taxes?

A18. Analyzing the net effect of taxes in capital structure decisions by corporations is an important part of the financial research. The bottom line is that taxes complicate the picture without changing the basic conclusion.

Q20. Please describe the potential impact of taxes.

A19. Interest expense is tax-deductible for corporations. That increases the pool of cash the corporation gets to keep out of its operating earnings (i.e., its earnings before interest expense). With no debt, 100 percent of operating income is subject to taxes. With debt, only the equity part of the operating income is subject to taxes. All else equal, the extra money kept from operating income increases the value of the corporation. The standard way to recognize that increase in value is to use an after-tax weighted-average cost of capital as a discount rate when valuing a company's operating cash flows.

Q21. Do personal taxes affect the value of debt, too?

A20. Yes, but in the other direction. One offset to debt's tax benefits at the corporate level is its higher tax burden at the personal level. Investors care about the money they get to keep after all taxes are paid, and while the corporation saves taxes by opting for debt over

equity, individuals pay more taxes on interest than on capital gains from equity (and for now, on dividends as well).

Q22. Are there factors other than taxes matter?

A21. Yes. The "all else" does not remain equal as more debt is added. The more debt, the more the non-tax effects of debt offset the tax benefits. Other costs include such effects as a loss of flexibility, the possibility of sending negative signals to investors, and a host of costs and risks associated with the danger of financial distress.

Q23. Does the tradeoff between the tax and non-tax effects of debt mean that firms have well-defined, optimal capital structures?

A22. No, the "tradeoff" model does not explain actual corporate behavior. Economic research confirms that real-world corporations act as if, after a moderate amount of debt is in place, the tax benefits of debt are not worth debt's other costs. In country after country and in industry after industry, the most profitable corporations in an industry tend to use the least debt. Economic research finds that the most profitable companies tend to use the least debt in a given industry. Yet these are the companies with the most operating income to shield from taxes, who would benefit most if interest tax shields were truly valuable net of debt's other costs. They also presumptively are the best-managed on average (else why are they the most profitable?). This means it is unrealistic to suppose that more debt is always better, or that greater tax savings due to higher interest expense always add value to the firm on balance.

Q24. If the tradeoff model doesn't explain capital structure decisions by firms, is there a model that does?

A23. No single model has (yet) emerged as 'the" explanation of capital structure. However, several alternative models attempt to model the tradeoff (e.g., the "pecking order" hypothesis and "agency cost" explanations).

Q25. What does the absence of an agreed theory of capital structure in the financial literature imply about the overall effect of debt on the value of the firm?

A24. The findings of the financial literature mean that within an industry, there is no well-defined optimal capital structure. The use of some debt does convey some value advantage in most industries, but that advantage is offset by other costs as firms add more debt.[25] The range of capital structures over which the value of the firm in any industry is maximized is wide and should be treated as flat. The location and level of that range, however, does vary from industry to industry, just as the overall cost of capital varies from industry to industry.

Figure E-2 illustrates the picture that emerges from the research. This figure shows the present value of an investment in each of four different industries. For simplicity, the investment is expected to yield $1.00 per year forever. For firms in relatively high-risk industries (Industry 1 in the graph, the lowest line), the $1.00 perpetuity is not worth much and any use of debt decreases firm value. For firms in relatively low-risk industries (Industry 4 in the graph), the perpetuity is worth more and substantial amounts of debt make sense. Industries 2 and 3 are intermediate cases.

The maximum net rate at which taxes can increase value in this figure equals 20 percent of interest expense, representing a balance between the corporate tax advantage to debt and the personal tax disadvantage. The figure plots the maximum possible impact of taxes on value as a separate line, starting at the all-equity value of the lowest-risk industry (Industry 4).

[25] Note that if debt did increase the value of the firm materially, competition would tend to take that value away, since issuing debt is an easy-to-copy competitive strategy. Prices would fall as firms copied the strategy, lowering operating earnings and passing the net tax advantages to debt through to customers (just as happens under rate regulation). Therefore, if also there were a narrow range of optimal capital structures within an industry, competition would drive all firms in the industry to capital structures within that range. This does not happen in practice, which contradicts one or both of the assumptions, i.e., (1) that debt adds material value on balance, and/or (2) that there is a narrow range of optimal capital structures.

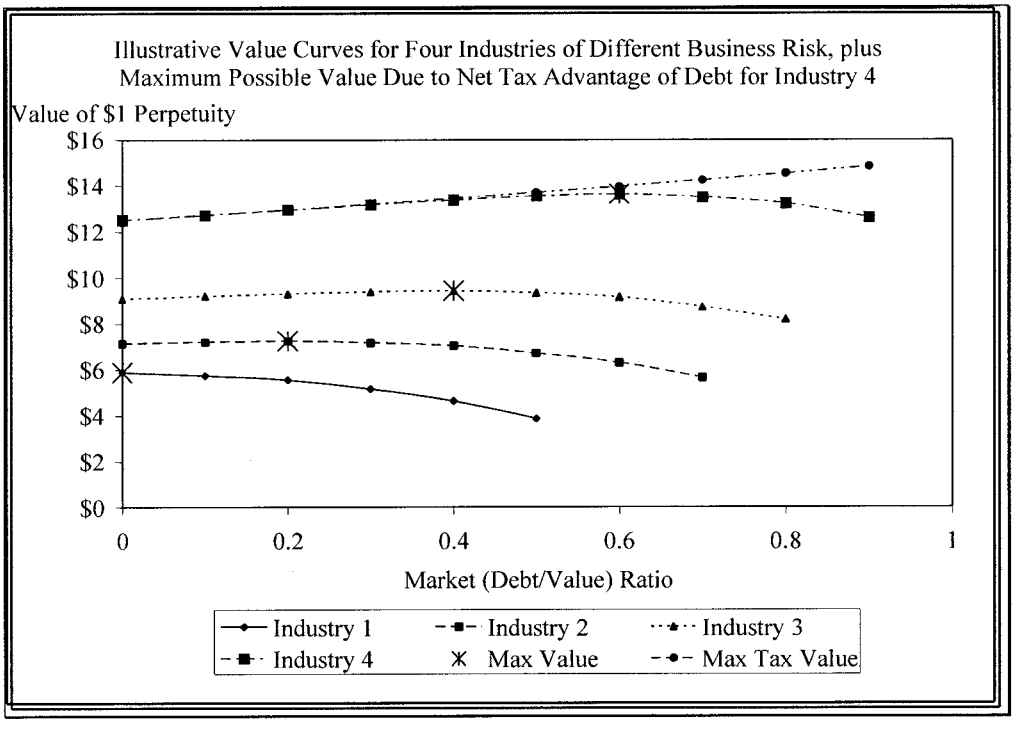

Figure E-2

Figure E-2 identifies a particular point as the maximum value on each of the four curves. However, the research shows that reliable identification of this maximum point, except in the extreme case where no debt should be used, is impossible. In accord with the research, the graph is prepared so that in none of the industries does a change in capital structure make much difference near the top of the curve. Even Industry 4, which increases in value at the maximum rate as quite a lot of debt is added, eventually must reach a broad range where changes in the debt ratio make little difference to firm value, given the research. For Industry 4, debt makes less than a 2 percent difference in the total value of the firm for debt-to-value ratios between 40 and 70 percent.

Q26. What does this imply for the overall cost of capital?

A25. Figure E-3 plots the after-tax weighted-average costs of capital ("ATWACCs") that correspond to the value curves in Figure E-2. This picture just turns Figure E-2 upside down. All the same conclusions remain, except that they are stated in terms of the overall cost of capital instead of the overall firm value. In particular, except for high-risk

industries, the overall cost of capital is essentially flat across a broad middle range of capital structures for each industry, which is the only outcome consistent with the research. For Industry 4, for example, the ATWACC changes by less than 15 basis points for debt-to-value ratios between 40 and 70 percent.

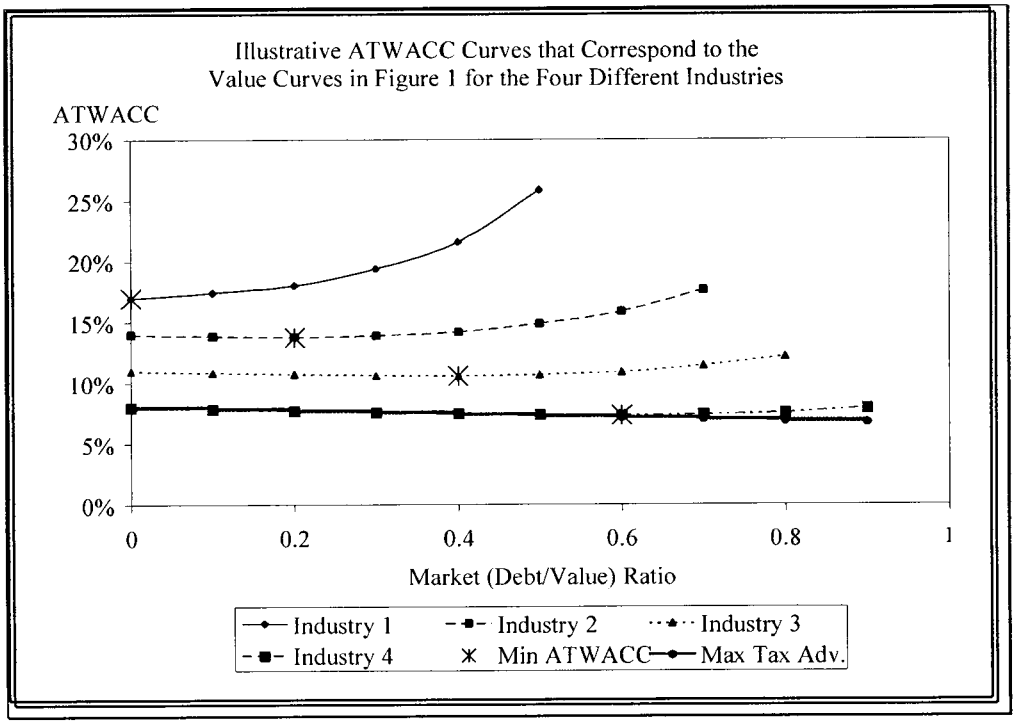

Figure E-3

Q27. How does this discussion relate to estimation of the right cost of equity for ratemaking purposes?

A26. When an analyst estimates the cost of equity for a sample of companies, s/he does so at the sample's actual market-value capital structure. That is, the sample evidence corresponds to ATWACCs that are already out somewhere in the broad middle range in which changes in the debt ratio have little or no impact on the overall value of the firm or the ATWACC.

The ATWACC curve is therefore virtually flat in a broad middle range. This assumption provides the tradeoff between the cost of equity and capital structure.

D. COMBINED EFFECTS

Q28. Please summarize the implications for the combined impact of the tax and non-tax effects of debt.

A27. The most profitable firms do not behave as if the precise amount of debt they use makes any material difference to value, and competition does not force them into an alternative decision, as it would if debt were genuinely valuable. The explanation that fits the facts and the research is that within an industry, there is no well-defined optimal capital structure. Use of some debt does convey an advantage in most industries, but that advantage is offset by other costs as firms add more debt. The range of capital structures over which the value of the firm in any industry is maximized is wide and should be treated as flat. The location and level of that range, however, does vary from industry to industry, just as the overall cost of capital varies from industry to industry. To conclude that more debt does add more value, once the firm is somewhere in the normal range for the industry, is to conclude that corporate management in general is either blind to an easy source of value or otherwise incompetent (and that their competitors let them get away with it).

The finding that there is no narrowly defined optimal capital structure implies that the ATWACCs for a sample of companies in a given industry is independent of capital structure (at least within a broad middle range of capital structures). The cost of equity for a rate-regulated company in the same industry is the number that yields the same ATWACC at the capital structure used to set the revenue requirement, since that is the cost of equity that (estimation problems aside) the sample companies would have had if their market-value capital structures had been equal to the regulatory capital structure.

1) Compliance Status Reports

1a) Arizona Department of Environmental Quality

Compliance Status Reports-Water

ARIZONA-AMERICAN WATER COMPANY

None of the water districts in this application require a compliance status report issued by the Arizona Department of Environmental Quality.

1b) Maricopa County Environmental Services Department

Compliance Status Reports-Water

Maricopa County
Environmental Services Department

PUBLIC WATER SYSTEM COMPLIANCE STATUS REPORT

System Name: AAWC- Anthem
PWS ID#: 07-504

Type of System: Community Number of POE's: 2 Surface Water: Yes
Number of Service Connections: 8568 Population Served: 25302

Assigned Monitoring Dates - Initial: 1/1/99 Phase II: 1/1/99 Phase V: 1/1/99

Does the water system have a Certified Operator? Yes

Does the system have major treatment plant deficiencies? No
Please describe: _____

Date of last inspection: May 21, 2009

Does the system have major O & M deficiencies? No
Please describe: _____

Does the system have water quality monitoring/reporting deficiencies? No.
Please describe: _____

General Public Water System Compliance Status? **Compliant**

Date of compliance review: **5/21/09** By: **Rob Collins** Initials: **RC**
Phone: **(602) 506-0719**

Requested By: post-inspection Fax Number/ Contact: _____ Tracking Number: _____
Supervisor Initials: _____ Date: _____

Drinking Water Program
Korissa Entringer, R.S., Manager
1001 N. Central Ave., Suite 250 Phoenix, Arizona 85004-1940 Phone: (602) 506-6666 Fax: (602) 372-0866

Maricopa County
Environmental Services Department

PUBLIC WATER SYSTEM COMPLIANCE STATUS REPORT

System Name: AZ American Sun City
PWS ID#: 07-099

Type of System: Community Number of POE's: 7 Surface Water: No
Number of Service Connections: 23,082 Population Served: 38016

Assigned Monitoring Dates - Initial: 1/1/94 Phase II: 1/1/94 Phase V: 1/1/94

Does the water system have a Certified Operator? Yes

Does the system have major treatment plant deficiencies? No
Please describe: ___

Date of last inspection: June 6, 2008

Does the system have major O & M deficiencies? No
Please describe: All deficiencies from last inspection corrected as per letter, photos, and documentation from R. Diaz dated 7/21/08.

Does the system have water quality monitoring/reporting deficiencies? No
Please describe: _____

General Public Water System Compliance Status? **Compliant**

Date of compliance review: **6/17/09** By: **Mike Mallette** Initials: **MKM**
Phone: **(602) 506-6644**

Requested By: R. Diaz Fax Number/ Contact: ____ Tracking Number: ____
Supervisor Initials: ____ Date: _____

Drinking Water Program
Korissa Entringer, Manager
1001 N. Central Ave., Suite 150Phoenix, Arizona 85004-1940 Phone: (602) 506-6666 Fax: (602) 506-6925

1c) Arizona Department of Environmental Quality

Compliance Status Reports-Wastewater

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Janice K. Brewer
Governor

Patrick J. Cunningham
Acting Director

June 8, 2009

Mr. Roman Diaz
Water Quality, American Water-Western Region
19820 N. 7th Street, Suite 201
Phoenix, Arizona 85024

RE: Compliance Status for Anthem Water Campus. Inventory number 103259, Permit number 23639.

Dear Mr. Diaz;

Your request for evaluation of compliance status of the above facility is completed. Our records indicate that Anthem Water Campus WWTP has Aquifer Protection Permit number 23639 and National Pollutant Elimination System (NPDES) permit number 36218 issued on 2/12/2002 and 4/17/2006 respectively.

Aquifer protection permit reporting requirements and monitoring results which have been submitted indicate the facility **is in compliance** based on the current information that is available to ADEQ. No enforcement actions are pending at this time.

It should be understood that the compliance status of a facility may change from time to time based upon monitoring results or a facility inspection. Therefore this is based on the most current information available.

Sincerely,

Fred Vakili, EHS II
Water Quality Data Unit
Water Quality Compliance Section
Phone: (602) 771-4535
FAV@AZDEQ.GOV

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Janice K. Brewer
Governor

Benjamin H. Grumbles
Director

June 30, 2009

Arizona American Water Company
Mr. Roman Diaz, Water Quality Supervisor
101 Corporate centers
19820 N. 7th Street, Suite 201
Phoenix, AZ 85024

RE: Compliance Status for Russell Ranch WWTP, Inventory number 105229, Place ID: 16296, Permit number: 26497 and 36953.

Dear Mr. Diaz,
Your request for evaluation of compliance status for the above facility is completed. Our records indicate that Russell Ranch WWTP has Aquifer Protection Permit number 26497 and 36953 issued on December 18, 2002 and May 29, 2007 respectively.

The Aquifer Protection Permit reporting requirements and monitoring results which have been submitted indicate the facility **is in compliance** based on the current information that is available to ADEQ. No enforcement actions are pending.

It should be understood that the compliance status of a facility may change from time to time based upon monitoring results or a facility inspection. Therefore this is based on the most current information available.

Sincerely,

Fred Vakili, EHS- II
Water Quality Data Unit
Water Quality Compliance Section
February 05, 2008

ARIZONA-AMERICAN WATER COMPANY

The latest compliance status reports for Verrado Water Reclamation (Permit Number 27395 and 36947) and Northwest Valley Regional Water Reclamation Facility (Permit Number 102667) have been requested from ADEQ but have not yet been received as of the filing of this application. As an interim solution, the Company is filing the Compliance Status Reports received during 2008 and will provide the latest status reports as soon as they are received from ADEQ.

Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.adeq.state.az.us

Stephen A. Owens
Director

February 05, 2008

Arizona American Water Company
Mr. Roman Diaz, Water Quality Supervisor
101 Corporate centers
19820 N. 7th Street, Suite 201
Phoenix, AZ 85024

RE: Compliance Status for Verrado Water Reclamation, Inventory number 105202, Place ID 16908, Permit number 27395 and 36947.

Dear Mr. Diaz,
Your request for evaluation of compliance status for the above facility is completed. Our records indicate that above facility has Aquifer Protection Permit number 27395 and 36947 issued on 8/11/2004 and 05/29/2007 respectively.

The Aquifer Protection Permit reporting requirements and monitoring results which have been submitted indicate the facility **is in compliance** based on the current information that is available to ADEQ. No enforcement actions are pending.

It should be understood that the compliance status of a facility may change from time to time based upon monitoring results or a facility inspection. Therefore this is based on the most current information available.

Sincerely,

Fred Vakili, EHS- II
Water Quality Data Unit
Water Quality Compliance Section

Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.adeq.state.az.us

Stephen A. Owens
Director

March 18, 2008

Arizona American Water Company
Mr. Roman Diaz, Water quality Supervisor
101 Corporate Centers
19820 N. 7th Street, Suite 201
Phoenix, AZ 85024

RE: Compliance Status for Sun City West Water Reclamation WWTP, Inventory number 102667, Place ID: 9539, Permit number 27576 and 36946.

Dear Mr. Diaz,
Your request for evaluation of compliance status for the above facility is completed. Our records indicate that Sun City West Water Reclamation WWTP has Aquifer Protection Permit number 27567 and 36946 issued on 2/1/05 and 5/29/2007 respectively.

The Aquifer Protection Permit reporting requirements and monitoring results which have been submitted indicate the facility **is in compliance** based on the current information that is available to ADEQ. No enforcement actions are pending.

It should be understood that the compliance status of a facility may change from time to time based upon monitoring results or a facility inspection. Therefore this is based on the most current information available.

Sincerely,

Fred Vakili, EHS- II
Water Quality Data Unit
Water Quality Compliance Section

1d) Maricopa County Environmental Services Department

Compliance Status Reports-Wastewater

ARIZONA-AMERICAN WATER COMPANY

None of the wastewater districts in this application require a compliance status report issued by the Maricopa County Environmental Services Department.

2) Monitoring Assistance Program Invoices

ARIZONA-AMERICAN WATER COMPANY

None of the Arizona-American Water Company districts included in this application for an increase in rates are subject to the Arizona Department of Environmental Quality's Monitoring Assistance Program (MAP) and, accordingly, no invoices are attached hereto.

3) Water Use Data

3a) Water

COMPANY NAME	Arizona American Water (Anthem 07- 504)

WATER USE DATA SHEET BY MONTH FOR CALENDAR YEAR 2008

MONTH	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	GALLONS PUMPED (Thousands)	GALLONS PURCHASED (Thousands)
JANUARY	8,533	81,903	96,263	0
FEBRUARY	8,526	73,861	84,066	0
MARCH	8,515	80,030	110,510	0
APRIL	8,492	85,933	122,479	0
MAY	8,488	108,672	140,068	0
JUNE	8,485	139,371	154,375	0
JULY	8,480	164,269	160,002	0
AUGUST	8,467	150,557	160,218	0
SEPTEMBER	8,460	146,808	136,505	3
OCTOBER	8,483	136,585	139,948	0
NOVEMBER	8,491	135,324	119,755	977
DECEMBER	8,605	107,540	96,408	140
	TOTALS ->	**1,410,853**	**1,520,597**	**1,120**

What is the level of arsenic for each well on your system. _____mg/l
(If more than one well, please list each separately)

55-577504 0.009 mg/l
55-577505 0.002 mg/l

If system has fire hydrants, what is the fire flow requirement? _____GPM for _____ hrs

If system has chlorination treatment, does this treatment system chlorinate continuously?
(X) Yes ( ) No

Is the Water Utility located in an ADWR Active Management Area (AMA)?
(X) Yes ( ) No

Does the Company have an ADWR Gallons Per Capita Per Day (GPCPD) requirement?
( ) Yes (X) No

If yes, provide the GPCPD amount:_____N/A_____

Arizona American Water
Eastern Division - Anthem Water District
Unaccounted For Water - 2008

Description	Quantity of Water (Kgal)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Production													
Water Treatment	105,165	92,361	119,766	130,970	148,823	162,871	168,788	168,995	144,994	148,675	127,149	104,971	1,623,528
Wells		24								40	123	26	213
COP Purchased Water	0	0	0	0	0	0	0	0	3	0	977	140	1,120
Re-used Back In Plant	(8,902)	(8,319)	(9,256)	(8,491)	(8,755)	(8,496)	(8,786)	(8,777)	(8,492)	(8,752)	(8,465)	(8,729)	(104,221)
- Hayward Strainers	8,680	8,120	8,680	8,400	8,680	8,400	8,680	8,680	8,400	8,680	8,400	8,680	102,480
- Plant Cleans	180	160	40	39	30	50	60	50	50	30	30	20	739
- Mixing Chemicals	26	23	30	33	37	41	42	42	36	37	32	26	406
- Other Misc. Usage	16	16	506	19	8	5	4	5	6	5	3	3	596
Mixing Chemicals - Field	0	0	0	0	0	0	0	0	0	0	0	0	0
Well Pumped Waste	0	0	0	0	0	0	0	0	0	(15)	(29)	0	(44)
Net Production	**96,263**	**84,066**	**110,510**	**122,479**	**140,068**	**154,375**	**160,002**	**160,218**	**136,505**	**139,948**	**119,755**	**96,408**	**1,520,596**
Sales													
Residential	72,206	65,321	70,753	82,320	92,908	99,977	112,549	103,803	100,898	95,896	95,614	76,533	1,068,778
Commercial	9,697	8,538	9,233	12,448	15,696	22,940	29,551	24,464	23,807	20,504	19,392	13,557	209,827
Industrial		2	44	62	68	64			1			5	246
Fire Service													0
OPA (COP Wheeled Water)													0
Resale				(8,897)		16,390	22,169	22,290	22,102	20,185	20,318	17,445	132,002
Miscellaneous													0
Total Sales	81,903	73,861	80,030	85,933	108,672	139,371	164,269	150,557	146,808	136,585	135,324	107,540	1,410,853
Total Non-Revenue Water	**14,360**	**10,205**	**30,480**	**36,546**	**31,396**	**15,004**	**(4,267)**	**9,661**	**(10,303)**	**3,363**	**(15,569)**	**(11,132)**	**109,742**
Ratio Non-Reveue Water	15%	12%	28%	30%	22%	10%	-3%	6%	-8%	2%	-13%	-12%	7.2%
Authorized Unbilled/Consumption													
Flushing Mains	0	0	0	0	0	0	0	0	0	0	0	0	0
Identified Fire Usage	0	0	0	0	30	30	0	0	0	0	0	0	60
Vandalism	0	0	0	0	0	0	0	0	0	0	0	0	0
Street Cleaning	0	0	0	0	0	0	0	0	0	0	0	0	0
Draining Storage Tanks	0	0	0	0	0	0	0	0	0	0	0	0	0
Online Analyzers & Chlorinators	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Meter Testing	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire Hydrant Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0
Flushing Sewer Mains	0	0	0	0	0	0	0	0	0	2	0	0	2
Total Water Losses	0	0	0	0	30	30	0	0	0	2	0	0	62
Ratio Unsold & Authorized vs Produced	15%	12%	28%	30%	22%	10%	-3%	6%	-8%	2%	-13%	-12%	7%
Identified Leakage	616	0	900	200	0	100	250	0	0	300	400	1,100	3,866
Tank Overflows	0	0	0	0	0	0	0	0	0	0	0	0	0
Unaccounted For Water													
Gallons	13,744	10,205	29,580	36,346	31,366	14,874	(4,517)	9,661	(10,303)	3,061	(15,969)	(12,232)	105,815
Percentage	14.28%	12.14%	26.77%	29.68%	22.39%	9.64%	-2.82%	6.03%	-7.55%	2.19%	-13.33%	-12.69%	6.96%

Negative numbers indicate quantity or percentage above production or 100%

Unaccounted Water 2008 Anthem

COMPANY NAME Arizona American Water (Anthem Non-Potable)

WATER USE DATA SHEET BY MONTH FOR CALENDAR YEAR 2008

MONTH	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	GALLONS PUMPED (Thousands)	GALLONS PURCHASED (Thousands)
JANUARY	60	34,751	30,266	
FEBRUARY	60	48,956	20,891	
MARCH	61	33,276	50,701	
APRIL	58	71,043	67,215	
MAY	52	76,895	79,017	
JUNE	52	68,144	83,677	
JULY	52	78,328	85,283	
AUGUST	54	56,887	81,979	
SEPTEMBER	54	26,768	68,993	
OCTOBER	54	62,058	65,401	
NOVEMBER	55	114,605	49,006	
DECEMBER	65	26,724	21,098	
	TOTALS ->	698,435	703,527	0

What is the level of arsenic for each well on your system. _____mg/l
(If more than one well, please list each separately)

If system has fire hydrants, what is the fire flow requirement? _____GPM for _____ hrs

If system has chlorination treatment, does this treatment system chlorinate continuously?
( ) Yes ( ) No

Is the Water Utility located in an ADWR Active Management Area (AMA)?
(X) Yes ( ) No

Does the Company have An ADWR Gallons Per Capita Per Day (GPCPD) requirement?
( ) Yes (X) No

If yes, provide the GPCPD amount:_____N/A_____

Arizona American Water
Eastern Division - Anthem Non-Potable Water District
Unaccounted For Water - 2008

Description	Quantity of Water (Kgal)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Production													
Treated Water	68,093	62,239	71,496	74,980	80,831	84,143	87,601	83,917	78,908	82,448	70,822	68,292	913,770
20" Irrigation	54,542	51,558	42,616	35,834	33,948	28,883	36,444	33,681	36,452	31,907	42,547	58,341	486,753
14" Irrigation	13,551	10,681	28,880	39,146	46,883	55,260	51,157	50,236	42,456	50,541	28,275	9,951	427,017
Recharge	(96)	(198)	(373)	(899)	(359)	(224)	(400)	(677)	(6,037)	(12,090)	(5,225)	(6,432)	(33,010)
Discharge	(37,731)	(41,150)	(20,422)	(6,866)	(1,455)	(242)	(1,918)	(1,261)	(3,878)	(4,957)	(16,591)	(40,762)	(177,233)
In-Plant Usage	0	0	0	0	0	0	0	0	0	0	0	0	0
Mixing Chemicals - Field	0	0	0	0	0	0	0	0	0	0	0	0	0
Well Pumped Waste	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Production	**30,266**	**20,891**	**50,701**	**67,215**	**79,017**	**83,677**	**85,283**	**81,979**	**68,993**	**65,401**	**49,006**	**21,098**	**703,527**
Sales													
Residential	41	40	36	29	93	111	256						606
Commercial	356	410	929	1,409	1,671	2,042	2,586	2,319	1,253	824	1,301	455	15,555
Industrial	17	15	11	8	10	7	6	5	4	6	5	4	98
Fire Service													0
OPA													0
Resale	15,387	35,972	9,434	22,755	14,932								98,480
Miscellaneous	18,950	12,519	22,866	46,842	60,189	65,984	75,480	54,563	25,511	61,228	113,299	26,265	583,696
Total Sales	34,751	48,956	33,276	71,043	76,895	68,144	78,328	56,887	26,768	62,058	114,605	26,724	698,435
Total Non-Revenue Water	**(4,485)**	**(28,065)**	**17,425**	**(3,828)**	**2,122**	**15,533**	**6,955**	**25,092**	**42,225**	**3,343**	**(65,599)**	**(5,626)**	**5,092**
Ratio Non-Reveue Water	-15%	-134%	34%	-6%	3%	19%	8%	31%	61%	5%	-134%	-27%	1%
Authorized Unbilled/Consumption													
Flushing Mains	0	0	0	0	0	0	0	0	0	0	0	0	0
Identified Fire Usage	0	0	0	0	0	0	0	0	0	0	0	0	0
Vandalism	0	0	0	0	0	0	0	0	0	0	0	0	0
Street Cleaning	0	0	0	0	0	0	0	0	0	0	0	0	0
Draining Storage Tanks	0	0	0	0	0	0	0	0	0	0	0	0	0
Online Analyzers & Chlorinators	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Meter Testing	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire Hydrant Maintenance	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Water Losses	0	0	0	0	0	0	0	0	0	0	0	0	0
Ratio Unsold & Authorized vs Produced	-15%	-134%	34%	-6%	3%	19%	8%	31%	61%	5%	-134%	-27%	1%
Identified Leakage	0	0	0	0	0	0	0	0	0	0	0	0	0
Tank Overflows	0	0	0	0	0	0	0	0	50	50	0	0	100
Unaccounted For Water													
Gallons	(4,485)	(28,065)	17,425	(3,828)	2,122	15,533	6,955	25,092	42,175	3,293	(65,599)	(5,626)	4,992
Percentage	-14.82%	-134.34%	34.37%	-5.70%	2.69%	18.56%	8.16%	30.61%	61.13%	5.04%	-133.86%	-26.67%	0.71%

Negative numbers indicate quantity or percentage above production or 100%

Unaccounted Water 2008 Anthem Non-Potable

COMPANY NAME Arizona American Water Company (Sun City 07- 099)

WATER USE DATA SHEET BY MONTH FOR CALENDAR YEAR 2008

MONTH	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	GALLONS PUMPED (Thousands)	GALLONS PURCHASED (Thousands)
JANUARY	23,014	285,813	291,977	
FEBRUARY	22,987	251,362	279,582	
MARCH	23,002	266,997	367,144	
APRIL	22,996	311,557	397,818	
MAY	23,005	372,044	474,373	
JUNE	22,999	433,540	514,368	
JULY	22,981	466,447	536,322	
AUGUST	22,969	481,461	516,762	
SEPTEMBER	22,955	440,319	416,008	
OCTOBER	22,944	354,599	473,125	
NOVEMBER	22,927	418,967	438,376	
DECEMBER	22,935	360,072	283,547	
	TOTALS ->	**4,443,178**	**4,989,402**	**0**

What is the level of arsenic for each well on your system. _____mg/l
(If more than one well, please list each separately) - **See attached**

If system has fire hydrants, what is the fire flow requirement? _____GPM for _____ hrs

If system has chlorination treatment, does this treatment system chlorinate continuously?
(X) Yes ( ) No *With the flow of the wells feeding the treatment system

Is the Water Utility located in an ADWR Active Management Area (AMA)?
(X) Yes ( ) No

Does the Company have an ADWR Gallons Per Capita Per Day (GPCPD) requirement?
(X) Yes ( ) No

If yes, provide the GPCPD amount:_____253*_____

*Estimate

Arizona American Water
Central Division - Sun City Water District
Unaccounted For Water - 2008

Description	Quantity of Water (Kgal)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Production													
Water Treatment													0
Wells	292,149	280,244	367,159	399,180	474,428	515,741	536,422	518,276	418,042	473,326	438,472	283,706	4,997,145
Purchased Water													0
In-Plant Usage	(10)	(8)	(5)	(7)	(8)	(10)	(7)	(8)	(9)	(5)	(8)	(9)	(94)
Mixing Chemicals - Field	0	0	0	0	0	0	0	0	0	0	0	0	0
Well Pumped Waste	(162)	(654)	(10)	(1,355)	(47)	(1,363)	(93)	(1,506)	(2,025)	(196)	(88)	(150)	(7,649)
Net Production	291,977	279,582	367,144	397,818	474,373	514,368	536,322	516,762	416,008	473,125	438,376	283,547	4,989,402
Sales													
Residential	226,804	205,121	213,175	236,769	291,396	337,613	368,711	383,079	342,279	271,685	334,435	291,097	3,502,164
Commercial	53,022	42,705	46,257	52,818	55,168	68,853	68,321	76,042	71,514	62,422	60,624	59,160	716,906
Industrial	787	326	297	329	317	294	253	317	330	339	384	269	4,242
Fire Service													0
OPA													0
Resale													0
Miscellaneous	5,200	3,210	7,268	21,641	25,163	26,780	29,162	22,023	26,196	20,153	23,524	9,546	219,866
Total Sales	285,813	251,362	266,997	311,557	372,044	433,540	466,447	481,461	440,319	354,599	418,967	360,072	4,443,178
Total Non-Revenue Water	**6,164**	**28,220**	**100,147**	**86,261**	**102,329**	**80,828**	**69,875**	**35,301**	**(24,311)**	**118,526**	**19,409**	**(76,525)**	**546,224**
Ratio Non-Reveue Water	2%	10%	27%	22%	22%	16%	13%	7%	-6%	25%	4%	-27%	10.95%
Authorized Unbilled/Consumption													
Flushing Mains	0	0	0	0	0	0	5	22	7	0	0	0	34
Identified Fire Usage	0	0	0	0	0	0	0	0	0	0	0	0	0
Vandalism	0	0	0	0	0	0	0	0	0	0	0	0	0
Street Cleaning	0	0	0	0	0	0	3	0	0	6	3	20	32
Draining Storage Tanks	650	300	0	0	0	0	0	0	0	0	0	0	950
Online Analyzers & Chlorinators	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Meter Testing	1	1	1	1	1	1	1	1	1	1	1	1	12
Fire Hydrant Maintenance	10	0	0	10	80	0	0	0	0	0	7	2	109
Flushing Sewer Mains	0	0	0	0	0	0	0	0	0	13	0	0	13
Total Water Losses	661	301	1	11	81	1	9	23	8	20	11	23	1,150
Ratio Unsold & Authorized vs Produced	2%	10%	27%	22%	22%	16%	13%	7%	-6%	25%	4%	-27%	10.92%
Identified Leakage	916	900	950	822	916	996	770	802	757	6,022	19	662	14,532
Tank Overflows	42	28	41	12	0	0	14	18	0	0	0	0	155
Unaccounted For Water													
Gallons	4,545	26,991	99,155	85,416	101,332	79,831	69,082	34,458	(25,076)	112,484	19,379	(77,210)	530,387
Percentage	1.56%	9.65%	27.01%	21.47%	21.36%	15.52%	12.88%	6.67%	-6.03%	23.77%	4.42%	-27.23%	10.63%

Negative numbers indicate quantity or percentage above production or 100%

Unaccounted Water 2008 Sun City

3b) Wastewater

COMPANY NAME	Arizona American Water - Anthem Wastewater

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	8,059	52.681	2.074
FEBRUARY	8,049	49.287	2.345
MARCH	8,042	52.634	1.95
APRIL	8,021	50.284	1.943
MAY	8,017	50.208	1.947
JUNE	8,017	45.534	2.051
JULY	8,014	46.309	1.757
AUGUST	8,008	48.69	1.971
SEPTEMBER	8,001	48.353	1.911
OCTOBER	8,022	50.949	2.052
NOVEMBER	8,009	50.542	2.188
DECEMBER	8,013	51.654	2.172
	TOTALS ->	597.125	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)	**Reuse and recharge**
Wastewater Inventory Number (all wastewater systems are assigned an inventory number)	**103259**
Groundwater Permit Numbers	**N/A**
Aquifer Protection Permit Number	**P-103259**
ADEQ Reuse Permit Number	**R-103259**
EPA NPDES Permit Number	**N/A**

COMPANY NAME	Arizona American Water - AF Verrado Wastewater

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	1,965	5.273	0.248
FEBRUARY	1,963	5.341	0.261
MARCH	1,962	5.574	0.243
APRIL	1,961	5.617	0.239
MAY	1,961	5.704	0.248
JUNE	1,959	5.166	0.242
JULY	1,959	6.006	0.372
AUGUST	1,956	6.088	0.249
SEPTEMBER	1,956	5.748	0.247
OCTOBER	1,955	5.841	0.256
NOVEMBER	1,952	5.955	0.244
DECEMBER	1,948	6.065	0.234
	TOTALS ->	**68.378**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)		**Reuse and recharge**
Wastewater Inventory Number (all wastewater systems are assigned an inventory number)	Verrado	**105202**
Groundwater Permit Numbers	Verrado	**USF 71-207708.0000**
Aquifer Protection Permit Number	Verrado	**P-105202**
ADEQ Reuse Permit Number	Verrado	**Type 2 General Class A+** **R-105583**
EPA NPDES Permit Number		**N/A**

COMPANY NAME	Arizona American Water - AF Russell Ranch Wastewater

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	143	0.99	0.076
FEBRUARY	145	0.84	0.053
MARCH	146	0.886	0.036
APRIL	147	0.755	0.034
MAY	147	0.759	0.042
JUNE	149	0.622	0.03
JULY	149	0.627	0.028
AUGUST	152	0.643	0.028
SEPTEMBER	152	0.632	0.028
OCTOBER	153	0.719	0.03
NOVEMBER	156	0.905	0.042
DECEMBER	160	1.06	0.046
	TOTALS ->	**9.438**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)		**Reuse and recharge**
Wastewater Inventory Number (all wastewater systems are assigned an inventory number)	Russell Ranch	**105229**
Groundwater Permit Numbers		
Aquifer Protection Permit Number	Russell Ranch	**P-105229**
ADEQ Reuse Permit Number	Russell Ranch	**Type 2 General Class A+ R-105661**
EPA NPDES Permit Number		**N/A**

COMPANY NAME	Arizona American Water (Northwest Valley Regional Water Reclamation Facility)

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	17,412	84.548	3.227
FEBRUARY	17,433	81.106	3.204
MARCH	17,453	88.215	3.281
APRIL	17,462	79.194	3.101
MAY	17,462	73.996	2.777
JUNE	17,497	66.890	2.505
JULY	17,532	68.829	2.502
AUGUST	17,569	70.646	2.645
SEPTEMBER	17,625	69.132	2.688
OCTOBER	17,692	76.212	2.829
NOVEMBER	17,734	79.451	2.966
DECEMBER	17,784	79.655	2.844
	TOTALS ->	**917.874**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)	**Ground Water Recharge**
Wastewater Inventory Number (all wasterwater systems are assigned an inventory number)	**102667**
Groundwater Permit Numbers	**N/A**
ADEQ Aquifer Protection Permit Number	**P-102667**
ADEQ Reuse Permit Number	**N/A**
EPA NPDES Permit Number	**N/A**

COMPANY NAME	Arizona American Water (NE Agua Fria Wastewater)

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	2,428	10.389	0.408
FEBRUARY	2,448	9.411	0.390
MARCH	2,467	10.326	0.402
APRIL	2,499	9.287	0.366
MAY	2,535	9.139	0.350
JUNE	2,577	8.292	0.330
JULY	2,622	8.002	0.300
AUGUST	2,655	8.343	0.326
SEPTEMBER	2,703	8.053	0.326
OCTOBER	2,745	9.574	0.376
NOVEMBER	2,774	10.074	0.400
DECEMBER	2,816	10.238	0.374
	TOTALS ->	**111.128**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)	**Ground Water Recharge**
Wastewater Inventory Number (all wasterwater systems are assigned an inventory number)	**102667**
Groundwater Permit Numbers	**N/A**
ADEQ Aquifer Protection Permit Number	**N/A**
ADEQ Reuse Permit Number	**N/A**
EPA NPDES Permit Number	**N/A**

COMPANY NAME	Arizona American Water (Sun City West Wastewater)

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	14,984	74.159	2.819
FEBRUARY	14,985	71.695	2.814
MARCH	14,986	77.889	2.879
APRIL	14,963	69.907	2.735
MAY	14,927	64.857	2.427
JUNE	14,920	58.598	2.175
JULY	14,910	60.827	2.202
AUGUST	14,914	62.303	2.319
SEPTEMBER	14,922	61.079	2.362
OCTOBER	14,947	66.638	2.453
NOVEMBER	14,960	69.377	2.566
DECEMBER	14,968	69.417	2.470
	TOTALS ->	**806.746**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)	**Ground Water Recharge**
Wastewater Inventory Number (all wasterwater systems are assigned an inventory number)	**102667**
Groundwater Permit Numbers	**N/A**
ADEQ Aquifer Protection Permit Number	**N/A**
ADEQ Reuse Permit Number	**N/A**
EPA NPDES Permit Number	**N/A**

COMPANY NAME	Arizona American Water (Sun City Wastewater)

WASTEWATER FLOWS

MONTH/YEAR	NUMBER OF SERVICES	TOTAL MONTHLY SEWAGE FLOW (MG)	SEWAGE FLOW ON PEAK DAY (MG)
JANUARY	22,034	127.031	5.078
FEBRUARY	22,008	120.951	5.096
MARCH	22,019	126.759	5.048
APRIL	22,013	111.206	5.050
MAY	22,050	103.649	4.038
JUNE	22,048	93.760	4.026
JULY	22,026	97.642	4.053
AUGUST	22,012	98.232	4.053
SEPTEMBER	21,998	94.557	4.055
OCTOBER	21,993	104.895	4.402
NOVEMBER	21,978	108.923	4.219
DECEMBER	21,965	111.450	4.060
	TOTALS ->	**1,299.055**	

PROVIDE THE FOLLOWING INFORMATION AS APPLICABLE

Method of Effluent Disposal (leach field, surface water discharge, reuse, injection wells, groundwater recharge, evaporation ponds, etc.)	**N/A**
Wastewater Inventory Number (all wasterwater systems are assigned an inventory number)	**100339**
Groundwater Permit Numbers	**N/A**
ADEQ Aquifer Protection Permit Number	**N/A**
ADEQ Reuse Permit Number	**N/A**
EPA NPDES Permit Number	**N/A**

4) Major Plant In Service Inventory

4a) WATER

COMPANY NAME	Arizona American Water (Anthem 07- 504)

WATER COMPANY PLANT DESCRIPTION

WELLS

ADWR ID Number*	Pump Horsepower	Pump Yield (Gpm)	Casing Depth (Feet)	Casing Diameter (Inches)	Meter Size (inches)	Year Drilled
55-577504	125	700	600	12	8	2000
55-577505	100	500	600	12	8	2000

*Arizona Department of Water Resources Identification Number

OTHER WATER SOURCES

Name or Description	Capacity (gpm)	Gallons Purchased or Obtained (in thousands)
CAP Water (Ak-Chin)	4,861	1,667,549
City of Phoenix Interconnect	3,472	1,120

BOOSTER PUMPS		FIRE HYDRANTS	
Horsepower	Quantity	Quantity Standard	Quantity Other
30	1	1,026	
100	2		
125	2		
150	4		
350	2		
450	4		

STORAGE TANKS		PRESSURE TANKS	
Capacity	Quantity	Capacity	Quantity
1,250,000	2	5,000	1
1,670,000	2	10,000	2
		15,000	1

COMPANY NAME	Arizona American Water (Anthem 07- 504)

WATER COMPANY PLANT DESCRIPTION (CONTINUED)

MAINS

Size (in inches)	Material	Length (in feet)
2	N/A	
3	N/A	
4	PVC	6,861
6	PVC	78,895
8	PVC	361,468
10	PVC	518
12	PVC	212,068
14	PVC	1,227
16	PVC	33,473
18	PVC	21,683
20	PVC	5,709
24	PVC	8,270
30	PVC	46,308
Undetermined	PVC	38,910
	TOTAL =	**815,391**

CUSTOMER METERS

Size (in inches)	Quantity
5/8 X 3/4	
5/8	10
3/4	5,003
1	3,501
1 1/2	124
2	171
3	11
4	5
6	3
8	2
10	1
12	1
	8,832

For the following three items, list the utility owned assets in each category.

TREATMENT EQUIPMENT:

Zenon micro-filtration system divided into four process trains with a total capacity of 7 MGD.
Associated pumps, valves, piping, and instrumentation. Chlorine feed and injection equipment.
Three UV Disinfection units not on line, Chlorine contact chamber is on line.

STRUCTURES:

Process tank building, process control and equipment building, electrical building, administrative office
building shared with the water plant, block perimeter wall shared with the water plant.
One 1,500 kW generator, one 350 kW generator at Upper Reservoir, one 600kW generator at CAP
One 1,000 kW generator shared with wastewater plant.

OTHER:

Six vehicles ad various tools shared between water and wastewater plant

COMPANY NAME	Arizona-American Water (Sun City 07- 099)

WATER COMPANY PLANT DESCRIPTION

WELLS

	ADWR ID Number*	Pump Horsepower	Pump Yield (Gpm)	Casing Depth (Feet)	Casing Diameter (Inches)	Meter Size (Inches)	Year Drilled
6.4	55-606518	None	Standby	910	20	12	1950
6.1	55-574914	250	1200	1200	16	12	1999
6.2	55-606520	450	1820	1317	16	12	1973
5.4	55-606521	350	1320	1176	20	12	1952
5.3	55-606522	400	1910	1206	16	12	1973
5.2	55-606523	400	1420	1000	20	12	1954
4.1	55-606524	325	1250	1206	16	10	1969
6.3	55-606526	350	1340	1006	20	12	1956
20A	55-606537	None	Standby	N/A	20	N/A	1953
3.1	55-606528	400	2000	1200	16	14	1975
1.1	55-606529	250	1575	900	20	10	1951
2.2	55-606530	200	875	750	20	12	1948
2.1	55-606532	250	1025	1000	20	12	1954
IW	55-807594	125	650	N/A	16	8	1998
8.3	55-606536	500	1850	1214	16	12	1975
8.2	55-606535	350	1600	1000	20	12	1946/1952
5.5	55-606534	400	1765	1215	16	8	1974
8.1	55-536983	250	1250	1020	16	12	1993
5.1	55-606525	350	1340	760	20	12	1948
2.3	55-606531	125	500	600	16	10	1953
YT	55-608175	200	Standby	1050	14	10	1947
1.2	55-608176	200	1250	1090	20	8	1958
2.4	55-207783	200	1200	1090	20	10	2006

*Arizona Department of Water Resources Identification Number

OTHER WATER SOURCES

Name or Description	Capacity (gpm)	Gallons Purchased or Obtained (in thousands)

BOOSTER PUMPS		FIRE HYDRANTS	
Horsepower	Quantity	Quantity Standard	Quantity Other
25	2	1,843	
30	4		
40	1		
75	7		
100	15		
150	7		

STORAGE TANKS		PRESSURE TANKS	
Capacity	Quantity	Capacity	Quantity
50,000	1	5,000	10
84,000	2	10,000	11
300,000	5		
460,000	2		
500,000	1		
570,000	1		
675,000	2		
1,250,000	4		

COMPANY NAME	Arizona American Water (Sun City 07- 099)

WATER COMPANY PLANT DESCRIPTION (CONTINUED)

MAINS

Size (in inches)	Material	Length (in feet)
1	Various	-
3	Various	-
4	Various	159,720
5	Various	-
6	Various	818,252
8	Various	251,504
10	Various	121,093
12	Various	219,574
14	Various	367
16	Various	22,238
18	Various	2,472
Undetermined	Various	21,430
	TOTAL =	**1,616,650**

CUSTOMER METERS

Size (in inches)	Quantity
5/8 X 3/4	19,555
3/4	812
1	520
1 1/2	1,619
2	631
3	25
4	5
5	
6	10
7	
8	2
Unknown	
TOTAL =	**23,179**

For the following three items, list the utility owned assets in each category.

TREATMENT EQUIPMENT:
Gas chlorination equipment and enclosures

STRUCTURES:
Buildings and enclosures associated with wells and booster stations

OTHER:
N/A

COMPANY NAME	Arizona American Water (Sun City 07- 099)

Arsenic Data by Well

PWS_NO	Well #	DWR #	Date	->	Result	Unit	Comments
04-07-099	1.1	Well 18B (55-606529)	1/28/2009		0.005	ppb	
04-07-099	1.2	Well 18C2 (55-608176	1/28/2009		0.007	ppb	
04-07-099	2.1	Well 30A (55-606532)	01/28/09		0.006	ppb	
04-07-099	2.2	Well 19B (55-606530)	2006		7	ppb	
04-07-099	2.3	Well 29A (55-606531)	1/29/2009		0.005	ppb	
04-07-099	2.4	Well 19C (55-608177)	1/29/2009		0.006	ppb	
04-07-099	3.1	Well 17E (55-606527)	1/29/2009		0.004	ppb	
04-07-099	4.1	Well 7C (55-606524)	1/29/2009		0.006	ppb	
04-07-099	5.2	Well 7B (55-606523)	1/26/2009		0.006	ppb	
04-07-099	5.3	Well 5D (55-606522)	2006		6	ppb	
04-07-099	5.4	Well 5A (55-606521)	1/27/2009		0.006	ppb	
04-07-099	5.5	Well 32C (55-606534)	1/26/2009		0.005	ppb	
04-07-099	6.1	Well 4C (55-606519)	1/22/2009		0.011	ppb	
04-07-099	6.2	Well 4D (55-606520)	1/28/2009		0.007	ppb	
04-07-099	6.3	Well 9A (55-606526)	1/26/2009		0.006	ppb	
04-07-099	8.1	Well 32D (55-536983)	2006		6	ppb	
04-07-099	8.2	Well 32B (55-606535)	2006		6	ppb	
04-07-099	8.3	Well 31D (55-606536)	2006		5	ppb	
04-07-099	8.4	Well 33B (55-606533)					out of service

4b) WASTEWATER

COMPANY NAME	Arizona American Water - AF Verrado Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITIES

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Verrado Water Reclamation Facility: Activated Sludge, BNR
DESIGN CAPACITY OF PLANT (Gallons Per Day) (Gallons Per Day)	Verrado 830,000

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity (gals)
Verrado High School Lift Station	2	15	217	5,828

FORCE MAINS

Size	Material	Length (in feet)
8 inch	Ductile Iron	5,264

MANHOLES / CLEANOUTS

Type	Quantity (MANHOLES)	Quantity (CLEANOUTS)
Standard	2,694	121
Drop		

COMPANY NAME	Arizona American Water - AF Verrado Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	n/a	
6	PVC	246
8	PVC	357,336
10	PVC	10,631
12	PVC	24,247
15	PVC	46,940
18	PVC	25,566
21	PVC	9,868
24	PVC	
30	PVC	
Undetermined	PVC	93,545
	TOTAL =	**568,379**

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Verrado: Aerobic Digester, Belt Filter Press
DISINFECTION EQUIPMENT (Chlorinator, Ultra-Violet, Etc.)	Verrado: 1-700 gal NaOCl tank, 2 NaOCl pumps
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	Verrado: 4 Disc Filter Units (10 micron)
STRUCTURES (Buildings, Fences Etc)	Verrado: Administrative Modular Trailer, Dewatering building, Motor Control building, Shop building, block fence around entire permieter of property
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Various tools and equipment associated with wastewater collection and treatment. Verrado: 750 kW ad 2,000 kW on site standby Generators, 4 work trucks

COMPANY NAME	Arizona American Water - AF Russell Ranch Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITIES

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Russell Ranch Water Reclamation Facility: Activated Sludge, BNR
DESIGN CAPACITY OF PLANT (Gallons Per Day) (Gallons Per Day)	Russell Ranch 60,000

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity (gals)

FORCE MAINS

Size	Material	Length (in feet)
8 inch	Ductile Iron	N/A

MANHOLES / CLEANOUTS

Type	Quantity	Quantity
Standard	106	10
Drop		

COMPANY NAME	Arizona American Water - AF Russell Ranch Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	n/a	
6	PVC	
8	PVC	21,688
10	PVC	949
12	PVC	80
15	PVC	
18	PVC	
21	PVC	
24	PVC	
30	PVC	
Undetermined	PVC	8,227
	TOTAL =	**30,944**

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Russell Ranch: Aerobic Digester, Vault and Haul
DISINFECTION EQUIPMENT (Chlorinator, Ultra-Violet, Etc.)	Russell Ranch: 1 NaOCl pump, 1 dechlor ($NaHSO_3$pump)
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	
STRUCTURES (Buildings, Fences Etc)	Russell Ranch: Storage shed, block fence around entire permieter of property
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Various tools and equipment associated with wastewater collection and treatment. Russell Ranch: 275 kW standby generator

COMPANY NAME	Arizona American Water - Anthem Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITIES

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Extended aeration with anoxic zone and Zenon microfiltration system
DESIGN CAPACITY OF PLANT (Gallons Per Day)	3,000,000

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity (gals)
Influent Lift Station	4	30	2,932	9,700
Reject Water Lift Station	2	20	1,400	6,500
Panhandle 1 Lift Station	2	7.5	494	5,000
Panhandle 2 Lift Station	2	23	500	5,000
Panhandle 3 Lift Station	2	5	700	5,000

FORCE MAINS

Size	Material	Length (in feet)
4 inch	Ductile Iron	5,622
6 inch	Ductile Iron	3,499
8 inch	Ductile Iron	81
18 inch	Ductile Iron	9,276

MANHOLES / CLEANOUTS

Type	Quantity	Quantity
Standard	1,909	198
Drop		

COMPANY NAME	Arizona American Water - Anthem Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	n/a	
6	PVC	4,820
8	PVC	411,323
10	PVC	23,871
12	PVC	19,572
15	PVC	3,224
18	PVC	9,933
21	PVC	2,170
24	PVC	1,070
30	PVC	
Undetermined	PVC	18,831
	TOTAL =	494,814

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Belt filter press, 1.5 meter belt
DISINFECTION EQUIPMENT (Chlorinator, Ultra-Violet, Etc.)	UV or Chlorine (NaOCl) injection with chlorine contact chamber
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	Zenon Zee-Weed 500 microfiltration system
STRUCTURES (Buildings, Fences Etc)	Common administration building shared with water plant, headworks building, process building, solids building, perimeter wall. One 1,000,000 gallon non-potable/reclaimed water storage reservoir
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Various tools and equipment associated with wastewater collection and treatment. 2,000 kW generator, three lift station geenrators, Panhandle 1-50 kW, Panhandle 2-60 kW, Pandhandle 3-80 kW

COMPANY NAME	Arizona American Water (Sun City Wastewater)

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITY

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Treated by the City of Tolleson under a long-term contract
DESIGN CAPACITY OF PLANT (gallons Per Day	N/A

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity (gals)
Baptist Village L.S. 11577 W Peoria Ave	2	7.5	100	1,700
Youngtown L.S. 11602 W Peoria Ave	2	70	1200	7,520
111th Ave L.S. 111th Avenue at Olive	2	3	160	1,000
Coyote Lakes L.S. 17280 N 115th Ave	2	40	500	7,000
Citrus Point L.S. 16401 N 115th Ave	2	20	500	1,200
Paradise Resort L.S. 10950 W Union Hills	2	7.5	700	7,900
Agua Fria Ranch L.S. 9901 N Agua Fria Pkwy	2	30	860	6,033

FORCE MAINS

Size	Material	Length (in feet)
4 inch	Various	2,982
6 inch	Various	2,037
8 inch	Various	12,313
10 inch	Various	10,387
12 inch	Various	10,410

MANHOLES

CLEANOUTS

Type	Quantity	Quantity
Standard	4,573	766
Drop		

COMPANY NAME	Arizona American Water (Sun City Wastewater)

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	Various	121
6	Various	9,795
8	Various	1,243,574
10	Various	68,441
12	Various	31,493
15	Various	16,281
18	Various	10,441
21	Various	8,053
24	Various	0
27	Various	1,310
30	Various	2,926
33	Various	1,155
36	Various	867
Undetermined	Various	50,733
	TOTAL =	1,445,190

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	N/A
DISINFECTION EQUIPMENT (Chlorinator, Ultra-Violet, etc.)	N/A
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, etc.)	N/A
STRUCTURES (Buildings, Fences Etc)	N/A
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	99th Avenue metering station, various tools and equipment associated with wastewater collection

COMPANY NAME	Arizona American Water (Northwest Valley Regional Water Reclamation Facility)

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITY

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Northwest Valley Regional Water Reclamation Facility (formerly Sun City West WRF) Activated sludge, BNR w/ DN filtration
DESIGN CAPACITY OF PLANT (gallons Per Day	5,000,000

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity(gals)

FORCE MAINS

Size	Material	Length (in feet)

MANHOLES / CLEANOUTS

Type	Quantity	Quantity

COMPANY NAME	Arizona American Water (Northwest Valley Regional Water Reclamation Facility)

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
	TOTALS =	0

SERVICES

Size (in inches)	Material	Quantity

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Aerobic Digesters (3), Belt pressed sludge is hauled to landfill
DISINFECTION EQUIPMENT	Hypochlorite injections at filter effluent ad Sodium Bisultate dechlorination at discharge weir.
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	Rapid sand filter
STRUCTURES (Buildings, Fences, Etc.)	Admin/Maintenance/Control Building at Treatment Plant; VFD/Control Building at Bell Road Lift Station
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Various tools and equipment associated with wastewater collection

COMPANY NAME	Arizona American Water - NE Agua Fria Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITIES

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
DESIGN CAPACITY OF PLANT (Gallons Per Day)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity (gals)
NE Agua Fria Lift Station 1 (Corte Bella)	2	35	1,760	55,600

FORCE MAINS

Size	Material	Length (in feet)
Included with Agua Fria Wastewater		

MANHOLES / CLEANOUTS

Type	Quantity	Quantity
Standard	Included with Agua Fria WW	Included with Agua Fria WW
Drop		

COMPANY NAME	Arizona American Water - NE Agua Fria Wastewater

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	n/a	
6	PVC	Included with Agua Fria Wastewater
8	PVC	
10	PVC	
12	PVC	
15	PVC	
18	PVC	
21	PVC	
24	PVC	
30	PVC	
Undetermined	PVC	
	TOTAL =	0

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
DISINFECTION EQUIPMENT (Chlorinator, Ultra-Violet, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
STRUCTURES (Buildings, Fences Etc)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Refer to the Northwest Valley Regional Water Reclamation Facility (page)

COMPANY NAME	Arizona American Water (Sun City West Wastewater)

WASTEWATER COMPANY PLANT DESCRIPTION

TREATMENT FACILITY

TYPE OF TREATMENT (Extended Aerations, Step Aerations, Oxidation Ditch, Aerobic Lagoon, Anaerobic Lagoon, Trickling Filter, Septic Tank, Wetland, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
DESIGN CAPACITY OF PLANT (gallons Per Day	Refer to the Northwest Valley Regional Water Reclamation Facility (page)

LIFT STATION FACILITIES

Location	Quantity of Pumps	Horsepower Per Pump	Capacity Per Pump (GPM)	Wet Well Capacity(gals)
Bell Road L.S. Bell Rd & El Mirage	4	250	2,800	49,400

FORCE MAINS

Size	Material	Length (in feet)
18 inch	ACP	18,578

MANHOLES / CLEANOUTS

Type	Quantity	Quantity
Standard	2,679	410
Drop		

COMPANY NAME	Arizona American Water (Sun City West Wastewater)

WASTEWATER COMPANY PLANT DESCRIPTION (CONTINUED)

COLLECTION MAINS

Size (in inches)	Material	Length (in feet)
4	Various	973
6	Various	1,840
8	Various	825,102
10	Various	24,565
12	Various	18,932
15	Various	20,089
18	Various	19,638
21	Various	5,933
24	Various	2,440
27	Various	0
30	Various	0
33	Various	0
36	Various	2,623
Undetermined	Various	3,324
	TOTALS =	925,459

SERVICES

Size (in inches)	Material	Quantity
4	n/a	n/a
6	n/a	n/a
8	n/a	n/a
12	n/a	n/a
15	n/a	n/a

For the following three items, list the utility owned assets in each category.

SOLIDS PROCESSING AND HANDLING FACILITIES	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
DISINFECTION EQUIPMENT Chlorinator, Ultra-Violet, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
FILTRATION EQUIPMENT (Rapid Sand, Slow Sand, Activated Carbon, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
STRUCTURES (Buildings, Fences, Etc.)	Refer to the Northwest Valley Regional Water Reclamation Facility (page)
OTHER Laboratory Equipment, Tools, Vehicles, Standby Power Generators, Etc.	Refer to the Northwest Valley Regional Water Reclamation Facility (page)

5) Curtailment Tariff
and
Cross Connection/Backflow Tariff

ARIZONA-AMERICAN WATER COMPANY

Arizona-American's curtailment tariffs for all its districts were filed on October 12, 2007 in compliance with Decision No. 67093. The tariffs were approved by the Commission Staff and became effective on October 24, 2007.

Arizona-American's cross-connection control tariffs for all its districts were approved by the Commission in various rate case decisions. The approved tariffs are on file with the Commission.

Application for
W-01303A-09-0343
And SW-01303A-09-0343

PART 1 OF 2
BAR CODE # 0000097671

To review Part 2 please see:

BAR CODE #0000097675