

ORIGINAL



BEFORE THE ARIZONA CORPORATION COMMISSION

RECEIVED

COMMISSIONERS

MIKE GLEASON, Chairman
JEFF HATCH-MILLER
WILLIAM A. MUNDELL
KRISTIN K. MAYES
GARY PIERCE

2008 JUN 20 P 4: 25
AZ CORP COMMISSION
DOCKET CONTROL

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

Arizona Corporation Commission
DOCKETED
JUN 20 2008

DOCKETED BY [Signature]

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

1
2
3
4
5
6
7
8
9

REVISED 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 hereby applies, as of May 2, 2008, in accordance with A.R.S. § 40-250 and the Commission's Rule R 14-2-103 for rate increases for its following districts:

- Agua Fria Water District;

- 1 • Havasu Water District;
- 2 • Mohave Water District;
- 3 • Paradise Valley Water District;
- 4 • Sun City West Water District;
- 5 • Tubac Water District; and
- 6 • Mohave Wastewater District.

7 2. **Sufficiency.** On June 2, 2008, the Commission's Utilities Division Staff ("Staff")
8 filed a Deficiency Letter which stated that Arizona-American's May 2, 2008, rate application did
9 not meet the sufficiency requirements as outlined in Arizona Administrative Code R14-2-103.
10 Staff listed specific deficiencies by Arizona-American's operating districts. In addition, the
11 Deficiency Letter stated that Staff has "serious concerns with ... the inclusion of the filing of
12 applications for ... Anthem Water, Anthem Wastewater, and Agua Fria Wastewater." This
13 Revised Application is being filed in response to Staff's Deficiency Letter. It has been revised
14 where appropriate to resolve specific deficiency issues and removes the Anthem Water, Anthem
15 Wastewater, and Agua Fria Wastewater districts from Arizona-American's application of May 2,
16 2008. Arizona-American is also filing today a separate "Response to Deficiency Letter."

17 3. **Filing Deadlines.** This new rate case filing complies with deadlines for filing
18 new rate cases established by the Commission in Decisions 68825, 69173, 69181, and 69396.

19 4. **Arizona-American's Financial Condition.** Arizona-American's financial
20 condition continues to decline. Most of Arizona-American's operating districts have under-
21 earned for several years and Arizona-American, as a whole, has lost nearly \$30 million since
22 American Water purchased the assets of Citizens Water Resources in 2002. This unfortunate
23 trend continues. Arizona-American again had a net income loss of \$4.6 million in 2007 and
24 expects to continue to operate at a loss in 2008 and 2009 until new rates are implemented.

25 5. **Times Interest Ratio.** A company's Times Interest Earned Ratio ("TIER")
26 represents the number of times earnings will cover interest expense on short-term and long-term
27 debt. A TIER of less than 1.0 is not sustainable in the long-term. At the end of 2006, the

1 Commission concluded that Arizona-American's TIER was only 0.44, meaning that Arizona-
2 American cannot be a viable long term water utility unless it can improve its TIER. So far,
3 despite an equity infusion of \$15 million in 2007, TIER has not materially improved. As of
4 December 31, 2007, Arizona-American's TIER was still 0.72.

5 6. Reasons for Poor Financial Condition. Arizona-American's current financial
6 condition can be attributed to at least three factors. First, in Decision No. 65453 the
7 Commission imposed a moratorium on filing rate case application from January 2003, until
8 January 2006. This largely prevented Arizona-American's from transferring capital investments
9 into rate-base and from recovering increased operating expenses. Second, Decision No. 63584
10 included a provision that assets purchased from Citizens would be not be immediately included
11 in rate base, but would instead be amortized into rate-base over a period ranging from six-and-
12 one-half years to ten years. Despite the resulting delay in recognizing these assets, Arizona-
13 American had agreed to this condition with Staff, but was assuming only a one-year rate
14 moratorium. The Commission's three-year moratorium meant that Arizona-American could
15 only begin to recover these assets after the moratorium expired, new rate cases were filed, and
16 the Commission approved recovery. The first case to approve recovery of any portion of the
17 amortizations was Decision No. 69440, dated May 1, 2007, for our Mohave Water District. As
18 of April 30, 2008, Arizona-American has been authorized rate recovery for only \$25 million of
19 the total \$125 million of deferred AIAC and CIAC. Third, the nature of historic test years in
20 Arizona automatically causes a lag between the date a company expends capital and the date that
21 the company starts to earn a return on and of that capital. This is a particular issue for companies
22 like Arizona-American that must invest to meet the needs of its customers in fast-growing areas
23 like Maricopa and Mohave Counties.

24 7. Steps Already Taken by Arizona-American to Improve Its Financial Health.
25 First, Arizona-American has not paid a dividend since 2003 to its parent, American Water. This
26 has helped slow the erosion of Arizona-America's equity balance. Second, despite Arizona-
27 American's failure to pay dividends, or even to generate positive earnings, American Water has

District	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley Water	Sun City West Water	Tubac Water
Revenue Increase	\$9,192,203	\$ 815,803	\$1,655,410	\$3,101,550	\$4,276,305	\$278,214
Percentage Increase	48.8%	79.5%	32.4%	39.5%	75.0%	65.2%

Table 2. Wastewater Districts

District	Mohave Wastewater
Revenue Increase	\$ 642,148
Percentage Increase	80.7%

12. **Other Requested Approvals.** As more specifically requested by its witnesses,

Arizona-American's requests also include the following additional approvals.

Witness

Approvals

Broderick

- Post-test-year amortization of Imputed AIAC
- White Tanks Plant CWIP in Rate Base
- White Tanks Plant O&M Deferral
- White Tanks Plant accounting authorizations
- Tubac Water ACRM
- Discontinue existing ACRM surcharges for Agua Fria, Havasu, Paradise Valley and Sun City West
- Modify the Paradise Valley Public Safety Surcharge to apply to all customers, with proceeds accounted for as revenue, and with up to four additional step increases
- System Benefit Charge to fund landscape conversion programs.

Cole

- Increase service and meter-installation fees
- Increase meter-test charge
- Standardize after-hours reconnect charge in each district
- End annual fire-hydrant inspections for Sun City Water

Hubbard

- Power-supply adjustment clause
- Tank maintenance reserve
- Formal adoption of filed terms and conditions of service

Lenderking

- Modify Paradise Valley Water CAP Surcharge

Townsley

- Extend Agua Fria Water Hook-up Fee expiration

1 13. Witnesses. This Application is supported by the revised testimony and exhibits
2 of nine witnesses:

3 a. Thomas M. Broderick. Mr. Broderick is the Director, Rates &
4 Regulation for operations in Arizona, New Mexico, and Texas, and has overall
5 responsibility for interactions with the Arizona Corporation Commission.

6 Mr. Broderick first summarizes the total requested revenue increase of
7 \$19,961,632, based on a test year ending December 31, 2007.

8 Mr. Broderick sponsors Schedules A-1, A-3, D-1, D-2, D-3, D-4, E-4, and E-9.

9 Mr. Broderick testifies that Arizona-American's cost of capital is not less than
10 8.40%. The average cost of long-term debt is 5.463% and the cost of equity is 11.75%.
11 The forecasted equity ratio is 46.75% and the debt ratio is 53.25%. Short-term debt has
12 again been excluded from the calculation of the capital structure.

13 Mr. Broderick testifies that Arizona-American's rate case expense is \$612,000.

14 Mr. Broderick supports and explains Arizona-American's request that
15 amortizations of imputed regulatory AIAC should be recognized through July 14, 2008.

16 Mr. Broderick supports and explains Arizona-American's request that \$25 million
17 of White Tanks Plant CWIP should be included in rate base.

18 Mr. Broderick supports and explains Arizona-American's request for a White
19 Tanks Plant O&M deferral mechanism equivalent to an ACRM step increase.

20 Mr. Broderick supports and explains several specific White Tanks Plant
21 accounting requests.

22 Mr. Broderick supports and explains Arizona-American's requests for an ACRM
23 for Tubac district and to discontinue existing ACRM surcharges for Agua Fria, Havasu,
24 Paradise Valley and Sun City West.

25 Mr. Broderick sponsors rate base adjustments TMB-7; TMB-8; and TMB-9.

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

1 Mr. Townsley discusses Arizona-American's current poor financial condition and
2 emphasizes that timely and adequate rate relief from the Commission is critically
3 important.

4 Mr. Townsley discusses Arizona-American's agreement with the Maricopa
5 County Municipal Water Conservation District Number One ("MWD"), which provides
6 MWD an option to participate in the White Tanks Plant.

7 Mr. Townsley supports Arizona-American's requests to extend the expiration date
8 of the Agua Fria Hook-up Fees and to include construction work in progress in rate base
9 are appropriate.

10 Mr. Townsley demonstrates that Arizona-American's Achievement Incentive Pay
11 benefits our customers.

12 c. **Joseph E. Gross.** Mr. Gross is Arizona-American's Director of
13 Engineering for Arizona, New Mexico, Hawaii, and Texas.

14 Mr. Gross discusses three major capital projects under way for which it seeks to
15 recover associated post-test-year investment: the White Tanks Regional Water Treatment
16 Plant; the Mohave Wastewater Treatment Plant Expansion; and the Paradise Valley Fire
17 Flow Project, Phase 3.

18 Mr. Gross discusses four smaller projects underway, which should be completed
19 in time for the Commission Staff's engineering report: the Well 12 Replacement
20 (Paradise Valley Water); the Big Bend Acres Tank (Mohave Water); the Sierra Montana
21 Tank (Agua Fria Water); and Distribution System Improvements, Phase 2 (Agua Fria
22 Water);

23 Mr. Gross discusses the planned Tubac Arsenic Treatment Facility.

24 Mr. Gross discusses the Mohave County Comprehensive Planning Study and the
25 status of projects recommended in the Study.

1 Mr. Gross discusses how construction of the White Tanks Plant will allow a
2 developer to supply only water to satisfy average-day demand for the development, rather
3 than maximum-day demand

4 Mr. Gross finally discusses how the recent real-estate slowdown has reduced the
5 number of customers subject to the Agua Fria Water Hook-up Fee. He includes a
6 forecast of new customers that will actually be subject to the increased hook-up fees.

7 d. **Bradley J. Cole**. Mr. Cole is Arizona-American's Director of Operations
8 for Central Arizona, which includes the Sun City Water and Wastewater District, Sun
9 City West Water and Wastewater Districts and Agua Fria Water and Wastewater
10 Districts.

11 Mr. Cole first describes the service areas and facilities for each of Arizona-
12 American's six water districts that are included in this case: Agua Fria Water; Havasu
13 Water; Mohave Water; Paradise Valley Water; Sun City West Water and Tubac Water.

14 Mr. Cole supports Mr. Broderick's request for a mechanism to recover deferred
15 first-year O&M costs for the White Tanks Regional Treatment Facility.

16 Mr. Cole discusses the need for an arsenic-treatment facility for the Tubac Water
17 District.

18 Mr. Cole discusses Arizona-American's new storage-tank maintenance program
19 and supports Ms. Hubbard's request to fund this program.

20 Mr. Cole explains why chemical and water-quality-testing expenses have
21 increased in recent years

22 Mr. Cole explains why Arizona-American proposes to increase various service
23 charges

24 Mr. Cole describes the service areas and facilities for Arizona-American's
25 Mohave Wastewater Districts that are included in this case.

26 Mr. Cole supports Arizona-American's request to terminate the annual fire-
27 hydrant inspection compliance report requirement for the Sun City Water District.

1 e. Sheryl L. Hubbard. Ms. Hubbard is Arizona-American's Manager,
2 Rates & Regulation.

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

- 4 • Schedule A-2 – Arizona-American Summary of Operations
- 5 • Schedule A-4 – Arizona-American Construction Expenditures and Gross
- 6 • Utility Plant in Service
- 7 • Schedule A-5 – Arizona-American Summary of Cash Flows
- 8 • Schedule B-6 – Arizona-American Computation of Cash Working Capital
- 9 • Schedule C-1 – Arizona-American Adjusted Test Year Income Statement
- 10 • Schedule C-2 – Arizona-American Income Statement Pro Forma
- 11 • Adjustments
- 12 • Schedule C-3 – Arizona-American Computation of Gross Revenue
- 13 • Conversion Factor
- 14 • Schedule E-2 – Comparative Income Statements
- 15 • Schedule E-3 – Comparative Statement of Changes in Financial Position
- 16 • Schedule E-6 – Comparative Operating Income Statements
- 17 • Schedule E-7 – Operating Statistics
- 18 • Schedule E-8 – Taxes Charged to Operations
- 19 • Schedule F-1 – Projected Income Statements
- 20 • Schedule F-2 – Statement of Cash Flows-Present and Proposed Rates
- 21 • Schedule F-3 – Projected Construction Requirements
- 22 • Schedule F-4 – Assumptions Used in Developing Projections

23 Ms. Hubbard supports the revenue-requirement calculation for each district.

24 Ms. Hubbard sponsors and explains the lead-lag study that supports Arizona-
25 American's request for cash-working capital.

26 Ms. Hubbard sponsors and explains the following adjustments to operating
27 income:

- 28 • Adjustment SLH-1 – Annualize Payroll Expense
- 29 • Adjustment SLH-2 – Annualize Power Expense
- 30 • Adjustment SLH-3 – Normalize Purchased Water
- 31 • Adjustment SLH-4 – Annualize Chemicals Expense
- 32 • Adjustment SLH-6 - Annualize Management Fees
- 33 • Adjustment SLH-7 - Annualize Pensions Expense
- 34 • Adjustment SLH-8 – Amortize Rate Case Expense
- 35 • Adjustment SLH-9 – Annualize Insurance Expense
- 36 • Adjustment SLH-10 – Tank Maintenance Accrual
- 37 • Adjustment SLH-11 – Annualize Depreciation/CIAC
- 38 • Adjustment SLH-12 – Annualize Property Taxes
- 39 • Adjustment SLH-15 – Annualize 401K Expense
- 40
- 41

- Adjustment SLH-16 – Line 21 Clean-up
- Adjustment SLH-17 – Remove CAP Revenue and Expense
- Adjustment SLH-18 – Interest Synchronization
- Adjustment SLH-19 – Federal and State Income Taxes
- Adjustment SLH-20 – Annualize Postage Increase
- Adjustment SLH-21 – One-Time Service Company Charges
- Adjustment SLH-22 – Adjust Conservation Expenses
- Adjustment SLH-23 – Adjustment to Remove Prior Period Labor Adjustment

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

- For a power supply adjustment mechanism that will enable Arizona-American to adjust its rates in the future for changes in rates paid for electric and gas costs;
- For a tank maintenance reserve to fund tank maintenance expenditures; and
- For formal adoption by the Commission of the terms and conditions of service on file at the Commission.

f. **Linda J. Gutowski**. Ms. Gutowski is a Senior Rate Analyst for Arizona-American, where she prepares regulatory filings.

Ms. Gutowski sponsors rate base Exhibits B-1 through B-5 for each district.

Ms. Gutowski sponsors and explains the following rate-base adjustments for each district (as applicable): LJG-1; LJG-2; LJG-3; LJG-4; LJG-5; LJG-6; LJG-10; LJG-11; and LJG-12.

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

Ms. Gutowski sponsors and explains 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.

Ms. Gutowski sponsors and explains the present-rate portion of the H Schedules.

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

1 Mr. Lenderking discusses Arizona-American's present water-conservation
2 programs and then discusses what changes, if any, will be required under the new
3 requirements of the Arizona Department of Water Resources.

4 Mr. Lenderking discusses how Arizona-American will meet its water-supply
5 requirements for the Paradise Valley Water District, now that it will no longer be using
6 water supplied from the PCX-1 well owned by the Salt River Project. He explains that
7 Arizona-American has added storage for the Paradise Valley Water District, presently has
8 enough capacity to run the system without the PCX-1 well, and among other things, plans
9 to replace its Well 12 with a new well, which will return its production to its original
10 level of 2200 gallons per minute.

11 Mr. Lenderking explains that Arizona-American will store and recover the
12 district's 3,231 acre-feet allocation of CAP water at the Tonopah Desert Recharge
13 Project, owned by the Central Arizona Water Conservation District. The stored CAP
14 water will then be "recovered" from wells in the Paradise Valley Water District.

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

18 Dr. Villadsen selects two benchmark samples, water utilities and gas local
19 distribution companies ("LDC"). She estimates the sample companies' cost of equity,
20 associated after-tax weighted-average cost of capital, and the corresponding cost of
21 equity at 46.9 and 41.6 percent equity. She also reviews recent Arizona water and
22 wastewater decisions. In undertaking her analysis, Dr. Villadsen notes that the overall
23 cost of capital is constant within a broad middle range of capital structures although the
24 distribution of costs and risks among debt and equity holders is not. Because Arizona-
25 American's requested target of 46.9 percent equity is lower than the percentage equity
26 among many utilities, its financial risk is higher and the return required by investors
27 increases with the level of risk they carry. Should short-term debt be included for an

1 equity percentage of 41.6 percent, Arizona-American's capitalization is further below
2 that of the average water utility.

3 Based on the evidence from the samples, Dr. Villadsen estimates a cost of equity
4 for the benchmark samples at Arizona-American's capital structure to be in the range of
5 11.0 to 12.5 percent, so that Arizona-American's request for 11.75 percent is equal to the
6 midpoint. Dr. Villadsen also reviewed recent Arizona decisions and found that the
7 decisions correspond to a cost of equity of approximately 11.0 and 12.25 percent when
8 applied to an entity with 46.9 and 41.6 percent equity, respectively. She therefore finds
9 that Arizona-American's request for 11.75 percent return on equity is reasonable and
10 fully supported by her analysis.

11 i. **Paul R. Herbert.** Mr. Herbert is employed by Gannett Fleming, Inc.,
12 where he is the President of the Valuation and Rate Division.

13 Mr. Herbert discusses the cost-of-service and rate-design studies prepared for
14 each of the operating districts submitted in this case. He explains that cost-allocation
15 studies are used to determine and allocate the total district cost of service to the several
16 service classifications in each district. The studies provide a basis for determining the
17 extent to which the revenues to be derived from each classification are commensurate
18 with the cost of serving that classification, within each district.

19 Mr. Herbert sponsors Schedules G-1 through G-9, and the proposed-rates portion
20 of the H schedules.

21 14. **Supporting Documents.** In addition to the revised testimony, this Revised
22 Application is supported by the Other Required Information and Required Schedules (By
23 District), which accompanied Arizona-American's original May 2, 2008, Application, and
24 Arizona-American's Response to Deficiency Letter, which is also being filed today in these
25 dockets.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
JEFF HATCH-MILLER
WILLIAM A. MUNDELL
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
THOMAS M. BRODERICK
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

REVISED DIRECT TESTIMONY
OF
THOMAS M. BRODERICK
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008

TABLE OF CONTENTS

1			
2			
3			
4			
5			
6			
7			
8			
9			
10	EXECUTIVE SUMMARY		iii
11	I INTRODUCTION AND QUALIFICATIONS		1
12	II PURPOSE OF TESTIMONY		2
13	III SUMMARY OF RATE CASE		2
14	IV COST OF CAPITAL (ALL DISTRICTS)		5
15	V RATE CASE EXPENSE (ALL DISTRICTS)		7
16	VI ACQUISITION PREMIUM (ALL DISTRICTS)		7
17	VII IMPUTED REGULATORY ADVANCES AND CONTRIBUTIONS (ALL		
18	DISTRICTS EXCEPT PARADISE VALLEY)		8
19	VIII WHITE TANKS PLANT (AGUA FRIA WATER)		11
20	A CWIP IN RATE BASE		11
21	B WHITE TANKS PLANT O&M DEFERRAL		16
22	C WHITE TANKS PLANT ACCOUNTING REQUESTS		19
23	IX ARSENIC REMEDIATION ISSUES		24
24	A TUBAC		24
25	B ELIMINATE ACRMS (AGUA FRIA, HAVASU, PARADISE VALLEY AND SUN		
26	CITY WEST WATER DISTRICTS)		27
27	C RECOVERY OF ARSENIC MEDIA DEFERRAL (HAVASU)		27
28	X RATE DESIGN INCLUDING SURCHARGES (PARADISE VALLEY)		28
29	XI HOOK-UP FEES (HAVASU WATER)		32
30	XII WASTEWATER EFFLUENT TARIFF (MOHAVE WASTEWATER)		32
31			
32	EXHIBIT TMB-1 – Summary of Schedule A-1s, B-1s and C-1s		
33			
34	EXHIBIT TMB-2 - Cost of Capital		
35			
36	EXHIBIT TMB-3 - Rate Case Expense		
37			
38	EXHIBIT TMB-4 – White Tanks’ AFUDC Reduction		
39			
40	EXHIBIT TMB-5 - Tubac ACRM Step 1 Forecast		
41			
42	EXHIBIT TMB-6 - Paradise Valley Average Residential Usage		

1 EXECUTIVE SUMMARY
2

3 Thomas M. Broderick testifies that:
4

5 This new rate case filing complies with deadlines for filing new rate cases established by the
6 Commission in Decisions 68825, 69173, 69181, and 69396.
7

8 The total requested revenue increase is \$19,961,632 and the test year is 2007. Test year adjusted
9 revenues and expenses include annualized actual ACRM revenues and expenses.
10

11 This case includes all Arizona districts, except the districts of Anthem Water, Anthem/Agua Fria
12 Wastewater, Sun City Water, Sun City Wastewater, and Sun City West Wastewater which had
13 rate cases recently.
14

15 Arizona-American's cost of capital is not less than 8.40%. The average cost of long-term debt is
16 5.463% and the cost of equity is 11.75%. The forecasted equity ratio is 46.75% and the debt
17 ratio is 53.25%. Short-term debt has again been excluded from the calculation of the capital
18 structure.
19

20 Arizona-American's proposed rate case expense is \$612,000.
21

22 Amortizations of imputed regulatory AIAC should extend through July 14, 2008, rather than
23 cease at December 31, 2007, because the full six and one-half year amortization period will
24 expire July 14, 2008 and new rates in this case will not be established until late 2009 – long after
25 the end of the amortization period.
26

27 White Tanks Plant CWIP should be included in rate base in the amount of \$25 million because
28 the real estate slowdown has caused actual hook-up fees to be far below the forecast and it is fair
29 for existing Agua Fria customers to pay for a portion of the White Tanks Plant in order to stay
30 the course on funding the balance of the Plant via hook-up fees.
31

32 Arizona-American proposes a White Tanks Plant O&M deferral mechanism equivalent to an
33 ACRM step increase which authorizes a deferral of twelve months of O&M expenses and
34 recovery in the subsequent twelve months. Such a mechanism also provides the Commission an
35 additional opportunity to include White Tanks Plant in service in rate base in the event that
36 actual hook-up fees further disappoint.
37

38 Arizona-American proposes to amortize incremental White Tanks Plant hook-up fees in an
39 accelerated amount, but not to exceed the total post in-service AFUDC accrued in that month to
40 keep the deferred accumulated balance of post-in-service AFUDC at zero. Second, each month
41 Arizona-American will also amortize any remaining available incremental WHU-1 fees in an
42 amount not to exceed the monthly depreciation expense for the White Tanks Plant. Third, each
43 month any remaining incremental WHU-1 funds will be applied as a contribution to the White
44 Tanks Plant. All such contributions shall reduce the White Tanks Plant in the next month for
45 purposes of calculating post-in-service AFUDC, depreciation expense, and the White Tanks
46 Plant balance.
47

48 Arizona-American requests an ACRM for Tubac district as a result of the US EPA's denial of a
49 3-year extension in the arsenic compliance deadline and because Arizona-American plans to
50 construct a facility in Tubac to be in-service in 2010. The estimated Step 1 increase is a \$25.98

1
2
3
4
5
6
7
8
9

per month increase in the basic service charge and a \$3.14 per 1000 gallons increase for a 5/8 inch meter residential customer.

The existing ACRM surcharges for Agua Fria, Havasu, Paradise Valley and Sun City West should cease upon implementation of permanent rates at the conclusion of this case as the revenues and expenses would thereafter be in permanent rates.

Other Arizona-American's witnesses present important requests in this case.

1 **I INTRODUCTION AND QUALIFICATIONS**

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

4 A. My name is Thomas M. Broderick. My business address is 19820 N. 7th Street, Suite
5 201, Phoenix, Arizona 85024, and my business phone is 623-445-2420.

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

7 A. I am employed by American Water as Director, Rates & Regulation for operations in
8 Arizona, New Mexico and Texas. Arizona-American Water Company ("Arizona-
9 American" or the "Company") is a wholly-owned subsidiary of American Water.

10 **Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE**
11 **COMPANY.**

12 A. I am responsible for water and wastewater rate cases and public utility regulation in
13 Arizona, New Mexico and Texas.

14 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND**
15 **EDUCATION.**

16 A. For more than 20 years before joining the Company in 2004, I held various management
17 positions in the electric-utility industry with responsibilities for regulatory and
18 government affairs, corporate economics, planning, load forecasting, finance and
19 budgeting with Arizona Public Service Company, PG&E National Energy Group and
20 Energy Services, and the United States Agency for International Development. I was
21 employed at APS for nearly 14 years as Supervisor, Regulatory Affairs, then Supervisor,
22 Forecasting, and then Manager, Planning. I was designated APS' Chief Economist in the
23 early 1990s. For PG&E National Energy Group, I was Director, Western Region-
24 External Relations. For USAID, I was Senior Energy Advisor to Ukraine.

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

3 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

4 **A.** Yes, on many occasions.

5 **II PURPOSE OF TESTIMONY**

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

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

8 **III SUMMARY OF RATE CASE**

9 **Q. WHAT ARE ARIZONA-AMERICAN'S REQUESTED REVENUE INCREASES**
10 **IN THIS CASE?**

11 **A.** Arizona-American's requested revenue increases, rate base and operating expenses are
12 summarized on Exhibit TMB-1. The total requested revenue increase is \$19,961,632.
13 This requested rate base for these seven districts is \$198, 272,853.

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

16 **A.** Other requests by Arizona-American include approval of various accounting treatments
17 especially as regards the White Tanks Plant, and various surcharges such as a Tubac
18 ACRM and a Paradise Valley Public Safety surcharge.

19 **Q. WHAT WITNESSES SUPPORT ARIZONA-AMERICAN'S REQUEST?**

20 **A.** In addition to my testimony, the following witnesses are providing testimony to support
21 Arizona-American's direct case: Mr. Paul Townsley, Mr. Joseph Gross, Mr. Bradley J.
22 Cole, Ms. Sheryl Hubbard, Ms. Linda Gutowski, Mr. John C. (Jake) Lenderking, and
23 external expert witnesses Dr. Bente Villadsen and Mr. Paul Herbert.

1 **Q. DOES THIS CASE INCLUDE EVERY ARIZONA-AMERICAN DISTRICT?**

2 A. No. This case complies with Commission orders that Arizona-American file new rate
3 cases for its Agua Fria, Havasu, and Sun City West water districts by May 31, 2008, and
4 for its Paradise Valley water district by September 30, 2008, as a requirement of the
5 authorization of arsenic surcharges for those districts. This case includes **all** Arizona
6 districts, **except** the districts of Anthem Water, Anthem/Agua Fria Wastewater, Sun City
7 Water, Sun City Wastewater, and Sun City West Wastewater which had rate cases very
8 recently.

9 **Q. WHAT SCHEDULES ARE YOU SPONSORING?**

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

11 **Q. WHAT IS SCHEDULE A-1?**

12 A. Schedule A-1 titled "Computation of Increase in Gross Revenue Requirements" for each
13 district shows the calculation of the increase in gross revenue requested by Arizona-
14 American in this proceeding. This increase in gross revenue represents the amount
15 necessary for Arizona-American to continue providing safe and reliable service to its
16 customers within each district, while providing an opportunity for Arizona-American to
17 earn a reasonable rate of return on its investment in plant, equipment, and working
18 capital. The increase in gross revenue requirement for each district based on a 2007 test-
19 year is shown in the following tables.

Table 1 – Water Districts

District	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley Water	Sun City West Water	Tubac Water
Revenue Increase	\$9,192,203	\$ 815,803	\$1,655,410	\$3,101,550	\$4,276,305	\$278,214

Table 2. Wastewater Districts

District	Mohave Wastewater
Revenue Increase	\$ 642,148

1
2
3 **Q. WHAT IS SCHEDULE A-3?**

4 A. Schedule A-3 titled "Summary of Capital Structure" summarizes the debt and equity of
5 the Company allocated to the operating districts for the years 2007, 2006, and 2005 as
6 well as projected year 2008. The test-year 2007 figures for each water and wastewater
7 district are unadjusted from Arizona-American's accounting records.

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

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

11 **Q. WHAT IS SCHEDULE E-4?**

12 A. Schedule E-4 titled "Statement of Changes in Stockholder's Equity-Test Year Ended
13 December 31, 2007" details the changes in components comprising stockholder's equity
14 since the beginning of 2005 to the end of the test year.

15 **Q. WHAT IS SCHEDULE E-9?**

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

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

1 A. Yes.

2 **IV COST OF CAPITAL (ALL DISTRICTS)**

3 **Q. WHAT IS THE REQUESTED COST OF CAPITAL?**

4 A. Arizona-American's cost of capital is not less than 8.40%. This amount is calculated in
5 the D Schedules, which I sponsor.

6 **Q. WHAT IS THE AMOUNT AND COST OF DEBT?**

7 A. Exhibit TMB-2 displays long-term debt in the amount of \$189.2 million, with an average
8 cost of debt of 5.463%. The amount of long-term debt excludes an upcoming August
9 2008 maturity of \$4.5 million in long-term debt.

10 **Q. WHAT IS THE REQUESTED CAPITAL STRUCTURE?**

11 A. Arizona-American's forecasted equity ratio is 46.75% and its debt ratio is 53.25%.
12 Short-term debt has again been excluded from the calculation of the capital structure.
13 Exhibit TMB-2 does display short-term debt, including an amount for the \$20.2 million
14 Anthem refund which occurred in March 2008.

15 **Q. WHAT ARE THE AMOUNT AND ESTIMATED COST OF EQUITY?**

16 A. The amount of equity is forecasted at \$166.1 million with an associated estimated cost of
17 11.75%. The amount of equity includes another post-test-year equity infusion of \$20
18 million which occurred in May 2008 and an additional \$10 million equity infusion which
19 may occur in August 2008.

20 **Q. WHAT ARE ARIZONA-AMERICAN'S RETAINED EARNINGS?**

21 A. Because Arizona-American has been unprofitable for many years, retained earnings are a
22 negative \$28.9 million at the end of the 2007 test year. Arizona-American's negative
23 retained earnings are the cumulative result of net income being negative nearly every

1 year since 2002. Unfortunately, this sorry state of affairs worsened in 2007 and net
2 income is forecasted to be negative again in 2008 and into 2009, until new permanent
3 rates can be implemented after a decision in this rate case. Without the rates requested
4 herein, Arizona-American cannot achieve positive net income. Retained earnings can
5 also be updated for actual results throughout the course of this case until the hearing.

6 **Q. WHY IS DR. VILLADSEN'S ESTIMATED COST OF EQUITY OF 11.75% NEAR**
7 **HER UPPER RANGE FOR A COMPANY WITH A 46.75% EQUITY RATIO?**

8 A. I informed Dr. Villadsen that Commission Staff was certain to recommend that short-
9 term debt be included in the capital structure and that the Commission would probably
10 accept that recommendation. Dr. Villadsen informed me that if Staff's recommendation
11 is accepted by the Commission, then her estimated cost of equity of 11.75% would be in
12 the lower, not upper, range for an equity ratio of 41.62% (which is the ratio resulting after
13 inclusion in the capital structure of the short-term debt displayed in Exhibit TMB-2).

14 **Q. WILL ADDITIONAL SHORT-TERM DEBT BE DRAWN DURING THE TERM**
15 **OF THIS CASE?**

16 A. Yes. Significant additional short-term debt will be drawn in 2008 to finance construction
17 of the White Tanks Regional Water Treatment Plant ("White Tanks Plant"). The short-
18 term debt balance can also be updated for actual results throughout the course of this
19 case.

20 **Q. IS IT ARIZONA-AMERICAN'S POSITION THAT SHORT-TERM DEBT**
21 **LARGELY FINANCES CONSTRUCTION WORK IN PROGRESS ("CWIP")?**

22 A. Yes, that has been and continues to be our position. Therefore, it is logical, consistent,
23 and a partially consequential position for Arizona-American to request that \$25 million of
24 CWIP for the White Tanks Plant be included in rate base in response to Commission

1 Staff's inclusion of short-term debt in the capital structure. I discuss this proposal further
2 in Section VIII.A, below.

3 **Q. IF THE COMMISSION ACCEPTS ARIZONA-AMERICAN'S REQUEST TO**
4 **INCLUDE \$25 MILLION OF CWIP IN RATE BASE FOR THE WHITE TANKS**
5 **PLANT, WOULD YOU ACCEPT INCLUDING SHORT-TERM DEBT IN THE**
6 **CAPITAL STRUCTURE?**

7 A. Yes, that would be an appropriate matching of rate base and invested capital.

8 **V RATE CASE EXPENSE (ALL DISTRICTS)**

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

11 A. Exhibit TMB-3 displays by cost component proposed rate case expense of \$612,000.
12 Included in this estimate are substantial postage costs to issue the initial and post case
13 notices required by the Commission to each customer. The rate case expense cost per
14 customer is less than the expenses approved for recent Arizona-American rate cases,
15 because many more districts are involved and there are economies of scale (e.g., roughly
16 the same expense for the cost-of-equity witness regardless of size of case).

17 Ms. Hubbard sponsors Schedule C-2 income statement adjustment SLH-8, which relies
18 on a four-factor allocation of this proposed rate case expense to each district amortized
19 over three years.

20 **VI ACQUISITION PREMIUM (ALL DISTRICTS)**

21 **Q. HAS THE COMPANY REMOVED THE PREMIUM IT PAID TO ACQUIRE**
22 **ASSETS FROM CITIZENS?**

23 A. Yes. Schedule B-2 rate base adjustment TMB-9 removes the remaining unamortized
24 amount of this acquisition premium. Please note two things. First, the acquisition-

1 premium amortization has been a below-the-line expense, so that it has not affected rates
2 in these districts. Second, the premium and the associated amortization expense have
3 been reflected in the books for Paradise Valley Water, although this was not one of the
4 districts acquired from Citizens Utilities ("Citizens"). Removal of the unamortized
5 acquisition premium corrects this accounting treatment.

6 **VII IMPUTED REGULATORY ADVANCES AND CONTRIBUTIONS (ALL**
7 **DISTRICTS EXCEPT PARADISE VALLEY)**

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

11 A. Schedule B-2 rate base adjustments TMB-7 and TMB-8 and Schedule C-2 income
12 statement adjustment SLH-11 result from Commission Decision No. 63584 (dated April
13 24, 2001), which approved a settlement agreement requiring the imputation of advances
14 in aid of construction ("AIAC") and contributions in aid of construction ("CIAC") for
15 ratemaking purposes in future rate proceedings in the former Citizens' Districts. The
16 Decision also required re-building the imputed CIAC through reductions to actual
17 depreciation expense. These imputations reduce rate base and depreciation expense until
18 they have been fully amortized on a timetable also established in Decision No. 63584.
19 With one exception, the method we use to calculate recovery in this case is identical to
20 methods used by Staff and RUCO and accepted by the Commission in recent rate cases.

21 **Q. WHAT IS THAT EXCEPTION?**

22 A. I propose to amortize regulatory AIAC through July 14, 2008, rather than ceasing
23 regulatory AIAC amortization at the end of the test year December 31, 2007. This means
24 that rate base adjustment TMB-7 will not reduce test-year rate base. I do not propose to
25 alter the end date for the CIAC amortization.

1 **Q. WHY SHOULD THE COMMISSION AUTHORIZE AMORTIZING IMPUTED**
2 **REGULATORY AIAC ALMOST SEVEN MONTHS BEYOND THE END OF**
3 **THE TEST YEAR?**

4 A. On July 14, 2008, the six-and-one-half year period established for amortizing imputed
5 regulatory AIAC in Decision No. 63584 will be over; whereas, the ten-year period
6 established for amortizing imputed regulatory CIAC continues until January 14, 2012.
7 The measurement period for both imputed regulatory AIAC and CIAC began January 15,
8 2002. Since new rates in this case are not likely to be implemented until late in 2009, the
9 entire established amortization period for imputed regulatory AIAC will have already
10 been over for more than one year by then. Stated alternatively, if the Commission does
11 not accept my proposal to fully amortize imputed regulatory AIAC in this case, then the
12 remaining amortization from January 1, 2008 through July 14, 2008, will not be
13 recognized in rates until completion of the rate case *after this case*, or several years later.
14 That seems unfair and not in keeping with the intention of this Settlement, especially in
15 light of Arizona-American's dismal financial performance and the fact that no rate
16 increases associated with this Settlement occurred in any district until the completion of
17 the Mohave rate case in 2007. Further, recognizing the final seven months of
18 amortization in this case could postpone the need to file future rate cases to recognize the
19 rate-base increase, thereby allowing the Commission and the parties to conserve
20 personnel and financial resources that could be better deployed elsewhere.

21 **Q. WASN'T THERE AN ISSUE IN RECENT CASES OVER THE EXACT ENDING**
22 **DATE FOR IMPUTED AIAC AND CIAC?**

23 A. Yes, but that was a measurement issue, as opposed to a policy issue. In the recent Sun
24 Cities' Wastewater rate case there was a measurement issue concerning the exact ending
25 of the test year – December 9 versus December 31. That issue did not arise in the recent

1 Sun City Water rate case; all parties agreed that the test year ended December 31, just as
2 it does in this rate case. Our request to extend amortization of imputed regulatory AIAC
3 through July 14, 2008, is strictly based on policy and equity grounds.

4 **Q. HASN'T ARIZONA-AMERICAN AGREED IN PREVIOUS CASES NOT TO**
5 **INCLUDE POST-TEST-YEAR AMORTIZATIONS OF REGULATORY AIAC**
6 **AND CIAC?**

7 **A.** Yes. In order to minimize contested issues, Arizona-American has previously withdrawn
8 requests to include these post-test-year amortizations, despite the resulting financial
9 impact. And Arizona-American still agrees not to include post-test-year amortizations of
10 imputed regulatory CIAC. As I stated before, the issue is the imputed regulatory AIAC
11 amortization. Total rate base for all districts increases by \$3,734,397 amount as a result
12 of the additional amortization of imputed regulatory AIAC from January 1, 2008 through
13 July 14, 2008. Commission Staff and RUCO may argue this reduces the value bargained
14 for in this Settlement. However, a rigid adherence to the test-year amortization in this
15 case is misplaced given that many of the districts have seen no amortization at all to date.
16 The rates established in this case in September 2009 will be the first opportunity to
17 include any amortization for the Agua Fria, Havasu, Sun City West and Tubac water
18 districts. Nearly a decade of sustained losses in net income is not a good bargain for
19 customers or the shareholder of the state's largest private water utility. I do not believe it
20 was the intention of the Commission to impose such losses, or the intention of Arizona-
21 American to accept them at the time the Settlement was entered into.

1 **VIII WHITE TANKS PLANT (AGUA FRIA WATER)**

2 **A CWIP IN RATE BASE**

3 **Q. IS ARIZONA-AMERICAN REQUESTING COMMISSION APPROVAL TO**
4 **INCLUDE \$25 MILLION OF THE WHITE TANKS PLANT CONSTRUCTION**
5 **WORK IN PROGRESS (“CWIP”) IN RATE BASE?**

6 A. Yes. Agua Fria Water district’s Schedule B-2 rate base Adjustment LJG-10 includes this
7 amount. If the Commission approves Arizona-American’s request, AFUDC would cease
8 on the amount of CWIP included in rate base starting on the date that new permanent
9 rates are implemented in this case. While I support the specific request to include CWIP
10 in rate base, Mr. Townsley and Mr. Gross provide important additional supporting project
11 and schedule details about the White Tanks Plant. In particular, Mr. Gross discusses how
12 existing customers will utilize the entire initial capacity of the White Tanks Plant starting
13 in 2010. Hence, this request is revenue neutral. Permanent rates are anticipated to be
14 established in late 2009, with the White Tanks Plant is forecasted to be in-service a few
15 months later, April 2010.

16 **Q. WHAT WAS THE WHITE TANKS PLANT’S CWIP BALANCE AT THE END**
17 **OF THE TEST YEAR?**

18 A. While the balance was only \$8.4 million at the end of the 2007 test year, it will climb to
19 \$43.2 million by the end of 2008. Arizona-American will provide updates and
20 supporting information throughout the conduct of this case. The current estimate of the
21 total cost of the White Tanks Plant including AFUDC is \$61.9 million for 13.5 mgd
22 capacity.

23 **Q. IS ARIZONA-AMERICAN PROPOSING TO CHANGE THE AGUA FRIA**
24 **WATER DISTRICT HOOK-UP FEE (“WHU-1”)?**

1 A. No. To the contrary, Mr. Townsley requests that the recently-approved increase be
2 extended from 2015 until December 31, 2020 in order to allow more time to fund the
3 White Tanks Plant. The WHU-1 fee was increased substantially in 2007 for the purpose
4 of providing additional contributions to offset the White Tanks Plant's costs. As Mr.
5 Townsley testifies, the anticipated additional proceeds from the WHU-1 tariff are falling
6 far short of expectations, due largely to the emerging real estate slowdown. In 2007, only
7 \$73,485 in incremental hook-up fees were available to the White Tanks Plant versus
8 \$1,064,988 forecasted for 2007 during the White Tanks Plant hearing. However, if we
9 were to request an increase in the WHU-1 fee in response to the real estate slowdown, we
10 expect this would be received negatively by the residential home-builder community.

11 **Q. WHY SHOULD EXISTING AGUA FRIA WATER CUSTOMERS PAY ALMOST**
12 **HALF THE COST OF THE WHITE TANKS PLANT?**

13 A. First, as I discussed above, the plant will enter service shortly after rates are effective as a
14 result of this filing and will immediately begin providing renewable surface water to
15 customers, nearly all of whom will never pay a hook-up fee. Thus, it is certainly fair that
16 these customers shoulder a reasonable share of the plant's cost. Second, if CWIP were
17 not included in rate base, the accumulated balance of the hook-up fee is forecasted to be
18 exhausted by the end of 2010, given the revised customer forecast. Arizona-American
19 needs to avoid this situation as our auditors may not allow us to recognize the associated
20 deferrals and even a portion of the plant balance may be in jeopardy under possible
21 interpretations of FASB 92. Setting this very important concern aside, the accumulated
22 hook-up fees would not pay off the White Tanks Plant until 2027 without any CWIP in
23 rate base, again given the revised customer forecast. Clearly, the year 2027 is not an
24 acceptable pay off date.

1 **Q. ISN'T THIS A CHANGE FROM ARIZONA-AMERICAN'S PREVIOUS**
2 **PROPOSAL FOR NEW CUSTOMERS TO PAY FOR THE ENTIRE COST OF**
3 **THE WHITE TANKS PLANT VIA THE WHU-1 HOOK-UP FEE?**

4 A. Yes, this is an update to our original funding plan for this project. As I testified in the
5 White Tanks case:

6 If the Agua Fria Water Facilities Hook-up Fee is set at the level proposed by Staff
7 and the Commission provides the necessary accounting approvals, then Arizona-
8 American does not presently intend to ask for a rate increase for capital costs
9 associated with building the White Tanks Plant. This intention will be re-
10 examined based on information known at the time of the next rate cases for the
11 Agua Fria Water District.¹

12 **Q. WHAT WILL ARIZONA-AMERICAN DO IF THE COMMISSION DOES NOT**
13 **AUTHORIZE INCLUDING CWIP IN RATE BASE?**

14 A. If hook-up fees remain low through 2009 and the Commission does not authorize
15 including CWIP in rate base, Arizona-American will face an even more difficult financial
16 situation by 2010. The primary issue is cash-flow. By 2010, Arizona-American will
17 have funded (provided cash for) the White Tanks Plant and it will then go in service with
18 additional cash requirements for O&M expenses. Although the Commission has
19 authorized the deferral of White Tanks Plant depreciation, post in-service AFUDC and
20 will also consider a deferral of White Tanks Plant O&M expenses in this case, Arizona-
21 American will still be providing cash until White Tanks Plant is either paid for by hook-
22 up fees or placed in rates. Given this difficult scenario, Arizona-American may be forced
23 in the next rate case to request approval to include the entire White Tanks Plant
24 investment in rate base. Arizona-American's request for CWIP in rate base is designed,

¹ Docket No W-01303A-05-0718, Exhibit A-7 – Surrebuttal Testimony of Thomas M. Broderick at 6.

1 in large part, to reduce the likelihood that such a rate-base request will be necessary.

2 Including a portion of the White Tank Plant's CWIP in rate base will help stay the course
3 for having the balance funded via hook-up fees.

4 If the Commission approves Arizona-American's request for CWIP in rate base in this
5 case, Arizona-American will endeavor to do its best to have the balance of the White
6 Tanks Plant funded via hook-up fees. Put differently, the Commission can help preserve
7 the intention of funding much of the White Tanks Plant by hook-up fees if it allows \$25
8 million of CWIP in rate base in this case.

9 **Q. WHY DOES CASH-FLOW MATTER?**

10 A. Cash pays the bills, and Arizona-American is already unable to generate enough cash to
11 pay all bills, which forces additional borrowing. For the adjusted test year 2007,
12 Arizona-American's operating income for these seven districts was \$4,623,998 (Exhibit
13 TMB-1, Summary of Schedule A-1's), yet interest expense alone was \$5,769,740
14 (Exhibit TMB-1, Summary of Schedule C-1's). This situation is not sustainable,
15 especially as debt and interest expense will increase further during the construction of the
16 White Tanks Plant. For several years now, American Water has been infusing equity into
17 Arizona-American in order to pay interest expense and maintain a balanced capital
18 structure.

19 **Q. HOW MUCH WOULD AFUDC BE REDUCED IF THE COMMISSION**
20 **APPROVED CWIP IN RATE BASE?**

21 A. I do have an exhibit, but first one must bear in mind that AFUDC is greater than
22 previously forecasted simply because hook-up fees (which begin reducing AFUDC in the
23 month received) are so much lower during the construction period than earlier forecasted.
24 But, setting that aside, Exhibit TMB-4 re-forecasts the White Tanks Plant cost including

1 AFUDC and offsets the cost with revised forecasted hook-up fees using current forecast
2 information. It also offsets the White Tanks Plant cost with \$25 million of CWIP in rate
3 base starting September 2009. It also incorporates the impacts of several proposed
4 accounting entries resulting from the recent Commission-authorized deferral. By
5 performing the calculation both with and without CWIP in rate base, accumulated
6 AFUDC is reduced by \$6.0 million when CWIP is included in rate base for the period
7 September 2009 through September 2011 (the forecasted date of new rates in the next
8 rate case for the Agua Fria Water District). Exhibit TMB-4 assumed the \$25 million
9 CWIP in rate base remains in rate base through the next rate case.

10 Mr. Gross sponsors the revised customer forecast and associated adjustments to arrive at
11 the effective customer growth in Agua Fria district that pays the WHU-1 fee.

12 **Q. HAS RUCO PREVIOUSLY EXPRESSED SUPPORT FOR REDUCING WHITE**
13 **TANKS PLANT AFUDC?**

14 **A.** Yes. During the proceeding to increase the WHU-1 fee, RUCO supported a much larger
15 hook-up fee increase and stated "RUCO still believes that the Company's Option 2 will
16 result in less AFUDC accruals than will Option 1, and is therefore still preferable."²

17 **Q. WHAT IS THE FORECASTED UNRECOVERED WHITE TANKS PLANT**
18 **BALANCE AT SEPTEMBER 2009 ASSUMING \$25 MILLION OF CWIP GOES**
19 **INTO RATE BASE?**

20 **A.** Exhibit TMB-4 displays a remaining net investment of \$29.3 million at September 30,
21 2009. This balance is forecasted to grow to a maximum of \$33.1 million at December
22 2010. This remaining balance would be recovered by hook-up fees.

² Docket No. W-01303A-05-0718, Exhibit R-2 – Rebuttal Testimony of William Rigsby at 2. (Option 2 was a significantly larger hook-up fee.)

1 Q. EXHIBIT TMB-4 ALSO SHOWS AN UNRECOVERED WHITE TANKS PLANT
2 BALANCE AT FEBRUARY 2017 TO BE \$0. IS THAT WHEN WHITE TANKS
3 PLANT AND DEFERRALS ARE FORECASTED TO BE FULLY RECOVERED?

4 A. Yes, based on current forecast information and assuming the Commission authorizes the
5 inclusion of \$25 million of CWIP in rate base in this proceeding. That date is already
6 several years later than initially desired and planned for.

7 Q. IF THE MARICOPA WATER DISTRICT ("MWD") EXERCISES ITS OPTION
8 TO EXPAND THE WHITE TANKS PLANT, WOULD ARIZONA-AMERICAN
9 AGREE TO REVISIT THE AMOUNT OF WHITE TANKS PLANT TO BE
10 PERMANENTLY INCLUDED IN RATE BASE IN THE NEXT RATE CASE?

11 A. Yes. This is an evolving and dynamic situation and if the Commission approves the
12 White Tanks Plant's CWIP in rate base, then Arizona-American can certainly agree—
13 once we know whether MWD will be involved in the White Tanks Plant—to revisit how
14 much of White Tanks Plant should remain in rate base permanently versus how much
15 should be collected via hook-up fees. Also, by then we may know more about the
16 recovery of the real estate market in the Agua Fria Water District.

17 **B WHITE TANKS PLANT O&M DEFERRAL**

18 Q. ARIZONA-AMERICAN WAS AUTHORIZED TO FILE, AS PART OF ITS 2008
19 AGUA FRIA WATER RATE CASE, A PROPOSED MECHANISM TO DEFER
20 AND SUBSEQUENTLY RECOVER O&M EXPENSES FOR WHITE TANKS
21 PLANT (DECISION NO. 69914, PAGE 29, LINES 25-28). WHAT IS THE
22 PROPOSED MECHANISM?

23 A. Arizona-American proposes an O&M deferral mechanism that is essentially the same as
24 an ACRM mechanism. The ACRM mechanism authorizes a deferral of 12 months of
25 initial actual O&M expenses. At the conclusion of the initial 12-month period, Arizona-

1 American submits evidence of *actual* O&M expense along with the other required
2 schedules and approximately ninety days later a surcharge rate increase is authorized
3 which recovers two times the actual O&M expense (i.e., the deferred expenses plus an
4 equal amount to recover the on-going expenses). And at the end of 12 months following
5 implementation of the surcharge, the surcharge is reduced down to an amount equal to
6 the actual on-going expenses (which are equal to the actual expenses from the deferral
7 period) until the completion of the next rate case which places on-going expenses in
8 permanent rates.

9 **Q. WHAT IS THE ESTIMATE OF WHITE TANKS PLANT O&M FOR 2010?**

10 A. Exhibit BJC-1 to Mr. Cole's direct testimony shows \$1.927 million as an annualized
11 amount of O&M for 2010. Mr. Cole sponsors the details of the White Tanks Plant O&M
12 forecast which is merely an early estimate subject to significant revision in the future. I
13 am sponsoring Arizona-American's request for a deferral of the first year's O&M
14 expense for the White Tanks Plant.

15 **Q. WOULD THE DEFINITION OF ELIGIBLE O&M EXPENSES DIFFER FROM**
16 **AN ACRM?**

17 A. Yes. The ACRM recovers only arsenic media related O&M expense; whereas, the White
18 Tanks Plant O&M expense would obviously contain a more broad definition, including
19 labor expense for personnel located at the White Tanks Plant. I propose to include all the
20 O&M categories displayed in Exhibit BJC-1. Now, rather than later, would be the time
21 to examine the O&M cost categories proposed for recovery via an ACRM-like surcharge.

22 **Q. WOULD THE WHITE TANKS PLANT SURCHARGE MECHANISM ALSO**
23 **ALLOW RECOVERY OF WHITE TANKS PLANT?**

1 A. Yes, it would be useful if the Commission created this additional opportunity given how
2 dynamic and evolving the situation is with the White Tanks Plant. Therefore, I also
3 request authorization to include an additional portion of the unrecovered White Tanks
4 Plant as a type of ACRM step 1 increase, with the understanding that the Commission
5 may or may not allow any additional White Tanks Plant investment in rates via this
6 mechanism.

7 **Q. HOW DOES THAT REQUEST DOVETAIL WITH THE EXISTING HOOK-UP**
8 **FEE, WHITE TANKS PLANT DEFERRALS, AND THE NEW REQUEST FOR**
9 **CWIP IN RATE BASE?**

10 A. Each of these mechanisms would be coordinated and integrated. An ACRM-like Step 1
11 increase (in addition to a Step 2 increase for O&M expense) for the White Tanks Plant
12 would permit the recovery of, for example, White Tanks Plant depreciation expense (as
13 there is no need to wait for twelve months of actual data for depreciation expense). This
14 would reduce the amount of deferred depreciation recovered via the hook-up fee, thereby
15 allowing the hook-up fee to pay down more actual plant investment. The mechanism
16 could also include additional plant in rate base.

17 **Q. WHAT CRITERIA SHOULD THE COMMISSION APPLY TO DETERMINE**
18 **HOW MUCH DEPRECIATION OR ADDITIONAL WHITE TANKS PLANT**
19 **SHOULD BE RECOVERED THROUGH AN ACRM-LIKE MECHANISM?**

20 A. I propose that the target date of not later than May 2015 be established as the date to
21 payoff all amounts via the hook-up fee. In other words, the CWIP-in-rate-base and
22 ACRM-like mechanism should be utilized so that hook-up fees will fully fund the
23 remaining White Tanks Plant within the first five years of its in-service date or by May
24 2015. Since the current forecast projects payoff by February 2017, the mechanism
25 proposed herein can help accelerate that date.

1 Q. WOULD THIS ACRM-LIKE SURCHARGE CONTAIN AN EARNINGS TEST?

2 A. Yes. The earnings test of the ACRM limits the amount of the ACRM surcharge to an
3 amount consistent with the authorized return on equity. If the Commission authorizes
4 both Step 1 and 2 ACRM-like surcharges for the White Tanks Plant, an earnings test
5 would be acceptable.

6 C WHITE TANKS PLANT ACCOUNTING REQUESTS

7 Q. ARE YOU FAMILIAR WITH THE CURRENT WATER FACILITIES HOOK-UP
8 FEE ("WHU-1") FOR ARIZONA-AMERICAN'S AGUA FRIA WATER
9 DISTRICT?

10 A. Yes. In Decision No. 69914, dated September 27, 2007, the Commission approved
11 Arizona-American's request to increase its existing WHU-1 tariff to fund construction of
12 its planned White Tanks Plant. The Commission-approved hook-up fees as follows:

<u>Meter Size</u>	<u>Fee</u>
5/8 x 3/4-inch	\$ 3,280
3/4-inch	4,920
1-inch	8,200
1 1/2-inch	16,400
2-inch	26,240
3-inch	52,480
4-inch	82,000
6-inch or larger	164,000

13 Q. DECISION NO. 69914 STATES "ADDITIONALLY, THE COMPANY
14 REQUESTS THAT IT BE ALLOWED TO PROPOSE, IN ITS NEXT RATE CASE
15 FILING FOR THE AGUA FRIA WATER DISTRICT, SPECIFIC ACCOUNTING
16 ENTRIES TO MEET THIS OBJECTIVE." (PAGE 24, LINES 23-25) WHAT
17 OBJECTIVE IS THIS REFERING TO?

18 A. This statement refers to Arizona-American's expressed objective of not depressing
19 earnings as a result of constructing the White Tanks Plant. Accordingly, the Commission
20 approved the Company's request to record post-in-service AFUDC and to defer post in-

1 service depreciation expense. The Decision was otherwise silent concerning the exact
2 accounting entries needed to recover these deferrals.

3 **Q. WHAT SPECIFIC ACCOUNTING ENTRIES IS ARIZONA-AMERICAN NOW**
4 **PROPOSING TO AUGMENT THE EXISTING ACCOUNTING ORDER?**

5 A. I will first discuss how Arizona-American intends to account for WHU-1 proceeds during
6 the period until the White Tanks Plant goes into service.

7 **Q. WHAT IS ARIZONA-AMERICAN PROPOSAL TO ACCOUNT FOR HOOK-UP**
8 **FEEES FOR THE PERIOD UNTIL THE WHITE TANKS PLANT GOES INTO**
9 **SERVICE IN APRIL 2010?**

10 A. As I testified in the White Tanks case, all proceeds generated from the **increase** in the
11 WHU-1 tariff should be applied to the White Tanks Plant. This ensures that additional
12 funds generated by the Commission-approved increase in the WHU-1 are applied as
13 intended – to finance the White Tanks Plant.

14 **Q. HOW MUCH HAS BEEN GENERATED TO-DATE BY THE INCREASED**
15 **HOOK-UP FEES TO OFFSET THE COST OF THE WHITE TANKS PLANT?**

16 A. As of December 31, 2007, only \$73,485 has been generated to offset the White Tank
17 Plant costs. This is attributable to Arizona's real estate slowdown and developer
18 properties that were grandfathered and permitted to pay the previous (lower) amount of
19 the WHU-1 fees.

20 In accordance with Decision No. 69914, Agua Fria Water Schedule B-2 rate base
21 adjustment LJG-5 removes \$73,485 in Contributions as an increase to rate base. This
22 contributed amount is already reducing White Tanks Plant AFUDC under Arizona-
23 American's proposal.

1 **Q. HOW WOULD THE PROPOSED ALLOCATION OF WHU-1 FUNDS BE**
2 **APPLIED TO THE WHITE TANKS PLANT AND OTHER ELIGIBLE**
3 **PROJECTS?**

4 A. For a new water customer with a 5/8 x 3/4-inch meter, the previous WHU-1 Fee was
5 \$1,150, while the current WHU-1 Fee is \$3,280. Arizona-American proposes to continue
6 to apply \$1,150 of the current \$3,280 Hook-Up Fee towards water-supply projects *other*
7 than the White Tanks Plant, and apply the \$2,130 balance toward the White Tanks Plant
8 and so forth for all the other meter sizes.

9 **Q. WILL ARIZONA-AMERICAN ACCOUNT EACH MONTH FOR THE WHU-1**
10 **FUNDS AVAILABLE FOR THE WHITE TANKS PLANT?**

11 A. Yes. The \$73,485 was initially booked to account 271160. However, that amount was
12 reclassified to account 271161 to isolate the funds from other contributions/hook-up fees.
13 This account will be used for all future incremental WHU-1 fees. Also, when we book
14 AFUDC on the White Tanks Plant, we will first subtract the amount of hook-up fees
15 accumulated in account 271161 from the asset value so that we are only recording
16 AFUDC on the net amount of funds that the Company is financing. When the White
17 Tanks Plant is placed in service, the balance in account 271161 will be applied as
18 described below (for the post-in-service period).

19 **Q. WHAT ACCOUNTING TREATMENT ARE YOU PROPOSING ONCE THE**
20 **WHITE TANKS PLANT IS IN SERVICE?**

21 A. The remaining completed cost of the White Tanks Plant, including accumulated AFUDC,
22 will continue to be offset by available incremental WHU-1 fees during the post-in-service
23 period. At the in-service date, we propose to change the accounting for WHU-1 available
24 to White Tanks Plant, because post-in-service AFUDC and deferred depreciation expense
25 will begin, as authorized in Decision No. 69914.

1 **Q. WHAT POST-IN SERVICE ACCOUNTING HAS ALREADY BEEN**
2 **AUTHORIZED?**

3 A. The Commission authorized Arizona-American to book post-in-service AFUDC and to
4 defer depreciation expense in order to keep it whole on its investment until such time that
5 the accumulated hook-up fees are sufficient to fund the entire plant balance. Post-in-
6 service AFUDC is calculated only on the balance of the White Tanks Plant remaining
7 after applying all the WHU-1 proceeds dedicated to the White Tanks Plant.

8 **Q. HOW DOES ARIZONA-AMERICAN PROPOSE TO ACCOUNT FOR WHU-1**
9 **FEEES AFTER THE WHITE TANKS PLANT ENTERS SERVICE?**

10 A. Arizona-American asks the Commission to approve the following accounting treatments
11 as a package for use after the White Tanks Plant enters service:

- 12 1. First, each month Arizona-American will amortize incremental (amount above the
13 original hook-up fee) WHU-1 fees in an accelerated amount, but not to exceed the
14 total post in-service AFUDC accrued in that month. This will result in the recovery
15 of an amount equivalent to post-in-service AFUDC each month and keep the deferred
16 accumulated balance of post-in-service AFUDC at zero.
- 17 2. Second, each month Arizona-American will also amortize in an accelerated amount
18 remaining available incremental WHU-1 fees in an amount not to exceed the monthly
19 depreciation expense for the White Tanks Plant.
- 20 3. Third, each month the remaining incremental WHU-1 funds, if any, will be applied as
21 a contribution to the White Tanks Plant. All such contributions shall reduce the
22 White Tanks Plant in the next month for purposes of calculating post-in-service
23 AFUDC, depreciation expense, and the White Tanks Plant balance.

1 4. However, if the accumulated incremental WHU-1 funds in any month are insufficient
2 to cover the post-in-service AFUDC or to allow its amortization to fully offset White
3 Tanks Plant's depreciation expense, Arizona-American will defer the unrecovered
4 post-in-service AFUDC and depreciation expense for recovery at a time when hook-
5 up fees are sufficient or until it is included in rate base. This will be accomplished by
6 using the accumulated amounts in account 271161 as a balancing account. Please
7 note that in the forecast in Exhibit TMB-4, the additional WHU-1 fees are inadequate
8 to fund post-in-service AFUDC and depreciation from April 2010 through December
9 2012. Therefore, the accumulated balance in account 271161 (as opposed to just the
10 new amount collected each month) is amortized over that period.

11 **Q. HOW DOES THE PROCESS YOU HAVE JUST DESCRIBED SATISFY**
12 **ARIZONA-AMERICAN'S EARLIER STATED OBJECTIVE OF NOT**
13 **DEPRESSING EARNINGS?**

14 A. By recovering post-in-service AFUDC as it is incurred, Arizona-American will recover
15 its White Tanks Plant cost of capital on an on-going basis. If this were not the case, we
16 would incur a reduction in earnings, because, for financial reporting purposes generally
17 accepted accounting principles ("GAAP") would not allow deferring the equity portion of
18 post-in-service AFUDC. Instead, earnings would be reduced. So, even with the
19 Commission-authorized deferral and subsequent recovery of this amount, our earnings in
20 the present time frame would be reduced if we are not granted the accounting explained
21 above. We believe that would not be in keeping with the Commission's intention.

22 **Q. IS COMMISSION AUTHORIZATION NECESSARY IN ORDER FOR**
23 **ARIZONA-AMERICAN TO IMPLEMENT THE ACCOUNTING PROCESS YOU**
24 **ARE PROPOSING?**

1 A. Yes. Approval is needed in order to account for a portion of the accumulated WHU-1
2 fees as an accelerated amortization of a contribution in an amount equal to post-in-service
3 AFUDC. Commission approval is also needed for the accelerated amortization of the
4 accumulated WHU-1 contributions in an amount equal to the deferred depreciation on the
5 White Tanks Plant.

6 **Q. HOW DO AGUA FRIA CUSTOMERS BENEFIT FROM THE PRE- AND POST-**
7 **IN-SERVICE ACCOUNTING OF THE WHITE TANKS PROJECT?**

8 A. Of all the WHU-1 fee eligible projects, only the White Tanks Plant was authorized an
9 accounting deferral order. Arizona-American's proposal clearly identifies the amount of
10 WHU-1 available to the White Tanks Plant and minimizes the post-in-service AFUDC
11 and deferred depreciation expense which is ultimately paid for by customers.

12 **Q. HOW DOES THE REQUEST FOR THE WHITE TANKS PLANT CWIP IN**
13 **RATE BASE IMPACT THE PROPOSED ACCOUNTING PROCESS?**

14 A. It does not impact the accounting process. To the extent that the remaining plant amount
15 subject to recovery by the WHU-1 fees is reduced by the amount of CWIP in rate base
16 (including the assumption that the CWIP in rate base remains in rate base permanently),
17 the accounting deferrals will be calculated only on the amount of White Tanks Plant not
18 in rate base. The forecast in Exhibit TMB-4 assumes the inclusion of the requested \$25
19 million CWIP in rate base as of an estimated date of September 1, 2009.

20 **IX ARSENIC REMEDIATION ISSUES**

21 **A TUBAC**

22 **Q. WHAT ARE ARIZONA-AMERICAN'S CURRENT PLANS FOR ARSENIC**
23 **REMEDICATION IN TUBAC?**

1 A. Mr. Gross discusses a planned arsenic-remediation project for our Tubac Water District.
2 He indicates that Arizona-American must begin constructing an arsenic-remediation
3 facility for the district, because on January 18, 2008, the Environmental Protection
4 Agency denied our request for a three-year exemption from the requirement to meet the
5 new arsenic maximum contaminant level. Construction of Tubac's arsenic-treatment
6 facility will commence in summer 2008, with the facility placed in service two summers
7 later. Mr. Gross explains, however, that the current estimated net plant cost of \$2.3
8 million is substantially lower than the previous estimate, because a developer will
9 contribute approximately \$1 million toward the facility.

10 **Q. IS ARIZONA-AMERICAN REQUESTING APPROVAL OF AN ARSENIC COST**
11 **RECOVERY MECHANISM ("ACRM") FOR TUBAC IN THIS RATE CASE?**

12 A. Yes. An ACRM provides the opportunity for rate recovery on this facility to commence
13 roughly ninety days following the placement of Tubac's arsenic-remediation facility in
14 service for customers – much quicker than possible in a rate case. Even with the recent
15 substantial reduction in the estimated net plant cost of Tubac's arsenic facility, the cost of
16 the facility will more than double Tubac's adjusted 2007 rate base. Without an ACRM,
17 Arizona-American's financial situation would further decline.

18 **Q. ARE YOU REQUESTING AN ACRM IDENTICAL TO THOSE PREVIOUSLY**
19 **APPROVED BY THE COMMISSION FOR ARIZONA-AMERICAN?**

20 A. Yes, with the minor exception that we would like to include the associated engineering
21 overheads.³

22 **Q. WHY HASN'T ARIZONA-AMERICAN PREVIOUSLY REQUESTED AN ACRM**
23 **FOR ITS TUBAC WATER DISTRICT?**

³ This is consistent with more recent precedent concerning Arizona Water Company ACRMs. See Docket No. W-01445A-00-0962.

1 A. Arizona-American originally included the Tubac Water District in its application that
2 resulted in Decision No. 68310, which approved an ACRM two-step rate increase process
3 for our Agua Fria, Havasu and Sun City West water districts. However, on May 4, 2005,
4 Arizona-American moved to delete Tubac from that case because there was strong
5 community interest in pursuing alternative technologies and community interest in
6 seeking an extension in the arsenic compliance deadline. That motion (which was
7 granted) stated, "Arizona-American reserves the right to make an ACRM filing for its
8 Tubac Water District in a new docket at a later date." All of Arizona-American's eight
9 other arsenic-remediation facilities went into service in 2006, so Tubac customers have
10 benefited from a four-year delay before they will have to fund an arsenic-remediation
11 facility.

12 **Q. WHAT IS THE ESTIMATED ACRM STEP-1 RATE INCREASE IN TUBAC?**

13 A. For an estimated net arsenic plant investment of \$2.3 million, with an estimated four-
14 percent depreciation rate (Account 320.1-water treatment), the estimated annual increase
15 in the revenue requirement for ACRM Step 1 is \$416,332. This is in addition to the
16 \$278,214 base revenue increase requested in this case. Tubac's adjusted test year
17 revenues were \$423,061. For the ACRM, \$416,332 translates to an estimated \$25.98 per
18 month increase in the monthly minimum charge for residential 5/8-inch meter customers
19 and a \$3.14 increase in the charge per 1,000 gallons. These amounts are derived in
20 Exhibit TMB-5.

21 Please recall that the actual Step 1 increase is based on actual, not estimated, plant costs.
22 The current plan is that the Step 1 ACRM in Tubac would be effective in the third quarter
23 of 2010, following completion of construction in summer 2010. The local Tubac
24 community already knows we are proceeding with this project.

1 \$88,300, has been included in both the Havasu ACRM Step 2 increase (filed April 14,
2 2008) and in Schedule C-2 income adjustment SLH-4 for on-going arsenic media
3 replacement costs. Mr. Cole can provide the operational details regarding arsenic-media
4 replacement in Havasu (and elsewhere for that matter).

5 **X RATE DESIGN INCLUDING SURCHARGES (PARADISE VALLEY)**

6 **Q. IS ARIZONA-AMERICAN PROPOSING TO REVISE THE EXISTING RATE**
7 **DESIGN FOR ITS PARADISE VALLEY WATER DISTRICT?**

8 **A.** Yes. Arizona-American's rate design witness Mr. Paul Herbert sponsors the rate design
9 for all districts in this case. I only discuss select issues herein.

10 First, Mr. Herbert proposes enhancements to the existing rate design for residential
11 customers in Paradise Valley. The new residential tiers are as follows:

12 Tier 1:	0 to 4,000 gallons
13 Tier 2:	4,001 to 20,000 gallons
14 Tier 3:	20,001 to 65,000 gallons
15 Tier 4:	65,001 to 125,000 gallons
16 Tier 5:	Over 125,001 gallons

17 This updates the existing three tiers, which presently break at 25,000 gallons, and 80,000
18 gallons.

19 The new rate design creates a low usage tier, as is typical in our other water districts and
20 it creates higher priced tiers 4 and 5, respectively, in order to further encourage
21 conservation.

1 **Q. DID THE RATE DESIGN ORDERED IN DECISION NO. 68858 WHICH WAS**
2 **EFFECTIVE AUGUST 2006 CAUSE RESIDENTIAL CUSTOMERS TO**
3 **CONSERVE?**

4 A. Apparently not, at least that we can see based on residential-average-consumption data
5 before and after the last rate increase. Recall that the now controversial High Block
6 surcharge began August 1, 2006, for residential consumption in excess of 80,000 gallons.
7 Then, in March 2007, a large ACRM Step 1 increase occurred, which was followed in
8 October 2007 by the implementation of the Public Safety surcharge. However, an
9 examination of Exhibit TMB-6, which displays Paradise Valley district's actual (not
10 weather normalized) average daily water usage by residential customers since 2004,
11 indicates that the established slight upward trend in usage continued unabated after
12 August 2006. No doubt many individual customers conserved after the rate increase, but
13 that is not the overall result. This means that either other existing residential customers
14 increased consumption or that new residential customers consumed more than existing
15 customers or both. Clearly, if conservation in Paradise Valley remains important to the
16 Commission, then something else must be attempted.

17 **Q. ARE YOU PROPOSING TO CEASE THE HIGH-BLOCK SURCHARGE?**

18 A. Yes. If our proposal for five residential rate tiers is approved, the high-block surcharge is
19 unnecessary and can be terminated upon completion of this rate case.

20 **Q. WOULD THE PUBLIC-SAFETY SURCHARGE REMAIN IN EFFECT?**

21 A. Yes, the public-safety surcharge would be the sole remaining surcharge used to fund fire-
22 flow improvements in the district.

23 **Q. DO YOU PROPOSE TO MODIFY THE PUBLIC SAFETY SURCHARGE?**

1 A. Yes. The public-safety surcharge should apply to all residential and commercial
2 consumption, not just that over 25,000 gallons per month. All customers of Paradise
3 Valley Water district benefit from improved fire flows. We also propose to account for
4 the proceeds from this surcharge as revenue and not as a contribution in aid of
5 construction. This topic is presently under re-consideration in a matter which re-opened
6 the previous Paradise Valley rate case for the limited purpose of considering a proposed
7 Rate Design Agreement. No doubt the outcome in that case will inform this case
8 regarding the future direction of the Public Safety surcharge.

9 **Q. HOW MANY FUTURE STEP INCREASES IN THE PUBLIC-SAFETY**
10 **SURCHARGE ARE NEEDED TO FUND ALL REMAINING FIRE-FLOW**
11 **PROJECTS FOR PARADISE VALLEY?**

12 A. Up to an additional four step increases in the Public-Safety Surcharge are necessary to
13 fund the remaining projects. Construction phases 4 through 7 are scheduled for
14 completion in the 2009 to 2012 timeframe. Phase 3 is already underway and is scheduled
15 to be completed in late 2008 and, therefore, a step rate increase is necessary during this
16 case depending on how the re-opened matter is resolved.

17 It is up to the Commission whether to include the phase 3 plant in rate base at the
18 conclusion of this rate case (and again re-set the Public-Safety Surcharge at zero), or
19 whether to continue its recovery via the then existing surcharge (followed by four more
20 step increases).

21 If the Commission again wishes to order the filing of another Paradise Valley rate case by
22 a date certain as a requirement of the Public-Safety Surcharge, then Arizona-American
23 would not oppose a deadline of no later than May 31, 2013.

1 **Q. COMMISSION DECISION NO. 68303 APPROVED AN ACCOUNTING**
2 **DEFERRAL ORDER FOR PARADISE VALLEY FIRE FLOW AND**
3 **COMMISSION DECISION NO. 68858 MODIFIED THAT ORDER. DO YOU**
4 **HAVE A PROPOSAL FOR RECOVERING THE AUTHORIZED DEFERRAL IN**
5 **THIS CASE?**

6 A. Yes. I propose that recovery of any remaining amounts of this deferral occur via the
7 Public-Safety Surcharge. The deferral may be already recovered in the Public-Safety
8 Surcharge before this case is completed, depending, in part, on how the re-opened case is
9 resolved.

10 **Q. ARE THERE ANY OTHER SURCHARGE PROPOSALS FOR PARADISE**
11 **VALLEY?**

12 A. Yes. Arizona-American proposes a new system-benefit surcharge applicable to
13 consumption in residential rate tier 5 (consumption exceeding 125,001 gallons per
14 month). The system-benefit surcharge would fund programs such as the new residential-
15 landscape conversion program the Town of Paradise Valley intends to propose later in
16 this case. It can also fund other programs from time to time as Arizona-American may
17 request and the Commission may approve. The system-benefit surcharge would be
18 accounted for as revenue and trued-up in the next rate case for accumulated under- or
19 over-spending.

20 **Q. HOW WOULD THE NEW PARADISE VALLEY LANDSCAPE-CONVERSION**
21 **PROGRAM WORK?**

22 A. The Town told me they would create and administer a landscape-conversion program and
23 inform Arizona-American which customers qualify for a rate discount. The Town will
24 propose specific program details later in this case. Arizona-American's role in this
25 program would be to provide a water-rate discount for, say, up to five years to Paradise

1 Valley district customers determined by the Town to have met the program's criteria.
2 The rate discount would be funded by revenues collected from the system-benefit
3 surcharge described above. As soon as we have the key program details, the initial
4 amount of the system-benefit charge can be proposed based on an amount necessary to
5 help provide residential customers an incentive to convert landscape and based on an
6 estimate of the size of the target population the Town would like to incent to convert
7 landscape to reduce water usage. An on-going rate discount is preferable to a one-time
8 rebate, because rebate programs may tend to benefit free riders (people or developers that
9 were going to do a landscape conversion without any incentive).

10 Arizona-American looks forward to learning more about this program from the Town of
11 Paradise Valley and will respond further in its rebuttal testimony.

12 **XI HOOK-UP FEES (HAVASU WATER)**

13 **Q. HAVE PROCEEDS OBTAINED FROM HAVASU WATER DISTRICT'S**
14 **ARSENIC IMPACT FEE ("AIF") BEEN APPLIED AS CONTRIBUTIONS TO**
15 **REDUCE HAVASU'S ARSENIC RATE BASE?**

16 **A.** Yes. Through the end of the test year, \$61,805 in AIF proceeds had been collected and
17 reflected as contributions which reduced test year rate base in Schedule B rate base for
18 Havasu. This is well short of expectations.

19 **XII WASTEWATER EFFLUENT TARIFF (MOHAVE WASTEWATER)**

20 **Q. WHY IS ARIZONA-AMERICAN ASKING TO INCREASE THE RATE FOR**
21 **TREATED EFFLUENT IN THE MOHAVE WASTEWATER DISTRICT?**

22 **A.** We are asking to increase the rate for treated effluent from \$200 to \$250 per acre-foot.
23 Only one customer—a golf course known as Desert Lakes—is on this tariff. Arizona-
24 American has agreed to provide Desert Lakes all effluent available from wastewater

1 operations. Desert Lakes, in turn, has an agreement with the Mohave Valley Irrigation
2 and Drainage District to furnish all remaining water needed for golf course irrigation, but
3 this water must be replaced with reclaimed wastewater by the year 2017. Currently, we
4 estimate that the effluent being produced and provided is about half of the golf course's
5 irrigation requirements. We also believe that the cost of treated effluent at the increased
6 rate will remain below the cost of water from the District. Thus, as the Mohave
7 Wastewater District's sewage flows grow the golf course should continue to purchase all
8 of the effluent produced. A rate increase for treated effluent reduces the rate increase
9 required from other Mohave Wastewater customers at test-year effluent volumes (see
10 Schedule C-2 income statement adjustment LJG-4).

11 **Q. ARE EFFLUENT RATES ELSEWHERE COMPARABLE?**

12 A. Yes. Woodruff's rate is \$300 per acre foot. Gold Canyon is presently \$256 per acre foot.
13 The nearby City of Bullhead is presently \$256 per acre foot.

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

15 A. Yes.

Summary of Schedule A-1's

Line No.		Total Water & Wastewater Districts	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley	Sun City West	Tubac Water	Total Wastewater Districts	Mohave Wastewater
1	Original Cost Rate Base	\$198,272,853	\$96,976,395	\$4,221,474	\$12,041,310	\$40,864,986	\$37,901,085	\$1,527,454	\$4,740,149	\$4,740,149
2	Adjusted Operating Income	\$4,623,998	\$2,601,288	(\$131,419)	\$37,140	\$1,552,498	\$587,425	(\$38,553)	\$15,619	\$15,619
3	Current Rate of Return	2.33%	2.68%	-3.11%	0.31%	3.80%	1.55%	-2.52%	0.33%	0.33%
4	Required Operating Income	\$16,654,920	\$8,146,017	\$354,604	\$1,011,470	\$3,432,659	\$3,183,691	\$128,306	\$398,173	\$398,173
5	Required Rate of Return	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%	8.40%
6	Operating Income Deficiency	\$12,030,921	\$5,544,729	\$486,022	\$974,330	\$1,880,161	\$2,596,266	\$166,859	\$382,553	\$382,553
7	Gross Revenue Conversion Factor	1.6592	1.6578	1.6785	1.6990	1.6496	1.6471	1.6674	1.6786	1.6786
8	Increase in Gross Revenue Requirement	\$19,951,632	\$9,192,203	\$815,803	\$1,655,410	\$3,101,550	\$4,276,305	\$278,214	\$642,148	\$642,148
9	Test Year Adjusted Present Rate Revenue	\$39,732,055	\$18,818,613	\$1,026,587	\$5,113,631	\$7,848,732	\$5,701,431	\$426,900	\$796,161	\$796,161
10	Percent Rate Increase	50.2%	48.8%	79.5%	32.4%	39.5%	75.0%	65.2%	80.7%	80.7%
11	Test Year Adjusted Current ROE	-0.82%	0.03%	-5.66%	-1.89%	-1.45%	-1.12%	-4.91%	-2.34%	-2.34%
12	Year End Number of Annualized Customers	73,012	33,948	1,427	15,783	4,617	15,446	550	1,241	1,241

Arizona-American's Cost of Debt			
	Adjusted TY	Annual Interest	Interest Rate
Long-Term Debt			
Sept '13 PILR - Monterey	32,726	2,049	6.260% Actual
Aug '13 PILR - Montex/Lincoln	19,220	1,107	5.761% Actual
Aug '15 PILR - Rosalee	38,347	2,753	7.180% Actual
Aug '15 PILR - T.O. Development	32,847	2,358	7.179% Actual
Sept '28 L-T Note - Maricopa	10,635,000	386,051	3.630% Actual
Dec '13 L-T Promissory Note	24,700,000	1,331,330	5.390% Actual
Dec '16 L-T Promissory Note	11,200,000	618,240	5.520% Actual
Dec '18 L-T Promissory Note	123,100,000	6,918,220	5.620% Actual
Oct '37 L-T Promissory Note (1)	10,000,000	650,000	6.500% ACC Max.
Oct '37 L-T Promissory Note	6,450,000	425,249	6.593% Actual
Phoenix Agreement (2)	3,000,000	-	0.000% Forecast
Long-Term Debt (3)	189,208,140	10,337,356	5.463%
Total Debt	\$ 189,208,140	\$ 10,337,356	5.463%

53.2%

Arizona-American's Cost of Equity		
Common Equity	Adjusted TY	Cost of Equity
Common Stock	522,880	Actual
Paid in Capital	164,468,228	Actual
Retained Earnings	(28,867,782)	Actual
Equity Infusion (4)	30,000,000	Forecast
Total Common Equity	\$ 166,123,326	11.75%
Total Capitalization	\$ 355,331,466	100%

46.8%

100%

FYI: Short Term Debt:

Commercial Paper	\$ 19,065,498	\$ 984,733	5.165% Actual 02/08
Aug '08 L-T Senior Notes	\$ 4,519,474	321,877	7.122% Actual
2008 Anthem Refund Payment (5)	\$ 20,226,122	1,044,679	5.165% Actual 02/08

Footnotes:

- (1) The actual rate for this note is 6.593%, but the ACC authorized ceiling is 6.5%.
- (2) A \$1 M payment is due September 12, 2009 (the 3rd anniversary of the 2nd payment).
- (3) Excluded Tolleson obligation for ratemaking purposes as per ACC precedent.
- (4) An equity infusion occurred May 2008 (\$20 m) and another may occur August 2008 (\$10 m)
- (5) The 2008 Anthem refund payment was paid as per the 4th Amendment to the Anthem Agreement.

<u>Rate Case Expense:</u>	<u>Estimated Expense</u>
External Counsel	\$ 200,000
Cost of Equity External Witness	\$ 75,000
Rate Design & Cost of Service External Witness	\$ 125,000
Shared Services Center - Rates Staff:	\$ 75,000
ACC Required Customer Notices:	
-Required Initial Customer Notice - Letter	\$ 50,000
-Required Post Case New Rates Notice - Letter	\$ 50,000
-Required Newspaper Publish Initial Customer Notice	\$ 4,000
-Required Newspaper Publish ACC Public Comment Meetings	\$ 2,000
Company Sponsored Public Participation Meetings:	
-Notice	\$ 4,000
-Community Meetings (room reservation costs)	\$ 7,000
-Travel	\$ 5,000
Case Production:	
-External duplicating costs, binders, tabs	\$ 5,000
Witness Training	\$ 10,000
TOTAL	<u>\$ 612,000</u>

Arizona American Water
White Tank Water Treatment Plant
Monthly Amortization/Accounting Table

PRE-IN-SERVICE PERIOD

Date	Beginning of month asset cost including AFUDC	Beginning of month investment net of accumulated depreciation	Beginning of month AFUDC for current month	Beginning of month accumulated cost of capital thru Aug. 31, then 8.4%	Additional costs incurred during month	Hook-up fees collected during current month vary each month	Hook-up fees to be amortized for post-in-service AFUDC and depreciation offset	Ending net accumulated hook-up fees (after amortization)	Ending asset balance net of accumulated depreciation	Current month net hook-up fee after allocating to post-in-service AFUDC	No. of incremental customers who paid hook-up fee	Company's ending net investment in White Tanks Plant
Jan-08	8,449,468	8,375,983	45,370	1,192,719				73,485	9,687,557			9,614,072
Feb-08	9,687,557	9,614,072	52,076	2,055,053		63,004	399,628	73,485	13,721,201		14	13,721,201
Mar-08	13,794,686	13,721,201	74,323	2,416,674		46,447	400,733	136,489	16,235,665			16,149,194
Apr-08	16,285,683	16,149,194	87,475	2,902,259		27,639	402,682	182,636	18,975,417		10	18,792,481
May-08	18,975,417	18,792,481	101,793	3,525,552		82,931	402,204	210,775	21,602,962		6	21,391,787
Jun-08	21,602,962	21,391,787	115,872	4,310,334		108,278	400,378	283,706	25,628,768		18	25,335,062
Jul-08	25,628,768	25,335,062	137,232	5,398,987		138,279	400,756	401,995	29,762,986		24	29,361,001
Aug-08	29,762,986	29,361,001	158,038	6,808,860		187,546	398,993	588,177	36,980,344		20	36,422,167
Sep-08	33,021,985	32,652,154	176,526	8,646,572		243,370	399,628	601,547	40,242,203		10	39,640,656
Oct-08	36,980,344	36,422,167	197,287	11,016,448		311,507	399,628	676,274	43,218,671		16	42,543,277
Nov-08	40,242,203	39,840,656	214,720	14,000,337		382,593	399,628	776,274	46,959,693		0	44,503,478
Dec-08	43,218,671	42,543,277	230,443	17,538,882		469,531	399,628	944,866	50,324,486		60	48,014,827
Jan-09	46,959,693	46,014,827	249,247	21,692,129		569,828	399,628	1,265,361	53,182,548		72	47,459,470
Feb-09	50,324,486	47,459,470	267,072	26,464,217		682,167	399,628	1,590,398	55,320,337		73	48,734,088
Mar-09	53,182,548	50,147,656	283,876	31,919,101		814,516	399,628	1,744,158	57,064,495		34	50,147,656
Apr-09	55,862,551	51,023,174	300,313	38,056,228		969,599	399,628	2,159,374	58,330,188		93	51,023,174
May-09	58,330,188	51,883,944	317,633	45,000,000		1,148,811	399,628	2,563,025	59,330,188		50	51,883,944
Jun-09	61,148,811	52,747,163	333,921	52,857,714		1,353,335	399,628	2,972,290	60,330,188		43	52,747,163
Jul-09	64,000,000	53,616,133	350,337	61,616,133		1,589,930	399,628	3,372,650	61,616,133		44	53,616,133
Aug-09	66,930,188	54,482,481	367,801	71,337,801		1,859,930	399,628	3,772,650	63,330,188		23	54,482,481
Sep-09	69,930,188	55,353,944	385,811	82,000,000		2,148,811	399,628	4,167,481	65,167,481		54	55,353,944
Oct-09	72,930,188	56,228,768	404,811	93,811,111		2,448,811	399,628	4,567,481	67,000,000		23	56,228,768
Nov-09	75,930,188	57,104,158	424,811	106,811,111		2,748,811	399,628	4,967,481	68,833,333		55	57,104,158
Dec-09	78,930,188	58,000,000	444,811	121,000,000		3,048,811	399,628	5,367,481	70,666,667		88	58,000,000
Jan-10	81,930,188	58,900,000	464,811	136,444,444		3,348,811	399,628	5,767,481	72,500,000		64	58,900,000
Feb-10	84,930,188	59,800,000	484,811	153,111,111		3,648,811	399,628	6,167,481	74,333,333		86	59,800,000
Mar-10	87,930,188	60,700,000	504,811	171,000,000		3,948,811	399,628	6,567,481	76,166,667		86	60,700,000

Total Plant cost without AFUDC \$85,456,234

POST IN-SERVICE PERIOD

Date	Beginning of month asset balance net of accumulated depreciation	Beginning of month investment net of accumulated depreciation	Beginning of month AFUDC for current month	Beginning of month accumulated cost of capital / 11.88%	Monthly depreciation of asset (assumes 40 year life)	Hook-up fees collected during current month vary each month	Hook-up fees to be amortized for post-in-service AFUDC and depreciation offset	Ending net accumulated hook-up fees (after amortization)	Ending asset balance net of accumulated depreciation	Current month net hook-up fee after allocating to post-in-service AFUDC	No. of incremental customers who paid hook-up fee	Company's ending net investment in White Tanks Plant
Apr-10	37,024,949	36,642,302	322,643	322,483	77,135	210,026	4,592,673	4,193,045	36,947,814	-189,602	47	32,754,769
May-10	36,947,814	36,474,814	323,604	323,604	77,135	125,883	4,318,938	3,816,168	36,870,679	-274,856	28	32,952,490
Jun-10	36,870,679	36,402,481	324,565	324,565	77,135	371,869	4,283,188	3,690,486	36,793,543	-27,693	84	32,903,048
Jul-10	36,793,543	36,328,768	325,526	325,526	77,135	468,618	4,248,438	3,571,911	36,716,408	87,415	110	32,738,497
Aug-10	36,716,408	36,253,944	326,487	326,487	77,135	565,357	4,213,688	3,451,333	36,639,273	-85,146	69	32,756,508
Sep-10	36,639,273	36,178,768	327,448	327,448	77,135	662,096	4,178,938	3,324,257	36,562,137	82	90	32,679,291
Oct-10	36,562,137	36,103,543	328,409	328,409	77,135	758,835	4,144,188	3,192,137	36,485,002	-203,880	44	32,806,036
Nov-10	36,485,002	36,028,318	329,370	329,370	77,135	855,574	4,109,438	3,056,611	36,407,867	-87,325	75	32,796,226
Dec-10	36,407,867	35,953,093	330,331	330,331	77,135	952,313	4,074,688	2,921,166	36,330,731	-397,174	1	33,116,264
Jan-11	36,330,731	35,877,868	331,292	331,292	77,135	1,049,052	4,039,938	2,786,255	36,253,586	-22,330	86	33,061,459
Feb-11	36,253,586	35,802,643	332,253	332,253	77,135	1,145,791	4,005,188	2,649,744	36,176,461	-21,769	86	33,006,113
Mar-11	36,176,461	35,727,418	333,214	333,214	77,135	1,242,530	3,970,438	2,514,257	36,101,315	-21,242	86	32,950,720
Apr-11	36,099,325	35,652,193	334,175	334,175	77,135	1,339,269	3,935,688	2,378,744	36,026,166	-20,690	86	32,895,774
May-11	36,022,166	35,576,968	335,136	335,136	77,135	1,436,008	3,900,938	2,243,233	35,951,015	-20,132	86	32,840,729
Jun-11	35,945,055	35,501,743	336,097	336,097	77,135	1,532,747	3,866,188	2,107,722	35,875,864	-19,589	86	32,785,784
Jul-11	35,867,820	35,426,518	337,058	337,058	77,135	1,629,486	3,831,438	1,972,211	35,800,713	-19,040	86	32,730,839
Aug-11	35,790,585	35,351,293	338,019	338,019	77,135	1,726,225	3,796,688	1,836,700	35,725,562	-18,491	86	32,675,894
Sep-11	35,713,350	35,276,068	338,980	338,980	77,135	1,822,964	3,761,938	1,701,189	35,650,411	-17,942	86	32,620,949
Oct-11	35,636,115	35,200,843	339,941	339,941	77,135	1,919,703	3,727,188	1,565,678	35,575,260	-17,393	86	32,566,004
Nov-11	35,558,880	35,125,618	340,902	340,902	77,135	2,016,442	3,692,438	1,430,167	35,500,109	-16,844	86	32,511,059
Dec-11	35,481,645	35,050,393	341,863	341,863	77,135	2,113,181	3,657,688	1,294,656	35,425,058	-16,295	86	32,456,114
Jan-12	35,404,410	34,975,168	342,824	342,824	77,135	2,209,920	3,622,938	1,159,145	35,350,007	-15,746	86	32,401,169
Feb-12	35,327,175	34,900,000	343,785	343,785	77,135	2,306,659	3,588,188	1,023,634	35,275,056	-15,197	86	32,346,224

\$25 M CWP in rate base and new AFUDC rate starts

Mar-12	35,250,837	2,953,649	32,297,188	318,083	77,135	382,246	3,335,885	396,218	2,939,677	35,173,702	-13,972	86	32,234,025
Apr-12	2,938,677	3,184,559	32,324,025	318,459	77,135	382,246	3,321,923	396,584	2,926,329	35,086,566	-13,348	86	32,170,238
May-12	3,296,329	3,174,829	32,324,025	317,829	77,135	382,246	3,308,574	394,984	2,926,329	35,019,431	-12,718	86	32,105,820
Jun-12	3,913,611	3,165,550	32,040,766	317,192	77,135	382,246	3,295,857	394,328	2,901,530	34,942,296	-12,081	86	32,040,766
Jul-12	3,845,160	3,150,901	32,040,766	316,550	77,135	382,246	3,283,776	393,668	2,890,081	34,865,160	-11,439	86	31,975,070
Aug-12	3,885,610	3,141,723	31,908,724	315,915	77,135	382,246	3,272,337	393,008	2,879,301	34,788,025	-10,790	86	31,908,724
Sep-12	3,847,890	3,131,723	31,847,723	315,245	77,135	382,246	3,261,547	392,380	2,868,167	34,710,980	-10,134	86	31,847,723
Oct-12	3,847,890	3,121,723	31,786,723	314,573	77,135	382,246	3,251,147	391,719	2,858,985	34,633,755	-9,472	86	31,786,723
Nov-12	3,847,890	3,111,723	31,725,723	313,905	77,135	382,246	3,241,147	391,050	2,850,881	34,556,619	-8,804	86	31,725,723
Dec-12	3,847,890	3,101,723	31,664,723	313,237	77,135	382,246	3,231,147	390,375	2,842,762	34,479,484	-8,129	86	31,664,723
Jan-13	3,847,890	3,091,723	31,603,723	312,568	77,135	382,246	3,221,147	389,700	2,834,637	34,402,348	-7,454	86	31,603,723
Feb-13	3,847,890	3,081,723	31,542,723	311,899	77,135	382,246	3,211,147	389,025	2,826,510	34,325,213	-6,779	86	31,542,723
Mar-13	3,847,890	3,071,723	31,481,723	311,229	77,135	382,246	3,201,147	388,350	2,818,383	34,248,078	-6,104	86	31,481,723
Apr-13	3,847,890	3,061,723	31,420,723	310,559	77,135	382,246	3,191,147	387,675	2,810,256	34,170,943	-5,429	86	31,420,723
May-13	3,847,890	3,051,723	31,359,723	309,889	77,135	382,246	3,181,147	387,000	2,802,129	34,093,808	-4,754	86	31,359,723
Jun-13	3,847,890	3,041,723	31,298,723	309,219	77,135	382,246	3,171,147	386,325	2,794,002	34,016,673	-4,079	86	31,298,723
Jul-13	3,847,890	3,031,723	31,237,723	308,549	77,135	382,246	3,161,147	385,650	2,785,875	33,939,538	-3,404	86	31,237,723
Aug-13	3,847,890	3,021,723	31,176,723	307,879	77,135	382,246	3,151,147	384,975	2,777,748	33,862,403	-2,729	86	31,176,723
Sep-13	3,847,890	3,011,723	31,115,723	307,209	77,135	382,246	3,141,147	384,300	2,769,621	33,785,268	-2,054	86	31,115,723
Oct-13	3,847,890	3,001,723	31,054,723	306,539	77,135	382,246	3,131,147	383,625	2,761,494	33,708,133	-1,379	86	31,054,723
Nov-13	3,847,890	2,991,723	30,993,723	305,869	77,135	382,246	3,121,147	382,950	2,753,367	33,631,000	-72	86	30,993,723
Dec-13	3,847,890	2,981,723	30,932,723	305,199	77,135	382,246	3,111,147	382,275	2,745,240	33,553,865	137	86	30,932,723
Jan-14	3,847,890	2,971,723	30,871,723	304,529	77,135	382,246	3,101,147	381,600	2,737,113	33,476,730	462	86	30,871,723
Feb-14	3,847,890	2,961,723	30,810,723	303,859	77,135	382,246	3,091,147	380,925	2,728,986	33,400,595	1,137	86	30,810,723
Mar-14	3,847,890	2,951,723	30,749,723	303,189	77,135	382,246	3,081,147	380,250	2,720,859	33,324,460	1,812	86	30,749,723
Apr-14	3,847,890	2,941,723	30,688,723	302,519	77,135	382,246	3,071,147	379,575	2,712,732	33,248,325	2,487	86	30,688,723
May-14	3,847,890	2,931,723	30,627,723	301,849	77,135	382,246	3,061,147	378,900	2,704,605	33,172,190	3,162	86	30,627,723
Jun-14	3,847,890	2,921,723	30,566,723	301,179	77,135	382,246	3,051,147	378,225	2,696,478	33,095,055	3,837	86	30,566,723
Jul-14	3,847,890	2,911,723	30,505,723	300,509	77,135	382,246	3,041,147	377,550	2,688,351	33,018,920	4,512	86	30,505,723
Aug-14	3,847,890	2,901,723	30,444,723	299,839	77,135	382,246	3,031,147	376,875	2,680,224	32,942,785	5,187	86	30,444,723
Sep-14	3,847,890	2,891,723	30,383,723	299,169	77,135	382,246	3,021,147	376,200	2,672,097	32,866,650	5,862	86	30,383,723
Oct-14	3,847,890	2,881,723	30,322,723	298,499	77,135	382,246	3,011,147	375,525	2,663,970	32,790,515	6,537	86	30,322,723
Nov-14	3,847,890	2,871,723	30,261,723	297,829	77,135	382,246	3,001,147	374,850	2,655,843	32,714,380	7,212	86	30,261,723
Dec-14	3,847,890	2,861,723	30,200,723	297,159	77,135	382,246	2,991,147	374,175	2,647,716	32,638,245	7,887	86	30,200,723
Jan-15	3,847,890	2,851,723	30,139,723	296,489	77,135	382,246	2,981,147	373,500	2,639,589	32,562,110	8,562	86	30,139,723
Feb-15	3,847,890	2,841,723	30,078,723	295,819	77,135	382,246	2,971,147	372,825	2,631,462	32,485,975	9,237	86	30,078,723
Mar-15	3,847,890	2,831,723	30,017,723	295,149	77,135	382,246	2,961,147	372,150	2,623,335	32,410,840	9,912	86	30,017,723
Apr-15	3,847,890	2,821,723	29,956,723	294,479	77,135	382,246	2,951,147	371,475	2,615,208	32,335,705	10,587	86	29,956,723
May-15	3,847,890	2,811,723	29,895,723	293,809	77,135	382,246	2,941,147	370,800	2,607,081	32,260,570	11,262	86	29,895,723
Jun-15	3,847,890	2,801,723	29,834,723	293,139	77,135	382,246	2,931,147	370,125	2,598,954	32,185,435	11,937	86	29,834,723
Jul-15	3,847,890	2,791,723	29,773,723	292,469	77,135	382,246	2,921,147	369,450	2,590,827	32,110,300	12,612	86	29,773,723
Aug-15	3,847,890	2,781,723	29,712,723	291,799	77,135	382,246	2,911,147	368,775	2,582,700	32,035,165	13,287	86	29,712,723
Sep-15	3,847,890	2,771,723	29,651,723	291,129	77,135	382,246	2,901,147	368,100	2,574,573	31,960,030	13,962	86	29,651,723
Oct-15	3,847,890	2,761,723	29,590,723	290,459	77,135	382,246	2,891,147	367,425	2,566,446	31,884,895	14,637	86	29,590,723
Nov-15	3,847,890	2,751,723	29,529,723	289,789	77,135	382,246	2,881,147	366,750	2,558,319	31,809,760	15,312	86	29,529,723
Dec-15	3,847,890	2,741,723	29,468,723	289,119	77,135	382,246	2,871,147	366,075	2,550,192	31,734,625	15,987	86	29,468,723
Jan-16	3,847,890	2,731,723	29,407,723	288,449	77,135	382,246	2,861,147	365,400	2,542,065	31,659,490	16,662	86	29,407,723
Feb-16	3,847,890	2,721,723	29,346,723	287,779	77,135	382,246	2,851,147	364,725	2,533,938	31,584,355	17,337	86	29,346,723
Mar-16	3,847,890	2,711,723	29,285,723	287,109	77,135	382,246	2,841,147	364,050	2,525,811	31,509,220	18,012	86	29,285,723
Apr-16	3,847,890	2,701,723	29,224,723	286,439	77,135	382,246	2,831,147	363,375	2,517,684	31,434,085	18,687	86	29,224,723
May-16	3,847,890	2,691,723	29,163,723	285,769	77,135	382,246	2,821,147	362,700	2,509,557	31,358,950	19,362	86	29,163,723
Jun-16	3,847,890	2,681,723	29,102,723	285,099	77,135	382,246	2,811,147	362,025	2,501,430	31,283,815	20,037	86	29,102,723
Jul-16	3,847,890	2,671,723	29,041,723	284,429	77,135	382,246	2,801,147	361,350	2,493,303	31,208,680	20,712	86	29,041,723
Aug-16	3,847,890	2,661,723	28,980,723	283,759	77,135	382,246	2,791,147	360,675	2,485,176	31,133,545	21,387	86	28,980,723
Sep-16	3,847,890	2,651,723	28,919,723	283,089	77,135	382,246	2,781,147	360,000	2,477,049	31,058,410	22,062	86	28,919,723
Oct-16	3,847,890	2,641,723	28,858,723	282,419	77,135	382,246	2,771,147	359,325	2,468,922	30,983,275	22,737	86	28,858,723
Nov-16	3,847,890	2,631,723	28,797,723	281,749	77,135	382,246	2,761,147	358,650	2,460,795	30,908,140	23,412	86	28,797,723
Dec-16	3,847,890	2,621,723	28,736,723	281,079	77,135	382,246	2,751,147	357,975	2,452,668	30,833,005	24,087	86	28,736,723
Jan-17	3,847,890	2,611,723	28,675,723	280,409	77,135	382,246	2,741,147	357,300	2,444,541	30,757,870	24,762	86	28,675,723
Feb-17	3,847,890	2,601,723	28,614,723	279,739	77,135	382,246	2,731,147	356,625	2,436,414	30,682,735	25,437	86	28,614,723
Mar-17	3,847,890	2,591,723	28,553,723	279,069	77,135	382,246	2,721,147	355,950	2,428,287	30,607,600	26,112	86	28,553,723
Apr-17	3,847,890	2,581,723	28,492,723	278,399	77,135	382,246	2,711,147	355,275	2,420,160	30,532,465	26,787	86	28,492,723
May-17	3,847,890	2,571,723	28,431,723	277,729	77,135	382,246	2,701,147	354,600	2,412,033	30,457,330	27,462		

May-18	29,542,824	29,542,824	77,135	29,465,689	29,465,689
Jun-18	29,465,689	29,465,689	77,135	29,388,554	29,388,554
Jul-18	29,388,554	29,388,554	77,135	29,311,418	29,311,418
Aug-18	29,311,418	29,311,418	77,135	29,234,283	29,234,283
Sep-18	29,234,283	29,234,283	77,135	29,157,147	29,157,147
Oct-18	29,157,147	29,157,147	77,135	29,080,012	29,080,012
Nov-18	29,080,012	29,080,012	77,135	29,002,877	29,002,877
Dec-18	29,002,877	29,002,877	77,135	28,925,742	28,925,742
Jan-19	28,925,742	28,925,742	77,135	28,848,607	28,848,607
Feb-19	28,848,607	28,848,607	77,135	28,771,471	28,771,471
Mar-19	28,771,471	28,771,471	77,135	28,694,336	28,694,336
Apr-19	28,694,336	28,694,336	77,135	28,617,201	28,617,201
May-19	28,617,201	28,617,201	77,135	28,540,065	28,540,065
Jun-19	28,540,065	28,540,065	77,135	28,462,930	28,462,930
Jul-18	28,462,930	28,462,930	77,135	28,385,795	28,385,794
Aug-18	28,385,795	28,385,795	77,135	28,308,659	28,308,659
Sep-18	28,308,659	28,308,659	77,135	28,231,524	28,231,524
Oct-19	28,231,524	28,231,524	77,135	28,154,389	28,154,389
Nov-19	28,154,389	28,154,389	77,135	28,077,254	28,077,253
Dec-19	28,077,254	28,077,254	77,135	28,000,118	28,000,118
Jan-20	28,000,118	28,000,118	77,135	27,922,983	27,922,983
Feb-20	27,922,983	27,922,983	77,135	27,845,848	27,845,847
Mar-20	27,845,848	27,845,848	77,135	27,768,712	27,768,712
Apr-20	27,768,712	27,768,712	77,135	27,691,577	27,691,577
May-20	27,691,577	27,691,577	77,135	27,614,442	27,614,441
Jun-20	27,614,442	27,614,442	77,135	27,537,306	27,537,306
Jul-20	27,537,306	27,537,306	77,135	27,460,171	27,460,171
Aug-20	27,460,171	27,460,171	77,135	27,383,036	27,383,036
Sep-20	27,383,036	27,383,036	77,135	27,305,900	27,305,900
Oct-20	27,305,900	27,305,900	77,135	27,228,765	27,228,765
Nov-20	27,228,765	27,228,765	77,135	27,151,629	27,151,629
Dec-20	27,151,629	27,151,629	77,135	27,074,494	27,074,494

Tubac Water District
 Arsenic Revenue Requirement Forecast

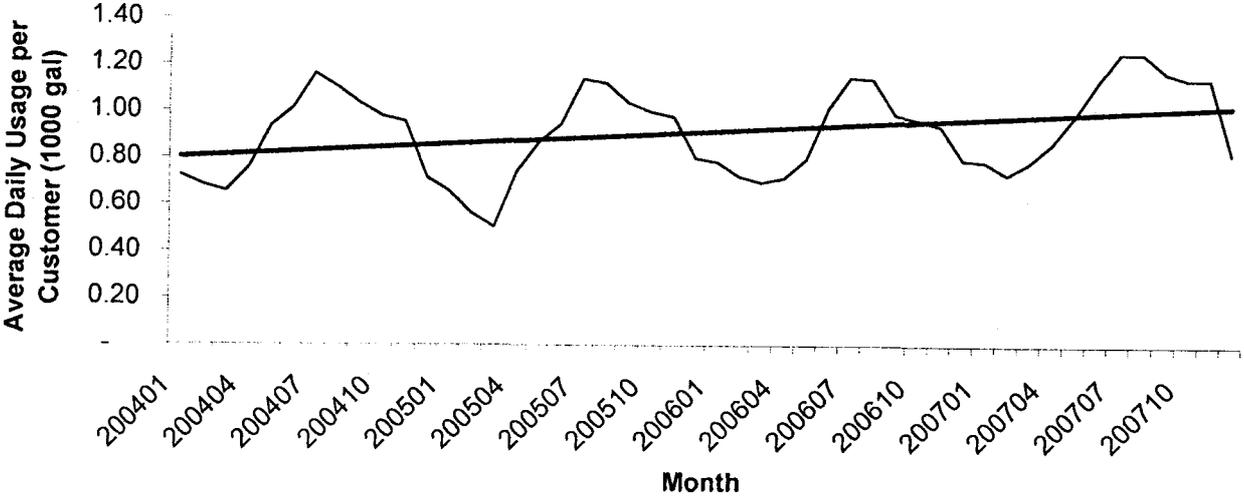
EXHIBIT TMB-5
 Page 1 of 1

[A]

Line No.		
1	Arsenic Plant Revenue Requirement	
2	Arsenic Plant in Service/Rate Base	\$ 2,300,000
3	Depreciation rate	4.00%
4	Depreciation expense	92,000
5	Depreciation expense net of tax savings	56,489
6	Recoverable O&M costs	-
7	Recoverable O&M costs net of tax savings	-
8	Arsenic Operating Income	<u>(56,489)</u>
9	Rate of return	-2.46%
10	Required Rate of Return	8.40%
11	Required Operating Income	193,200
12	Operating Income deficiency	249,689
13	Gross revenue conversion factor	1.6674
14	Revenue deficiency	<u><u>416,332</u></u>
15		
16		
17		
18		
19		
20		Proposed
21		ACRM
22	Rates	<u>Surcharge</u>
23	Minimum 5/8" Meter	\$ 25.98
24	Commodity Rate, per 1,000 gallons	3.1370
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		

EXHIBIT TMB-6

Average Daily Usage
Paradise Valley
Residential Customers



BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
JEFF HATCH-MILLER
WILLIAM A. MUNDELL
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
PAUL G. TOWNSLEY
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
PAUL G. TOWNSLEY
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	iii
I	INTRODUCTION AND QUALIFICATIONS	1
II	PURPOSE OF TESTIMONY.....	2
III	ARIZONA-AMERICAN'S FINANCIAL CONDITION.....	3
IV	WHITE TANKS PLANT UPDATE	7
A	NEED FOR WHITE TANKS PLANT.....	7
B	PARTNERSHIP WITH MARICOPA WATER DISTRICT.....	10
C	FUNDING THE WHITE TANKS PLANT	13
V	ACHIVEMENT INCENTIVE PAY ("AIP").....	15

1 **EXECUTIVE SUMMARY**

2
3 Paul G. Townsley testifies that:

4
5 Arizona-American's current financial condition is poor; timely and adequate rate relief from the
6 Commission is critically important.

7
8 Arizona-American has reached agreement with the Maricopa County Municipal Water
9 Conservation District Number One ("MWD") which provides MWD an option to participate in
10 the White Tanks Plan. Arizona-American's requests to extend the expiration date of the Agua
11 Fria Hook-up Fees and to include construction work in progress in rate base are appropriate.

12
13 Arizona-American's Achievement Incentive Pay benefits our customers.

14
15 American Water is now a publicly-traded company.

1 **I INTRODUCTION AND QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

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

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

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

9 **Q. PLEASE DESCRIBE ARIZONA-AMERICAN WATER ("ARIZONA-
10 AMERICAN") AND ITS BUSINESS.**

11 A. Arizona-American is a wholly-owned subsidiary of American Water. Arizona-American
12 is a public service corporation engaged in providing water and wastewater utility service
13 in portions of Maricopa, Mohave, and Santa Cruz Counties. Arizona-American is
14 Arizona's largest investor-owned water and wastewater utility, serving approximately
15 100,000 water customers and 50,000 sewer customers in the state. To serve its water
16 customers, Arizona-American owns, operates and maintains potable water production,
17 treatment, storage, transmission, and distribution facilities. To serve its wastewater
18 customers, Arizona-American owns, operates, and maintains collection and treatment
19 facilities. Arizona-American also provides treated effluent to customers for irrigation and
20 other uses.

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

23 A. As President, I am responsible for maintaining Arizona-American's financial health;
24 enhancing the operating efficiency and reliability of the business; and for assuring that all

1 functions (e.g. planning, engineering, construction, production, distribution, customer
2 service, accounting, regulatory and human resources) are carried out in compliance with
3 all local, state, and federal laws and regulations, and standards of good business practice.
4 I am also ultimately responsible for assuring that we meet our customers' needs.

5 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

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

8 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

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

14 **Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?**

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

16 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE REGULATORY
17 COMMISSIONS?**

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

22 **II PURPOSE OF TESTIMONY**

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

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

2 **III ARIZONA-AMERICAN'S FINANCIAL CONDITION**

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

4 A. Unfortunately, there is no way to sugarcoat Arizona-American's poor financial condition.
5 Most of Arizona-American's operating districts have under-earned for several years and
6 Arizona-American, as a whole, has lost nearly \$30 million since American Water
7 purchased the assets of Citizens Water Resources in 2002. This unfortunate trend
8 continues. Arizona-American again had a net income loss of \$4.6 million in 2007 and
9 expects to continue to operate at a loss in 2008 and 2009 until new rates are implemented.

10 The Commission is already aware of Arizona-American's poor financial condition. For
11 example, in Decision No. 69730, the Commission evaluated Arizona-American's "Times
12 Interest Earned Ratio", or "TIER" and stated that "TIER represents the number of times
13 earning will cover interest expense on short-term and long-term debt.... [A] TIER of less
14 than 1.0 is not sustainable in the long-term"¹ The Commission further concluded that
15 Arizona-American's TIER was only 0.44 at the end of 2006, meaning that Arizona-
16 American cannot be a viable long term water utility unless it can improve its TIER. So
17 far, despite an equity infusion of \$15 million in 2007, TIER has not improved. As of
18 December 31, 2007, Arizona-American's TIER was still only 0.72.

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

21 A. Arizona-American's current financial condition can be attributed to at least three factors.
22 First, in Decision No. 65453, dated December 12, 2002, the Commission imposed a
23 moratorium on filing rate case application from January 2003 until January 2006. This

¹ P. 3, ln. 18-21.

1 largely prevented Arizona-American's from transferring capital investments into rate-
2 base and from recovering increased operating expenses.

3 Second, Decision No. 63584 included a provision that assets purchased from Citizens
4 would be not be immediately included in rate base, but would instead be amortized into
5 rate-base over a period ranging from six and one-half years to ten years. Despite the
6 resulting delay in recognizing these assets, Arizona-American had agreed to this
7 condition with Staff, but was assuming only a one-year rate moratorium. The
8 Commission-imposed three-year moratorium meant that Arizona-American could only
9 begin to recover these assets after the moratorium expired, new rate cases were filed, and
10 the Commission approved recovery. The first case to approve recovery of any portion of
11 the amortizations was Decision No. 69440, dated May 1, 2007, for our Mohave Water
12 District. As of April 30, 2008, Arizona-American has been authorized rate recovery for
13 only \$25 million of the total \$125 million of deferred AIAC and CIAC.

14 Third, the nature of historic test years in Arizona automatically causes a lag between the
15 date a company expends capital and the date that the company starts to earn a return on
16 and of that capital. This is a particular issue for companies like Arizona-American that
17 must invest to meet the needs of its customers in fast growing areas³ like Maricopa and
18 Mohave Counties.

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

21 **A.** Yes and I would be remiss if I didn't acknowledge how the Commission has helped
22 Arizona water utilities, including Arizona-American. The most significant assistance has
23 been the availability of the Commission's Arsenic Cost Recovery Mechanism ("ACRM")
24 and the lifting of the three-year moratorium as it applied to the Paradise Valley Water

1 District. In Decision No. 68310, dated November 14, 2005, the Commission authorized
2 Arizona-American to use ACRMs for its Havasu Water, Agua Fria Water, and Sun City
3 West water districts. Then, in Decision No. 68858, dated July 28, 2006, the Commission
4 authorized Arizona-American to use an ACRM for its Paradise Valley Water District.
5 The ACRMs have allowed Arizona-American to begin recovering \$42.7 million in
6 arsenic-remediation investments, without the usual regulatory lag and the need to file rate
7 cases. Without these ACRMs, Arizona-American's financial condition would be that
8 much worse. The Commission has also helped Arizona-American by approving
9 innovative financing proposals for fire-flow projects in its Paradise Valley Water District
10 and for a regional surface water treatment facility in its Agua Fria Water District.²

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

13 A. Arizona-American could not have made all the necessary capital investment in Arizona
14 without American Water's willingness to infuse new equity and make long-term
15 borrowing at a very attractive rate to Arizona-American. I don't know how much longer
16 Arizona-American's access of capital from or through its parent will continue if Arizona-
17 American continues to suffer net income losses. Without American Water's financial
18 commitment to Arizona-American, Arizona-American could face the threat of financial
19 restructuring or capital restrictions if its financial condition does not improve soon.

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

22 A. First, Arizona-American has not paid a dividend since 2003 to its parent, American
23 Water. This has helped slow the erosion of Arizona-America's equity balance.

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

1 Second, despite Arizona-American's failure to pay dividends, or even to generate
2 positive earnings, American Water has still been willing to infuse new equity to offset the
3 equity ratio erosions caused by these continuing losses and the need to issue new debt to
4 fund capital projects. American Water infused \$35 million of equity in 2006, \$15 million
5 more in 2007, and may another \$30 million in 2008. The goal of these equity infusions is
6 to maintain Arizona-American's equity ratio near the Commission's 40% target.³

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

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

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

16 **A.** In order to be a financially viable and stable water and wastewater utility to our
17 customers and investors, Arizona-American must make a return on and return of the
18 investment made by our shareholder. Currently, only \$160 million of Arizona-
19 American's investment is in rate base. In other words, although our customers in Arizona
20 are enjoying the benefit of \$364.8 million worth of Arizona-American's capital
21 investment, they are only paying for approximately 44% of the assets. In this case, we
22 are seeking to put additional \$143.8 million of our capital investment in rate base.

³ Decision No. 68858, dated July 28, 2006

1 It is also important that the Commission timely approve the requested rate relief. The last
2 two Arizona-American's rate cases (Docket Nos. W-01303A-06-0403 and WS-01303A-
3 06-0491) experienced prolonged delays during the Commission-approval process,
4 resulting in approximately \$3.7 million lost in revenue. The revenue lost from these two
5 delays can never be recovered by Arizona-American. Given the magnitude of the rate
6 relief sought in this case, while operating losses are expected to continue in 2008 and
7 2009, Arizona-American cannot bear any delays in obtaining timely Commission
8 approval of the rate increases requested in this application

9 **IV WHITE TANKS PLANT UPDATE**

10 **A NEED FOR WHITE TANKS PLANT**

11 **Q. WHAT IS THE WHITE TANKS SURFACE WATER TREATMENT PLANT?**

12 A. The White Tanks Surface Water Treatment Plant ("White Tanks Plant") is a regional
13 water treatment facility, designed to treat Colorado River Water delivered through
14 facilities owned by the Central Arizona Project ("CAP water"). As discussed in Mr.
15 Gross' testimony, the White Tanks Plant is presently under construction and is scheduled
16 to be in service in 2010.

17 **Q. WHY IS ARIZONA-AMERICAN CONSTRUCTING THE WHITE TANKS
18 PLANT?**

19 A. Over the last 50 years, the West Valley has developed largely based on groundwater
20 resources. As a result, groundwater overdraft and depletion in the area has been severe.
21 Arizona-American and other entities serving the West Valley have access to CAP water;
22 however, treatment is required before CAP water can meet current drinking-water
23 standards.

1 In 1997, a number of western Maricopa County municipalities and private water
2 companies holding CAP water contracts formed WESTCAPS to develop cooperative
3 regional solutions for use of the region's CAP water allocations and other renewable
4 water supplies. This effort was driven by the concerns of the Arizona Department of
5 Water Resources ("ADWR") and West Valley water providers about the long-term
6 consequences of continuing to use only groundwater to support population growth.
7 Continuing to rely solely on groundwater would be imprudent because of accelerated
8 groundwater level declines, land subsidence, declining well-production rates, and the
9 increasing number of wells that could not meet Safe Drinking Water Act water quality
10 standards.

11 In April 2001, WESTCAPS released its Regional Water Supply Plan. Groundwater
12 modeling studies, conducted by ADWR and by the Bureau of Reclamation as part of the
13 WESTCAPS study, warned that continued reliance on groundwater to support new
14 development will result in long-term groundwater declines that approach or exceed the
15 ADWR Assured Water Supply limit of 1000 feet below land surface. This would also
16 accelerate land-subsidence problems. The Regional Water Supply Plan concluded that
17 the area's water suppliers should maximize their uses of CAP water and other surface
18 water resources. To treat that water, WESTCAPS recommended the construction of two
19 regional treatment facilities.

20 One of those recommended treatment facilities has become the White Tanks Plant. The
21 WESTCAPS study selected the site of the proposed White Tanks Plant (Cactus and
22 Perryville Road, on the Beardsley canal) because of its location on the canal and its
23 proximity to multiple water provider service areas. The 45-acre plant site is large enough
24 to support a facility that could ultimately treat up to 80 million gallons per day ("MGD").

1 **Q. DOES ARIZONA-AMERICAN AGREE THAT THE WHITE TANKS PLANT IS**
2 **NEEDED?**

3 A. Yes. Arizona-American's recent experience underscores the need for the White Tanks
4 Plant. Most recently constructed wells within the Agua Fria Water District have
5 exhibited poor water quality and low rates of water production. Over the last few years,
6 levels of arsenic, fluoride, nitrate, chromium, or other constituents in excess of Federal
7 and State drinking water standards have become all-too common in new wells
8 constructed within the Agua Fria Water District south of Greenway Road. These wells
9 will require expensive wellhead treatment systems to remove the contaminants at a
10 considerably higher total capital and operation and maintenance cost than needed for
11 wells only a few years ago. To locate water, deeper drilling has been necessary, which
12 raises capital costs and increases pumping costs (electricity). In addition, well yields
13 below Greenway have been lower than for new wells north of Greenway. Overall,
14 Arizona-American's recent experience with new well construction—whether drilled by
15 the Company or by a developer—highlights the need for surface water treatment plant
16 capacity to minimize long-term water costs for Arizona-American's customers in its
17 Agua Fria District.

18 **Q. HOW WILL ARIZONA-AMERICAN USE THE WHITE TANKS PLANT?**

19 A. Arizona-American holds a CAP-water subcontract for 11,093 acre-feet per year, or nearly
20 one-half billion gallons. When the White Tanks Plant is completed, Arizona-American
21 will be able to treat its full allotment of CAP water and deliver it to its Agua Fria
22 customers. This will preclude the need to pump almost one-half billion gallons of ground
23 water each year.

1 In addition, Arizona-American expects that, through future expansions, the White Tanks
2 Plant will be available to treat up to 21,000 acre-feet per year of Agua Fria River Water
3 for delivery to Agua Fria customers within the MWD service territory.

4 **B PARTNERSHIP WITH MARICOPA WATER DISTRICT**

5 **Q. DOES ARIZONA-AMERICAN HAVE ANY POTENTIAL PARTNERS TO**
6 **SHARE THE COST OF THE WHITE TANKS PLANT?**

7 A. Yes. As discussed above, the White Tanks Plant has long been planned to be a regional
8 water treatment plant, serving not only customers of Arizona-American but also residents
9 from other West Valley communities. To facilitate regional use of the White Tanks
10 Plant, Arizona-American entered into a Joint Development Agreement (“JDA”) with the
11 Maricopa Water District (“MWD”) in November 2007. The JDA creates a partnership
12 between Arizona-American and MWD for possible future expansion of the White Tanks
13 Plant for regional uses.

14 **Q. WHAT ARE THE KEY TERMS OF THE JOINT DEVELOPMENT**
15 **AGREEMENT BETWEEN ARIZONA-AMERICAN AND MWD?**

16 A. Under the JDA, Arizona-American will proceed with the construction of its 13.5 MGD
17 treatment capacity (“Phase 1A”). MWD has the option until November 15, 2008, to
18 demand and fund the construction of 6.5 MGD of additional capacity (“Phase 1B”). If
19 MWD declines or fails to exercise the option by November 15, 2008, Arizona-American
20 retains the right to build Phase 1B of the White Tanks Plant.

21 If MWD elects to partner with Arizona-American to expand the White Tanks Plant,
22 Arizona-American and MWD will enter into a series of agreements outlining the
23 ownership, construction, management, and operation arrangement for the expanded

1 facility. The terms of these agreements have already been negotiated between Arizona-
2 American and MWD, and are ready to be executed once MWD exercise its option.

3 As stated, if MWD exercises its option, it will fund and construct the Phase 1B
4 expansion. Once both Phase 1A and 1B are completed, MWD will own 32.5% of the
5 White Tanks Plant, with Arizona-American owning the remaining 67.5%. To pay for its
6 share, MWD will pay Arizona-American 32.5% of the total project cost, with a credit to
7 MWD for its costs associated with constructing Phase 1B.

8 MWD and Arizona-American will jointly coordinate with other entities desiring
9 treatment services through future expansions of the White Tanks Plant. Both parties
10 have the right, but not the obligation, to take a 50% interest in providing services to such
11 entities. The parties will cooperate with future plant expansions, but each party can
12 proceed unilaterally with plant expansion if agreement cannot be reached.

13 **Q. HOW WOULD THE JDA BENEFIT CUSTOMERS?**

14 A. Because it will share common infrastructure already completed for Phase 1A, the cost per
15 MGD of constructing Phase 1B will be substantially less than the cost per MGD of
16 constructing Phase 1A. When MWD purchases its 32.5% share of the entire plant, this
17 will reduce Arizona-American's rate base associated with the White Tanks Plant.
18 Therefore, hook-up fees will more quickly recover the cost of the White Tanks Plant.

19 Another JDA provision would further reduce plant costs. Arizona-American will swap
20 the land under the plant for another MWD parcel of equal value, and MWD will lease an
21 undivided portion of the plant site to Arizona-American for 99 years at no cost. This
22 would reduce rate base by the cost of the land.

1 The JDA would also reduce operating costs. First, MWD already provides low-cost
2 power to several Arizona-American facilities. Under the JDA, MWD commits to also
3 provide electricity to the White Tanks Plant. This could be a significant benefit if it is
4 able to obtain preference power from federal hydropower projects. Second, with its
5 32.5% ownership interest, MWD would also be required to pay 32.5% of O&M costs that
6 do not vary with usage.

7 **Q. YOU HAVE DISCUSSED RATE BENEFITS OF THE JDA; ARE THERE OTHER**
8 **BENEFITS?**

9 A. Certainly. First, once MWD exercises its option to participate in the White Tanks Plant,
10 it makes it much less likely that MWD would construct its own competing treatment
11 facility. Second, as a quasi-municipal water provider, MWD's participation should make
12 other municipal water providers more willing to serve as customers being served by
13 future expansions. These two benefits will make possible greater economies of scale for
14 the White Tanks Plant.

15 MWD participation also provides water-supply benefits. First, owning the underlying
16 land and a share of the White Tanks Plant will let MWD use a future phase of the plant to
17 treat up to 21,000 acre-feet per year of Agua Fria River Water for delivery to Agua Fria
18 customers within the MWD service territory. This water will become available to Agua
19 Fria Water District customers as the district builds out and residential and commercial
20 uses replace irrigation uses. Because MWD's service territory is largely contained within
21 Arizona-American's Agua Fria Water CC&N, Agua Fria Water customers would
22 ultimately be able to annually receive over 800 million gallons of treated, renewable
23 surface water instead of groundwater. Second, the JDA commits the parties to develop a
24 regional solution, including the use of existing MWD irrigation wells, to meet potable
25 groundwater demands. This would reduce the need to drill additional wells.

1 **Q. WHAT IS THE STATUS OF MWD'S PARTICIPATION UNDER THE JDA?**

2 A. MWD has not yet exercised its option to participate in the White Tanks Plant, but I
3 remain optimistic. Arizona-American will update the Commission when it has new
4 information.

5 **C FUNDING THE WHITE TANKS PLANT**

6 **1 HOOK-UP FEE SUNSET DATE**

7 **Q. HOW DOES ARIZONA-AMERICAN PLAN TO FUND THE CONSTRUCTION**
8 **OF THE WHITE TANKS PLANT?**

9 A. The construction of the White Tanks Plant is currently being funded by the Hook-Up Fee
10 increase approved by the Commission in Decision No. 69914. The increase was
11 approved last September and is scheduled to sunset on December 15, 2015.

12 **Q. WILL THE INCREASED HOOK-UP FEES GENERATE SUFFICIENT**
13 **PROCEEDS TO PAY FOR THE WHITE TANKS PLANT CONSTRUCTION?**

14 A. No. Based on our current projection, it now appears that Arizona-American will not
15 collect enough Hook-Up Fee proceeds to fund the White Tanks Plant. At the time
16 Arizona-American filed its application with the Commission, the real estate market in
17 Arizona was robust. Since that time, the overall real estate market has cooled
18 dramatically. As a result, Arizona-American now projects that new Agua Fria Water
19 District connections will be only 1,400 in 2008. Mr. Gross sponsors the revised customer
20 forecast.

21 **Q. WHAT DOES ARIZONA-AMERICAN PROPOSE TO DO TO ADDRESS THE**
22 **SHORTFALL?**

23 A. Arizona-American first proposes to extend the Hook-Up Fee sunset date to December 31,
24 2020. Arizona-American initially requested a sunset date for the increased Hook-Up

1 Fees, based on the customer projection made in 2005, when the real estate market was
2 robust. In 2007, as the market began to slow, Arizona-American revised its sunset-date
3 request to 2015, which was reflected in Decision No. 69914. Based on its most recent
4 projection, Arizona-American now forecasts that it could be late 2027 before the White
5 Tanks Plant is fully paid for using Hook-Up Fee proceeds. Such a late date is
6 unacceptable and Mr. Broderick proposes to include \$25 million of White Tanks Plant
7 CWIP in rate base as well as request an O&M recovery mechanism similar to an ACRM.

8 **2 WHITE TANKS PLANT – CWIP IN RATE BASE**

9 **Q. HOW ELSE CAN THE COMMISSION HELP ARIZONA-AMERICAN DEAL**
10 **WITH THE DECLINE IN HOOK-UP FEE REVENUES?**

11 A. As noted earlier in my testimony, Arizona-American is a company in serious financial
12 difficulty. The current construction slowdown, with the associated decline in Hook-Up
13 Fees, will result in substantial negative cash flows for years to come. As a result we are
14 asking the Commission to authorize including some post-test year Construction Work in
15 Progress (“CWIP”) in rate base. While we appreciate the Commission’s allowing us to
16 defer depreciation expense and to record post-in-service AFUDC, these approvals do not
17 help the negative cash flows we will be experiencing. Including CWIP in rate base will
18 reduce negative cash flows associated with this project and ultimately, the project’s costs
19 (due to the deferred financing costs) to customers.

20 **Q. HOW MUCH CWIP DOES ARIZONA-AMERICAN PROPOSE TO INCLUDE IN**
21 **RATE BASE?**

22 A. We propose that \$25 million, approximately the forecasted CWIP balance at June 2008,
23 be placed in rate base.

1 **Q. WHAT WILL ARIZONA-AMERICAN NEED TO DO IF IT CANNOT RECOVER**
2 **A PORTION OF POST-TEST-YEAR CWIP IN RATE BASE?**

3 A. Arizona-American will have no choice but to file another rate case a few months before
4 the White Tanks Plant enters service and request the entire amount be included in rate
5 base.

6 **3 WATER FACILITIES HOOK-UP FEE INCREASE**

7 **Q. DID ARIZONA-AMERICAN CONSIDER INCREASING THE EXISTING**
8 **HOOK-UP FEE TO GENERATE MORE WHITE-TANKS FUNDS?**

9 A. Yes. However, although Arizona-American would consider a proposal to increase Hook-
10 Up Fees, the current real estate market may make it difficult for developers to support
11 such a proposal. Further, any significant Hook-Up Fee increase could have the
12 unintended consequence of reducing number of new connections in our Agua Fria Water
13 District, which would further reduce Hook-Up Fee proceeds.

14 **V ACHIVEMENT INCENTIVE PAY ("AIP")**

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

17 A. To attract and retain high quality personnel, Arizona-American needs to insure that the
18 "total compensation" offered to its employees is competitive with other companies. Total
19 compensation is a combination of key items including base salary, incentive pay,
20 pension, 401K, group insurance and some other lesser benefit items. The total value of
21 all of these items makes up the total compensation. Adjusting any one of these
22 components will require an offsetting adjustment in another component to maintain the
23 value of the total compensation offered to our employees. When used properly, incentive
24 pay helps to align the employee's work activities with the goals of the company and its
25 customers in a way that straight salary dollars, no matter how large, cannot achieve as

1 effectively. A well-designed incentive-pay plan can pull people together, direct them in
2 to achieve the goal you want them to achieve, and helps us better compete in today's
3 competitive environment.

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

6 A. Yes, for the following reasons. First, being able to attract and retain qualified employees
7 to manage and operate Arizona-American operations is certainly in the best interest of the
8 Arizona-American customers. However, even more importantly, the AIP is designed to
9 encourage and reward exactly the corporate results and employee behaviors that matter to
10 these customers. I will have more to say about this concept below.

11 **Q. PLEASE DESCRIBE ARIZONA-AMERICAN'S AIP.**

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

17 **Q. WHAT ARE THE FINANCIAL COMPONENT MEASURES?**

18 A. Arizona-American's operating income is the key financial measure. We believe that this
19 measure is the most critical gauge of our business success and is consistent with other
20 affiliated business units. Operating income is essentially the profit generated before any
21 interest income or expense, AFUDC and income taxes.

22 **Q. HOW DOES THE FINANCIAL COMPONENT BENEFIT CUSTOMERS?**

23 A. Operating income relates to the portion of the financial statements which are most closely
24 linked to the majority of the employees and is a critical precursor to key external items

1 such as Net Income and Cash Flow. These external measures are used to evaluate the
2 financial health of not only Arizona-American, but its parent American Water.
3 Consistently meeting these projections is a critical part of Arizona-American's ability to
4 encourage more investment from American Water to fund discretionary projects that
5 benefit our customers.

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

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

9 **Q. PLEASE DESCRIBE EACH PART OF THE OPERATIONAL COMPONENT.**

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

- 11 1. Favorable results in the regular customer satisfaction study; and
12 2. Favorable results in the customer service quality study;

13 For the Environmental measures, our annual goal is no public notification or customer
14 advisories in violation of drinking water or wastewater regulations. Again, customers are
15 the obvious beneficiaries. For the Health and Safety measure, our annual goal is meeting
16 specified targets for Lost Workday Case Rate. In this case, customers benefit from well-
17 trained, careful employees operating in a safe, well-maintained workplace.

18 **Q. WHAT IS THE INDIVIDUAL COMPONENT?**

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

21 **Q. HOW DO THE PERFORMANCE RATINGS SUPPORT ARIZONA-**
22 **AMERICAN'S PERFORMANCE**

1 A. Each employee works with the employee's supervisor at the beginning of the plan year to
2 determine their annual performance objectives. These performance objectives reward
3 employee for activities that align with Arizona-American's performance objectives

4 **Q. HOW DO PERFORMANCE RATING BENEFIT CUSTOMERS**

5 A. Many of the objectives are directly related to improved customer service. Other relate to
6 improving employee skills such as team-working and problem solving. Overall, the
7 objectives support Arizona-American's overall performance, which circles back to the
8 customer benefit that I just discussed.

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

12 A. One of our key incentive principles is that participants should be measured on
13 performance they can directly influence. Therefore, different employee classes have
14 different component weightings. For example, senior employees can more directly
15 influence financial goals, so the financial category is more heavily weighted for these
16 employees.

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

18 A. In 2007, Arizona-American employees earned \$ 349,612 in AIP as part of our
19 employees' compensation package.

20 **Q. HAS AMERICAN WATER COMPLETED ITS INITIAL PUBLIC OFFERING**
21 **("IPO")?**

22 A. Yes. The IPO was held on April 23, 2008. American Water is now traded on the New
23 York Stock Exchange under the symbol "AWK."

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

2 A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
JOSEPH E. GROSS, P. E.
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
JOSEPH E. GROSS, P. E.
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	iii
I	INTRODUCTION AND QUALIFICATIONS	1
II	PURPOSE OF TESTIMONY.....	2
III	MAJOR CONTINUING CAPITAL PROJECTS.....	2
A	WHITE TANKS REGIONAL WATER TREATMENT PLANT	3
B	MOHAVE WASTEWATER TREATMENT PLANT EXPANSION	4
C	PARADISE VALLEY FIRE FLOW PROGRAM (PHASE 3)	5
IV	OTHER POST-TEST YEAR CAPITAL PROJECTS.....	6
V	TUBAC ARSENIC-TREATMENT FACILITY.....	8
VI	MOHAVE COUNTY COMPREHENSIVE PLANNING STUDY.....	9
VII	AGUA FRIA WATER SUPPLIES	10
VIII	AGUA FRIA DISTRICT PROJECTED GROWTH.....	11

1 EXECUTIVE SUMMARY
2

3 Mr. Gross testifies as follows:
4

5 Arizona-American has three major capital projects under way for which it seeks to recover
6 associated post-test-year investment:
7

- 8
- 9 1. White Tanks Regional Water Treatment Plant. The White Tanks Regional Water
10 Treatment Plant ("White Tanks Plant"), currently under construction, is a 13.5 MGD
11 surface water treatment facility to treat CAP water for distribution to customers in the
12 Agua Fria Water District. Construction of the White Tanks Plant began in November
13 2007. As of March 31, 2008, total White Tanks Plant investment, including pre-
14 construction costs, was \$13 million. By September 30, 2008, the total investment should
15 total \$31 million. The overall project budget is estimated at \$61.5 million.
 - 16 2. Mohave Wastewater Treatment Plant Expansion. In September 2007, Arizona-American
17 began expanding the capacity of the Wishing Well Wastewater Treatment Plant
18 ("Mohave Treatment Plant") that treats wastewater for Mohave Wastewater District
19 customers. Based on growth projections, demands will approach the 250,000 gpd design
20 capacity of the Mohave Treatment Plant in 2008. The expansion of the Mohave
21 Treatment Plant will add 250,000-gallons-per-day in new treatment capacity, allowing
22 service for up to 1,500 additional service connections. Arizona-American expects to
23 place the Mohave Treatment Plant Expansion in service in July 2008. As of the end of the
24 test year, Arizona-American had invested \$1.5 million in the Mohave Treatment Plant
25 Expansion. The total investment is expected to be \$4.0 million.
 - 26 3. Paradise Valley Fire Flow Project, Phase 3. In its Paradise Valley Water District,
27 Arizona-American is in the midst of a multi-year, phased, program to upgrade main
28 capacity, add fire hydrants, increase water storage and pumping capacity. Arizona-
29 American expects to complete Phase 3 of its fire-flow projects by September 30, 2008, at
30 a cost of \$3.6 million. In 2007, we began constructing one-half mile of 24" water main in
31 McDonald Drive. Phase 3 construction will continue in 2008, with one-half mile of 16"
32 water main in Lincoln Drive, and one-third mile of 8" water main in Tatum Boulevard.
33
34

35 Arizona-American also has five smaller projects underway, which should be completed in time
36 for the Commission Staff's engineering report.
37

- 38
- 39 1. Well 12 Replacement (Paradise Valley Water). The existing Well 12 is being replaced
40 due to a failure in its casing, which restricted its production to approximately 50% of the
41 original 2200 gallons per minute. The replacement well will allow the facility to regain
42 its original production capacity, and should be completed by December 2008, at a cost of
43 \$1.93 million.
 - 44 2. Big Bend Acres Tank (Mohave Water). This storage tank is being built to replace an old
45 existing tank which has experienced severe structural problems and has inadequate
46 capacity. The new 250,000 gallon tank should be completed by August 31, 2008, at a
47 cost of \$611,000.
 - 48 3. Sierra Montana Tank (Agua Fria Water). This 2.2 million gallon storage tank is being
49 built to increase storage capacity at Arizona-American's Water Plant 8. The tank should
50 be completed in August 2008, at a cost of \$2.05 million.
51

1
2
3
4
5
6
7
8
9
4. Distribution System Improvements, Phase 2 (Agua Fria Water). This consists of essential projects needed for groundwater distribution and storage improvements before the 2010 completion of the White Tanks Plant. The components of this project involve connecting an MWD well to the reservoir at Water Plant 8, adding a water line to serve the Cool Well subdivision, and eliminating a pipeline bottleneck at Bell and Reems Roads. The three components of this project should be completed in October 2008, at a total cost of \$1.19 million.

10
11
12
13
14
15
16
17
18
19
Tubac Arsenic Treatment Facility. Arizona-American is also planning to build an arsenic-treatment facility for its Tubac Water District to comply with the new arsenic mcl. The EPA denied our request for a three-year exemption. The current plan is to partner with the developer of Tubac Marketplace, a commercial project in the downtown area. The partnership reduces the expected cost of the facilities by approximately \$1 million. The developer will provide the required site, storage, and pumping capacity; and Arizona-American will provide the water-supply and arsenic-treatment facilities. The present cost estimate is \$2.3 million. Design will begin this summer (2008), with construction to begin in spring 2009 and be completed approximately one year later.

20
21
22
23
24
25
26
27
28
29
Mohave County Comprehensive Planning Study. This study lays out a five-year plan for prioritized improvements required to provide adequate water supply, storage, and pumping capacity within the Bullhead City and Havasu service areas. In Bullhead City, site procurement is underway this year for one well, which should be operational in 2009. Also, the Big Bend Acres 250,000-gallon storage tank will be completed in August 2008. Future projects include additional wells, storage, and an interconnection with Bermuda Water. In the Havasu Water District, an interconnection with the City of Lake Havasu will be completed this year. Future projects include upgrades to Well No. 9, additional storage facilities, and SCADA improvements.

30
31
32
33
34
35
36
Agua Fria Water Supplies. Because of the construction of the White Tanks Plant, developer are now only being required to supply water to satisfy average-day demand for the development, rather than maximum-day demand. New groundwater supplies will still be required to meet customer demands during the annual scheduled outage of the Beardsley Canal, scheduled outages of the White Tanks Plant, and any unscheduled outages of the Canal, Plant, or associated facilities. There is no longer any need for the 3.5-mile contingency pipeline.

37
38
39
40
41
42
43
Agua Fria District Projected Growth. Arizona-American previously forecast 4200 new hook-ups in 2008. Because of the recent real-estate slowdown, the Company now expects many fewer hook-ups in 2008, with the downward trend expected to continue. Further, many existing projects are grandfathered, so these customers will not be responsible for the increased hook-up fee. A forecast of new customers that will actually be subject to the increased hook-up fees follows:

Year	2008	2009	2010	2011	2012	2013
Customers	134	615	764	1030	1031	2180

44
45
Therefore the proceeds generated by hook-up fees to fund the White Tanks Plant will also be much less.

1 I **INTRODUCTION AND QUALIFICATIONS**

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

4 A. My name is Joseph E. Gross. My business address is 19820 N. 7th Street, Suite 201,
5 Phoenix, Arizona 85024, and my telephone number is 623-445-2401.

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

7 A. I am employed by Arizona-American Water Company ("Arizona-American") as Director
8 of Engineering for Arizona, New Mexico, Hawaii, and Texas.

9 Q. **PLEASE BRIEFLY OUTLINE YOUR RESPONSIBILITIES IN ARIZONA AS**
10 **THE DIRECTOR OF ENGINEERING.**

11 A. I am responsible for the planning, programming, and project delivery of Arizona-
12 American's capital program; first providing input to the budgeting process, then
13 providing oversight of the design and construction contracts to ensure compliance with
14 assigned budget and schedule.

15 Q. **PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

16 A. I received a Bachelor of Science degree from the United States Military Academy in civil
17 engineering and a Master of Science degree from the Ohio State University in Geodetic
18 Science.

19 Q. **HAVE YOU HAD ANY OTHER FORMAL TRAINING?**

20 A. I attended two-week senior executive management training programs at Carnegie Mellon
21 University in 1986 and at Arizona State University in 1994.

22 Q. **PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

1 A. I joined Arizona-American in October 2004. I was previously employed by the City of
2 Scottsdale for fourteen years in the positions of Capital Project Management Director,
3 Water Campus Project Director, and Water Resources Director. Before that, I had
4 extensive field-level and executive-level experience in the US Army Corps of Engineers,
5 including large projects located in the United States, Iran, and Saudi Arabia. Among
6 other responsibilities, I supervised the Corps' extensive flood-control projects in the
7 Phoenix metropolitan area from 1979 to 1982.

8 **Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?**

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

10 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

11 A. I submitted testimony in Arizona-American's White Tanks hook-up fee case (Docket No.
12 W-1303A-05-0718), its arsenic-cost-recovery mechanism ("ACRM") case for its Agua
13 Fria, Sun City West, and Havasu Water Districts (Docket No. W-01303A-05-0280, *et*
14 *al*), its Paradise Valley Water District rate case (Docket No. W-01303A-05-0405), and in
15 its Sun City Water District rate case (Docket No. W-01303A-07-0209).

16 **II PURPOSE OF TESTIMONY**

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

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

19 **III MAJOR CONTINUING CAPITAL PROJECTS**

20 **Q. PLEASE DESCRIBE ARIZONA-AMERICAN'S MAJOR CONTINUING
21 CAPITAL PROJECTS.**

22 A. The following major capital projects were begun during the test year (2007) and are still
23 under construction:

- White Tanks Regional Water Treatment Plant;

- 1 • Mohave Wastewater Treatment Plant Expansion; and
- 2 • Paradise Valley Fire Flow Project, Phase 3.

3 I will next discuss each project in greater detail.

4 **A WHITE TANKS REGIONAL WATER TREATMENT PLANT**

5 **Q. WHAT IS THE WHITE TANKS REGIONAL WATER TREATMENT PLANT?**

6 A. The White Tanks Regional Water Treatment Plant ("White Tanks Plant"), currently
7 under construction, is a surface-water treatment facility. Arizona-American holds a
8 Central Arizona Project ("CAP") water subcontract for 11,093 acre-feet per year, and has
9 designed the White Tanks Plant to treat CAP water for distribution to customers in the
10 Agua Fria Water District. The White Tanks Plant is designed to treat 13.5 million
11 gallons per day ("MGD") in Phase I(a). It is expandable to 20 MGD in Phase I(b) with
12 the addition of one more treatment-unit train. Eventually the White Tanks Plant can
13 accommodate the addition of three additional 20-MGD phases, for a total treatment
14 capacity of 80 MGD at the 45-acre plant site. With expansion, the White Tanks Plant
15 will be able to treat additional CAP water or other surface-water supplies.

16 **Q. WHAT IS THE STATUS OF THE WHITE TANKS PLANT?**

17 A. The White Tanks Plant is located on an Arizona-American-owned parcel near the
18 intersection of Cactus Road and Perryville Road, adjacent to the Beardsley Canal.
19 Facilities will include a new raw water intake, a water treatment plant, and a high-service
20 pumping station.

21 Construction of the White Tanks Plant began in November 2007, with Garney
22 Construction as the prime contractor. Before construction actually began, \$6 million had
23 already been invested in pre-construction costs, primarily project design, site acquisition,
24 legal, and internal costs.

1 As of March 31, 2008, total White Tanks Plant investment, including pre-construction
2 costs, was \$13 million. By September 30, 2008, the total investment should reach \$31
3 million.

4 **Q. WHEN WILL THE WHITE TANKS PLANT BEGIN SERVING AGUA FRIA**
5 **WATER CUSTOMERS?**

6 A. Arizona-American expects to place the White Tanks Plant in service in the second
7 quarter of 2010. Arizona-American will then be able to use the full Phase IA capacity
8 (13.5 MGD) to serve Agua Fria Water District customers with treated CAP Water.

9 **Q. WHAT IS THE EXPECTED TOTAL COST OF THE WHITE TANKS PLANT?**

10 A. The overall project budget is estimated at \$61.5 million. Mr. Townsley and Mr.
11 Broderick are requesting various Commission authorizations pertaining to cost recovery
12 of the White Tanks Plant.

13 **B MOHAVE WASTEWATER TREATMENT PLANT EXPANSION**

14 **Q. WHY IS ARIZONA-AMERICAN EXPANDING ITS MOHAVE WASTEWATER**
15 **TREATMENT PLANT?**

16 A. Mohave Wastewater District customers are served by the Wishing Well Wastewater
17 Treatment Plant ("Mohave Treatment Plant").¹ The Mohave Treatment Plant
18 experienced peak demands of over 200,000 gallons per day in 2007, and has an existing
19 design capacity of 250,000 gallons per day. Based on growth projections, demands will
20 approach the design capacity of the Mohave Treatment Plant in 2008.

21 In September 2007, Arizona-American began expanding the capacity of the Mohave
22 Treatment Plant, based on a final design and low bid submitted by Technology

¹ There is another small wastewater treatment system that treats wastewater produced by three commercial customers.

1 Construction, Inc. An Aquifer Protection Permit has already been issued and the Arizona
2 Department of Environmental Quality has approved adding 250,000-gallons-per-day in
3 new treatment capacity. The expansion of the Mohave Treatment Plant will allow service
4 for up to 1,500 additional service connections.

5 **Q. WHEN WILL THE MOHAVE TREATMENT PLANT EXPANSION BEGIN**
6 **SERVING MOHAVE WASTEWATER CUSTOMERS?**

7 A. Arizona-American expects to place the Mohave Treatment Plant Expansion in service in
8 July 2008.

9 **Q. WHAT IS THE EXPECTED TOTAL COST OF THE MOHAVE TREATMENT**
10 **PLANT EXPANSION?**

11 A. As of the end of the test year, Arizona-American had invested \$1.5 million in the
12 Mohave Treatment Plant Expansion. The total investment is expected to be \$4.0 million.
13 This project is included in Schedule B-2 rate base adjustment LJG-8.

14 **C PARADISE VALLEY FIRE FLOW PROGRAM (PHASE 3)**

15 **Q. WHAT IS THE PARADISE VALLEY FIRE-FLOW PROGRAM?**

16 A. In its Paradise Valley Water District, Arizona-American is in the midst of a multi-year,
17 phased, program to upgrade main capacity, add fire hydrants, increase water storage and
18 pumping capacity.

19 **Q. WHAT INVESTMENTS ARE SCHEDULED FOR 2008?**

20 A. Arizona-American expects to complete Phase 3 of its fire-flow projects by September 30,
21 2008, at a cost of \$3.6 million. In 2007, we began constructing one-half mile of 24"
22 water main in McDonald Drive. Phase 3 construction will continue in 2008, with one-
23 half mile of 16" water main in Lincoln Drive, and one-third mile of 8" water main in
24 Tatum Boulevard.

1 Q. **WHAT PROJECTS ARE SCHEDULED AFTER 2008?**

2 A. Design is basically complete for the projects scheduled for 2009 and 2010. Arizona-
3 American is working closely with the Town concerning scheduling and traffic impact of
4 the construction projects.

5 Q. **HOW DOES ARIZONA-AMERICAN PROPOSE TO RECOVER ITS PHASE 3
6 FIRE-FLOW INVESTMENTS?**

7 Mr. Broderick proposes to recover investments for Phase 3 and subsequent phases
8 through a re-design of the existing Public Safety surcharge. Please see his testimony for
9 more details.

10 **IV OTHER POST-TEST YEAR CAPITAL PROJECTS**

11 Q. **ARE THERE ANY OTHER CAPITAL PROJECTS THAT ARIZONA-
12 AMERICAN EXPECTS TO COMPLETE BEFORE COMMISSION STAFF
13 COMPLETES ITS ENGINEERING AUDIT?**

14 A. Yes. The four projects below should be completed in time for the Commission Staff
15 engineering report in this case.

- 16 1. Well 12 Replacement (Paradise Valley Water)
- 17 2. Big Bend Acres Tank (Mohave Water)
- 18 3. Sierra Montana Tank (Agua Fria Water)
- 19 4. Distribution System Improvements, Phase 2 (Agua Fria Water)

20 Arizona-American requests that these projects be included in rates established in this case
21 and each project is displayed within the B Schedules for each respective district.

22 However, all capital projects are under evaluation, which may delay some of these
23 projects. Arizona-American will update the status of these projects in its rebuttal
24 testimony.

1 Q. PLEASE BRIEFLY DISCUSS EACH PROJECT, ITS COST, AND ITS
2 EXPECTED COMPLETION DATE.

3 A. Certainly. I will briefly discuss each project in turn.

4 **Well 12 Replacement (Paradise Valley Water)**. The existing Well 12 is being replaced
5 due to a failure in its casing, which restricted its production to approximately 50% of the
6 original 2200 gallons per minute. The replacement well, on the site of the arsenic-
7 treatment plant and 140 feet from the existing well, will allow the facility to regain its
8 original production capacity needed to serve our customers. This replacement well
9 should be completed by December 2008 at a cost of \$1.93 million.

10 **Big Bend Acres Tank (Mohave Water)**. This storage tank is being built to replace an
11 old existing tank which has experienced severe structural problems and has inadequate
12 capacity. The new 250,000 gallon tank, to be constructed on the same site, should be
13 completed by August 31, 2008, at a cost of \$611,000.

14 **Sierra Montana Tank (Agua Fria Water)**. This 2.2 million gallon storage tank is being
15 built to increase storage capacity at Arizona-American's Water Plant 8. The added
16 capacity is needed to accommodate future growth and fire-flow requirements. The tank
17 should be completed in August 2008, at a cost of \$2.05 million.

18 **Distribution System Improvements, Phase 2 (Agua Fria Water)**. This project began
19 in 2007 as a result of Arizona-American's 2004 Source-of-Supply Study, which
20 determined essential projects needed for groundwater distribution and storage
21 improvements before the 2010 completion of the White Tanks Plant. The components of
22 this project involve connecting an MWD well to the reservoir at Water Plant 8, adding a
23 water line to serve the Cool Well subdivision, and eliminating a pipeline bottleneck at
24 Bell and Reems Roads. This bottleneck consisted of a 12" pipe connecting two 16"

1 pipes, which severely restricted distribution of water from north to south. The project is
2 being constructed in partnership with a City of Surprise roadway project, thus reducing
3 costs to our customers. The three components of this project should be completed in
4 October 2008 at a total cost of \$1.19 million.

5 **V TUBAC ARSENIC-TREATMENT FACILITY**

6 **Q. IS ARSENIC TREATMENT REQUIRED IN THE TUBAC WATER DISTRICT?**

7 A. Yes. As discussed by Mr. Cole, the U. S. Environmental Protection Agency has denied
8 our request for a three-year exemption and now Arizona-American must construct an
9 arsenic-treatment facility for its Tubac Water customers in order to comply with the new
10 federal arsenic standards.

11 **Q. HOW WILL ARIZONA-AMERICAN TREAT ARSENIC IN TUBAC?**

12 A. In 2004, Arizona-American designed a treatment project to comply with the new EPA
13 Arsenic Rule. This project was opposed by citizens, primarily due to the impact on water
14 rates and the project location. Since that time, the Company has investigated a number of
15 options, including point-of-use treatment in homes, and partnering with developers
16 needing additional storage and pumping capacity. The current plan is to partner with the
17 developer of Tubac Marketplace, a commercial project in the downtown area.

18 **Q. HOW DOES PARTNERING WITH THE TUBAC MARKETPLACE
19 DEVELOPER BENEFIT TUBAC WATER CUSTOMERS?**

20 A. The partnership reduces the expected cost of the facilities by approximately \$1 million.
21 The developer will provide the required site, storage, and pumping capacity; and
22 Arizona-American will provide the water-supply and arsenic-treatment facilities.

23 **Q. WHAT IS ARIZONA-AMERICAN'S REVISED ESTIMATE FOR ITS SHARE OF
THE TUBAC ARSENIC TREATMENT FACILITY?**

1 A. The present estimate is \$2.3 million.

2 **Q. HOW DOES ARIZONA-AMERICAN PROPOSE TO RECOVER THE COST OF**
3 **THE TUBAC ARSENIC TREATMENT FACILITY?**

4 A. Mr. Broderick discusses Arizona-American's proposal to recover the facility's cost
5 through an ACRM mechanism similar to that currently in effect in other districts.

6 **Q. WHAT IS THE SCHEDULE FOR CONSTRUCTING THE TUBAC ARSENIC**
7 **TREATMENT FACILITY?**

8 A. Design will begin this summer (2008), with construction to begin in spring 2009 and
9 completed approximately one year later.

10 **VI MOHAVE COUNTY COMPREHENSIVE PLANNING STUDY**

11 **Q. WHAT IS THE MOHAVE COUNTY COMPREHENSIVE PLANNING STUDY?**

12 A. This study was completed in 2007 and lays out a five-year plan for prioritized
13 improvements required to provide adequate water supply, storage, and pumping capacity
14 within the Bullhead City and Havasu service areas.

15 **Q. WHAT IS ARIZONA-AMERICAN DOING TO IMPLEMENT THE STUDY'S**
16 **RECOMMENDATIONS?**

17 A. In Bullhead City, site procurement is underway this year for one well, which should be
18 operational in 2009. Also, the Big Bend Acres 250,000-gallon storage tank will be
19 completed in August 2008. Future projects include additional wells, storage, and an
20 interconnection with Bermuda Water. In the Havasu Water District, an interconnection
21 with the City of Lake Havasu will be completed this year. Future projects include
22 upgrades to Well No. 9, additional storage facilities, and SCADA improvements.

1 **VII AGUA FRIA WATER SUPPLIES**

2 **Q. IN DECISION NO. 69914, DATED SEPTEMBER 27, 2007, THE COMMISSION**
3 **ORDERED THAT ARIZONA-AMERICAN TAKE SEVERAL ACTIONS**
4 **CONCERNING WATER SUPPLIES IN THE COMPANY'S AGUA FRIA**
5 **WATER DISTRICT. ARE YOU FAMILIAR WITH THAT DECISION?**

6 **A.** Yes. The Commission ordered (page 30):

7 *IT IS FURTHER ORDERED* that Arizona-American Water Company
8 shall review its existing line extension agreements in the Agua Fria Water
9 District that require developers to drill new wells, in order to determine
10 whether it is feasible to amend those line extension agreements to reduce the
11 number of required wells, in cooperation with the parties to those line
12 extension agreements.

13 *IT IS FURTHER ORDERED* that, in conjunction with the review of line
14 extension agreements required by the previous Ordering Paragraph, Arizona-
15 American Water Company shall consider whether there exist less costly
16 alternatives for the utility and the developers to supply water for new
17 developments in order to minimize and otherwise supplant the number of new
18 wells that will need to be drilled in the Agua Fria District. In the course of this
19 review, Arizona-American Water Company shall consider a proposed 3.5 mile
20 contingency pipeline alternative in relation to the requirement for new wells to
21 be drilled in the southern portion of the Agua Fria District.

22 **Q. HAS ARIZONA-AMERICAN EVALUATED WHETHER IT CAN REDUCE THE**
23 **"NUMBER OF NEW WELLS THAT WILL NEED TO BE DRILLED IN THE**
24 **AGUA FRIA DISTRICT"?**

25 **A.** Yes. Completion of the White Tanks Plant will allow Arizona-American to treat its
26 11,093 acre-feet per year CAP water allotment and to supply this renewable water supply
27 to our Agua Fria customers. This will benefit existing and future customers by
28 substantially reducing the need for new wells in the district. As a result, developers will
29 now be required to only supply water to satisfy average-day demand for the development,

1 rather than maximum-day demand. Changing from a maximum-day to average-day
2 demand requirement for RED Development's Prasada Mixed Use Gateway, located at
3 Cactus Road and the 303 Freeway, reduced the number of required wells from six to two.
4 Similarly, at Fulton Homes' Prasada Lakes Development, located on Cactus Road from
5 Perryville to Citrus, the changed demand requirement dropped the number of needed
6 wells from four to two.

7 **Q. WHY ARE ANY NEW WELLS STILL REQUIRED?**

8 A. Groundwater supplies will still be required to meet customer demands during the annual
9 scheduled outage of the Beardsley Canal, scheduled outages of the White Tanks Plant,
10 and any unscheduled outages of the Canal, Plant, or associated facilities.

11 **Q. HAS ARIZONA-AMERICAN CONSIDERED THE 3.5-MILE CONTINGENCY**
12 **PIPELINE ALTERNATIVE DISCUSSED BY THE COMMISSION?**

13 A. Yes. The 3.5-mile pipeline was considered as a possible contingency if the White Tanks
14 Plant could not be constructed in a timely manner. Now that Plant construction is
15 underway, there is no need for that contingency pipeline.

16 **VIII AGUA FRIA DISTRICT PROJECTED GROWTH**

17 **Q. TO SUPPORT ITS EARLIER REQUEST TO INCREASE WATER HOOK-UP**
18 **FEES IN ITS AGUA FRIA WATER DISTRICT, ARIZONA-AMERICAN**
19 **INCLUDED A FORECAST OF CUSTOMER GROWTH, NEW WATER-SUPPLY**
20 **PROJECT COSTS, AND HOOK-UP FEE REVENUES. ARE YOU FAMILIAR**
21 **WITH THAT FORECAST?**

22 A. Yes. This projection was provided to the Commission in Docket No. W-01303A-05-
23 0718, the docket that culminated in Decision No. 69914, dated September 27, 2007.

1 Arizona-American used this projection to support its request for an increased hook-up
2 fee.

3 **Q. IS THIS CUSTOMER GROWTH PROJECTION STILL ACCURATE?**

4 A. No. Because of the current real-estate slow-down, Arizona-American evaluated the
5 impact of the current housing-market decline on projected proceeds from hook-up fees
6 required to finance the White Tanks Plant and other improvements in the district.

7 **Q. WHAT IS THE UPDATED (LOWER) CUSTOMER-GROWTH FORECAST FOR**
8 **THE AGUA FRIA WATER DISTRICT AS A RESULT OF THE REAL ESTATE**
9 **SLOW-DOWN?**

10 A. The new customer-growth forecast follows:

Year	2008	2009	2010	2011	2012	2013
Customers	1447	1564	1848	2330	2601	2630

11 However, it is important to note that not all these customers will be subject to the
12 increased water-facilities hook-up fee. Many of the customers that will be added to the
13 system will be grandfathered, primarily because the associated on-site facilities were
14 completed before the effective date of the new tariff.

15 **Q. WHAT IS THE UPDATED FORECAST OF CUSTOMERS THAT WILL**
16 **ACTUALLY BE SUBJECT TO THE INCREASED HOOK-UP FEE?**

17 A. The forecast of new customers that will actually be subject to the increased hook-up fee
18 follows:

Year	2008	2009	2010	2011	2012	2013
Customers	134	615	764	1030	1031	2180

19 Mr. Broderick's Exhibit TMB-4 uses this lower forecast to project the proceeds that will
20 be available to fund the White Tanks Plant and for other purposes.

1 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

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

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
JEFF HATCH-MILLER
WILLIAM A. MUNDELL
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
BRADLEY J. COLE
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
BRADLEY J. COLE
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

I	INTRODUCTION	1
II	PURPOSE OF TESTIMONY	3
III	WATER DISTRICTS.....	3
A	AGUA FRIA WATER DISTRICT	3
B	HAVASU WATER DISTRICT	6
C	MOHAVE WATER DISTRICT	6
D	PARADISE VALLEY WATER DISTRICT	9
E	SUN CITY WEST WATER DISTRICT	11
F	TUBAC WATER DISTRICT	12
G	COMMON WATER ISSUES	14
1	Tank Maintenance.....	14
2	Chemicals.....	16
3	Service Line, Meter Installation, Meter Test Charges and After-hour Connection Charges	16
IV	MOHAVE WASTEWATER	19
V	SUN CITY WATER DISTRICT ANNUAL FIRE HYDRANT INSPECTION COMPLIANCE REPORT	20

EXHIBIT BJC-1 – Estimated White Tanks Deferred O&M Costs.

EXHIBIT BJC-2 – Letter Denying Request for an Arsenic Compliance Exemption.

EXHIBIT BJC-3 – Tank Maintenance Schedule

EXHIBIT BJC-4 – Estimated Service Line and Meter Installation Charges

1 **EXECUTIVE SUMMARY**
2

3 Bradley J. Cole testifies as follows:
4

5 **Water District Descriptions**

6 Mr. Cole first describes the service areas and facilities for each of Arizona-American's six water
7 districts that are included in this case: Agua Fria Water; Havasu Water; Mohave Water; Paradise
8 Valley Water; Sun City West Water and Tubac Water.
9

10 **White Tanks Deferred O&M Recovery**

11 Mr. Cole supports Mr. Broderick's request for a mechanism to recover deferred first-year O&M
12 costs for the White Tanks Regional Treatment Facility. Exhibit BJC-1 estimates these costs.
13

14 **Tubac Arsenic-Treatment Facility**

15 Mr. Cole discusses the need for an arsenic-treatment facility for the Tubac Water District.
16 Exhibit BJC-2 is a copy of a January 18, 2008 letter from the U.S. Environmental Protection
17 Agency, which denied Arizona-American's request for an exemption from the new federal
18 arsenic standard.
19

20 **Storage-Tank Maintenance Program**

21 Mr. Cole discusses Arizona-American's new storage-tank maintenance program and supports
22 Ms. Hubbard's request to fund this program. Exhibit BJC-3 provides the cost and schedule of all
23 tanks scheduled for maintenance in the districts.
24

25 **Chemicals**

26 Mr. Cole explains why chemical expenses have increased in recent years. The first reason is the
27 chemical cost has risen from year-to-year, typically tracking the Consumer Price Index. Second,
28 we are now operating arsenic-treatment facilities located in the Agua Fria, Havasu, Sun City
29 West and Paradise Valley water districts. New chemicals used in these facilities include Ferric
30 Chloride, Polymer, Sodium Chloride, Sodium Hydroxide, Sodium Hypochlorite, and Sulfuric
31 Acid. The third and final reason is growth, particularly in the Agua Fria and Mohave Water
32 districts.
33

34 **Service Charges**

35 Mr. Cole explains why Arizona-American proposes to increase various service charges:

- 36 1. For the Agua Fria, Havasu, Mohave, Paradise Valley, Sun City West water districts,
37 Arizona-American proposes to increase the service and meter-installation fees for meters
38 1 ½-inch or smaller from \$660 to the amounts consistent with Staff's recommendations;
39 2. Revise its service and meter-installation fees for meter size 2-inch or larger from \$660 to
40 the actual cost of installing the service line and meters (Exhibit BJC-4 details the cost
41 estimates for installing service lines and meter);
42 3. Increase its meter-test charge to \$81 per meter; and
43 4. Standardize its after-hours reconnect charge in each district at \$90.00.
44

45 **Mohave Wastewater**

1 Mr. Cole describes the service areas and facilities for Arizona-American's Mohave Wastewater
2 District.

3

4

Sun City Water - Fire Hydrant Inspection

5 Mr. Cole supports Arizona-American's request to terminate the annual fire-hydrant inspection
6 compliance report requirement for the Sun City Water District.

1 **I INTRODUCTION**

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

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

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

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

11 **Q. WHAT ARE YOUR RESPONSIBILITIES AS THE DIRECTOR OF**
12 **OPERATIONS?**

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

15 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

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

22 I am also an Arizona Department of Environmental Quality ("ADEQ") Grade III Water
23 Distribution System Operator and a Grade II Water Treatment Plant Operator (#22916).

1 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

2 A. I have been employed by Arizona-American for approximately three years and in my
3 present capacity as the Director of Operations for Central Arizona for the past ten
4 months. As the Director of Operations, I oversee and manage Arizona-American's water
5 and wastewater services in the Sun City, Sun City West, and Agua Fria districts. Prior to
6 becoming the Director of Operations, I was employed as the General Manager of
7 Arizona-American's Eastern Operations for a period of two years, and my responsibilities
8 included overseeing the water and wastewater operations in the communities of Tubac,
9 Paradise Valley, Anthem, Bullhead City, and Lake Havasu. Prior to becoming the
10 General Manager of Arizona-American's Eastern Division, I held the role of Arizona
11 Production Manager overseeing Arizona-American's water and wastewater treatment
12 plants in the communities of Sun City, Paradise Valley, and Anthem.

13 Prior to my employment with Arizona-American, I was employed for nearly 15 years by
14 California-American Water Company ("California-American"). Like Arizona-American,
15 California-American is a subsidiary of American Water. Before being promoted and
16 transferred to the Arizona-American operations as the Production Manager, I held the
17 position of Operations Manager for almost three years in California-American's Ventura
18 County operations located in the City of Thousand Oaks. Before that, I held the position
19 of Operations Supervisor for nearly four years and the remainder of my prior experience
20 with California-American included the positions of Laborer, Utility Worker, and
21 Distribution Clerk.

22 **Q. DO YOU HAVE ANY PROFESSIONAL AFFILIATIONS?**

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

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE ANY REGULATORY**
2 **UTILITY COMMISSION?**

3 A. Yes. I sponsored testimony and testified in Arizona-American's Anthem/Agua Fria
4 water and wastewater rate case (Docket No. WS-01303A-06-0405), Arizona-American's
5 Mohave Water and Wastewater rate case (Docket No. WS-01303A-06-0014), and
6 Arizona-American's Sun City Water rate case (Docket No. W-01303A-07-0209).

7 **II PURPOSE OF TESTIMONY**

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

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

10 **III WATER DISTRICTS**

11 **A AGUA FRIA WATER DISTRICT**

12 **Q. PLEASE DESCRIBE THE AGUA FRIA WATER DISTRICT**

13 A. Arizona-American's Agua Fria Water service area ("Agua Fria Water") comprises
14 approximately 70 square miles located in Maricopa County. It is bounded by Grand
15 Avenue/US Route 60 on the north, McDowell Road/Interstate 10 on the south, State
16 Route 303 and Reems Road on the east, and the Beardsley Canal/Perryville Road to the
17 west. The system also includes the Verrado Development, which is bounded by Northern
18 Avenue and Glendale Avenues on the north, US Route 10 on the south, Tuthill Road on
19 the east, and 235th Avenue and 227th Avenues on the west.

20 The service area includes portions of unincorporated Maricopa County, the City of
21 Surprise, the City of Goodyear, the Town of Buckeye and the City of Glendale.

22 A majority of the service area is still undeveloped. Within the developed area, the land
23 use is predominantly residential. Most of the existing commercial use in the north is
24 comprised of strip malls along Grand Avenue. The central portion of the service area

1 consists of large, irrigated lots and agricultural land that is rapidly being replaced by
2 residential developments. Luke Air Force Base is located in the southeast part of the
3 service area. The area of high noise contours surrounding Luke Air Force Base is
4 restricted to non-residential use.

5 At the end of 2007 there were approximately 33,000 service connections in the Agua Fria
6 Water District. In 2007, we saw an increase of approximately 2,300 new service
7 connections, which is down from previous year's growth during the recent real-estate
8 boom. We expect continued slow growth for the next couple of years.

9 At build out, the number of service connections in the Agua Fria Water District should
10 approach 90,000 with an average annual daily production of 43 million gallons per day.

11 **Q. PLEASE DESCRIBE THE AGUA FRIA WATER DISTRICT'S PRODUCTION,**
12 **TREATMENT, AND DISTRIBUTION SYSTEM.**

13 **A.** There are 38 groundwater production wells in the district. In 2007, we pumped over 5.8
14 billion gallons of water from Arizona-American owned wells and purchased nearly 146
15 million gallons from other sources. At present, there are approximately 3,888,835 linear
16 feet of water mains (736.52 miles), 6,120 fire hydrants, and 15,342 gate valves. The
17 district's 15 water tanks provide over 18 million gallons of storage. Other than
18 chlorination, most wells do not require water treatment. The district provides arsenic
19 removal at four locations: Agua Fria Water Plants 1, 2, and 5, and at Agua Fria Trunk
20 Line Well No. 1. Each location uses an absorptive media technology that effectively
21 removes arsenic from the water before it enters the distribution system.

22 **Q. HOW MANY PEOPLE ARE CURRENTLY CHARGED WITH OPERATING**
23 **THE WATER FACILITIES OF THE AGUA FRIA WATER SYSTEM?**

1 A. There are four water operators dedicated to operating Agua Fria Water's 38 wells,
2 booster stations and water storage facilities, with assistance from Sun City and Sun City
3 West operators from time to time. In addition to the operators, Agua Fria Water also
4 shares with the Sun City and Sun City West Water Districts a pool of 12 maintenance
5 operators, three line locators, eleven meter readers, eight field customer-service
6 representatives, 12 utility workers and dedicated supervisory and supportive management
7 staff. When the pooled employees work on Agua Fria Water-related matters, they
8 appropriately charge their time and expenses to that district. Arizona-American's ability
9 to share employees among three districts allows Arizona-American to reduce expenses
10 without compromising the high quality of service we provide to customers in Sun City,
11 Sun City West and Agua Fria Water Districts.

12 **Q. DOES ARIZONA-AMERICAN PROPOSE A MECHANISM TO DEFER AND**
13 **RECOVER OPERATIONS AND MAINTENANCE EXPENSES ASSOCIATED**
14 **WITH THE WHITE TANKS PLANT UNTIL SUCH EXPENSES CAN BE**
15 **PLACED IN RATE BASE?**

16 A. Yes. Mr. Gross discusses the planned White Tanks Plant and how it will serve Agua Fria
17 customers by treating renewable surface-water resources. Mr. Broderick proposes a
18 mechanism to recover the deferred White Tanks Plant first-year O&M costs. Exhibit
19 BJC-1, which was done under my supervision in September of 2007, estimates these
20 costs to be \$1.927 million.

21 **Q. HOW DID YOU ESTIMATE THE WHITE TANKS PLANT-RELATED**
22 **OPERATIONS AND MAINTENANCE EXPENSE?**

23 A. The labor-related expenses in Exhibit BJC-1 consist of the estimated salaries, benefits,
24 and training expenses for six full-time employees dedicated to the operation of the White

1 Tanks Plant. The estimated non-labor O&M costs, such as chemical and power costs, are
2 based on treatment capacity of 13.5 MGD.

3 **B HAVASU WATER DISTRICT**

4 **Q. PLEASE DESCRIBE THE HAVASU WATER DISTRICT?**

5 A. The Havasu Water District covers approximately 3,486 acres (5.45 square miles).
6 Topography within the area currently serviced ranges in elevation from 475-770 feet. The
7 pipe network consists of approximately 30.8 miles of main, ranging in size from two to
8 16 inches. The Havasu Water District's water production facilities include three
9 production wells, five ground level storage tanks, five booster pump stations, and five
10 pressure regulating valves.

11 **Q. HOW MANY EMPLOYEES ARE CURRENTLY PROVIDING SERVICE TO**
12 **THE HAVASU WATER DISTRICT?**

13 A. There are currently three employees providing service to the 1,525 customers in the
14 Havasu Water. One employee was brought on-board in 2007 to help operate and
15 maintain the water distribution system, its wells, pumps, and its new arsenic removal
16 facility. We do not plan to bring on any new other employees in the near future.

17 **C MOHAVE WATER DISTRICT**

18 **Q. PLEASE DESCRIBE THE MOHAVE WATER DISTRICT.**

19 A. The Mohave Water District is located within Bullhead City and unincorporated areas of
20 Mohave County. The overall service area covers approximately 17,397 acres (27.19
21 square miles). There are approximately 15,800 customers in the district. The topography
22 within the service area ranges in elevation from 590-1,260 feet. The Mohave Water
23 District has one operating center and five separate water systems:

- 1 • The Bullhead City water system (PWS # 08-032), also known as the Main System,
2 serves a majority of the Bullhead City area in Mohave County, with a certificated
3 area of approximately 25 square-miles.
- 4 • The Camp Mohave water system (PWS # 08-037) serves an unincorporated portion of
5 southern Bullhead City, Mohave County, with a 0.5 square-mile certificated area.
- 6 • Lake Mohave Highlands system (PWS # 08-062) serves an area located to the north
7 of the main Bullhead City service area, with a service area of approximately 0.6
8 square miles.
- 9 • Desert Foothills system (PWS # 08-137) serves an area in the northwest corner of the
10 main Bullhead City service area, with a service area of approximately 0.6 square
11 miles.
- 12 • Rio Vista Ranches system (PWS # 08-333) serves a subdivision in southern Bullhead
13 City, Mohave County, with a 0.5 square-mile certificated area.

14 **Q. PLEASE DESCRIBE THE MOHAVE WATER DISTRICT'S WATER**
15 **PRODUCTION, TREATMENT, AND DISTRIBUTION SYSTEM.**

16 **A.** The five systems within the Mohave water are not interconnected; each has its own water
17 production, storage, and distribution facilities. All of Mohave Water's water is provided
18 from wells. The terrain of this service territory is varied, rocky and desert; thus,
19 maintaining proper pressure in the many pressure zones is the primary operational
20 challenge. The water distribution system consists of approximately 199.7 miles of main,
21 ranging in size from 2-inches to 18-inches. The only treatment provided in the Mohave
22 Water system is in the form of chlorination before the water enters the distribution
23 system.

24 The Bullhead City system consists of six groundwater production wells, ten storage
25 tanks, two booster station sites, and a distribution system serving 14,300 customers. The

1 storage tanks provide a combination of both gravity and pumped storage for the system.
2 There are currently 3.2 Million Gallons ("MG") of gravity storage and 1.48 MG of
3 pumped storage in the Main System. There are currently no emergency interconnections
4 with other water purveyors to supplement the supply from the wells.

5 The Camp Mohave system has one pumping site consisting of a well, storage tank,
6 pumping facilities and a distribution system serving 97 customers. This system is
7 interconnected with Bermuda Water Company.

8 The Lake Mohave Highlands system has two production wells, three ground storage
9 tanks, three booster pump stations, and a distribution network serving 249 customers. The
10 storage tanks provide pumped storage for the system with total volume of 0.49 MG. This
11 system has an emergency tie-in through a 4-inch meter with North Mohave Valley Water
12 Company.

13 The Desert Foothills system is supplied by one production well, two storage tanks, two
14 booster pump stations,, and a distribution network serving 1,028 customers. The storage
15 tanks provide a combination of both gravity and pumped storage for the system with a
16 total volume of 0.5 MG.

17 The Rio Vista Ranches receives its water from the Bermuda Water Company. This
18 system only has a distribution system serving approximately 97 customers.

19 **Q. HOW MANY EMPLOYEES ARE CURRENTLY CHARGED WITH**
20 **OPERATING THE MOHAVE WATER SYSTEM?**

21 There are 15 employees who operate and maintain, read meters, and provide customer
22 service to more than 15,800 customers in the Mohave Water.

1 **D PARADISE VALLEY WATER DISTRICT**

2 **Q. PLEASE DESCRIBE THE PARADISE VALLEY WATER DISTRICT.**

3 A. The Paradise Valley District is located in Maricopa County. It serves approximately half
4 of the Town of Paradise Valley and portions of the City of Scottsdale. There are
5 approximately 4,750 customers in the district.

6 **Q. PLEASE DESCRIBE PARADISE VALLEY'S WATER PRODUCTION,
7 TREATMENT, AND DISTRIBUTION SYSTEM.**

8 A. Our Paradise Valley customers currently receive treated water from six wells located on
9 the eastern edge of the service area. The wells range in depth from 1,000 to 1,740 feet
10 and have flow rates from 1,300 to 2,500 gallons per minute. The distribution system,
11 which covers about 8.5 square miles, consists of approximately 121 miles of mains
12 ranging in size from two to thirty inches in diameter. The system has nine pressure zones
13 due to the varying elevations in the service area. The combined capacity of the thirteen
14 ground storage tanks is 4.529 million gallons.

15 All the water from our Paradise Valley wells is pumped to the Paradise Valley Arsenic
16 Removal Facility ("PVARF") for chlorination, storage, and arsenic-removal treatment.

17 **Q. HOW DOES THE PVARF REMOVE ARSENIC FROM PARADISE VALLEY'S
18 WATER SUPPLY?**

19 A. The PVARF entered service in September 2006 and treats water to satisfy the new federal
20 drinking-water standard of 10 micrograms per liter. The PVARF utilizes a
21 coagulation/filtration process to reduce the arsenic concentration in the drinking water
22 supply. Ferric chloride is used to adsorb the arsenic in the raw water. The arsenic is then
23 captured in the granular media, where it is settled out as sludge, dewatered with a plate
24 filter press, and hauled off to a landfill.

1 **Q. WILL ARIZONA-AMERICAN USE THE PCX-1 WELL TO SUPPLY WATER IN**
2 **THE PARADISE VALLEY WATER DISTRICT?**

3 A. No. As discussed by Mr. Lenderking, Arizona-American Water permanently
4 disconnected the PCX-1 well in January, so water from that well will no longer be used
5 to serve our customers

6 **Q. HOW MANY EMPLOYEES CURRENTLY OPERATE THE PARADISE**
7 **VALLEY WATER SYSTEM?**

8 A. There are 14 employees who operate and maintain the water distribution system, PVARF,
9 wells, booster stations, and MRTF. In addition, these employees also read meters and
10 provide customer service.

11 **Q. DOES ARIZONA-AMERICAN INCLUDE ANY POST-TEST-YEAR PLANT IN**
12 **SERVICE IN THIS APPLICATION?**

13 A. Yes, Arizona-American proposes to include in its rate base the replacement well for the
14 existing Well No. 12 and a new turbine for Well No. 17. The Well No. 12 replacement
15 will be in service by December 2008 and Well No.17 will be online by summer 2008.
16 Please see page 12 of Paradise Valley's Schedule B for the post-test rate base adjustment
17 relating to Well Nos. 12 and 17.

18 **Q. WHY IS ARIZONA-AMERICAN REPLACING WELL NO. 12?**

19 A. As stated by Mr. Gross, Well No. 12 is being replaced due to a failure in its casing, which
20 restricted its production to approximately 50% of the original 2200 gallons per minute.
21 Well No. 12 has been in service since 1962 and was scheduled for replacement in 2009 -
22 2010, however, due to the need to meet customer demands in summer 2009 and regain its
23 original production capacity, we have moved up the planned replacement. The

1 permitting process began in April 2008 and the well replacement should be completed by
2 December 2008. The approximate replacement cost is \$1,930,000.

3 **Q. WHY IS ARIZONA-AMERICAN REPLACING THE PUMP FOR WELL NO. 17?**

4 **A.** This is a capital project to replace the aging submersible pump with a new turbine. The
5 replacement is necessary because submersible pump parts are difficult to find and it takes
6 twice as long to repair as a turbine. It also takes 7 to 10 weeks to find a replacement if
7 the submersible pump needs to be replaced entirely.

8 **Q. ARE THE REPLACEMENT WELLS INTENDED TO SERVE ANY NEW**
9 **GROWTH?**

10 **A.** No. The Paradise Valley Water District experiences very minimal growth. The
11 replacement wells are needed to meet the current customers' demands.

12 **E SUN CITY WEST WATER DISTRICT**

13 **Q. PLEASE DESCRIBE THE SUN CITY WEST WATER DISTRICT.**

14 **A.** The Sun City West Water District is located in the northwest portion of the Phoenix
15 metropolitan area, Maricopa County, and provides water service to approximately 15,400
16 customers in the unincorporated community of Sun City West. The certificated area is
17 substantially built-out, with only minor in-fill growth occurring.

18 **Q. PLEASE DESCRIBE THE SUN CITY WEST WATER DISTRICT'S**
19 **PRODUCTION AND DISTRIBUTION SYSTEM.**

20 **A.** The water distribution system consists of 1,003,254 linear feet (195 miles) of water
21 distribution mains, with 1,142 fire hydrants, and over 2,600 gate vales. Ten wells feed
22 two water plants (combination booster stations and water tanks). Located at each of the
23 two water plants are two water tanks with a total combined storage capacity of 4.0
24 million gallons.

1 The Sun City West Water District is located in the Phoenix Active Management Area.
2 The primary source of supply is groundwater withdrawn from wells within its certificated
3 service territory and recovered CAP water. Arizona-American acquired, as part of the
4 Citizen's acquisition, contracts for the delivery of 2,372 acre-feet CAP water. The CAP
5 water is delivered to the Maricopa County Municipal Water Conservation District
6 Number One ("MWD") Groundwater Saving Facility and legally recovered from
7 Arizona-American's wells in the district.

8 **Q. HOW MANY EMPLOYEES ARE CURRENTLY CHARGED WITH**
9 **OPERATING THE SUN CITY WEST WATER SYSTEM?**

10 **A.** There are five dedicated water operators operating the district's production facilities, with
11 additional assistance from Sun City Water and Agua Fria Water operators from time to
12 time. Sun City West also shares with the Agua Fria Water and Sun City Water districts a
13 pool of 12 maintenance operators, three line locators, eleven meter readers, eight field
14 customer service representatives, 12 utility workers, and dedicated supervisory and
15 supportive management staff. When these employees work on Sun City West-related
16 matters, they appropriately charge their time and expenses to that district. Arizona-
17 American's ability to share employees among three districts reduces expenses without
18 compromising our high quality of service.

19 **F TUBAC WATER DISTRICT**

20 **Q. PLEASE DESCRIBE THE TUBAC WATER DISTRICT.**

21 **A.** The Tubac Water District is located in Santa Cruz County in the southern Arizona.

22 **Q. PLEASE DESCRIBE THE TUBAC WATER DISTRICT'S PRODUCTION AND**
23 **DISTRIBUTION SYSTEM.**

1 A. Tubac Water provides water to 535 customers in three difference pressure zones. The
2 water is pumped from four groundwater wells and disinfected with sodium hypochlorite.
3 The treated water is then delivered to our customers.

4 **Q. DOES TUBAC WATER'S WATER SUPPLY MEET THE FEDERAL ARSENIC**
5 **STANDARD?**

6 A. No. As the Commission knows, the new federal standard for arsenic is 10 µg/L.
7 Unfortunately, Tubac Water's running annual average for the fourth quarter of 2007 was
8 31 µg/L.

9 **Q. DID ARIZONA-AMERICAN SEEK AN EXEMPTION FROM THE ARSENIC**
10 **STANDARD?**

11 A. Yes. At the urging of our Tubac customers, Arizona-American sought to delay
12 enforcement and gain an exemption from the arsenic standard. Exhibit BJC-2 is a copy
13 of a January 18, 2008, letter from the U.S. Environmental Protection Agency, which
14 denied our request for an exemption. We are now required to provide drinking water that
15 meets the 10 µg/L arsenic standard.

16 **Q. WHAT DOES ARIZONA-AMERICAN PLAN TO DO TO MEET THE FEDERAL**
17 **ARSENIC STANDARD?**

18 A. As discussed by Mr. Gross, Arizona-American plans to build an arsenic-removal facility,
19 which was originally designed in 2004. To reduce the capital investment in the facility,
20 Arizona-American now plans to partner with the developer of the Tubac Marketplace, a
21 commercial project in the downtown area.

22 **Q. HAS ARIZONA-AMERICAN SOUGHT OTHER SOLUTIONS TO RESOLVE**
23 **THE ARSENIC ISSUE IN TUBAC?**

1 A. Yes. In 2004, we designed an arsenic-removal facility after considering seven different
2 treatment technologies and selecting the absorptive media technology. At that time, there
3 was significant opposition by the citizens of Tubac due to the potential rate impact and
4 site location. We decided to halt the construction of the arsenic-removal facility while
5 exploring other possible alternatives. First and foremost, we worked with ADEQ on
6 getting an exemption from the rule. Unfortunately, ADEQ failed to grant the exemption.

7 Second, we investigated Point-of-Use ("POU") devices, which would be located at the
8 customer's premises. We determined that this alternative was not cost effective. There
9 are too many customers, such as a school and various restaurants, that would require
10 specially fabricated devices. With over 500 other customers, a POU solution would not
11 be affordable and manageable. Furthermore, while a POU solution has a lower capital
12 costs, the operation and maintenance costs are significantly higher. Over time the option
13 with the higher O&M costs will eventually eclipse the option with the higher capital cost.

14 Third, we also looked at the possibility of blending the water with other nearby sources of
15 water with low arsenic level. This option would not work because there was not enough
16 low-arsenic water source within or near the Tubac area to blend with.

17 **Q. HOW MANY EMPLOYEES ARE CURRENTLY OPERATING THE TUBAC**
18 **WATER SYSTEM?**

19 There are currently two full-time employees who work for in the district, performing
20 system operations and maintenance, meter reading, and customer service. There are no
21 immediate plans to increase staffing levels.

22 **G COMMON WATER ISSUES**
23 **1 Tank Maintenance**

24 **Q. WHAT IS ARIZONA-AMERICAN'S TANK MAINTENACE STRATEGY?**

1 A. Arizona-American's strategy for tank maintenance is to provide the right maintenance for
2 the right tank at the right time. The program's objective is to extend the life of the asset
3 and avoid costly repairs or replacements. To achieve this strategy, Arizona-American
4 established a ten-year tank maintenance program beginning 2009. Maintenance needs,
5 which can include repainting the interior or exterior surfaces, structural repairs, and
6 cathodic protection, are typically identified through routine inspection schedules. We
7 typically plan on repainting the tanks every ten years, but inspection results can either
8 accelerate or push back planned maintenance. For example, if a tank was last painted ten
9 years ago and the inspection results provided that repainting can be delayed another three
10 years, we will do so. That goes toward providing the right maintenance on the right tank
11 at the right time.

12 We try to program the maintenance activities over a ten-year period to avoid expense
13 shock to any single particular district. In doing this, we might only program these
14 expensive maintenance activities on two or three tanks a year so that the total cost of the
15 program for all tanks is spread out over a ten-year period. It would be very costly to any
16 single district if all of its tanks were maintained in one year.

17 **Q. WHAT ARE THE TEN-YEAR TANK MAINTENANCE SCHEDULES FOR THE**
18 **AGUA FRIA, HAVASU, MOHAVE, PARADISE VALLEY, SUN CITY WEST**
19 **AND TUBAC WATER DISTRICTS?**

20 A. Exhibit BJC-3 provides the cost and schedule of all tanks scheduled for maintenance in
21 the districts.

22 **Q. HOW DOES ARIZONA-AMERICAN PROPOSE TO FUND THE SCHEDULED**
23 **TANK MAINTENANCE?**

1 A. It is very difficult to annualize the cost of the ten-year maintenance schedule because we
2 often adjust the schedule based on the condition the tanks. As I stated earlier, our regular
3 inspections of our tanks may reveal certain tank conditions requiring acceleration or
4 delay of planned maintenance. The tank maintenance reserve account proposed by Ms.
5 Hubbard is an appropriate way to fund the ten-year maintenance plan.

6 **2 Chemicals**

7 **Q. WHAT HAS HAPPENED TO CHEMICAL EXPENSE IN RECENT YEARS?**

8 A. Chemical expenses have increased, for three primary reasons. The first reason is the cost
9 of chemicals has risen from year-to-year, typically tracking the Consumer Price Index.
10 Second, we are now operating arsenic-treatment facilities located in the Agua Fria,
11 Havasu, Sun City West and Paradise Valley water districts. New chemicals used in these
12 facilities include Ferric Chloride, Polymer, Sodium Chloride, Sodium Hydroxide,
13 Sodium Hypochlorite, and Sulfuric Acid. The third and final reason is growth,
14 particularly in the Agua Fria and Mohave Water districts. As our customer base has
15 increased, we have had to treat more water and there use more chemicals

16 **3 Service Line, Meter Installation, Meter Test Charges and After-Hour**
17 **Connection Charges**

18 **Q. IS ARIZONA-AMERICAN ASKING TO INCREASE SERVICE AND METER-**
19 **INSTALLATION FEES?**

20 A. Yes. For the Agua Fria, Havasu, Mohave, Paradise Valley, and Sun City West water
21 districts, Arizona-American proposes to increase the service and meter-installation fees
22 for meters 1 ½-inch or smaller from \$660 to the amounts consistent with Staff's
23 recommendations (Staff Memorandum Re: Update Of State's Typical Service Line And
24 Meter Installation Charges, dated February 21, 2008), and from \$660 to the actual cost of
25 installing the service line and meters for meter 2-inch or larger.

1 **Q. WHAT IS THE ESTIMATED COST OF INSTALLING SERVICE LINES AND**
2 **METERS?**

3 A. The cost of installing a 20-foot service line in an established area with paved streets is
4 approximately \$4,130 to \$5,700, depending on factors such as whether we use outside
5 contractors or in-house labor, and whether re-paving is required.

6 **Q. WHAT ARE THE PROPOSED SERVICE AND METER INSTALLATION,**
7 **METER TESTING, AND ESTABLISHMENT CHARGES?**

8 A. Please see Exhibit BJC-4, which details the cost estimates for installing service lines and
9 meter. We are asking to modify the existing Service Line and Meter Installation Charge
10 to obtain full-cost payment from the customer as an advance in aid of construction. The
11 tariff should be changed to read "An applicant for water service shall pay to the
12 Company, as a refundable advance in aid of construction, the full cost to provide the new
13 service line and meter." The Company would provide an up-front cost estimate for each
14 project and then provide a true-up against actual costs once the project is completed.

15 **Q. IS ARIZONA-AMERICAN ASKING TO INCREASE THE SERVICE LINE AND**
16 **METER CHARGES FOR ITS SUN CITY WATER DISTRICT?**

17 A. No. The Sun City Water District is not part of this case. Further, it is a built-out district
18 with very few new connections. If necessary, we can revise the Sun City Water District's
19 Service Line, Meter, and Service Charges in a future rate case.

20 **Q. IS ARIZONA-AMERICAN ASKING FOR NEW METER-TEST CHARGES?**

21 A. Yes. Arizona-American asks to raise the meter test charge to \$81 per meter. The current
22 meter-test charge is \$10 for our Agua Fria, Sun City, and Sun City West water districts,
23 and \$15 for our Paradise Valley Water District.

1 **Q. WHY IS ARIZONA-AMERICAN ASKING TO INCREASE ITS METER-TEST**
2 **CHARGES?**

3 A. The current meter test charge only recovers a fraction of the true cost. It takes Arizona-
4 American an average of four-and-one half man-hours to perform this activity and each
5 employee involved in the testing earns approximately \$18.00/hour in wages and benefits.
6 Therefore, the cost of doing a meter testing is approximately \$81.

7 **Q. IS ARIZONA-AMERICAN ASKING FOR NEW AFTER-HOUR**
8 **RECONNECTION CHARGES?**

9 A. Yes. Commission Rule 14-2-403-D authorizes a water utility to charge an after-hour
10 charge for a service connection/reconnection. Currently, the approved after-hours
11 reconnection charges range from \$35.00 in our Havasu Water District to \$90.00 in our
12 Anthem Water District, although the costs to provide this service should not vary
13 significantly.

14 We typically turn off service for nonpayment of utility bills typically during normal
15 business hours. Therefore, the reconnection requests typically arrive after 5:00 pm when
16 the customer has returned home for the day. If the customer wants to reconnect service
17 that evening, we have to call someone in to return back to work, on overtime pay, to
18 make the service reconnection. Because an employee is paid at 1.5 times his regular pay
19 and the process takes as much as two hours to complete, it makes sense to raise the after-
20 hours reconnect charge in each district to the level set in the Anthem water tariff - \$90.00.
21 This would provide consistency among the six water districts, discourage late payments
22 of bills, discourage after-hours reconnects, and provide for a full-cost recovery of direct
23 labor expenses incurred plus overhead.

1 **IV MOHAVE WASTEWATER**

2 **Q. PLEASE BRIEFLY DESCRIBE THE MOHAVE WASTEWATER DISTRICT?**

3 A. The Mohave Wastewater System is comprised of two distinct service areas located in
4 Mohave Valley and at the Arizona Gateway development. The Mohave Valley area is
5 served by our Wishing Wells Treatment Plant, located south of Bullhead City. This is a
6 250,000 gpd extended aeration plant that serves a collection system. As discussed by Mr.
7 Gross, the plant is being expanded to 500,000 gpd. The treatment process consists of
8 influent entering into the headworks, aeration basin and clarifier tanks, aerobic digester,
9 trickling filters, and a chlorine contact tank. The treated effluent is then disposed into
10 ponds on a golf course, where it is used primarily for turf irrigation. The Mohave Valley
11 service area is approximately 3.5 square-miles.

12 Arizona Gateway Treatment Plant ("Gateway Plant") is located at the intersection of
13 Highway 95 and Interstate 40 and is approximately 12 miles north of Lake Havasu City.
14 The Gateway Plant is an underground 112,000 gpd extended aeration plant that serves a
15 collection system for a commercial development block that includes a truck stop, fast-
16 food chains, a gas station, storage buildings, and other structures. Influent enters into a
17 flow-equalization basin, and is treated in two separate train aeration reactors with a
18 sludge holding tank. The effluent is then disinfected using chlorination/de-chlorination
19 and disposed into an evaporation pond located within the compound of the treatment
20 plant site. This service area is approximately 0.25 square-miles.

21 **Q. HOW MANY EMPLOYEES ARE CURRENTLY OPERATING THE MOHAVE**
22 **WASTEWATER DISTRICT?**

23 A. At present, there is only one employee that operates and maintains the Wishing Well
24 Wastewater Treatment Plant and associated sewer collection system. If needed,
25 additional support is provided by Water Operators from the Mohave Water system.

1 Periodic sewer main cleaning and inspection services are provided from the Sun City
2 staff on an as-needed basis.

3 **V SUN CITY WATER DISTRICT ANNUAL FIRE HYDRANT INSPECTION**
4 **COMPLIANCE REPORT**

5 **Q. ARE YOU PROPOSING TO TERMINATE THE ANNUAL FIRE HYDRANT**
6 **INSPECTION COMPLIANCE REPORT REQUIREMENT FOR THE SUN CITY**
7 **WATER DISTRICT?**

8 **A.** Yes. In Decision 67093, the Commission ordered Arizona-American, in conjunction
9 with the fire department serving Youngtown and Sun City, to test the fire hydrants in the
10 Sun City Water District, and file annual reports detailing whether the hydrants are
11 operational. Arizona-American submitted inspection schedules for all the fire hydrants in
12 the Sun City Water District in the past three years and all are operational. Therefore, the
13 annual inspection requirement is no longer needed. Furthermore, Arizona-American
14 commits to assist the fire department to ensure that hydrants within our service territories
15 are operational.

16 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

17 **A.** Yes.

WHITE TANKS REGIONAL WATER TREATMENT PLANT
 ESTIMATED O&M COSTS

	Operating Period											BUDGET		
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		2020	2021
LABOR														
500101 Direct Salaries	\$172,963	\$388,422	\$388,030	\$395,791	\$403,707	\$411,761	\$420,016	\$428,417	\$436,985	\$445,639	\$454,332	\$463,073	\$471,857	\$480,684
500136 Project Manager (CAPITAL)														
500111 Overtime	\$27,927	\$28,468	\$29,056	\$29,637	\$30,230	\$30,834	\$31,451	\$32,080	\$32,721	\$33,376	\$34,043	\$34,724	\$35,419	\$36,127
500107 Bonuses														
500107 Benefits	\$132,212	\$154,856	\$157,553	\$160,304	\$163,107	\$165,973	\$168,892	\$171,864	\$174,887	\$177,961	\$181,085	\$184,258	\$187,481	\$190,753
Task 001 Other	\$533,102	\$645,764	\$694,533	\$745,732	\$797,047	\$850,598	\$906,359	\$964,387	\$1,024,784	\$1,086,648	\$1,151,085	\$1,218,112	\$1,287,740	\$1,359,967
500304 Auto Rentals	\$178	\$732	\$747	\$762	\$777	\$793	\$808	\$825	\$841	\$858	\$875	\$893	\$910	\$928
500352 Rewards and Recognition	\$187	\$191	\$195	\$198	\$203	\$207	\$212	\$217	\$222	\$228	\$233	\$238	\$243	\$248
500305 Meals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500310 Air Travel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500306 Auto Mileage	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500303 Lodging	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500307 Special Functions	\$208	\$212	\$216	\$221	\$226	\$230	\$234	\$239	\$244	\$249	\$254	\$259	\$264	\$269
500406 Advertising	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500521 Vehicle Expense	\$2,447	\$2,903	\$2,982	\$3,021	\$3,061	\$3,103	\$3,146	\$3,190	\$3,235	\$3,281	\$3,328	\$3,376	\$3,424	\$3,473
500520 Leased Auto Expense	\$15,908	\$15,918	\$16,238	\$16,591	\$16,982	\$17,420	\$17,915	\$18,466	\$19,075	\$19,744	\$20,474	\$21,266	\$22,121	\$23,041
500401 Telephone and Telemetry	\$5,626	\$5,731	\$5,845	\$5,962	\$6,081	\$6,203	\$6,327	\$6,453	\$6,583	\$6,714	\$6,848	\$6,985	\$7,125	\$7,264
500442 Postage and Freight	\$4,054	\$4,125	\$4,202	\$4,282	\$4,364	\$4,448	\$4,534	\$4,622	\$4,712	\$4,804	\$4,898	\$4,994	\$5,091	\$5,189
500308 Other Travel	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500444 Operating Supplies	\$4,054	\$4,135	\$4,218	\$4,301	\$4,386	\$4,472	\$4,559	\$4,648	\$4,738	\$4,829	\$4,921	\$5,014	\$5,108	\$5,203
500571 Other Utilities	\$44,108	\$45,080	\$45,982	\$46,901	\$47,839	\$48,796	\$49,772	\$50,767	\$51,781	\$52,814	\$53,865	\$54,934	\$56,021	\$57,126
500576 Equipment Rental Out	\$4,370	\$4,457	\$4,546	\$4,637	\$4,730	\$4,824	\$4,919	\$5,016	\$5,114	\$5,213	\$5,313	\$5,414	\$5,516	\$5,619
500741 Client Plant & Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500571 Tools	\$1,040	\$1,081	\$1,124	\$1,168	\$1,212	\$1,257	\$1,302	\$1,348	\$1,394	\$1,441	\$1,488	\$1,536	\$1,584	\$1,632
500571 Chemicals	\$704,288	\$716,373	\$732,741	\$747,396	\$762,343	\$777,590	\$793,142	\$809,005	\$825,185	\$841,689	\$858,523	\$875,693	\$893,207	\$911,064
500701 Taxes and Licenses	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500572 Uniforms Expense	\$2,497	\$2,547	\$2,598	\$2,650	\$2,703	\$2,757	\$2,812	\$2,868	\$2,924	\$2,981	\$3,038	\$3,096	\$3,154	\$3,213
500574 Maintenance Supplies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500577 Laboratory Supplies	\$5,202	\$5,306	\$5,412	\$5,520	\$5,631	\$5,743	\$5,858	\$5,975	\$6,095	\$6,217	\$6,341	\$6,468	\$6,597	\$6,728
500578 Safety Supplies	\$1,857	\$1,894	\$1,934	\$1,974	\$2,014	\$2,054	\$2,094	\$2,134	\$2,174	\$2,214	\$2,254	\$2,294	\$2,334	\$2,374
500521 Consultant	\$1,644	\$1,677	\$1,710	\$1,743	\$1,776	\$1,809	\$1,842	\$1,875	\$1,908	\$1,941	\$1,974	\$2,007	\$2,040	\$2,073
500523 Consultants	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500524 Contract Hauling	\$1,644	\$1,677	\$1,710	\$1,743	\$1,776	\$1,809	\$1,842	\$1,875	\$1,908	\$1,941	\$1,974	\$2,007	\$2,040	\$2,073
500529 Contract Lab	\$28,010	\$28,530	\$29,051	\$29,572	\$30,093	\$30,614	\$31,135	\$31,656	\$32,177	\$32,698	\$33,219	\$33,740	\$34,261	\$34,782
500542 Dues and Membership	\$1,248	\$1,273	\$1,298	\$1,323	\$1,348	\$1,373	\$1,398	\$1,423	\$1,448	\$1,473	\$1,498	\$1,523	\$1,548	\$1,573
500544 Books and Publications	\$520	\$531	\$541	\$552	\$563	\$574	\$585	\$596	\$607	\$618	\$629	\$640	\$651	\$662
500545 Training and Tuition	\$1,581	\$1,592	\$1,604	\$1,616	\$1,628	\$1,640	\$1,652	\$1,664	\$1,676	\$1,688	\$1,700	\$1,712	\$1,724	\$1,736
500731 Community Involvement	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500541 Meetings and Conventions	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500445 Insurance Expense	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500582 Natural Gas	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500584 Utility	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500584 UV Royalty	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Task 001 Subtotal	\$827,609	\$844,243	\$861,128	\$878,350	\$895,917	\$913,835	\$932,112	\$950,754	\$969,768	\$989,165	\$1,009,048	\$1,029,327	\$1,049,710	\$1,070,756
Task 008 Solid Waste Disposal														
500501 Vehicle Expense	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500444 Operating Supplies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500576 Equipment Rental Out	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500574 Maintenance Supplies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500577 Fuel Oil	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500528 Outside Services (Tipping fee)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500524 Contract Hauling	\$56,100	\$57,222	\$58,386	\$59,533	\$60,724	\$61,938	\$63,177	\$64,441	\$65,730	\$67,044	\$68,385	\$69,753	\$71,146	\$72,564
Task 008 Subtotal	\$56,100	\$57,222	\$58,386	\$59,533	\$60,724	\$61,938	\$63,177	\$64,441	\$65,730	\$67,044	\$68,385	\$69,753	\$71,146	\$72,564
Task 009	\$69,677	\$9,871	\$10,068	\$10,269	\$10,475	\$10,684	\$10,898	\$11,116	\$11,338	\$11,565	\$11,796	\$12,032	\$12,273	\$12,518
Task 010	\$1,428,968	\$1,455,099	\$1,484,201	\$1,513,685	\$1,544,163	\$1,575,046	\$1,606,547	\$1,638,678	\$1,671,451	\$1,704,880	\$1,738,978	\$1,773,757	\$1,809,233	\$1,845,510
Repairs Budget														
500576 Equipment Rental	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
500578 R&R	\$11,262	\$11,487	\$11,716	\$11,948	\$12,184	\$12,423	\$12,665	\$12,910	\$13,158	\$13,409	\$13,663	\$13,920	\$14,180	\$14,443
500574 Annual Maintenance	\$114,852	\$116,169	\$117,490	\$118,815	\$120,144	\$121,477	\$122,814	\$124,155	\$125,499	\$126,847	\$128,198	\$129,552	\$130,909	\$132,269
500521 Outside Services	\$125,784	\$128,300	\$130,794	\$133,269	\$135,724	\$138,169	\$140,604	\$143,029	\$145,444	\$147,849	\$150,244	\$152,629	\$155,004	\$157,369
Repairs Subtotal	\$252,902	\$257,663	\$259,984	\$262,332	\$264,617	\$266,840	\$269,002	\$271,104	\$273,146	\$275,228	\$277,349	\$279,500	\$281,681	\$283,892
Insurance & Bonding														
LOI for DIB LC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DIB LC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Op's LC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Primary (AMS) Construction Bond	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Subcontractor Bond	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Property Insurance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal - Insurance & Bonding	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Purchases														
CAMS	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Start-up Tools	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Start-up Lab Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
REGIONAL OVERHEAD														
Subtotal - Capital Purchases	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Energy	\$337,325	\$344,071	\$350,853	\$357,672	\$364,531	\$371,434	\$378,383	\$385,376	\$392,414	\$399,492	\$406,611	\$413,770	\$420,970	\$428,211
Budget Subtotal	\$1,889,676	\$1,927,470	\$2,014,948	\$2,102,028	\$2,189,654	\$2,277,824	\$2,366,547	\$2,455,822	\$2,545,651	\$2,636,044	\$2,727,022	\$2,818,595	\$2,910,768	\$3,003,541



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 18 2008

Nina Miller
Environmental Compliance Manager
Arizona American Water Company
19820 N. 7th Street - Suite 201
Phoenix, AZ 85024

Dear Ms. Miller:

We are in receipt of the arsenic exemption request forwarded by the Arizona Department of Environmental Quality (ADEQ) on your behalf for the following public water system:

- Arizona American Water Company, Tubac Public Water System (PWS ID AZ 0412001)

As provided under Section 1416 of the Safe Drinking Water Act, EPA will evaluate the request in accordance with 40 Code of Federal Regulations (CFR) 142.50, Subpart F, Exemptions Issued by the Administrator. We will also coordinate our review with ADEQ to ensure that they are kept informed of the status of your exemption request.

Exemptions are administrative tools that allow eligible water systems additional time to develop long-term strategies to achieve and maintain regulatory compliance while continuing to provide acceptable levels of public health protection. In order for the EPA to consider issuing an exemption, all the following criteria are to be met:

- demonstration of compelling factors;
- demonstration of PWS operational data;
- demonstration of no unreasonable risk to public health;
- demonstration of management or restructuring changes;
- demonstration of taking practicable steps to meet the MCL; and
- demonstration of no existing variance for arsenic.

Our preliminary review indicates that the information provided in the exemption request for the Tubac Public Water System does not support the issuance of a federal exemption for arsenic. Our decision is based on the arsenic analytical result for Well No. 4, reported as 39 parts per billion (ppb), which is above the threshold level of 35 ppb, the level which EPA considers does not pose an unreasonable risk to public health. **Your request for an exemption for the Tubac Public Water System is hereby denied at this time.**

Under the Safe Drinking Water Act, Congress established a timeframe that allows water systems up to five years to comply with new or revised drinking water standards. Under the revised arsenic MCL of 10 ppb, water systems were allowed to operate at levels between 10 ppb and 50 ppb for up to five years after the date of federal promulgation or by January 23, 2006. As

a matter of congressional policy, exposure at 50 ppb for the five years from January 22, 2001 to January 23, 2006 is not believed to pose an unreasonable risk to health.

In granting exemptions, which would extend the period of time for systems to meet a drinking water standard during which the system would continue to provide water above the MCL, EPA looked at the duration of exposure that should not generally pose an unreasonable risk to health based on arsenic concentrations over time. Under this approach, EPA has made a determination that exemptions would not be available for systems with arsenic concentrations above 35 ppb. A more detailed explanation can be found in Appendix G-3: Exemptions & the Arsenic Rule at the following EPA website:

http://www.epa.gov/safewater/arsenic/pdfs/ars_final_app_g.pdf. You are encouraged to work with ADEQ on a plan to reduce the levels of arsenic being delivered to your customers.

Should you have any questions or would like to provide additional information to demonstrate how the Tubac Public Water System would operate without posing an unreasonable risk to health, please contact Kevin Ryan, at (415) 972-3806 or alternatively, at ryan.kevin@epa.gov.

Sincerely,



Corine Li, P.E.
Manager
Drinking Water Office

cc: John Calkins ADEQ

Paved Areas

Arizona Water Works Material Costs

Material/Labor	1" Service	2" Service
Saddle 6"	\$ 66.55	\$ 76.14
Corporation Stop	\$ 25.47	\$ 111.12
Copper Tubing (60'/40')	\$ 298.80	\$ 518.80
Angle Meter Stop	\$ 41.26	\$ 111.12
Meter Box	\$ 100.00	\$ 213.45
AMR Water Meter (Neptune)	\$ 157.85	\$ 305.19
Sub-total	\$ 689.93	\$ 1,335.82

Wheeler Construction Labor Costs

Material/Labor	Short Run Service 20 LF (1" & 2" with Asphalt)	Long Run Service 60 LF (1" & 2" with Asphalt)	Total
	Quantity	Unit	Unit Price
Foreman and Pickup	6	HR	80.00
Backhoe and Operator	8	HR	145.00
1/2 Sack Slurry	12	HR	40.00
Asphalt Crew	2	CY	80.00
Asphalt Buy	4	HR	500.00
Hot Tap	2	TN	60.00
Road Plates	1	EA	300.00
Traffic Control	1	EA	300.00
Sub-total			\$ 3,010.00

Range

Size	Short	Long
1-inch Service	\$ 5,699.33	\$ 6,549.93
2-inch Service	\$ 6,346.82	\$ 7,195.82

Arizona American Water Labor Costs

Material/Labor	Short Run Service 20 LF (1" & 2" with Asphalt)	Long Run Service 60 LF (1" & 2" with Asphalt)	Total
	Quantity	Unit	Unit Price
Utility Worker IV	6	HR	25.00
Dump Truck	2	HR	21.00
Backhoe	4	HR	99.00
Laborers (2)	12	HR	16.00
Service Truck	6	HR	15.80
1/2 Sack Slurry	2	CY	80.00
Asphalt Crew	4	HR	500.00
Asphalt Buy	2	TN	60.00
Hot Tap	1	EA	30.00
Road Plates	1	EA	68.00
Traffic Control	1	EA	300.00
Sub-total			\$ 3,438.80

Range

Size	Short	Long
1-inch Service	\$ 4,128.73	\$ 4,784.33
2-inch Service	\$ 4,774.62	\$ 5,400.22

Hot Tap = \$25+20%
 Road Plates = \$325+\$16+20%

Non Paved Areas

Arizona Water Works Material Costs

Material/Labor	1" Service	2" Service
Saddle 6"	\$ 66.55	\$ 76.14
Corporation Stop	\$ 25.47	\$ 111.12
Copper Tubing (60'/40')	\$ 298.80	\$ 518.80
Angle Meter Stop	\$ 41.26	\$ 111.12
Meter Box	\$ 100.00	\$ 213.45
AMR Water Meter (Neptune)	\$ 157.85	\$ 305.19
Sub-total	\$ 689.93	\$ 1,335.82

Wheeler Construction Labor Costs

Material/Labor	Short Run Service 20 LF (1" & 2" without Asphalt)	Long Run Service 60 LF (1" & 2" without Asphalt)	Total
	Quantity	Unit	Unit Price
Foreman and Pickup	6	HR	80.00
Backhoe and Operator	8	HR	145.00
Laborers (2)	12	HR	40.00
Hot Tap	1	EA	300.00
Road Plates	1	EA	300.00
Traffic Control	1	EA	300.00
Sub-total			\$ 2,730.00

Range

Size	Short	Long
1-inch Service	\$ 3,419.93	\$ 4,029.93
2-inch Service	\$ 4,065.82	\$ 4,675.82

Arizona American Water Labor Costs

Material/Labor	Short Run Service 20 LF (1" & 2" without Asphalt)	Long Run Service 60 LF (1" & 2" without Asphalt)	Total
	Quantity	Unit	Unit Price
Utility Worker IV	6	HR	25.00
Dump Truck	2	HR	21.00
Backhoe	4	HR	99.00
Laborers (2)	12	HR	16.00
Service Truck	6	HR	15.80
Hot Tap	1	EA	30.00
Road Plates	1	EA	68.00
Traffic Control	1	EA	300.00
Sub-total			\$ 1,196.80

Range

Size	Short	Long
1-inch Service	\$ 1,848.73	\$ 2,234.33
2-inch Service	\$ 2,494.62	\$ 2,880.22

Hot Tap = \$25+20%
 Road Plates = \$325+\$16+20%

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
JEFF HATCH-MILLER
WILLIAM A. MUNDELL
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
SHERYL L. HUBBARD
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
SHERYL L. HUBBARD
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	ii
I.	INTRODUCTION AND QUALIFICATIONS	1
II.	PURPOSE OF TESTIMONY.....	2
III.	SPONSORED SCHEDULES.....	3
IV.	REVENUE REQUIREMENT	4
V.	WORKING CAPITAL.....	5
VI.	ADJUSTED OPERATING INCOME.....	6
A	OPERATING REVENUES.....	7
B	OPERATING EXPENSES.....	11
C	PRO FORMA ADJUSTMENTS.....	11
VII.	COMPANY'S FINANCIAL STATEMENTS.....	21

1 **EXECUTIVE SUMMARY**
2

3 Sheryl L. Hubbard testifies as follows:
4

5 **Sponsored Schedules**
6

7 Ms. Hubbard sponsors the following schedules for each district in the case:
8

- 9
- 10 • Schedule A-2 – Arizona-American Summary of Operations
 - 11 • Schedule A-4 – Arizona-American Construction Expenditures and Gross Utility Plant in Service
 - 12 • Schedule A-5 – Arizona-American Summary of Cash Flows
 - 13 • Schedule B-6 – Arizona-American Computation of Cash Working Capital
 - 14 • Schedule C-1 – Arizona-American Adjusted Test Year Income Statement
 - 15 • Schedule C-2 – Arizona-American Income Statement Pro Forma Adjustments
 - 16 • Schedule C-3 – Arizona-American Computation of Gross Revenue Conversion Factor
 - 17 • Schedule E-2 – Comparative Income Statements
 - 18 • Schedule E-3 – Comparative Statement of Changes in Financial Position
 - 19 • Schedule E-6 – Comparative Operating Income Statements
 - 20 • Schedule E-7 – Operating Statistics
 - 21 • Schedule E-8 – Taxes Charged to Operations
 - 22 • Schedule F-1 – Projected Income Statements
 - 23 • Schedule F-2 – Statement of Cash Flows-Present and Proposed Rates
 - 24 • Schedule F-3 – Projected Construction Requirements
 - 25 • Schedule F-4 – Assumptions Used in Developing Projections
- 26

27 **Revenue Requirement**
28

29 Ms. Hubbard supports the revenue-requirement calculation for each district. Mr. Broderick
30 shows these amounts in his testimony.
31

32 **Cash Working Capital**
33

34 Ms. Hubbard sponsors the lead-lag study that supports Arizona-American's request for cash-
35 working capital.
36

37 **Operating Income Adjustments**
38

39 Ms. Hubbard sponsors the following adjustments to operating income:
40

- 41
- 42 • Adjustment SLH-1 – Annualize Payroll Expense
 - 43 • Adjustment SLH-2 – Annualize Power Expense
 - 44 • Adjustment SLH-3 – Normalize Purchased Water
 - 45 • Adjustment SLH-4 – Annualize Chemicals Expense
 - Adjustment SLH-6 - Annualize Management Fees

- 1 • Adjustment SLH-7 - Annualize Pensions Expense
- 2 • Adjustment SLH-8 – Amortize Rate Case Expense
- 3 • Adjustment SLH-9 – Annualize Insurance Expense
- 4 • Adjustment SLH-10 – Tank Maintenance Accrual
- 5 • Adjustment SLH-11 – Annualize Depreciation/CIAC
- 6 • Adjustment SLH-12 – Annualize Property Taxes
- 7 • Adjustment SLH-15 – Annualize 401K Expense
- 8 • Adjustment SLH-16 – Line 21 Clean-up
- 9 • Adjustment SLH-17 – Remove CAP Revenue and Expense
- 10 • Adjustment SLH-18 – Interest Synchronization
- 11 • Adjustment SLH-19 – Federal and State Income Taxes
- 12 • Adjustment SLH-20 – Annualize Postage Increase
- 13 • Adjustment SLH-21 – One-Time Service Company Charges
- 14 • Adjustment SLH-22 – Adjust Conservation Expenses
- 15 • Adjustment SLH-23 – Blank

16
17 **Additional Requests**

18
19 Ms. Hubbard also supports the following requests by Arizona-American:

- 20
- 21 • For a power supply adjustment mechanism that will enable Arizona-American to adjust
- 22 its rates in the future for changes in rates paid for electric and gas costs;
- 23 • For a tank maintenance reserve to fund tank maintenance expenditures; and
- 24 • For formal adoption by the Commission of the terms and conditions of service on file at
- 25 the Commission.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, 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, and my business phone is 623-445-2419.

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 29 years of experience in public utility accounting and regulation; 18 years employed with 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.

1 My responsibilities with Citizens included ensuring compliance with applicable state
2 statutes and regulatory rules and decisions, as well as preparation of rate cases and other
3 regulatory filings with state regulatory agencies in Arizona and Colorado.

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

10 I have been employed with Arizona-American since March 2007.

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

15 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

16 **A.** Yes, I have testified before this Commission on numerous occasions.

17 **II. PURPOSE OF TESTIMONY**

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

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

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

22 **A.** Each water and wastewater district has been assembled as a stand-alone filing complete
23 with all standard filing requirement schedules. Whenever possible, schedules will be

1 discussed as applicable to all of the water and wastewater districts. I include a table
2 detailing Arizona-American's proposed values by district for each schedule's results
3 when discussing schedules that support the calculation of Schedule A-1 – Computation of
4 Increase in Gross Revenue Requirements (Schedules B-1, C-1, D-1, if applicable).
5 Similarly, since most of the *pro forma* adjustments that I am proposing are premised
6 upon the same underlying principles regardless of the district, I will discuss the *pro forma*
7 adjustments by category of adjustment. For any *pro forma* adjustments that do not apply
8 to all seven of the water and wastewater districts, I discuss the specific district or districts
9 affected by the proposed adjustment.

10 **Q. DOES YOUR TESTIMONY IN THIS PROCEEDING INCORPORATE**
11 **RECOMMENDATIONS OF OTHER COMPANY WITNESSES?**

12 A. Yes, it does. I have incorporated recommendations sponsored by Mr. Broderick, Mr.
13 Cole, Mr. Lenderking, Mr. Gross, and Ms. Gutowski as *pro forma* adjustments to test-
14 year expenses when applicable.

15 **III. SPONSORED SCHEDULES**

16 **Q. PLEASE IDENTIFY THE SCHEDULES YOU ARE SPONSORING.**

17 A. I am sponsoring the following schedules for each of the seven water and wastewater
18 districts:

- 19 • Schedule A-2 – Arizona-American Summary of Operations
- 20 • Schedule A-4 – Arizona-American Construction Expenditures and Gross Utility Plant
21 in Service
- 22 • Schedule A-5 – Arizona-American Summary of Cash Flows
- 23 • Schedule B-6 – Arizona-American Computation of Cash Working Capital
- 24 • Schedule C-1 – Arizona-American Adjusted Test Year Income Statement
- 25 • Schedule C-2 – Arizona-American Income Statement Pro Forma Adjustments

- 1 • Schedule C-3 – Arizona-American Computation of Gross Revenue Conversion Factor
- 2 • Schedule E-2 – Comparative Income Statements
- 3 • Schedule E-3 – Comparative Statement of Changes in Financial Position
- 4 • Schedule E-6 – Comparative Operating Income Statements
- 5 • Schedule E-7 – Operating Statistics
- 6 • Schedule E-8 – Taxes Charged to Operations
- 7 • Schedule F-1 – Projected Income Statements
- 8 • Schedule F-2 – Statement of Cash Flows-Present and Proposed Rates
- 9 • Schedule F-3 – Projected Construction Requirements
- 10 • Schedule F-4 – Assumptions Used in Developing Projections

11 **IV. REVENUE REQUIREMENT**

12 **Q. WHAT IS SCHEDULE A-2?**

13 A. Schedule A-2 for each of Arizona-American's districts is titled "Summary Results of
14 Operations". This schedule contains operating history for the years 2007, 2006, and
15 2005, as well as projected year 2008. The figures summarized for the test year 2007 are
16 shown both unadjusted, as reflected in Arizona-American's accounting records, and
17 adjusted for known and measureable *pro forma* changes identified in Arizona-American's
18 application for each water and wastewater district.

19 **Q. WHAT IS SCHEDULE A-4?**

20 A. Schedule A-4 titled "Construction Expenditures and Gross Utility Plant in Service"
21 presents the historical construction expenditures for the years 2007, 2006, and 2005, as
22 well as three years of projected expenditures. This schedule also contains annual cost
23 data for net plant placed in service and balances of gross utility plant in service for the
24 same periods shown for construction expenditures. Mr. Gross provides direct testimony
25 on test-year and projected construction activities for this proceeding.

1 Q. WHAT IS SCHEDULE A-5?

2 A. Schedule A-5 titled "Summary of Cash Flows" is a statement of cash flows detailing the
3 changes in the cash accounts for years 2007, 2006, and 2005.

4 V. WORKING CAPITAL

5 Q. WHAT IS THE CASH WORKING CAPITAL COMPONENT OF THE
6 WORKING CAPITAL REQUIREMENT?

7 A. The cash working capital component of the working capital allowance measures the
8 investor-supplied capital used to meet day-to-day working cash needs. Cash working
9 capital represents the average amount of capital provided by investors, over and above
10 the investment in plant and other rate base items to finance cost of service from the time
11 that service is rendered and the associated revenues are collected. Although there are
12 several methods for computing cash working capital, the Commission Staff has
13 consistently recommended the use of the lead/lag methodology to determine cash
14 working capital for large water utilities in this jurisdiction.

15 Q. WHAT IS SCHEDULE B-6?

16 A. Schedule B-6 titled "Lead/Lag Summary-Working Capital Requirement" details Arizona-
17 American's working-cash component of the working capital allowance for each of the
18 water and wastewater districts in this proceeding. Revenue lag days are determined by
19 measuring the amount of time between the provision of services and the receipt of
20 payment for those services. Revenue lag days indicate a provision of working capital by
21 investors and are shown in Column [b] of Schedule B-6. The revenue lag days
22 calculation is the sum of the service lag, the billing lag and the collection lag.

23 The measurement of the time between the incurrence of expenses and the payment of
24 those obligations, referred to as the expense lag days, offsets the revenue lag. Expense

lag days represent a use of working capital by investors and are presented on Line 2 of Schedule B-6. The net of the revenue lag days and the expense lag days is computed to quantify the provision or use of working capital by investors. The following tables summarize the cash-working-capital component for each water and wastewater district:

Table 3 – Cash Working Capital Component of Working Capital-Water Districts

District	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley Water	Sun City West Water	Tubac Water
Cash Working Capital	\$1,409,860	\$102,420	\$ 367,562	\$ 549,034	\$ 480,140	\$ 40,665

Table 4 – Cash Working Capital Component of Working Capital - Wastewater Districts

District	Mohave Wastewater
Cash Working Capital	\$ 58,358

VI. ADJUSTED OPERATING INCOME

Q. WHAT IS SCHEDULE C-1?

A. Schedule C-1 titled “Adjusted Test Year Income Statement” details the revenues and expenses and the resulting net income on an unadjusted test year and an adjusted test year basis that includes proposed pro forma adjustments.

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:

1 **Table 5 – Adjusted Operating Income -Water Districts**

District	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley Water	Sun City West Water	Tubac Water
Adjusted Operating Income	\$ 2,601,288	(\$ 131,419)	\$ 37,140	\$ 1,552,498	\$ 587,425	(\$ 38,553)

2 **Table 6 – Adjusted Operating Income - Wastewater Districts**

District	Mohave Wastewater
Adjusted Operating Income	\$ 15,619

3 **A OPERATING REVENUES**

4 **Q. ARE YOU SPONSORING THE OPERATING REVENUE IN THIS**
5 **PROCEEDING?**

6 **A.** Only in part. I am responsible for removing revenues from surcharges authorized by the
7 Commission for recovery of Central Arizona Project (“CAP”) water costs for Paradise
8 Valley Water, Agua Fria Water, and Sun City West Water districts.

9 **Q. WHY ARE YOU REMOVING CAP-SURCHARGE REVENUE?**

10 **A.** The Commission has authorized mechanisms to recover deferred and ongoing CAP
11 municipal and industrial charges incurred by Arizona-American for Agua Fria Water,
12 Paradise Valley Water, and Sun City West Water. These mechanisms enable Arizona-
13 American to retain its CAP allocations by providing cost recovery of the expenses
14 associated with purchasing this renewable source of water that is a vital part of the long-
15 term water supply for these districts.

16 **Q. WHAT IS THE MECHANISM AUTHORIZED BY THE COMMISSION FOR**
17 **THE AGUA FRIA WATER DISTRICT?**

1 A. Arizona-American's Agua Fria water district has an allocation of 11,093 acre-feet of
2 water, of which 10,900 acre feet were delivered to the Maricopa Water District Recharge
3 Facility ("MWD") during the test year. In Decision No. 63334 (issued February 2, 2001)
4 the Commission approved a request for a hook-up fee for Arizona-American's Agua Fria
5 water district to recover the deferred and on-going CAP capital charges not used or
6 delivered to MWD. At that time, it was projected that the deferred charges would be
7 fully amortized in approximately 10 years.

8 **Q. WHAT IS THE BALANCE IN THE DEFERRED CAP CAPITAL CHARGES**
9 **ACCOUNT AS OF THE END OF THE TEST YEAR?**

10 A. In May 2006, Arizona-American filed a compliance report pertaining to the deferred
11 CAP capital charges stating that the deferred CAP charges had been fully recovered as of
12 January 31, 2006, and, as ordered by the Commission, the remaining balance at that time
13 of \$59,922 would be applied to on-going CAP capital costs for water not used or
14 delivered. Collection of the CAP hook-up fees has been discontinued since January
15 2006; however, some developments have outstanding obligations that have already been
16 reflected in the compliance reports. The remaining balance of \$59,922 has been applied
17 to CAP capital costs not used or delivered through 2008.

18 Test year expenses for purchased CAP water including charges from the Maricopa Water
19 District totaled \$899,344.

20 **Q. WHAT IS THE MECHANISM AUTHORIZED BY THE COMMISSION FOR**
21 **THE PARADISE VALLEY WATER DISTRICT?**

22 A. Arizona-American's Paradise Valley Water District has an allocation of 3,231 acre feet
23 of water, all of which was delivered during the test year to the Salt River Project ("SRP")
24 pursuant to a water exchange agreement. The current CAP-cost recovery for the Paradise

1 Valley water district was approved by the Commission in Decision No. 61831 (July 20,
2 1999). Recovery of deferred CAP costs of \$533,115 was authorized over a five-year
3 period which ended in June 2004. In that decision, the Commission also approved a
4 surcharge mechanism for the Paradise Valley Water District to recover on-going CAP
5 capital charges. The approved surcharge applies to residential consumption greater than
6 45,000 gallons per month and to all non-residential consumption. The surcharge includes
7 a provision for an annual true-up.

8 **Q. IS ARIZONA-AMERICAN PROPOSING ANY CHANGES TO THE EXISTING**
9 **CAP SURCHARGE FOR THE PARADISE VALLEY WATER DISTRICT IN**
10 **THIS PROCEEDING?**

11 **A.** Yes, but the request is for minimal changes to the calculation of the annual surcharge. As
12 discussed in the testimony of Mr. Lenderking, Arizona-American is no longer
13 participating in the water exchange agreement with SRP that provided a use for the
14 Paradise Valley CAP allocation in the past. Instead, the full CAP allocation will be
15 delivered to the Tonopah Desert Recharge Project to be recovered from wells in the
16 district. As a result of the new arrangement, Arizona-American will replace the SRP
17 wheeling charge of \$22.63 per acre foot with a Central Arizona Water Conservation
18 District ("CAWCD") storage charge of \$8 per acre foot.

19 As with the original water exchange agreement, Arizona-American will not incur Arizona
20 Department of Water Resources' groundwater pumping fees when it pumps the stored
21 CAP water from its Paradise Valley wells. However, these savings will be offset by the
22 power costs for pumping the stored "CAP Water" from district wells. Therefore, this
23 imputed savings in the original CAP surcharge calculation should not be a component in
24 future CAP surcharge calculation, as is also true of the SRP wheeling charge. A revised

1 calculation of the CAP surcharge calculation will be submitted in the Company's rebuttal
2 filing in this proceeding.

3 **Q. WHAT IS THE MECHANISM AUTHORIZED BY THE COMMISSION FOR**
4 **SUN CITY WEST WATER DISTRICT?**

5 A. In Decision No. 62293 (issued February 1, 2000), the Commission approved a
6 Groundwater Savings Fee for the Sun City West Water District in conjunction with a
7 request for the Sun City Water District to recover deferred and on-going Central Arizona
8 Project ("CAP") capital charges not used or delivered to MWD. The Commission's
9 decision provided a surcharge mechanism to recover both deferred CAP capital charges
10 and the on-going capital and delivery charges. The Sun City West Water District has an
11 allocation of 2,382 acre feet of water, of which 2,372 acre feet were delivered to the
12 Maricopa Water District Recharge Facility ("MWD") during the test year.

13 The approved mechanism for Sun City West Water District provides for recovery of
14 deferred CAP M&I charges of \$495,540 over a five-year period beginning in February
15 2001 and a separate adjustable surcharge for the recovery of on-going CAP capital and
16 delivery charges.

17 **Q. HAS ARIZONA-AMERICAN RECOVERED THE DEFERRED CAP M&I**
18 **CHARGES WITHIN THE FIVE-YEAR RECOVERY PERIOD?**

19 A. Yes. As of January 31, 2006, Arizona-American has fully recovered the deferred CAP
20 capital charges; however, we continue to incur the ongoing capital and delivery charges.

21 **Q. IS ARIZONA-AMERICAN PROPOSING ANY REVISION TO THE**
22 **GROUNDWATER SAVINGS FEE FOR SUN CITY WEST WATER DISTRICT?**

23 A. No. The mechanism as originally designed allows for increases and decreases in the cost
24 of CAP water and provides an efficient procedure for billing customers for this cost

1 without over or under recoveries. Accordingly, Arizona-American is not seeking to
2 modify this mechanism in any way at this time.

3 **B OPERATING EXPENSES**

4 **Q. WHAT ARE ARIZONA-AMERICAN'S REQUESTED TOTAL OPERATING**
5 **EXPENSES BY DISTRICT?**

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

7 **Table 7 – Operating Expenses -Water Districts**

District	Agua Fria Water	Havasu Water	Mohave Water	Paradise Valley Water	Sun City West Water	Tubac Water
Operating Expenses	\$16,217,325	\$1,158,005	\$ 5,076,491	\$ 6,926,235	\$ 5,114,006	\$ 465,453

8 **Table 8 – Operating Expenses - Wastewater Districts**

District	Mohave Wastewater
Operating Expenses	\$ 780,542

9 **C PRO FORMA ADJUSTMENTS**

10 **Q. WHAT PRO FORMA ADJUSTMENTS IS ARIZONA-AMERICAN PROPOSING**
11 **TO THE HISTORICAL TEST YEAR.**

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

- 14 • Adjustment LJG-1 – Unbilled Revenue
- 15 • Adjustment LJG-2 – Eliminate Surcharges
- 16 • Adjustment LJG-3 – Miscellaneous Revenue Adjustments
- 17 • Adjustment LJG-4 – Annualize ACRM Surcharge
- 18 • Adjustment LJG-5 – Annualize Year End Customers

- 1 • Adjustment SLH-1 – Annualize Payroll Expense
- 2 • Adjustment SLH-2 – Annualize Power Expense
- 3 • Adjustment SLH-3 – Normalize Purchased Water
- 4 • Adjustment SLH-4 – Annualize Chemicals Expense
- 5 • Adjustment SLH-6 - Annualize Management Fees
- 6 • Adjustment SLH-7 - Annualize Pensions Expense
- 7 • Adjustment SLH-8 – Amortize Rate Case Expense
- 8 • Adjustment SLH-9 – Annualize Insurance Expense
- 9 • Adjustment SLH-10 – Tank Maintenance Accrual
- 10 • Adjustment SLH-11 – Annualize Depreciation/CIAC
- 11 • Adjustment SLH-12 – Annualize Property Taxes
- 12 • Adjustment SLH-15 – Annualize 401K Expense
- 13 • Adjustment SLH-16 – Line 21 Clean-up
- 14 • Adjustment SLH-17 – Remove CAP Revenue and Expense
- 15 • Adjustment SLH-18 – Interest Synchronization
- 16 • Adjustment SLH-19 – Federal and State Income Taxes
- 17 • Adjustment SLH-20 – Annualize Postage Increase
- 18 • Adjustment SLH-21 – One-Time Service Company Charges
- 19 • Adjustment SLH-22 – Adjust Conservation Expenses
- 20 • Adjustment SLH-23 – Adjustment to Remove Prior Period Labor Adjustment

21 **Q. ARE YOU SPONSORING ALL OF THE PRO FORMA ADJUSTMENTS**
22 **IDENTIFIED ABOVE?**

23 **A.** No. Ms. Gutowski sponsors the adjustments identified as LJG-1, LJG-2, LJG-3, LJG-4,
24 and LJG-5. Mr. Broderick sponsors the amount of rate case expense in SLH-8 and the

1 amount of the reduction to depreciation expense in SLH-11 for the amortization of the
2 imputed regulatory CIAC.

3 **Q. WHAT IS ADJUSTMENT SLH-1 – ANNUALIZE PAYROLL EXPENSE?**

4 A. This is a *pro forma* adjustment to reflect the known and measureable change in pay rates
5 for Arizona-American to annualize the latest known pay rates for employees of Arizona-
6 American at the end of the test year. The latest known rates, which became effective
7 March 24, 2008, form the basis of the annualization adjustment, however, Arizona-
8 American reserves the right to update this adjustment for the 2009 pay rates if the hearing
9 schedule permits the inclusion of that rate increase.

10 **Q. WHAT IS ADJUSTMENT SLH-2 – ANNUALIZE POWER EXPENSE?**

11 A. This is a *pro forma* adjustment that annualizes the increase in rates approved for Arizona
12 Public Service Company (“APS”) in July 2007 for the districts that receive power from
13 APS. Arizona-American has accounts billed under APS’s rate schedules E-30, E-32 and
14 E-221. The affected districts are Agua Fria Water, Paradise Valley Water, and Sun City
15 West Water. On March 31, 2008, APS filed an application for a nine percent rate
16 increase with the Commission. One component to APS’s rate application is its proposal
17 to disaggregate the E-32 tariff based upon customer demand. Given the timing of APS’s
18 filing and the filing of Arizona-American’s rate application filing, Arizona-American
19 requires additional time to determine how APS’s proposal to disaggregate Rate E-32 will
20 impact its accounts, as well as the impact of the other proposed rate schedule changes on
21 test-year power costs. Arizona-American will update the *pro forma* adjustment to power
22 expense to reflect the APS proposed increase during the rebuttal phase of the case.

23 Arizona-American districts Tubac, Mohave Water, and Mohave Wastewater systems
24 receive power from Unisource, which is presently before the Commission with a rate-

1 increase request. No final order has been issued. After the final order has been issued,
2 Arizona-American will update its *pro forma* adjustments for Tubac Water, Mohave
3 Water, and Mohave Wastewater to properly reflect known and measureable changes in
4 the cost of that power.

5 For Arizona-American's Agua Fria Water district, some of its electricity needs are
6 provided by the Maricopa Water District, which increased its rates by 10 percent, on
7 January 1, 2008. The increase in power costs is \$116,435 for the Agua Fria Water
8 District, based upon consumption during the test year and applying the rates in effect at
9 January 1, 2008.

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

11 A. Southwest Gas Corporation did not increase general rates during 2007 and at the time of
12 this filing is not projecting a general rate increase, however, with a monthly gas cost
13 adjustor mechanism, as natural gas prices increase, the gas cost adjustor can also
14 increase. Southwest Gas Corporation is currently anticipating natural gas price increases
15 of approximately two percent from 2008 to 2009.

16 **Q. WOULD APPROVAL BY THE COMMISSION OF A FUEL AND POWER
17 SUPPLY ADJUSTOR MECHANISM FOR ARIZONA-AMERICAN SHIELD
18 ARIZONA-AMERICAN FROM POWER SUPPLY INCREASES SUCH AS ARE
19 REFLECTED IN THE *PRO FORMA* ADJUSTMENTS TO POWER EXPENSE?**

20 A. Yes. Power cost increases are outside the control of Arizona-American and power cost
21 increases erode earnings to which Arizona-American is entitled. For the seven water and
22 wastewater districts included in this filing, the power costs escalations from two
23 providers, APS and MWD, add almost a half million dollars to water costs. To provide
24 Arizona-American a reasonable opportunity to earn its authorized return, an adjustor

1 mechanism should be approved for the districts included in this rate application.
2 Arizona-American requests approval of an adjustor mechanism from the Commission to
3 adjust rates as power rates vary from those included in the adjusted test-year expenses.
4 The change in power costs should be calculated by using test-year volumes of water sold
5 and the current rates for power. A threshold could be set that would provide a benchmark
6 for when adjustments would be allowed based upon a cost per-thousand-gallons sold.
7 Schedule H-8 is a proposed tariff for a power supply adjustor mechanism that could be
8 used for all districts.

9 **Q. WHAT IS ADJUSTMENT SLH-3 – NORMALIZE PURCHASED WATER?**

10 A. This adjustment applies only to the Havasu Water district and corrects an entry recorded
11 to the district's purchased water account to normalize the purchased water expense.

12 **Q. WHAT IS ADJUSTMENT SLH-4 – ANNUALIZE CHEMICALS EXPENSE?**

13 A. This is a *pro forma* adjustment to annualize the effect of changes in the cost of chemicals
14 used in water treatment operations. It incorporates 2008 price level increases that have
15 been negotiated contractually by American Water's Supply Chain department.

16 The Agua Fria Water, Havasu Water, Paradise Valley Water and Sun City West Water
17 districts each have an Arsenic Cost Recovery Mechanism ("ACRM") in place. During
18 2007, Arizona-American used some new chemicals in arsenic treatment (ferric chloride
19 and polymer) and increased volumes used for other chemicals (sodium hydroxide and
20 sulfuric acid). The costs of the ferric chloride chemicals, where applicable, were deferred
21 for each district in accordance with the applicable ACRM. Media replacement costs for
22 arsenic treatment were also deferred during 2007 for recovery in ACRM applications.
23 The *pro forma* adjustment to annualize chemicals quantifies a 12-month period of
24 chemicals and media replacement costs for the districts with arsenic treatment facilities.

1 Now that Arizona-American has made the rate filings required by the Commission as a
2 condition of approving ACRMs for these districts, it is appropriate to include these new
3 and on-going charges in each district's cost of service.

4 **Q. WHAT IS ADJUSTMENT SLH-6 – ANNUALIZE MANAGEMENT FEES?**

5 A. This is a *pro forma* adjustment to annualize the effect of the labor rate increase approved
6 in March 2008. I increased test-year labor and labor-related charges by four percent to
7 incorporate labor-rate increases granted in March 2008 at the Service Company level.

8 **Q. WHAT IS ADJUSTMENT SLH-7 – ANNUALIZE PENSION EXPENSE?**

9 A. This is a *pro forma* adjustment to annualize the increase in pension costs based on the
10 2008 funding liability. Employees of Arizona-American hired before January 1, 2006,
11 are eligible for a defined-benefit pension. The cost to fund this pension liability for 2008
12 is reflected in this pro forma adjustment.

13 **Q. WHAT IS ADJUSTMENT SLH-8 – AMORTIZE RATE CASE EXPENSE?**

14 A. This is a *pro forma* adjustment that adjusts regulatory expenses to include an
15 amortization of the costs incurred to prepare and process this rate application. The total
16 estimated costs of \$612,000 and the three-year amortization period are sponsored by Mr.
17 Broderick, while I am sponsoring the allocation of the amortization of the rate case
18 expenses among districts. To allocate the rate-case expense to each of the seven water
19 and wastewater districts, I calculated a four-factor allocation percentage limited to the
20 seven districts that are the subject of this rate application. I then applied this factor to the
21 annual amortization to determine the *pro forma* adjustments.

22 For districts with an unamortized balance from a previous rate case (Mohave Water and
23 Mohave Wastewater), I calculated a new amortization over three years based upon the

1 remaining balance as of June 2009. I used June 2009 because it is consistent with the
2 Commission's time-clock rules for a filing made by May 1, 2008.

3 **Q. WHAT IS ADJUSTMENT SLH-9 – ANNUALIZE INSURANCE EXPENSE?**

4 A. This is a *pro forma* adjustment to annualize the increase in group insurance expenses for
5 Arizona-American's water and wastewater districts. Group insurance includes premiums
6 for life insurance, medical insurance, dental insurance, long-term disability insurance,
7 short-term disability insurance, worker's compensation insurance and liability insurance.
8 The 2008 group insurance costs were compiled and the increase in these expenses above
9 the 2007 expenses supports this *pro forma* adjustment.

10 **Q. WHAT IS ADJUSTMENT SLH-10 – TANK MAINTENANCE ACCRUAL?**

11 A. This is a *pro forma* adjustment that will enable Arizona-American to begin reserving
12 funds that can be used to fund a tank-maintenance program. The program covers a ten-
13 year cycle and is further discussed by Mr. Cole. I have calculated the amount of funds
14 that Arizona-American should begin collecting from its customers to cover the costs that
15 Mr. Cole believes are needed to inspect and maintain the tanks for each water district. By
16 collecting funds for tank maintenance based upon a 10-year program, expenses, which
17 otherwise would fluctuate from year to year, will be leveled for rate recovery.

18 **Q. WHAT IS ADJUSTMENT SLH-11 – ANNUALIZE DEPRECIATION/CIAC?**

19 A. This is a *pro forma* adjustment that annualizes the depreciation expense on test-year
20 ending plant in service and the amortization of contributions in aid of construction. Ms.
21 Gutowski used the depreciation rates approved in each district's last rate proceeding to
22 calculate the depreciation annualization. This *pro forma* adjustment also includes the
23 amortization of regulatory assets previously authorized by the Commission in Decision
24 No. 67093. Also included in the *pro forma* adjustment is the reduction to depreciation

1 expense required by Decision No. 63584 that results from amortizing the imputed
2 regulatory CIAC. Continuation of these amortizations preserves the balances that
3 Arizona-American has on its balance sheet for accounting purposes.

4 **Q. WHAT IS ADJUSTMENT SLH-12 – ANNUALIZE PROPERTY TAXES?**

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

12 **Q. WHAT IS ADJUSTMENT SLH-15 – ANNUALIZE 401K EXPENSE?**

13 A. This is a *pro forma* adjustment that annualizes Arizona-American's contribution to its
14 employees' 401K program. Employees of Arizona-American hired after January 1, 2006
15 are only eligible for the Company's 401K plan. Arizona-American contributes a
16 percentage contribution and also matches a portion when employees contribute up to a
17 pre-established percentage.

18 **Q. WHAT IS ADJUSTMENT SLH-16 – LINE 21 CLEAN-UP?**

19 A. This is a *pro forma* adjustment that removes civic and charitable contributions,
20 membership dues, and other miscellaneous expenditures that are recorded in a
21 Miscellaneous Expense account, but are not typically recoverable from customers.

22 **Q. WHAT IS ADJUSTMENT SLH-17 – REMOVE CAP REVENUE AND**
23 **EXPENSES?**

1 A. This is a *pro forma* adjustment to isolate Central Arizona Project (“CAP”) surcharges and
2 purchased-water costs to enable retention of the mechanisms that are currently in place to
3 recover these charges. Sun City West Water, and Paradise Valley Water currently have
4 mechanisms in place, which I discuss in greater detail above in conjunction with
5 Operating Revenues. Agua Fria Water District’s mechanism is no longer in effect and
6 Arizona-American is including the purchased water costs for this district in its operating
7 expenses.

8 **Q. WHAT IS ADJUSTMENT SLH-18 – INTEREST SYNCHRONIZATION?**

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

22 **Q. WHAT IS ADJUSTMENT SLH-19 – FEDERAL AND STATE INCOME TAXES?**

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

1 **Q. WHAT IS ADJUSTMENT SLH-20 – ANNUALIZE POSTAGE INCREASE?**

2 A. This is a *pro forma* adjustment to annualize the effects of the May 14, 2007, and May 14,
3 2008, increases in postage rates.

4 **Q. WHAT IS ADJUSTMENT SLH-21 – ONE-TIME SERVICE COMPANY**
5 **CHARGES?**

6 A. This is a *pro forma* adjustment that removes charges from Management Fees that are one-
7 time, non-recurring and not appropriate for calculating revenue requirements for this
8 proceeding. The types of costs that have been removed are costs associated with business
9 change and divestiture. American Water is restructuring its corporate model to a more
10 state-based focus and it continues its transition from a wholly-owned subsidiary of RWE
11 to a publicly-traded entity.

12 **Q. WHAT IS ADJUSTMENT SLH-22 – ADJUST CONSERVATION EXPENSES?**

13 A. This is a *pro forma* adjustment that adjusts the test-year expenses to the level approved
14 by the Commission in Decision No. 67093 for the West Valley districts of Sun City
15 West, Sun City and Agua Fria. In that decision, the Commission authorized \$40,000 for
16 conservation-targeted expenditures. I first allocate the \$40,000 expense among the
17 districts based upon customer count and adjust expense to enable Arizona-American to
18 continue activities that inform and educate customers about the need for conservation.

19 **Q. WHY IS ARIZONA-AMERICAN REQUESTING COMMISSION APPROVAL**
20 **OF ITS RULES AND REGULATIONS FOR EACH DISTRICT?**

21 A. Rules and Regulations (“Rules”) for each district were filed in compliance with the
22 Commission’s order to provide tariffs after the issuance of Decision No. 67093. The
23 Commission Staff accepted the Rules but included a disclaimer in their files that if there
were any differences between the Rules filed by Arizona-American and the original

1 Citizen's Rules and Regulations, the Citizen's Rules and Regulations would prevail.
2 Arizona-American has compared both sets of Rules and Regulations and asks that the
3 Commission adopt the Arizona-American Rules and remove the disclaimer from its files
4 to reduce the potential for confusion by our customers or other interested parties.

5 **VII. COMPANY'S FINANCIAL STATEMENTS**

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

10 A. Yes, in part. I will be sponsoring all of the E-Series schedules except for Schedules E-1,
11 E-5, which are being sponsored by Ms. Gutowski and Schedules E-4 and E-9, which are
12 sponsored by Mr. Broderick.

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

14 A. Schedule E-2 titled, "Comparative Income Statements-Test Year Ended December 31,
15 2007" contains the income statements of each district for the years 2005, 2006, and 2007.
16 Schedule E-3 titled "Comparative Statement of Changes in Financial Position-Test Year
17 Ended December 31, 2007" presents the sources and applications of funds by the districts
18 for the years 2005, 2006, and 2007. Schedule E-6 titled "Comparative Departmental
19 Statements of Operating Income -Test Year Ended December 31, 2007" summarizes the
20 operating income statements on a functional basis for each district for the years 2005,
21 2006, and 2007. Schedule E-7 titled "Operating Statistics-Test Year Ended December
22 31, 2007" presents the district's operating statistics for sales quantities and customers for
23 the years 2005, 2006, and 2007. Schedule E-8 titled "Taxes Charged to Operations-Test
24 Year Ended December 31, 2007" provides details regarding taxes incurred by the district
25 for the years 2005, 2006, and 2007.

1 **Q. WHAT ARE THE F-SERIES OF SCHEDULES?**

2 A. I am sponsoring the F-Series of schedules. Appendix F of the standard filing
3 requirements is labeled "Projections and Forecasts". The data contained in the F-Series
4 of schedules compares current results of operations to projected results based upon
5 different assumptions. More specifically, Schedule F-1 titled "Projected Income
6 Statements-Present and Proposed Rates" forecasts 2008 income using test-year rates and
7 proposed revenue from this proceeding. Schedule F-2 titled, "Projected Statement of
8 Changes in Financial Position-Present and Proposed Rates" presents the sources and
9 applications of funds by the districts for the test year and projected results using the same
10 assumptions as Schedule F-1. Schedule F-3 titled "Projected Construction
11 Requirements" shows the district's projected construction expenditures for the years
12 2008, 2009, and 2010. This schedule provides additional detail concerning the
13 construction expenditures shown on Schedule A-4. Schedule F-4 titled "Assumptions
14 Used in Developing Projections" provides a general description of the assumptions used
15 in developing projections for 2008 concerning customer growth, customer water demand,
16 changes in expenses, and construction requirements.

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

18 A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
LINDA J. GUTOWSKI
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
LINDA J. GUTOWSKI
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	iii
I	INTRODUCTION AND QUALIFICATIONS	1
II	SCOPE AND PURPOSE OF TESTIMONY.....	2
III	RATE BASE.....	2
IV	ADJUSTED OPERATING REVENUE	13
V	COMPARATIVE STATEMENTS	18
VI	EFFECT OF PROPOSED TARIFF SCHEDULES	18

1 **EXECUTIVE SUMMARY**

2
3 Linda J. Gutowski testifies as follows:

4
5 **RATE BASE**

6
7 Ms. Gutowski sponsors rate base Exhibits B-1 through B-5. Rate base for each district follows:

8 **Table 1 – Summary of Rate Base**

<u>District</u>	<u>OCRB</u>
Agua Fria Water	\$96,976,395
Havasu Water	\$4,221,474
Mohave Water	\$12,041,310
Paradise Valley	\$40,864,986
Sun City West Water	\$37,901,085
Tubac Water	\$1,527,454
Mohave Wastewater	\$ 4,740,149
Total All Districts	\$198,272,853

9
10 **Common Rate-Base Adjustments**

11 Adjustment LJG-3 reallocates the UPIS balance from the Corporate District into the proper
12 district, based on plant coding:

13
14 Adjustment LJG-4 allocates the Common, or Corporate, Plant and Accumulated Depreciation to
15 each of the districts:

16
17 Adjustment LJG-5 is the opposite side of Adjustment LJG-3. It reverses the December 2007
18 Journal Entry and removes \$753,965 from the Corporate Plant accounts.

19
20 Adjustment LJG-6 decreases Advances and/or Contributions in Aid of Construction for dollars
21 associated with projects that are still in Construction Work in Progress ("CWIP").

22
23 Mr. Broderick has three adjustments on Schedule B-2. Adjustment TMB-7 is reserved for the
24 Imputed Regulatory Advances in Aid of Construction. Adjustment TMB-8 is reserved for the
25 Imputed Regulatory Contributions in Aid of Construction. Adjustment TMB-9 is reserved to
26 remove the Acquisition Adjustment from the Citizens Utilities purchase.

27
28 **Agua Fria Water Rate-Base Adjustments.** Adjustment LJG-1 removes \$76,503 from UPIS
29 and \$19,453 from Accumulated Depreciation. Adjustment LJG-2 removes Excess Hook-Up Fee
30 Contribution for the White Tanks Project. Adjustment LJG-10 adds \$25,000,000 of White Tanks
31 Project Costs to Rate Base. Adjustment LJG-11 adds Post-Test-Year Additions of \$3,214,033.

32
33 **Havasu Water Rate-Base Adjustments.** Adjustment LJG-1, corrects Accumulated
34 Depreciation for Havasu Water District by decreasing it \$20,809. Adjustment LJG-2 removes
35 \$77,319 of Plant and reduces Accumulated Depreciation by \$29,047 for the Plant that the
36 Commission found to be not useful in Decision 67093. Adjustment LJG-10 adds \$94,996 to rate
37 base for deferred ACRM O&M costs.

38
39 **Mohave Water Rate-Base Adjustments.** Adjustment LJG-1, adjusts the under-collection in the
40 Accumulated Depreciation for rate-making purposes. Adjustment LJG-2 removes (\$4,915) from

1 plant as a proposed retirement to go along with a Post-Test-Year addition recommended by Staff
2 in the last rate case. Adjustment LJG-10 includes estimated project costs of \$610,732 for the
3 Mohave Water District's Big Bend Acres 0.25MG Reservoir.
4

5 **Paradise Valley Water Rate-Base Adjustments.** Adjustments LJG-1 and LJG-2 correct
6 accumulated depreciation balances from the last rate case and the calculation going forward.
7 Adjustment LJG-10 corrects an error in plant-account assignment. Adjustment LJG-11 adds
8 \$1,899,267 to UPIS associated with well replacements and rehabilitations. Adjustment LJG-12
9 corrects a refund of High Block Surcharge monies.
10

11 **Sun City West Water Rate-Base Adjustments.** Adjustment LJG-1 reduces Accumulated
12 Depreciation for over-expensing.
13

14 **Tubac Water Rate-Base Adjustments.** Adjustment LJG-1 increases Accumulated
15 Depreciation for an under-collection that has been building up since the last rate case, Decision
16 No. 67093. Adjustment LJG-2 decreases UPIS by \$1,624 for Plant Not Used.
17

18 **Mohave Wastewater Rate-Base Adjustments.** Adjustment LJG-1 reduced accumulated
19 depreciation by \$225,743. Adjustment LJG-10 adds \$3,932,080 to UPIS for the Wishing Well
20 Wastewater Treatment Plant project.
21

22 **Schedule B-5.** Ms. Gutowski sponsors the Materials & Supplies and Prepayment portions of the
23 working capital calculation.
24

25 **INCOME STATEMENT ADJUSTMENTS.**

26
27 Ms Gutowski sponsors the following income-statement adjustments:
28

29 **Adjustment LJG-1** removes unbilled revenues for each district.
30

31 **Adjustment LJG-2** Blank
32

33 **Adjustment LJG-3** provides various types of individual adjustments for the districts.
34

35 **Adjustment LJG-4** (Agua Fria Water, Havasu Water, Paradise Valley, and Sun City West
36 Water) moves the ACRM revenue collected during the test year from Other Revenue to Water
37 Revenue. Other adjustments were made for Paradise Valley Water and Mohave Wastewater.
38

39 **Adjustment LJG-5** annualizes customer revenues for each district.
40

41 **E SCHEDULES**

42
43 Ms. Gutowski prepared Schedule E-1, the Comparative Balance Sheet schedule for each district,
44 and Schedule E-5, the Detail of Plant in Service schedule for each district.
45

46 **H SCHEDULES**

47
48 Ms. Gutowski sponsors the Present Rate portion of the H Schedules.

1 **I INTRODUCTION AND QUALIFICATIONS**

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

4 A. My name is Linda J. Gutowski. My business address is 19820 N. 7th Street, Suite 201,
5 Phoenix, AZ 85024, and my business phone is 623-445-2496.

6 **Q. IN WHAT CAPACITY AND BY WHO ARE YOU EMPLOYED?**

7 A. I am a Senior Rate Analyst for Arizona-American Water Company. Arizona-American
8 Water Company ("Arizona-American" or "the Company") is a wholly owned subsidiary
9 of American Water.

10 **Q. PLEASE DESCRIBE YOUR PRIMARY RESPONSIBILITIES FOR THE**
11 **COMPANY.**

12 A. I primarily prepare regulatory filings for Arizona-American.

13 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND**
14 **EDUCATION.**

15 A. I have a Bachelor of Arts degree in Economics from Susquehanna University. I studied
16 accounting for two years at the Wharton School at the University of Pennsylvania. I have
17 attended several utility seminars including the NARUC Rate Seminar, New Mexico
18 State's Basics of Regulation and the Rate Making Process, Edison Electric Institute's
19 Electric Rate Advanced Course, and Arthur Anderson's Advanced Regulatory Concepts
20 School as well as many company-sponsored training sessions.

21 I worked for American Water in New Jersey as a Staff Accountant and then as a Rate
22 Analyst from 1973 to 1976. I left to work as a financial analyst for a consulting firm of
23 environmental engineers, Betz Converse Murdoch, building water and wastewater plants
24 from 1976 through 1982. I was employed by the Arizona Corporation Commission as an

1 auditor and a rate analyst from 1983 until 1986. I then worked for six years in the rate
2 department at Arizona Public Service Company, developing new rates and supporting
3 regulatory filings. I returned to American Water in New Jersey as a rate analyst in 1993,
4 and moved to Arizona-American's Phoenix Office in December of 2005.

5 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

6 A. Yes. I testified in May 2007, on behalf of Arizona-American in the Anthem Water and
7 Anthem/Agua Fria Wastewater cases, Docket No. WS-01303A-06-0403. I also testified
8 in the Sun City Water case, Docket No. W-01303A-07-0209 in January 2008. When I
9 worked at the Commission, I testified concerning CC&N applications, fuel adjustor
10 cases, and small rate cases. I have provided testimony before Commissions in Ohio,
11 Maryland, and Missouri, and provided support for exhibits filed in 20 of the states in
12 which Arizona-American or one of its regulated affiliates currently or formerly operates.

13 **II SCOPE AND PURPOSE OF TESTIMONY**

14 **Q. WHAT IS THE SCOPE AND PURPOSE OF YOUR TESTIMONY?**

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

16 **III RATE BASE**

17 **Q. WHAT ARE ARIZONA-AMERICAN'S RATE BASE EXHIBITS?**

18 A. Schedule B-1 contains Summary of the Fair Value Rate Base for each District. The
19 Company has done an Original Cost Rate Base and did not conduct a study to determine
20 rate base based on reconstruction cost net of depreciation ("RCND"). Therefore, the
21 Original Cost Rate Base is what the Company is requesting as its Fair Value Rate Base.

22 Schedule B-2 contains Original Cost Rate Base Pro Forma Adjustment Schedules. The
23 first two or three pages for each District are the summary pages. These are followed by
24 detailed pages by year for each district, updating plant additions, retirements,

1 adjustments, and accumulated depreciation since the last rate case. Next are pages for the
2 common plant and accumulated depreciation that are allocated to each District. These
3 were built out from 2006, which is the test year for the Sun City Water rate case (W-
4 01303A-07-0209). That is the most recent time that the corporate allocation was
5 examined by Staff. These corporate allocation pages are the same in every district – just
6 the Four-Factor allocation changes. Following these pages are individual exhibits of Rate
7 Base Adjustments in the Schedule B-2's. Some of these vary for each district and some
8 of these are the same adjustment, although different amounts, in each district.

9 Schedule B-3 is blank as it would be a summary of the RCND Rate Base, which we are
10 not sponsoring. Schedule B-4, which would provide detail for the RCND plant accounts.
11 is therefore also blank.

12 Schedule B-5 provides the Computation of Working Capital. Ms. Hubbard is supporting
13 the Lead/Lag Study that resulted in the Cash Working Capital and I am supporting the
14 13-month Average of Materials and Supplies Inventories and the Prepayments, all of
15 which comprise the Working Capital.

16 **Q. COULD YOU SUMMARIZE RATE BASE BY DISTRICT?**

17 **A.** Yes. The following table summarizes rate base for each district (from Schedule B-1):

18 **Table 1 – Summary of Rate Base**

<u>District</u>	<u>OCRB</u>
Agua Fria Water	\$96,976,395
Havasu Water	\$4,221,474
Mohave Water	\$12,041,310
Paradise Valley	\$40,864,986
Sun City West Water	\$37,901,085
Tubac Water	\$1,527,454
Mohave Wastewater	\$ 4,740,149
Total All Districts	\$198,272,853

1 Q. WHAT ARE THE COMMON RATE-BASE ADJUSTMENTS FOR THE
2 DISTRICTS?

3 A. Adjustment LJG-3 spreads a December 2007 Journal Entry to each district's Utility Plant
4 in Service ("UPIS"). The December Journal Entry erroneously allocated UPIS to the
5 Corporate District. Adjustment LJG-3 reallocates the UPIS balance from the Corporate
6 District into the proper district, based on plant coding.

7 Q. WHAT IS THE MAGNITUDE OF EACH ADJUSTMENT LJG-3, BY DISTRICT?

8 A. Please see the following table:

9 Table 2 – UPIS Reallocation by District

<u>Districts</u>	<u>UPIS Moved</u>
Agua Fria Water	\$510,426
Havasu Water	\$6,156
Mohave Water	\$448
Paradise Valley	\$93,988
Sun City West	\$5,456
Total	\$616,474

10 Q. WHAT ABOUT THE DISTRICTS THAT ARE MISSING FROM THE LISTING
11 IN TABLE 2?

12 A. The Tubac Water and Mohave Wastewater districts had no work orders closed out in that
13 Journal Entry.

14 Q. WHAT ARE THE NEXT COMMON RATE BASE ADJUSTMENTS?

15 A. Adjustment LJG-4 allocates the Common, or Corporate, Plant and Accumulated
16 Depreciation to each of the districts. The Allocation is based on the Four-Factor
17 Allocation Method using the column for Number of Customers.

18 The Corporate Plant is the total of the 7th Street Phoenix office, the Sun City office, and
19 the Eastern Division office (which is comprised of less than \$17,000 in computer
20 equipment). These plant and accumulated depreciation dollars are spread across the

1 districts involved in this case, based on the district's percentage of total of metered
2 customers for the company. We have chosen to show the Corporate allocation on a
3 separate page for several reasons.

4 **Q. CAN YOU PLEASE EXPLAIN THOSE REASONS?**

5 **A.** Yes. The Commission recently examined Corporate Division Plant in the Sun City Water
6 case, W-01303A-07-0209. It is only necessary to update this data from the test year
7 which ended on December 31, 2006. Because the districts do not all have the same prior
8 test years, it is much easier to have the Corporate Division on a separate sheet and
9 allocate it from there.

10 Another reason is that we are now combining what were the Corporate, Central, and
11 Eastern Divisions. These divisions were created for operating reasons and not for rate-
12 making reasoning. For instance, many of the people who work out of the 7th Street and
13 the Sun City offices have jobs affecting the entire state. Both Operating Managers, the
14 one in charge of Central and the one in charge of Eastern, have offices and assistants in
15 the Sun City office building.

16 Another reason to allocate from the test-year ending balances is that this accounts for
17 customer growth. Agua Fria Water's allocation factors, for instance, have changed from
18 18.8% to 20.4% to 21.5% from 2005 through 2007, because this district has grown faster
19 than other districts. If we were to spread the Corporate Plant each year, the allocations
20 would change each year, while trying to show additions, retirements, and adjustments.
21 That makes the distribution difficult and somewhat senseless.

22 Finally, if we did not allocate Corporate Plant from the test-year-ending balances, we
23 would have to deal with changing depreciation rates from every rate case for most of the

1 districts. By holding the Corporate Plant out separately, we can set the depreciation rates
2 and leave them stable.

3 **Q. ARE THERE ANY MORE COMMON RATE BASE ADJUSTMENTS?**

4 A. Yes. Adjustment LJG-5 on Schedule B-2 is the opposite side of Adjustment LJG-3. This
5 reverses the December 2007 Journal Entry and removes it from the Corporate Plant
6 accounts. The amount removed is \$753,965 – and Table 2 above shows into which of the
7 Districts in this case the amounts are going.

8 Next, Adjustment LJG-6 on Schedule B-2 decreases Advances and/or Contributions in
9 Aid of Construction for dollars associated with projects that are still in Construction
10 Work in Progress (“CWIP”). Since these project amounts had not been transferred from
11 CWIP to Utility Plant in Service as of December 31, 2007, and therefore, are not part of
12 the increase to Rate Base, the associated balances of Advances or Contributions should
13 also not decrease Rate Base.

14 **Q. HOW MUCH WERE THE ADVANCES OR CONTRIBUTIONS IN EACH**
15 **DISTRICT REDUCED FOR THE PROJECTS THAT ARE IN CWIP AS OF THE**
16 **END OF THE TEST YEAR?**

17 A. Please see the following table:

Table 3 – Reductions of Advances or Contributions

<u>Districts</u>	<u>Advances</u>	<u>Contributions</u>
Agua Fria Water		\$3,432,286
Havasu Water		\$10,645
Mohave Water	\$291,909	\$94,452
Paradise Valley		\$322,588
Sun City West Water		\$17,318
Tubac Water		\$20,266
Mohave Wastewater		\$65,395
Total	\$291,909	3,962,948

1
2 **Q. MR. BRODERICK SPONSORS THREE ADJUSTMENTS THAT ARE COMMON**
3 **TO THE DISTRICTS THAT APPEAR ON SCHEDULE B-2. CAN YOU**
4 **DESCRIBE THEM AND THEIR NUMBERING?**

5 **A.** Adjustment TMB-7 is reserved for the Imputed Regulatory Advances in Aid of
6 Construction. The amortization of these runs out in July 2008, so these are fully
7 amortized, and no adjustment is needed to decrease rate base in any district for the
8 imputed advances.

9 Adjustment TMB-8 is reserved for the Imputed Regulatory Contributions in Aid of
10 Construction. These imputed contributions are being amortized over a 10-year period
11 rather than the 6.5-year period for the advances, so the Company is using the remaining,
12 unamortized balances as of December 31, 2007.

13 Adjustment TMB-9 is reserved to remove the Acquisition Adjustment from the Citizens
14 Utilities purchase. Because this acquisition is recorded in the Corporate Division, and
15 because we allocate Corporate to the Districts, Paradise Valley had incorrectly received a
16 piece of the acquisition adjustment, although it was not a part of the Citizens purchase.

17 **Q. WILL YOU PLEASE SUMMARIZE MR. BRODERICK'S COMMON**
18 **ADJUSTMENTS?**

19 **A.** Certainly, please see the following table:

Table 4 – Summary of Broderick Adjustments

<u>District</u>	<u>TMB-7</u>	<u>TMB-8</u>	<u>TMB-9</u>
Agua Fria Water	\$0	\$796,965	\$6,090,214
Havasu Water	\$0	\$113,427	\$281,816
Mohave Water	\$0	\$1,157,044	\$2,918,124
Paradise Valley	\$0	\$0	\$876,064
Sun City West	\$0	\$392,368	\$2,845,456
Tubac	\$0	\$58,023	\$98,857
Mohave Wastewater	\$0	\$131,237	\$226,486
Total	\$0	\$2,649,064	\$13,337,017

1
2 **Q. WHAT ARE THE REMAINING ADJUSTMENTS TO SCHEDULE B-2?**

3 A. These are individual adjustments particular to each district. I first discuss the water
4 districts, and then the Mohave Wastewater District.

5 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
6 **AGUA FRIA WATER DISTRICT?**

7 A. Adjustment LJG-1 removes \$76,503 from UPIS and \$19,453 from Accumulated
8 Depreciation. These are amounts that were found to be Plant not useful in the last rate
9 case, Decision No. 67093. This is the first rate case for this district since that Decision.

10 Adjustment LJG-2 on Schedule B-2 removes the Excess Hook-Up Fee Contribution for
11 the White Tanks Project. Decision No. 69914, effective September 27, 2007, allowed the
12 Company to increase the Agua Fria hook-up fee to collect contributions to be used to
13 fund the White Tanks Project. The excess amount of the new hook-up fees over the old
14 hook-up fees is to be deducted from the Contributions in this rate case. Mr. Broderick
15 further discusses this subject.

16 Adjustment LJG-10 adds \$25,000,000 of White Tanks Project Costs to Rate Base. The
17 funding schedule of the White Tanks Project has changed due to the downturn in the
18 Arizona real estate market, and it is important to request this additional funding up front.
19 Mr. Broderick discusses why this is appropriate.

1 My last adjustment, LJG-11, is to add Post-Test-Year Additions of \$3,214,033. Arizona-
2 American expects to complete the Sierra Montana 2.2 MG Reservoir by August 2008,
3 and the project costs are expected to be \$2,046,765. Also, we expect by October 2008 to
4 complete the Distribution System Improvements Phase 2 projects – the Cool Well
5 Waterline Connection, the Waddell Haciendas project, and the Reems Road Bypass.
6 Those projects are expected to cost \$1,167,268. Mr Gross further discusses these
7 projects.

8 These adjustments bring the total rate base for the Agua Fria Water District to
9 \$99,268,524, as summarized on Schedule B-1. This is a 500% increase in rate base over
10 the last rate case, which had a test year ending December 31, 2001. Over the last six
11 years, Arizona-American has made enormous investments to serve this fast-growing
12 district.

13 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
14 **HAVASU WATER DISTRICT?**

15 **A.** Adjustment LJG-1, corrects Accumulated Depreciation for Havasu Water District by
16 decreasing it \$20,809. There were errors in booked depreciation beginning in September
17 2006. Then, there was an erroneous double correction in October 2006. Finally, one of
18 the 300 plant accounts had the incorrect depreciation expense taken for 14 months in
19 2006 and 2007.

20 Adjustment LJG-2 removes \$77,319 of Plant and reduces Accumulated Depreciation by
21 \$29,047 for the Plant that the Commission found to be not useful in Decision 67093.
22 This is the first rate case for this district since that Decision.

23 In Decision No. 69162, dated December 5, 2006, Arizona-American was authorized to
24 defer until the next rate case the O&M costs for media replacement at the Havasu Arsenic

1 Treatment Plant. The result is to mitigate the impact of the ACRM on the Havasu system
2 by reducing the amount of the expected Step 2 increase by capitalizing, and thereby
3 deferring, recovery of eligible O&M costs. The media replacement in Havasu did cost
4 \$88,300. We filed for the Havasu ACRM Step 2 rate increase on April 14, 2008, and
5 expect to have the new rates in effect in August 2008. Adding AFUDC from then until
6 the expected date of rates in this case, September 2009, adds \$6,696 to the costs to be
7 deferred. Adjustment LJG-10 adds \$94,996 to rate base for deferred ACRM O&M costs.

8 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
9 **MOHAVE WATER DISTRICT?**

10 A. The first adjustment, LJG-1, adjusts the under-collection in the Accumulated
11 Depreciation for rate-making purposes. This amount has built to \$139,328 up since the
12 last rate case (Decision No. 69440). This amount comes from multiplying the plant
13 amounts each month by the depreciation rates and comparing to the booked depreciation
14 expense that was added to accumulated depreciation.

15 Adjustment LJG-2 removes (\$4,915) from plant as a proposed retirement to go along
16 with a Post-Test-Year addition recommended by Staff in the last rate case.

17 Arizona-American expects to complete the Mohave Water District's Big Bend Acres
18 0.25MG Reservoir by August 2008. Adjustment LJG-10 includes estimated project costs
19 of \$610,732 in rate base. Mr. Gross further discusses this project.

20 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
21 **PARADISE VALLEY WATER DISTRICT?**

22 A. Adjustments LJG-1 and LJG-2 correct accumulated depreciation balances from the last
23 rate case and the calculation going forward. LJG-1 increases accumulated depreciation
24 by \$107,315, an adjustment from Decision No. 68858. LJG-2 then reduces accumulated

1 depreciation by \$50,277 for an over collection when the plant additions, retirements, and
2 balances are multiplied by the depreciation rates.

3 Adjustment LYG-10 corrects an error in plant-account assignment. The Paradise Valley
4 Arsenic Treatment Facility was assigned to account 304.1, Structures & Improvements
5 Source of Supply instead of 304.3, Structures & Improvements Water Treatment.
6 Changing the plant account does nothing to UPIS, but the Commission approved
7 depreciation rate for 304.1 is 14.59%, whereas the depreciation rate for 304.3 is 2.00%.
8 Changing the plant account to 304.3 decreases the accumulated depreciation balance
9 from November 2006 through December 2007 by \$1,883,984.

10 As discussed by Mr. Gross and Mr. Cole, two wells are being replaced or rehabilitated in
11 Paradise Valley. Post Test Year Plant Additions and Retirements for Well No. 12
12 redrilling are expected to be \$1,935,000 less a retirement of \$159,974. The Additions
13 and Retirements for the Well No. 17 rehabilitation are expected to be \$288,080 less a
14 retirement of \$163,840. The net addition to UPIS on Adjustment LYG-11 is \$1,899,267.

15 Adjustment LYG-12 corrects a refund of High Block Surcharge monies to three
16 residential customers during the test year. The refund was put against Operating
17 Revenue. The High Block Surcharge funds go into Contributions, so any refund should
18 be applied to that account.

19 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
20 **SUN CITY WEST WATER DISTRICT?**

21 **A.** Adjustment LYG-1 reduces Accumulated Depreciation for an over-expensing, due to the
22 method I use to build-out accumulated depreciation which begins with the balance at the
23 end of the last rate case with a test-year ended December 2001 and multiplies the

1 additions, retirements, and adjustments through December 2007 by the allowed
2 depreciation rates compared to the book balance at December 2007.

3 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
4 **TUBAC WATER DISTRICT?**

5 A. Adjustment LJG-1 increases Accumulated Depreciation for an under-collection that has
6 been building up since the last rate case, Decision No. 67093. The amount of under-
7 collection by the end of December 2007 is \$1,624.

8 Adjustment LJG-2 decreases UPIS by \$1,624 for Plant Not Used as recommended by
9 Staff and accepted in Decision No. 67093. This is the first rate case for this district since
10 that decision.

11 **Q. WHAT INDIVIDUAL RATE BASE ADJUSTMENTS WERE MADE FOR THE**
12 **MOHAVE WASTEWATER DISTRICT?**

13 A. The approved accumulated depreciation in Decision No. 69440 with a test year ended
14 June 24, 2005, is \$82,199. The beginning book balance for this case was \$335,786.
15 Adjustment LJG-1 had to be made to bring accumulated depreciation down by \$225,743
16 by the end of December 2007.

17 Adjustment LJG-10 adds Post Test Year Plant of \$3,932,080 for the Wishing Well
18 Wastewater Treatment Plant project which is projected to be completed in May of 2008.
19 Mr. Gross further discusses this project.

20 **Q. WHAT IS SCHEDULE B-5 AND WHAT PART OF IT DID YOU PREPARE?**

21 A. Schedule B-5 shows the Working Capital computation. Working Capital is usually made
22 up of Cash Working Capital derived from a Lead/Lag study, a 13-Month Average of
23 Inventories, and any Prepayments on the Balance Sheet. As discussed earlier, Ms.

1 Hubbard is supporting the Lead/Lag computation and the resulting Cash Working Capital
2 calculation. I calculated the 13-month average of the inventories, both plant material and
3 chemical, if applicable, and the prepayment balances from the balance sheet. While each
4 of the water districts has its own chemical inventory, the plant and material inventory is
5 more centralized and shared. The Sun City inventory serves Sun City Water, Sun City
6 West Water, and Agua Fria Water. The Paradise Valley inventory serves Paradise
7 Valley, Anthem Water, and Tubac. Finally, the Mohave inventory serves Mohave Water
8 and Havasu Water. I split each of the inventories based on Net Plant from the Four
9 Factor Allocation worksheet for the test year.

10 **Q. CAN YOU SUMMARIZE MATERIALS AND SUPPLIES INVENTORIES AND**
11 **PREPAYMENTS FOR EACH DISTRICT?**

12 A. Yes. Please see the following table:

13 **Table 5 – Material and Supplies Inventories and Prepayments by District.**

<u>District</u>	<u>Mat'l & Supplies</u>	<u>Prepayments</u>
Agua Fria Water	\$192,139	\$214,929
Havasu Water	\$4,486	\$4,556
Mohave Water	\$8,897	\$57,963
Paradise Valley	\$38,726	\$117,955
Sun City West	\$56,510	\$24,906
Tubac Water	\$1,445	\$1,598
Mohave Wastewater	\$341	\$3,661
Total	\$302,544	\$425,568

14 **IV ADJUSTED OPERATING REVENUE**

15 **Q. YOU HAVE MADE SEVERAL ADJUSTMENTS TO OPERATING REVENUE IN**
16 **THIS CASE. WHAT ARE THE COMMON OPERATING REVENUE**
17 **ADJUSTMENTS FOR THE DISTRICTS?**

18 A. Income Statement Pro Forma Adjustments, Schedule C-2, Adjustment LJG-1 is to
19 remove Unbilled Revenue from the test year in every district. Unbilled Revenue is an
20 estimate of the usage at the end of the year that has yet to be billed. For instance, those

1 customers who get billed early in December have usage throughout December that will
2 not be billed again until January. The number of days remaining in December that they
3 were not billed for, times average daily revenue gives the journal-entry estimate of
4 unbilled revenue.

5 **Q. WHY WOULD YOU DELETE UNBILLED REVENUE FROM THE TEST**
6 **YEAR?**

7 A. We perform a bill analysis that looks at 12 bills for each customer, or less if the customer
8 was new during the year. Then we annualize the number of customers times usage and
9 add revenue to fill out the number of customers during the year. Because we look at 12
10 bills and annualize, there is no need to add any unbilled revenue. The Test Year Adjusted
11 Revenue dollars reflect 12 full bills.

12 **Q. CAN YOU SUMMARIZE THE UNBILLED REVENUE ADJUSTMENT (LJG-1)**
13 **BY DISTRICT?**

14 A. Yes. Please see the following table.

15 **Table 6 – Unbilled Revenue Removed from Test Year Booked Revenue.**

District	LJG-1
Agua Fria Water	(\$271,793)
Havasu Water	\$10,210
Mohave Water	(\$91,692)
Paradise Valley	(\$229,170)
Sun City West	(\$204,330)
Tubac Water	(\$2,957)
Mohave Wastewater	(\$19,166)
Total	(\$808,898)

16 **Q. WHAT OTHER REVENUE ADJUSTMENT IS COMMON TO ALL THE**
17 **DISTRICTS?**

18 A. Adjustment LJG-5 is the one used to Annualize Customer Growth in every District. For
19 the Water districts and the Sewer districts where rates are based on water volume, we
20 used the Residential 5/8", 3/4" and 1" Average Number of Customers and the Commercial

1 5/8", 3/4", 1", 1-1/2", and 2" Average Number of Customers and compared that to the Test
 2 Year End Number of Bills by meter size to obtain the customer growth in bills. We took
 3 the Average Monthly Gallons for each one of these class and meter sizes and multiplied
 4 by the Customer Growth Bills to get the growth in volume. These factors by meter size
 5 were then billed out at the present rates for each district. I included the ACRM Step 1
 6 rates in present rates in Agua Fria Water, Havasu Water, Paradise Valley Water, and Sun
 7 City West Water. In the Mohave Wastewater district, the sewer rates are flat rates so
 8 only the number of bills was used in the calculation.

9 **Q. DID YOU ALSO ADJUST OPERATING EXPENSES WHEN YOU ADJUSTED**
 10 **REVENUE FOR THE INCREASE OR DECREASE IN TEST-YEAR**
 11 **CUSTOMERS?**

12 **A.** Yes. For the water districts, I adjusted Purchased Water, Fuel & Power, and Chemical
 13 expense based on the increased or decreased volume of sales. For the wastewater
 14 districts, I adjusted Fuel & Power, Chemical Expense, and Waste Disposal Expense
 15 based on the increased or decreased number of bills. I used bills rather than volume for
 16 the Mohave Wastewater District, because these bills are flat-rate For both Water and
 17 Wastewater districts, I increased or decreased Postage Expense and Other Customer
 18 Accounting Expense based on the number of bills.

19 **Q. CAN YOU SUMMARIZE ADJUSTMENT LJG-5 BY DISTRICT?**

20 **A.** Yes. Please see the following table:

21 **Table 7 – Customer Annualization, LJG-5**

<u>District</u>	<u>Resid Rev</u>	<u>Comm'l Rev</u>	<u>Total Rev</u>	<u>Oper Expense</u>
Agua Fria Water	\$41,605	\$9,652	\$51,257	\$10,263
Havasu Water	(\$3,476)	(\$865)	(\$4,341)	(\$1,119)
Mohave Water	(\$435)	(\$378)	(\$813)	(\$138)
Paradise Valley	(\$10,237)	(\$6,651)	(\$16,888)	(\$2,465)
Sun City West	\$915	(\$595)	\$320	\$19
Tubac Water	\$669	\$243	\$912	\$90

<u>District</u>	<u>Resid Rev</u>	<u>Comm'l Rev</u>	<u>Total Rev</u>	<u>Oper Expense</u>
Mohave	\$633	\$0	\$633	\$198
Wastewater				
Total All Districts	\$29,674	\$1,406	\$31,080	\$6,848

1 **Q. ARE THERE ANY OTHER REVENUE ADJUSTMENTS THAT ARE COMMON**
2 **FOR ALL THE DISTRICTS?**

3 A. No.

4 **Q. WHAT IS ADJUSTMENT LJG-4?**

5 A. Agua Fria Water, Havasu Water, Paradise Valley, and Sun City West Water were all
6 provided Step 1 ACRMs. All four districts were ordered by the Commission to file rate
7 cases to roll these Step 1 rates into base rates and ask for Step 2 recovery as a surcharge,
8 if appropriate. The Step 2 ACRM cases have all now been filed. Therefore, I moved the
9 ACRM revenue collected during the test year from Other Revenue up to Water Revenue.

10 **Q. DID YOU NEED TO TAKE A FURTHER STEP IN PARADISE VALLEY?**

11 A. Yes. The Step 1 ACRM increase went into effect during the April revenue month, so I
12 needed to annualize the revenue that would have been collected had the Step 1 rates been
13 in effect the whole year. That annualization came to \$599,146 for the more than three
14 months that needed to be added.

15 **Q. IS ADJUSTMENT LJG-4 USED FOR ANYTHING ELSE?**

16 A. Yes. In Mohave Wastewater I had to increase revenue for an annual billing for effluent
17 sales that had not been sent out during the test year. It is an annual billing based on acre
18 feet and the rate changed May 1, 2007 with Decision No. 69440. The additional billing
19 to be added in the test year, normalized to the new rate, is \$41,299,

20 **Q. CAN YOU PLEASE EXPLAIN ADJUSTMENTS LJG-3 BY DISTRICT?**

21 A. Yes. Adjustment LJG-3 is reserved for various types of individual adjustments for the
22 districts. For the Agua Fria Water District, Adjustment LJG-3 removes December 2006

1 revenue of \$21,166 that was reallocated in January. It removes \$2,871 of prepaid water
2 expense booked to revenue in error. It removes \$48,519, which is the 2006 portion of
3 bulk water billing to Arizona Water that happened during the test year. And finally, it
4 adds back \$51,100 in miscellaneous credits and billings on the wrong rate schedules that
5 occurred on the books during the test year.

6 For the Havasu Water District, Adjustment LJG-3 adds back a credit adjustment that was
7 removed twice in error during the test year of \$18,690.

8 For the Mohave Water District, I annualized the rate increase granted on May 1, 2007 in
9 Decision 69440 by multiplying the billing factors from the H Schedules times the new
10 rates. The adjustment is \$212,262.

11 For the Paradise Valley Water District, Adjustment LJG-3 removes \$12,906 for the 2006
12 Premium billing of the Paradise Valley Country Club. That was part of an old contract
13 and will no longer be computed under the new contract. I added \$7,399 to test year
14 revenue for a turf account with a miscellaneous debit for additional revenue that was
15 billed at present rates but not for the ACRM revenue. I added back the \$20,291 High
16 Block Surcharge credit given to three customers. This credit rightfully offsets
17 Contributions, not Revenue and is the opposite of an adjustment made to rate base. I also
18 added back \$5,802 from test-year credit billing for a 2006 bill dispute resolution. And, I
19 added back Residential credits of \$28,107 and removed Commercial debits of (\$1,145).
20 These are miscellaneous credits and debits that happened during the test year.

21 For the Sun City West Water District, the adjustment corrects for miscellaneous credits
22 and adjustments given during the test year totaling \$4,167.

1 For the Mohave Wastewater District, I annualized the rate increase authorized in
2 Decision 69440 effective May 1, 2007 for \$57,282.

3 **V COMPARATIVE STATEMENTS**

4 **Q. DID YOU PREPARE ANY OF THE E SCHEDULES?**

5 A. Yes. I prepared Schedule E-1, the Comparative Balance Sheet schedule for each district,
6 and Schedule E-5, the Detail of Plant in Service schedule for each district.

7 **Q. HOW DID YOU PREPARE THE COMPARATIVE BALANCE SHEET**
8 **SCHEDULE?**

9 A. The Total Company Balance, Page 1 of Schedule E-1, comes right from the books and
10 records for the years 2005, 2006, and 2007. Page 2 is the Balance Sheet for the District.
11 The Corporate Division is allocated to the districts' trial balance based on the Four-Factor
12 Allocation of number of customers.

13 **Q. HOW WAS SCHEDULE E-5 DERIVED?**

14 A. Plant balances are listed on Schedule B-2 annually since the last rate case. I took the
15 amount for plant in service at 2006 and 2007 from that detail and used it on the E-5. The
16 column in between is the difference and represents the additions, retirements, and
17 adjustments during the test year. The second page of the schedule shows the detail of
18 plant in service for the Corporate Division. I applied Allocation Factors to that total for
19 each of the districts to calculate a district total including common plant allocation.

20 **VI EFFECT OF PROPOSED TARIFF SCHEDULES**

21 **Q. CAN YOU BRIEFLY DESCRIBE THE H SCHEDULES?**

22 A. Yes. Schedule H-1 is a summary of the revenue billed under present rates and the
23 amount that would be generated by the proposed increase in metered water rates.
24 Schedule H-2 is an analysis of revenue at present and proposed rates by class and meter

1 size in dollar amount and percentage. The average number of customers derived from the
2 bill count is also shown by meter size and in total. Schedule H-3 presents a comparison
3 of present and proposed rates and shows the changes by blocks. Schedule H-4 compares
4 present and proposed rates and the percentage increase at various consumption levels.
5 Schedule H-5 is the bill count of the bills during the test year.

6 **Q. WHICH PORTION OF THE H SCHEDULES ARE YOU SPONSORING?**

7 A. I am sponsoring the Present Rate portion of the H Schedules. These schedules, up to the
8 Proposed Rates, were prepared by me or under my direction. The Company uses all the
9 historic billing information and factors for the 12 months ending December 2007 for each
10 District. The current rates were applied to the billing information.

11 I updated the current rates for the Agua Fria Water, Havasu Water, Paradise Valley, and
12 Sun City West Water Districts to include the Step 1 ACRM surcharges. I also updated
13 the Mohave Water and Mohave Wastewater Districts to reflect rate increases that
14 occurred during the test year.

15 All present rate revenue ties out to the Test Year Adjusted Present Rate Revenue in
16 Schedule C-1 for the Water Revenue. These dollars by class are then brought over to
17 Schedule A-1, so that class percentage increases can be shown. Mr. Herbert sponsors the
18 Proposed Rate portion of the H Schedules.

19 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

20 A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
JOHN C. (JAKE) LENDERKING
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
JOHN C. (JAKE) LENDERKING
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	iii
I	INTRODUCTION AND QUALIFICATIONS	1
II	PURPOSE OF TESTIMONY.....	2
III	WATER CONSERVATION	2
IV	PARADISE VALLEY WATER – CAP SURCHARGE MODIFICATION.....	6

1 **EXECUTIVE SUMMARY**

2
3 Mr. Lenderking testifies as follows:

4
5 **WATER CONSERVATION**

6
7 Arizona-American presently spends approximately \$40,000 annually in its Sun City Water, Sun
8 City West Water and Agua Fria Water Districts on water conservation. This amount was
9 authorized by Commission Decision No. 60172, issued on May 7, 1997. This level of funding
10 has been used in part to assist Arizona American to meet ADWR conservation regulations.

11
12 Arizona-American's conservation program is called Save H2O. The Save H2O program
13 encourages and promotes water conservation in many ways, including:

- 14
- 15 • Participation in community events;
 - 16 • Water conservation messages in customer bills
 - 17 • Providing water conservation kits (upon request);
 - 18 • Home Water Audits;
 - 19 • Internet communication;
 - 20 • Financial assistance and staff participation in the Regional "Water Use it Wisely"
21 Campaign; and
 - 22 • RinseSmart Program.

23 As a compliance requirement, a report to the Commission is provided each year that provides
24 greater detail.

25 Arizona-American is considered by ADWR to be a "municipal water provider," which makes it
26 generally subject to ADWR regulation. The new ADWR water conservation program is known
27 as the Modified Non-Per Capita Conservation Program ("MNPCCP"). Because Arizona-
28 American already implements conservation measures, the effects of the MNPCCP on the
29 Arizona-American districts will be minimal.

30
31 **CAP SURCHARGE MODIFICATION**

32
33 Because of a failure at the Miller Road Treatment Facility, untreated water from the PCX-1 well
34 owned by the Salt River Project ("SRP"), a well contaminated with trichloroethylene was
35 introduced into the district's water supply. There were no health effects, but the incident
36 highlighted the risk of using the PCX-1 well as part of the district's water supply. Among other
37 things, Arizona-American has determined that it will no longer use the PCX-1 well as part of the
38 water supply for its Paradise Valley Water District.

39
40 Arizona-American has secured an allotment of CAP water for the benefit of its Paradise Valley
41 Water District customers. However, it has no economical way to physically deliver and treat the
42 CAP water for delivery to customers. Arizona-American was able to make use of its CAP
43 allocation through an exchange with SRP where it exchanged its CAP allocation with SRP in
44 return for rights to water pumped from the PCX-1 well. The exchange allowed Arizona-

1 American to take water from the PCX-1 well, treat it at the Miller Road Treatment Facility to
2 remove TCE, and then blend it with other water sources for delivery to Paradise Valley Water
3 District customers.
4

5 The current SRP water delivery charges and the SRP administrative charges total \$22.62 per acre
6 foot. The current CAP annual Municipal and Industrial water service charges are \$91 per acre
7 foot and the Municipal and Industrial capital charges are \$21 per acre foot. The seventh revised
8 CAP Surcharge, authorized by Commission Decision No. 61831, recovers both the SRP and
9 CAP costs.
10

11 Arizona-American has added storage for the Paradise Valley Water District and presently has
12 enough capacity to run the system without the PCX-1 well. Further, as discussed by Mr. Gross
13 in his testimony, Arizona-American is, among other things, replacing Well 12 with a new well,
14 which will return its production to its original level of 2200 gallons per minute.
15

16 Arizona-American will store and recover the district's 3,231 acre-feet allocation of CAP water at
17 the Tonopah Desert Recharge Project, owned by the Central Arizona Water Conservation
18 District ("CAWCD"). The stored CAP water will then be "recovered" from wells in the
19 Paradise Valley Water District. The cost to store water is much lower than the cost to exchange
20 water with SRP. The current price to store water at a CAWCD facility in the Phoenix AMA is
21 \$8 per acre foot while the cost to exchange water with SRP is \$22.62 per acre foot.

1 **I INTRODUCTION AND QUALIFICATIONS**

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

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

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

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

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

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

15 **Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

16 A. I received a Bachelor of Science degree (summa cum laude) from Arizona State
17 University in Environmental Resource Management with a concentration in Watershed
18 Ecology.

19 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

20 A. I joined Arizona-American in 2007. Before joining Arizona-American, I was employed
21 by the City of Phoenix in its Water Conservation office, where I worked towards the
22 development of the City's demand management plan, a plan that is still under
23 development. I also oversaw the implementation of the city's retrofit and audit program,
24 where we visited single-family homes, performed water audits, and replaced older

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

5 **Q. ARE YOU A MEMBER OF ANY ASSOCIATIONS?**

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

8 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?**

9 A. No.

10 **II PURPOSE OF TESTIMONY**

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

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

13 **III WATER CONSERVATION**

14 **Q. PLEASE DESCRIBE ARIZONA-AMERICAN'S WATER CONSERVATION
15 PROGRAM.**

16 A. Presently, approximately \$40,000 is spent annually in our Sun City Water, Sun City West
17 Water, and Agua Fria Water Districts on water conservation. This amount was
18 authorized by Commission Decision No. 60172, issued on May 7, 1997. This level of
19 funding has been used in part to assist Arizona-American to meet ADWR conservation
20 regulations.

21 Arizona-American's conservation program is called Save H2O. The Save H2O program
22 encourages and promotes water conservation in many ways, including:

- 23
- Participation in community events;

- 1 • Water conservation messages in customer bills
- 2 • Providing water conservation kits (upon request);
- 3 • Home Water Audits;
- 4 • Internet communication;
- 5 • Financial assistance and staff participation in the Regional “Water Use it Wisely”
- 6 Campaign; and
- 7 • RinseSmart Program.

8 As a compliance requirement, a report to the Commission is provided each year that
9 provides greater detail.

10 **Q. YOU MENTIONED “ADWR CONSERVATION REGULATIONS.” HOW DOES**
11 **ADWR REGULATE WATER PROVIDERS?**

12 A. Arizona-American is considered by ADWR to be a “municipal water provider,” which
13 makes it generally subject to ADWR regulation. For many years ADWR has relied upon
14 the total Gallons Per-Capita per Day (“GPCD”) program to regulate large municipal
15 water providers within AMAs. Under this program, ADWR had given municipal water
16 providers target GPCD rates and dates at which the municipal provider was to be at or
17 below the target GPCD rate. Generally, the GPCD rate was to go down over time. The
18 GPCD-based program had many obstacles that made it difficult for municipal water
19 providers to comply with the rates. There were also obstacles for ADWR’s
20 implementation.

21 **Q. WERE THERE ANY PARTICULAR OBSTACLES FOR PRIVATE WATER**
22 **COMPANIES?**

23 A. Yes. Private water companies cannot control water use and development within their
24 certificated area, and thus have little ability to decrease consumption and meet the target
25 GPCD rates. ADWR took note of these problems and asked for the public’s input in

1 developing a new program. ADWR surveyed and interviewed many of the municipal
2 water providers and developed a stakeholder process which began in 2006. The
3 stakeholder process has since been completed and a new program has been developed.

4 **Q. WHAT IS THE NEW ADWR WATER CONSERVATION PROGRAM?**

5 A. New legislation required modification of ADWR's Third Management Plan to
6 incorporate the new ADWR program, known as the Modified Non-Per Capita
7 Conservation Program ("MNPCCP"). The modification of the Third Management Plan
8 mandates that all large municipal providers that are not designated as having an assured
9 water supply will be regulated under the modified MNPCCP. This is to begin in 2010 or
10 sooner. The modification requires large municipal providers regulated under the
11 MNPCCP to implement up to ten water conservation measures from a list of measures
12 included in the program depending upon the number of connections. All municipal
13 providers regulated under the MNPCCP must have a public education program.
14 Additionally there are three tiers that a district will fall into, each tier containing more
15 conservation requirements than the previous one. The first tier is for districts that have
16 up to 5,000 connections, the second is for districts with 5,001 to 30,000 connections, and
17 the third tier is for districts with over 30,000 connections. The tiers require one, five, and
18 ten additional conservation measures respectively.

19 **Q. HOW DOES THE NEW ADWR WATER CONSERVATION PROGRAM**
20 **AFFECT ARIZONA-AMERICAN?**

21 A. The Agua Fria, Sun City, Sun City West, Tubac, and Paradise Valley water districts will
22 all be regulated in this program. However, because Arizona-American already
23 implements conservation measures, the effects of the MNPCCP on the Arizona-American
24 districts will be minimal.

1 Tubac Water has approximately 570 connections and is therefore in the first tier. This
2 district already meets the required level of conservation by having conservation materials
3 available, the use of bill inserts for conservation messaging, and meter replacements. The
4 new regulations have no effect on this system.

5 Paradise Valley Water has approximately 4,800 connections, so it is also in the first tier.
6 It already meets the required level of conservation by having conservation materials
7 available, providing bill inserts for conservation messaging, and offering meter
8 replacements. The new regulations have no effect on this system at this time, but in the
9 future this district will be over 5,000 connections and in the second tier. When this
10 occurs, this district may require some funding to meet the five additional conservation
11 requirements. The Paradise Valley District's conservation program will be reworked and
12 Arizona-American may ask the Commission to authorize additional funding in the next
13 rate case to remain in compliance.

14 However, because of very high water consumption in Paradise Valley Water district, Mr.
15 Broderick proposes in his testimony enhancements to the existing conservation-oriented
16 rate design for residential customers. He also proposes a system benefits surcharge to
17 fund, among other things, a landscape conversion program, which the Town of Paradise
18 Valley will propose later in this case.

19 Although Sun City Water is not included in this rate case, it contains approximately
20 23,000 connections and so is in the second tier which requires five more conservation
21 measures than the first tier. As mentioned earlier, this district already spends a portion of
22 the \$40,000 each year toward conservation, as required by Decision No. 60172.
23 Compliance will not be an issue.

1 Sun City West Water has approximately 15,500 connections. This puts it in the second
2 tier, which requires five more conservation measures than the first tier. As mentioned
3 earlier, this district already spends a portion of the \$40,000 each year toward
4 conservation, as required by Decision No. 60172. Compliance will not be an issue.

5 Agua Fria Water contains well over 30,000 connections and thus is in the third tier. This
6 tier requires ten more conservation measures than the first tier. As mentioned earlier, this
7 district already spends a portion of the \$40,000 each year toward conservation, as
8 required by Decision No. 60172. With some reworking, this district will likely meet or
9 exceed the required ten additional conservation measures. However, the MNPCCP
10 begins in 2010 and the reworking of the Agua Fria district's conservation is not yet
11 complete. This district may require some additional funding to meet the ten additional
12 conservation requirements. As the conservation program is reworked and ADWR
13 reviews it, Arizona-American may ask the Commission to authorize additional funding in
14 the next rate case to remain in compliance.

15 Finally because they are not in an AMA, the Mohave Water and Havasu Water districts
16 are not affected by the new requirements.

17 **IV PARADISE VALLEY WATER – CAP SURCHARGE MODIFICATION**

18 **Q. ARE YOU FAMILIAR WITH THE RECENT WATER CONTAMINATION**
19 **ISSUE IN THE PARADISE VALLEY WATER DISTRICT?**

20 **A.** Yes. The PCX-1 well is owned by the Salt River Project (“SRP”) and is contaminated
21 with trichloroethylene (“TCE”). Because of a failure at the Miller Road Treatment
22 Facility, untreated water from the PCX-1 well was introduced into the district's water
23 supply. There were no health effects, but the incident highlighted the risk of using the
24 PCX-1 well as part of the district's water supply.

1 Q. WHAT HAS ARIZONA-AMERICAN DONE AS A RESULT OF THE
2 CONTAMINATION INCIDENT?

3 A. Among other things, Arizona-American has determined that it will no longer use the
4 PCX-1 well as part of the water supply for its Paradise Valley Water District.

5 Q. HOW WAS IT THAT ARIZONA-AMERICAN WAS ABLE TO USE AN SRP
6 WELL AS PART OF ITS WATER SUPPLY?

7 A. Arizona-American has secured an allotment of CAP water for the benefit of its Paradise
8 Valley Water District customers. However, it has no economical way to physically
9 deliver and treat the CAP water for delivery to customers.

10 Arizona-American was able to make use of its CAP allocation through an exchange with
11 SRP. Arizona-American exchanged its CAP allocation with SRP in return for rights to
12 water pumped from the PCX-1 well. This changed the legal characteristic of the PCX-1
13 well water to CAP water. In turn, the CAP water provided to SRP legally became
14 groundwater.

15 Normally, SRP cannot provide water to areas outside its geographic boundaries. The
16 exchange allowed Arizona-American to take water from the PCX-1 well, treat it at the
17 Miller Road Treatment Facility to remove TCE, and then blend it with other water
18 sources for delivery to Paradise Valley Water District customers.

19 Q. HOW DID ARIZONA-AMERICAN RECOVER THE COSTS ASSOCIATED
20 WITH ITS "CAP WATER" FROM SRP'S PCX-1 WELL?

21 A. The current SRP water delivery charges and the SRP administrative charges total \$22.62
22 per acre foot. The current CAP annual Municipal and Industrial water service charges
23 are \$91 per acre foot and the Municipal and Industrial capital charges are \$21 per acre

1 foot. The seventh revised CAP Surcharge, authorized by Commission Decision No.
2 61831, recovers both the SRP and CAP costs.

3 **Q. HOW WILL ARIZONA-AMERICAN SUPPLY ADEQUATE WATER TO ITS**
4 **PARADISE VALLEY WATER CUSTOMERS WITHOUT THE PCX-1 WELL?**

5 A. Arizona-American has added storage for the Paradise Valley Water District and presently
6 has enough capacity to run the system without the PCX-1 well. Further, as discussed by
7 Mr. Gross in his testimony, Arizona-American is, among other things, replacing Well 12
8 with a new well, which will return its production to its original level of 2200 gallons per
9 minute.

10 **Q. WHAT WILL ARIZONA-AMERICAN DO WITH ITS CAP-WATER**
11 **ALLOCATION?**

12 A. Arizona-American will store and recover the district's 3,231 acre-feet allocation of CAP
13 water. ADWR encourages these arrangements because they are good water management.
14 Arizona-American will store 3,231 acre feet of CAP water at the Tonopah Desert
15 Recharge Project. This facility is owned by the Central Arizona Water Conservation
16 District ("CAWCD"). Arizona-American already has a storage agreement with
17 CAWCD, so it was able to immediately start storing the CAP water.

18 The stored CAP water will then be "recovered" from wells in the Paradise Valley Water
19 District. Physically, the water from the wells will be groundwater, but legally it will be
20 considered CAP water. This allows Arizona-American to fully utilize the district's CAP
21 water in alignment with the Phoenix AMA goal of safe yield.

22 **Q. HOW DOES THE STORAGE CHARGE COMPARE TO THE CHARGE TO**
23 **EXCHANGE WATER WITH SRP?**

1 A. The cost to store water is much lower than the cost to exchange water with SRP. The
2 current price to store water at a CAWCD facility in the Phoenix AMA is \$8 per acre foot
3 while the cost to exchange water with SRP is \$22.62 per acre foot.

4 **Q. ISN'T THE TONOPAH DESERT RECHARGE PROJECT LOCATED A LONG**
5 **WAY FROM THE PARADISE VALLEY WATER DISTRICT?**

6 A. Yes, this is the short-term solution as Arizona-American already holds a contract to store
7 at the Tonopah Desert Recharge Project. In the future, Arizona-American intends to
8 evaluate other storage options closer to the district.

9 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

10 A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
BENTE VILLADSEN
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
BENTE VILLADSEN
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

Section	Page #
EXECUTIVE SUMMARY	III
I. INTRODUCTION AND SUMMARY	1
II. THE COST OF CAPITAL AND RISK.....	5
A. The Cost of Capital and Risk	5
B. The Relationship Between Capital Structure and the Cost of equity	8
C. Implications for Analysis	10
III. THE COST OF CAPITAL FOR THE BENCHMARK SAMPLES	16
A. Preliminary Decisions	17
1. The Samples: Water Utilities and Gas Local Distribution Companies.....	17
2. Market-Value Capital Structure	20
3. Market Costs of Debt and Preferred Equity.....	21
B. Cost-of-Equity Estimation Methods.....	22
1. The Risk-Positioning Approach.....	23
a) Security Market Line Benchmarks.....	24
b) Relative Risk	26
c) Cost of Equity Capital Calculation.....	27
2. Discounted Cash Flow Method.....	29
C. The Samples and Results.....	36
1. The Water Utility Sample	36
2. Risk-Positioning Cost-of-Capital Estimates	37
a) Interest Rate Estimate.....	37
b) Betas and the Market Risk Premium.....	38
c) Risk-Positioning Results	39
3. The DCF Cost-of-Capital Estimates	42
a) Growth Rates.....	42
b) Dividend and Price Inputs	43
c) DCF Results	44
IV. ARIZONA-AMERICAN'S COST OF EQUITY	45
APPENDIX A RESUME	
APPENDIX B SELECTING THE WATER AND GAS LDC SAMPLES AND USE OF MARKET VALUES	

APPENDIX C RISK-POSITIONING METHODOLOGY AND EMPIRICAL RESULTS

APPENDIX D DISCOUNTED CASH FLOWS METHODOLOGY: DETAILED PRINCIPLES AND RESULTS

APPENDIX E EFFECT OF DEBT ON THE COST OF EQUITY

1 **EXECUTIVE SUMMARY**

2 Dr. Bente Villadsen, a Principal at *The Brattle Group*, files testimony on the cost of
3 capital for Arizona-American districts (collectively, "Arizona-American").

4 Dr. Villadsen selects two benchmark samples, water utilities and gas local distribution
5 companies ("LDC"). She estimates the sample companies' cost of equity, associated
6 after-tax weighted-average cost of capital, and the corresponding cost of equity at 46.9
7 and 41.6 percent equity. She also reviews recent Arizona water and wastewater decisions.
8 In undertaking her analysis, Dr. Villadsen notes that the overall cost of capital is constant
9 within a broad middle range of capital structures although the distribution of costs and
10 risks among debt and equity holders is not. Because Arizona-American's requested
11 target of 46.9 percent equity is lower than the percentage equity among many utilities, its
12 financial risk is higher and the return required by investors increases with the level of risk
13 they carry. Should short-term debt be included for an equity percentage of 41.6 percent,
14 Arizona-American's capitalization is further below that of the average water utility.

15 Based on the evidence from the samples, Dr. Villadsen estimates a cost of equity for the
16 benchmark samples at Arizona-American's capital structure to be in the range of 11.0 to
17 12.5 percent, so that Arizona-American's request for 11.75 percent is equal to the
18 midpoint. Dr. Villadsen also reviewed recent Arizona decisions and found that the
19 decisions correspond to a cost of equity of approximately 11.0 and 12.25 percent when
20 applied to an entity with 46.9 and 41.6 percent equity, respectively. She therefore finds
21 that Arizona-American's request for 11.75 percent return on equity is reasonable and
22 fully supported by her analysis.

1 **I. INTRODUCTION AND SUMMARY**

2 **Q1. PLEASE STATE YOUR NAME AND ADDRESS FOR THE RECORD.**

3 A1. My name is Bente Villadsen. My business address is *The Brattle Group*, 44 Brattle Street,
4 Cambridge, MA 02138.

5 **Q2. PLEASE DESCRIBE YOUR JOB AND EDUCATIONAL EXPERIENCE.**

6 A2. I am a Principal of *The Brattle Group*, ("Brattle"), an economic, environmental and
7 management consulting firm with offices in Cambridge, Washington, San Francisco,
8 London and Brussels. My work concentrates on regulatory finance and accounting. I
9 have previously prepared and presented cost-of-capital testimony before many regulatory
10 bodies, including the Arizona Corporation Commission ("Commission"). I hold a B.S.
11 and M.S. from University of Aarhus, Denmark and a Ph.D. from Yale University's
12 School of Management.

13 **Q3. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

14 A3. I have been asked by Arizona-American Company ("Arizona-American" or the
15 "Company") to estimate the cost of equity for Arizona-American's water and wastewater
16 districts. The cost of equity is the return that the Commission should provide the
17 Company an opportunity to earn on the portion of its rate base financed by equity.

18 To determine the cost of equity for Arizona-American, I first estimate the overall cost of
19 capital for two samples of regulated companies using several versions of the discounted
20 cash flow ("DCF") and risk-positioning models. Second, I determine the cost of equity
21 that the estimated overall cost of capital gives rise to at Arizona-American's requested
22 capital structure consisting of 46.9 percent equity. I also calculate the cost of equity at
23 approximately 41.6 percent equity. Third, I evaluate the relative risk of Arizona-
24 American and the sample companies to determine the recommended cost of equity for
25 Arizona-American.

1 **Q4. PLEASE SUMMARIZE ANY PARTS OF YOUR BACKGROUND AND**
2 **EXPERIENCE THAT ARE PARTICULARLY RELEVANT TO YOUR**
3 **TESTIMONY ON THESE MATTERS.**

4 A4. Brattle's specialties include financial economics, regulatory economics, and the utility
5 industry. I have worked extensively on cost of capital matters for electric, natural gas
6 distribution, pipeline and water utilities in both state and federal jurisdictions.
7 Additionally, I have significant experience in other areas of rate regulation, credit risk in
8 the utilities industry, energy contracts, and accounting issues. I have previously prepared
9 and presented cost-of-capital testimony before the Commission. I have also filed expert
10 testimony and appeared before other regulatory bodies and arbitration tribunals
11 concerning cost of capital, accounting questions, and damage issues. Appendix A
12 contains more information on my professional qualifications.

13 **Q5. PLEASE SUMMARIZE YOUR APPROACH TO ESTIMATING THE COST OF**
14 **CAPITAL FOR ARIZONA-AMERICAN.**

15 A5. To assess the cost of capital for Arizona-American, I select two benchmark samples,
16 regulated water utilities and natural gas local distribution companies ("LDC"). These
17 samples are selected to have risks characteristics comparable to those of Arizona-
18 American's districts. I also report results for a subsample of the water companies with a
19 high percentage of regulated revenues. I give greater weight to the results from the gas
20 LDC sample, because the water sample suffers from numerous data issues that make the
21 cost-of-equity estimates based on this sample not reliable at the present time. For each
22 sample, I estimate the sample companies' cost of equity using several versions of the
23 DCF method and of the risk-positioning model. Based on data availability and the current
24 state of the water and gas distribution industries I assign the most weight to the risk-
25 positioning models.

26 Next, based on the cost-of-equity estimates for each company and its market costs of debt
27 and preferred stock, I calculate each firm's overall cost of capital, i.e., its after-tax
28 weighted-average cost of capital ("ATWACC"), using the company market value capital
structure. I then calculate the samples' average ATWACC and the cost of equity for a

1 capital structure with 46.9 percent equity. Thus, I present the cost of equity that is
2 consistent with the samples' market information and Arizona-American's regulatory
3 capital structure. (By "regulatory capital structure," I mean the capital structure that
4 Arizona-American proposes in its application.)

5 Focusing on the overall cost of capital rather than its components avoids potential
6 problems of inconsistency between the estimated cost of equity and the level of financial
7 risk at the regulated company's capital structure.

8 **Q6. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING ARIZONA-**
9 **AMERICAN'S COST OF EQUITY.**

10 A6. The cost of equity for the water utility sample is about 13.5 percent for a range of 13.25
11 to 13.75 percent at 46.9 percent equity using the long-term risk-positioning method. The
12 corresponding overall after-tax weighted-average cost-of-capital point estimate is a bit
13 below 8.5 percent for a range of 8.25 to 8.75 percent. The gas LDC sample yields a cost-
14 of-equity range from 11.5 to 12 percent with a midpoint of 11.75. The corresponding
15 after-tax weighted-average cost-of-capital range from 7.25 to 7.75 percent. I specify a
16 minimum of plus or minus .25 percent (25 basis point) range because it is not really
17 possible to estimate the cost of capital or equity more precisely than that. The cost-of-
18 equity estimates that result from the multi-stage discounted cash flow method are a bit
19 lower for the water sample than for the gas LDC sample. Combined, the multistage DCF
20 results imply a range of 10 to 11 percent. The Simple DCF results are comparable for the
21 gas LDC sample at a little below 11 percent but much higher for the water sample at 15.5
22 to 16.5 percent – again at 46.9 percent equity.

23 Based on these results, and considering that I rely mostly on the gas LDC sample
24 estimates due to numerous data problems associated with the water sample, the most
25 reliable estimates for Arizona-American's cost of equity indicate a range of 11 to 12.5
26 percent with the most reliable results in the range of 11.5 to 12 percent. Arizona-
27 American's request for an 11.75 percent return on equity is within this range and at the
28 midpoint. It is also near the midpoint of my gas LDC risk-positioning estimates using the

1 long-term risk-positioning model. Including short-term debt in the capital structure
2 reduces the equity percentage to 41.6 percent, so the cost-of-equity estimates increase
3 100 to 150 basis points. In my opinion, the request for an 11.75 percent return on equity
4 is therefore very reasonable.

5 **Q7. WHY DO YOU NEED TO CONSIDER ARIZONA-AMERICAN'S**
6 **REGULATORY CAPITAL STRUCTURE?**

7 A7. A firm's cost of equity is a function of both its business risk and its financial risk. The
8 more leveraged a company is the higher its financial risk. Investors holding equity in
9 companies with higher risk require a higher rate of return, so as a company adds debt, the
10 cost of equity goes up at an ever increasing rate. The higher cost of equity offsets the
11 lower cost of debt, so that the after-tax weighted-average overall cost of capital remains
12 constant over a broad range of capital structures.

13 That is, the associated capital structure affects an estimated cost-of-equity estimate just as
14 a life insurance applicant's age affects the required life-insurance premium. It is
15 therefore necessary to calculate the cost of equity the sample companies would have had
16 at Arizona-American's regulatory capital structure to report accurately the market
17 evidence on the cost of equity.

18 **Q8. HOW IS THE REST OF YOUR TESTIMONY ORGANIZED?**

19 A8. The rest of my testimony is organized as follows:

20 *Section II* defines the cost of capital and discusses the principles relating the cost of
21 capital and capital structure for a business.

22 *Section III* presents the methods used to estimate the cost of capital for the benchmark
23 samples and the associated numerical analyses. This section also explains the basis of
24 my conclusions for the benchmark samples' returns on equity and overall costs of capital.

25 *Section IV* summarizes the analysis and discusses the recommendation for Arizona-
26 American.

1 Appendix A lists my qualifications.

2 Appendix B discusses in detail the selection procedure for each sample, and the methods
3 used to derive the necessary capital structure market value information.

4 Appendix C details the risk-positioning method including the numerical analyses.

5 Appendix D details the DCF method, including the numerical analyses.

6 Appendix E discusses the impact of leverage on the cost of capital in more detail.

7 I repeat portions of my testimony in the appendices in order to give the reader the context
8 of the issues before I present additional technical detail and further discussion.

9 **II. THE COST OF CAPITAL AND RISK**

10 **A. The Cost of Capital and Risk**

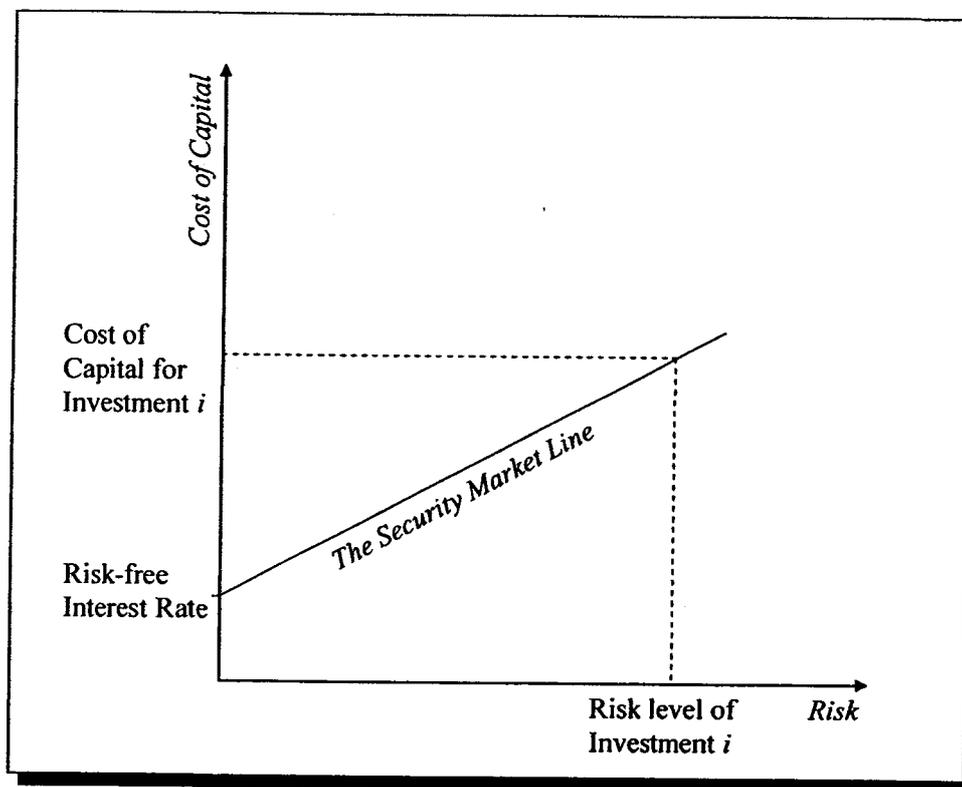
11 **Q9. PLEASE FORMALLY DEFINE THE "COST OF CAPITAL."**

12 **A9.** The cost of capital is the expected rate of return in capital markets on alternative
13 investments of equivalent risk. In other words, it is the rate of return investors require
14 based on the risk-return alternatives available in competitive capital markets. The cost of
15 capital is a type of opportunity cost: it represents the rate of return that investors could
16 expect to earn elsewhere without bearing more risk.¹

17 The definition of the cost of capital recognizes a tradeoff between risk and return that is
18 known as the "security market risk-return line," or "security market line" for short. This
19 line is depicted in Figure 1. Figure 1 shows that the higher the risk, the higher the cost of
20 capital. A version of Figure 1 applies for all investments. However, for different types
21 of securities, the location of the line may depend on corporate and personal tax rates.

¹ "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



Q10. WHY IS THE COST OF CAPITAL RELEVANT IN RATE REGULATION?

A10. U.S. rate regulation accepts the "cost of capital" as the right expected rate of return on utility investment.² 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

² 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).

1 same time, an expected return below the cost of capital does a disservice not just to
2 investors but, importantly, to customers as well. In the long run, such a return denies the
3 company the ability to attract capital, to maintain its financial integrity, and to expect a
4 return commensurate with that of other enterprises characterized by commensurate risks
5 and uncertainties.

6 More important for customers, however, are the economic issues an inadequate return
7 raises for them. In the short run, deviations of the expected rate of return on the rate base
8 from the cost of capital may seemingly create a "zero-sum game"-- investors gain if
9 customers are overcharged, and customers gain if investors are shortchanged. But in fact,
10 even in the short run, such action may adversely affect the utility's ability to provide
11 stable and favorable rates because some potential efficiency investments may be delayed
12 or because the company is forced to file more frequent rate cases. In the long run,
13 inadequate returns are likely to cost customers – and society generally – far more than
14 may be gained in the short run. Inadequate returns lead to inadequate investment,
15 whether for maintenance or for new plant and equipment. The costs of an
16 undercapitalized industry can be far greater than the short-run gains from shortfalls in the
17 cost of capital. Moreover, in capital-intensive industries (such as the water industry),³
18 systems that take a long time to decay cannot be fixed overnight. Thus, it is in the
19 customers' interest not only to make sure that the return investors expect does not exceed
20 the cost of capital, but also to make sure that it does not fall short of the cost of capital,
21 either.

22 Of course, the cost of capital cannot be estimated with perfect certainty, and other aspects
23 of the way the revenue requirement is set may mean investors expect to earn more or less
24 than the cost of capital even if the allowed rate of return equals the cost of capital exactly.
25 However, a commission that sets rates so investors expect to earn the cost of capital on
26 average treats both customers and investors fairly, which is in the long-run interests of
27 both groups.

³ Capital expenditures among water utilities have in the last several years exceeded 30% of revenues.

1 **B. The Relationship Between Capital Structure and the Cost of equity**

2 **Q11. PLEASE EXPLAIN WHY IT IS NECESSARY TO REPORT THE COST OF**
3 **EQUITY ADJUSTED FOR CAPITAL STRUCTURE.**

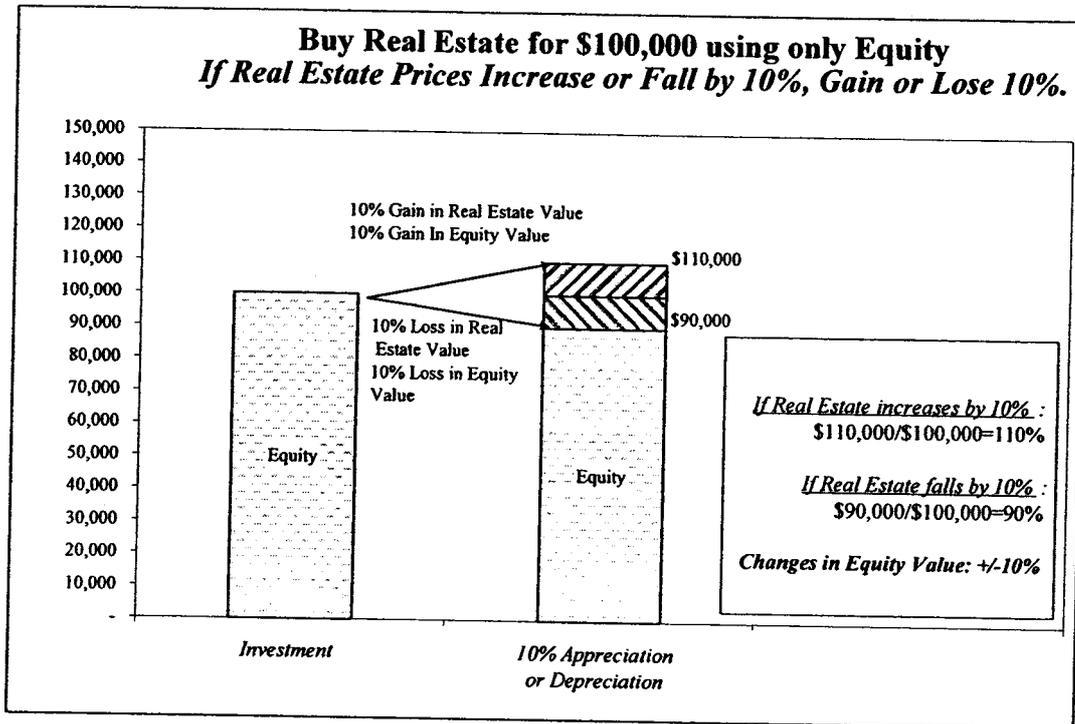
4 A11. In most jurisdictions in North America, rate regulation focuses on the components of the
5 rates. In other words, the focus of cost-of-capital estimation is usually on determining the
6 “right” cost of equity, and to a lesser degree on setting the allowed capital structure.

7 While the overall cost of capital depends primarily on the company’s line of business, the
8 distribution of the cost of capital among debt and equity depends on their share in total
9 revenues. Debt holders’ claim is usually a fixed amount (except in situations of default)
10 while equity holders are residual claimants, meaning that equity holders get paid last. In
11 other words, the use of debt imposes financial risk on the equity holders. Because a
12 company’s financial risk depends on its capital structure, the risk shareholders carry
13 increases with the leverage of the company. As shareholders expect to be compensated
14 for increased risk, the required rate of return increases with the company’s leverage. The
15 increased risk is caused by the fact that debt has a senior claim on a specified portion of
16 earnings and in bankruptcy on assets. As common equity is the most junior security, it
17 gets what’s left after everyone else has been paid. In other words, common equity
18 holders carry all residual risk. However, as explained in more detail in Appendix E, the
19 overall cost of capital is constant within a broad middle range of capital structures,
20 although the distribution of costs and risks among debt and equity holders is not.

21 **Q12. PLEASE PROVIDE AN EXAMPLE ON HOW DEBT ADDS RISK TO EQUITY.**

22 A12. As a simple example, think of an investor who takes money out of his savings account
23 and invests \$100,000 in real estate. The future value of the real estate is uncertain. If the
24 real estate market booms, he wins. If the real estate market goes down, he loses. Figure
25 2 below illustrates this.

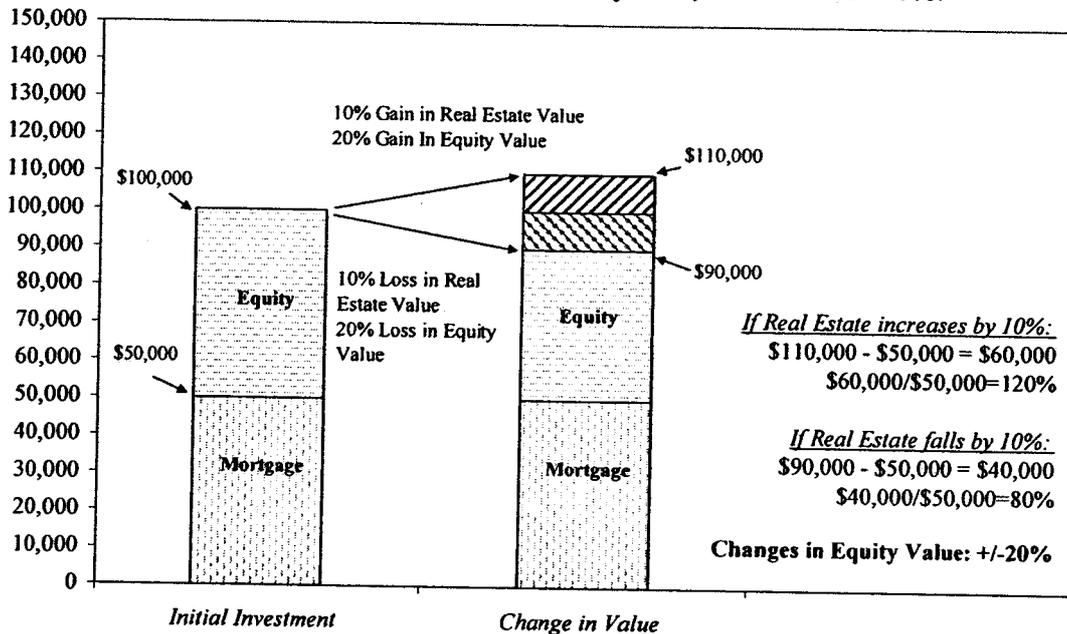
Figure 2. Financial risk example – equity financing



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

Buy Real Estate for \$100,000 with a \$50,000 Mortgage
If Real Estate Increase or Fall by 10%, Gain or Lose 20%.



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

Q13. PLEASE EXPLAIN THE IMPLICATIONS OF THE RELATIONSHIP BETWEEN CAPITAL STRUCTURE AND THE COST OF EQUITY FOR RATE REGULATION.

A13. 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.

1 **Q14. TO ASSESS THE MAGNITUDE OF FINANCIAL RISK FOR A RATE**
2 **REGULATED COMPANY, SHOULD YOU USE THE MARKET-VALUE OR**
3 **THE BOOK-VALUE CAPITAL STRUCTURE?**

4 A14. The market-value capital structure is the relevant quantity for analyzing the cost-of-
5 equity evidence, which is based on market information.⁴

6 **Q15. PLEASE PROVIDE AN EXAMPLE THAT ILLUSTRATES WHY MARKET**
7 **VALUES ARE RELEVANT.**

8 A15. Suppose in the previous example that the investor has invested in real estate 10 years ago.
9 Further assume that depreciation has reduced the book value of the real estate from
10 \$100,000 to \$75,000 and assume the investor has paid off 40 percent of his \$50,000
11 mortgage. Thus, the investor has a remaining mortgage of \$30,000 (= 60% × \$50,000).
12 The book value of the investor's equity is therefore \$45,000 (= \$75,000 - \$30,000).

13 What happens now if real estate prices rise or fall 20 percent? To answer that question,
14 we need to know how real estate prices have developed over the past 10 years. If the
15 market value of the real estate now is \$200,000, then a 20-percent decrease in the price of
16 real estate (\$40,000) is almost equal to the investor's book value equity. However, his
17 market value equity (or net worth) is equal to the value of the real estate minus what he
18 owes on the mortgage. If we assume that the market value of the mortgage equals the
19 unpaid balance (\$30,000), then the investor's net worth is calculated as follows:

⁴ 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 8th ed. (2006) pp. 503-06. 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.

$$\begin{aligned} \text{Net Worth} &= \text{Market Value of Real Estate} - \text{Remaining Mortgage} \\ &= \$200,000 - \$30,000 \\ &= \$170,000 \end{aligned}$$

1 Therefore, the rate of return on equity due to a 20 percent decline in real estate prices is
2 calculated as follows:

3 **Table 1. Calculating the Rate of Return on Equity**
4

Decline in Real Estate Value	\$40,000
Market-Value Equity	\$170,000
Rate of Return on Equity	$-\$40,000/\$170,000 = -23.5\%$

5 **Q16. PLEASE EXPLAIN THE IMPLICATIONS FOR RATE REGULATION AND**
6 **YOUR TESTIMONY.**

7 A16. Because the market risk, and therefore the cost of equity, depends on the market-value
8 capital structures, one must base the estimation of the sample companies' cost of capital
9 on market value capital structures. An approach that estimates the cost of equity for each
10 of the sample firms without explicit consideration of the market value capital structure
11 (i.e. the financial risk) underlying those costs risks material errors. The cost-of-equity
12 estimates of the sample companies at their actual market-value capital structures are not
13 necessarily reflected in the regulatory capital structure. Therefore, using book values
14 could lead to an incorrect rate of return. I avoid this problem by calculating each sample
15 company's ATWACC using its market value capital structure. I then use the sample
16 companies' average overall cost of capital to determine the corresponding return on
17 equity at Arizona-American's regulatory capital structure. This procedure ensures that
18 the capital structure and the estimated cost of equity are consistent.

19 In my analyses, I estimate the cost of equity for each of the sample firms using traditional
20 estimation methods (such as the DCF and Capital Asset Pricing Model ("CAPM")). I use

1 each company's estimated cost of equity along with Arizona-American's marginal tax
2 rate and each company's market cost of debt and market-value capital structure to
3 estimate the sample companies' overall cost of capital. I then calculate the sample
4 average overall cost of capital for each equity estimation method for both of the samples.
5 For each estimation method discussed above, I determine the cost of equity at Arizona-
6 American's regulated capital structure, so that is consistent with the sample's overall
7 cost-of-capital information.

8 **Q17. IS THE USE OF MARKET VALUES TO CALCULATE THE IMPACT OF**
9 **CAPITAL STRUCTURE ON THE RISK OF EQUITY INCOMPATIBLE WITH**
10 **USE OF A BOOK-VALUE RATE BASE FOR A REGULATED COMPANY?**

11 A17. No. Investors buy stock at market prices and expect a reasonable return on their
12 investment. Market-based cost-of-equity estimation methods, such as DCF or CAPM
13 which are frequently used in rate regulation, recognize this and rely on market data. That
14 is, the cost of capital is the fair rate of return on regulatory assets for both investors and
15 customers. Most regulatory jurisdictions in the U.S. measure the rate base using the net
16 book value of assets, not current replacement value or historical cost trended for inflation.
17 But the jurisdictions still apply market-derived measures of the cost of equity to that net
18 book value rate base.

19 The issue here is "what level of risk is reflected in that cost-of-equity estimate?" That
20 risk level depends on the sample company's market-value capital structure, not its book-
21 value capital structure. *That risk level would be different if the sample company's*
22 *market-value capital structure exactly equaled its book-value capital structure, so the*
23 *estimated cost of equity would be different, too.*

24 **Q18. PLEASE SUM UP THE IMPLICATIONS OF THIS SECTION.**

25 A18. The market risk, and therefore the cost of equity depends directly on the market-value
26 capital structure of the company or asset in question. It therefore is impossible to validly
27 compare the measured costs of equity of different companies without taking capital
28 structure into account. Capital structure and the cost of equity are unbreakably linked,

1 and any effort to treat the two as separate and distinct questions violates both everyday
2 experience (e.g., with home mortgages) and basic financial principles.

3 **Q19. HOW SHOULD A COST-OF-CAPITAL ANALYST IMPLEMENT THIS**
4 **PRINCIPLE?**

5 A19. As discussed further in Appendix E, there has been a great deal of financial research on
6 the effects of capital structure on the value of the firm. One of the key conclusions that
7 result from the research is that no narrowly defined optimal capital structure exists within
8 industries, although the typical range of capital structures does vary among industries.
9 Instead, there is a relatively wide range of capital structures within any industry in which
10 fine-tuning the debt ratio makes little or no difference to the value of the firm, and hence
11 to its overall after-tax cost of capital.

12 Accordingly, analysts should treat the market-value weighted average of the cost of
13 equity and the after-tax current cost of debt, or the "ATWACC" for short, as constant.
14 Sample evidence should be analyzed to determine the sample's average ATWACC,
15 which can be compared across different firms or industries. The economically
16 appropriate cost of equity for a regulated firm is the quantity that, when applied to the
17 regulatory capital structure, produces the same ATWACC. That value is the cost of
18 equity that the sample would have had, estimation problems aside, if the sample's
19 market-value capital structure had been equal to the regulatory capital structure in
20 question.

21 **Q20. HOW DO YOU CALCULATE THE COST OF EQUITY CONSISTENT WITH**
22 **THE MARKET-DETERMINED ESTIMATE OF THE SAMPLE'S AVERAGE**
23 **COST OF CAPITAL?**

24 A20. For simplicity assume that all sample companies have only common stock and debt.
25 Then the ATWACC is calculated as:

$$ATWACC = r_D \times (1 - T_C) \times D + r_E \times E \quad (1)$$

1 where r_D is the market cost of debt, r_E is the market cost of equity, T_C is the marginal
 2 corporate income tax rate, D is the percent debt in the capital structure, and E is the
 3 percent equity in capital structure. The cost of equity consistent with the overall cost-of-
 4 capital estimate (ATWACC), the market cost of debt and equity, the marginal corporate
 5 income tax rate and the amount of debt and equity in the capital structure can be
 6 determined by solving equation (1) for r_E .

7 **Q21. CAN YOU PROVIDE AN EXAMPLE OF HOW THIS FORMULA IS USED TO**
 8 **DETERMINE THE COST OF EQUITY?**

9 **A21.** Yes. Consider a company with a 40 percent marginal corporate income tax rate and a
 10 cost of debt equal to 6 percent. For simplicity, I assume there is no difference in the
 11 company's embedded cost of debt and the cost at which it currently can issue additional
 12 debt. Further, suppose that the ATWACC estimate based on a sample of companies with
 13 comparable business risk is 7.5 percent. If the company's capital structure has 50 percent
 14 debt and 50 percent equity, equation (1) above yields a cost-of-equity estimate of 11.4
 15 percent. If the equity ratio is lower, for example 45 percent, the cost of equity would
 16 instead be 12.3 percent. Conversely, a higher equity ratio such as 55 percent would
 17 imply a lower cost-of-equity estimate of 10.7 percent. Table 2 below summarizes these
 18 calculations as well as the dollar amount customers have to pay for financing costs.

19 **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).

1 The important point of this example is that the overall cost of capital does not depend on
2 the company's capital structure, as long as the capital structure is in a wide middle range
3 of values. Therefore, the cost to customers does not depend on the capital structure either.
4 A higher equity ratio simply means that a higher percentage return is paid to equity
5 investors, but the fraction of the rate base to which this higher return applies is lower.
6 The equity investors are compensated appropriately for the higher risk, but that has no
7 effect on the overall cost borne by customers. As long as equity investors are correctly
8 compensated for the risk of their investment, the only effect that a higher equity ratio has
9 is on how the return is divided between debt holders and equity holders, and not on how
10 much customers end up paying.

11 **Q22. BUT IS IT NOT THE CASE THAT IF THE ALLOWED RATE OF RETURN ON**
12 **EQUITY IS LOWER, THEN ALL ELSE EQUAL RATEPAYERS PAY LESS?**

13 **A22.** Yes, for a given equity percentage. However, it comes at a cost: if the rate of return on
14 equity appropriate for a capital structure with 55 percent equity were applied to a
15 company whose equity ratio is 45 percent, the company's equity investors would not be
16 appropriately compensated for the risk of their investment. In particular, in this situation
17 the expected return on equity would be set too low. Such a result would impair the
18 company's ability to attract investors, since they can expect higher returns elsewhere for
19 the same risk level. This may well have negative consequences for the utility's ability to
20 sustain an appropriate level of investment. Ultimately, this translates into a lower quality
21 of the services that the utility can provide to its customers. Alternatively, the company
22 could reduce its equity percentage with possibly negative effects on the cost of debt or
23 other credit factors.

24 **III. THE COST OF CAPITAL FOR THE BENCHMARK SAMPLES**

25 **Q23. HOW IS THIS SECTION OF YOUR TESTIMONY ORGANIZED?**

26 **A23.** As noted in *Section II*, I estimate the cost of capital using two samples of comparable risk
27 companies. This section first covers preliminary matters such as sample selection,
28 market-value capital structure determination, and the sample companies' costs of debt. It

1 then covers estimation of the cost of equity for the sample companies and the resulting
2 estimates of the sample's overall after-tax cost of capital.

3 **A. Preliminary Decisions**

4 **Q24. WHAT PRELIMINARY DECISIONS ARE NEEDED TO IMPLEMENT THE**
5 **ABOVE PRINCIPLES?**

6 A24. I must select the benchmark samples, calculate the sample companies' market-value
7 capital structures, and determine the sample companies' market costs of debt and
8 preferred equity.

9 **1. The Samples: Water Utilities and Gas Local Distribution**
10 **Companies**

11 **Q25. WHY DO YOU USE TWO SAMPLES?**

12 A25. The overall cost of capital for a part of a company depends on the risk of the business in
13 which the part is engaged, not on the overall risk of the parent company on a consolidated
14 basis.

15 Estimating the cost of capital for Arizona-American's regulated assets is the subject of
16 this proceeding. The ideal sample would be a number of companies that are publicly
17 traded "pure plays" in the water production, storage, treatment, transmission, distribution
18 and wastewater lines of business.⁵ "Pure play" is an investment term referring to
19 companies with operations only in one line of business. Publicly traded firms, firms
20 whose shares are freely traded on stock exchanges, are ideal because the best way to infer
21 the cost of capital is to examine evidence from capital markets on companies in the given
22 line of business.

23 Therefore, for this case, a sample of companies whose operations are concentrated solely
24 in the regulated portion of the water industry would be ideal. Unfortunately, the available

⁵ Most of the water utilities in *Value Line* have operations in the water as well as wastewater business.

1 sample of "water" utility companies in the U.S. is relatively small and has serious data
2 deficiencies. See *Section III.C.1* for a description of these deficiencies.

3 To select my sample of comparable water and gas LDC companies, I start with those
4 companies that are listed as a water utility or natural gas utility in *Value Line*.⁶ Usually,
5 I would apply several selection criteria to delete companies with unusual circumstances
6 that may bias the cost-of-capital estimation and companies whose risk characteristics
7 differ from those of the filing entity. However, the application of such criteria would
8 eliminate almost all the water utilities listed in *Value Line*. Therefore, I do not apply
9 selection criteria to the water utility sample although I do apply my standard criteria to
10 the gas LDC sample. Specifically, if I eliminate all water utilities with annual revenues
11 below \$300 million, less than 50 percent regulated revenues, lack of growth rates (from
12 Bloomberg or *Value Line*), or lack of a bond rating, I would be left with at most two
13 companies (Aqua America and California Water Services). A two company sample is
14 simply too small to provide reliable results. Therefore, I keep all water utilities with data
15 in my water utility sample, but I do report results for a subsample of companies that earn
16 a large percentage of revenues from regulated activities.⁷

17 **Q26. WHAT DO YOU DO TO OVERCOME THE WEAKNESSES OF THE WATER**
18 **UTILITY SAMPLE?**

19 **A26.** To overcome the weaknesses of the water sample, I select a second sample of regulated
20 utilities: gas local distribution companies. Gas LDCs, like water utilities, are regulated
21 by state regulatory bodies, have large distribution investments, and serve a mix of
22 residential, industrial, and commercial customers.

23 One reason for using the gas LDC sample is to generate a sample of regulated companies
24 whose primary source of revenues is in the regulated portion of the natural gas industry to
25 provide a check for the results of the water sample. Therefore, I start with *Value Line's*

⁶ 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*.

⁷ The only company listed as a water utility in *Value Line* that I do not include is Sun Hydraulics. This company's main line of business is the production of industrial equipment, not the water utility business.

1 universe of natural gas utilities, and eliminate those companies whose percentage of
2 assets attributed to regulated activities is less than 50 percent. In addition, I only include
3 companies with an investment grade bond rating, no recent sizable mergers or
4 acquisitions, no recent dividend cuts, and no other activity that could cause the estimation
5 parameters to be biased. Additionally, I require the companies to have necessary data
6 available. The final sample includes ten companies. Additional details of the sample
7 selection process for each sample and subsample are described below as well as in
8 Appendix B.

9 **Q27. IF THE BUSINESS RISK OF THE GAS LDC SAMPLE DIFFERS FROM THE**
10 **WATER SAMPLE, CAN YOU STILL RELY ON THE COST OF EQUITY**
11 **ESTIMATED FOR THE GAS LDC SAMPLE?**

12 A27. Yes. If the business and financial risk of the two samples differ, then a cost-of-capital
13 analyst can still make use of the information from the more reliable sample to evaluate
14 the reliability of the estimates from the water sample. The inference would be based on
15 information about the relative risk of the two industries.

16 **Q28. PLEASE ELABORATE ON THE WAY TWO SAMPLES WITH DIFFERENT**
17 **BUSINESS AND FINANCIAL RISKS CAN BE COMPARED.**

18 A28. As mentioned above, the overall cost of capital for a part of a company depends on the
19 risk of the business in which the part is engaged, not on the overall risk of the parent
20 company on a consolidated basis. According to financial economics, the overall risk of a
21 diversified company equals the market value weighted-average of the risks of its
22 components.

23 Calculating the overall after-tax weighted average cost of capital for each sample
24 company as described above allows the analyst to estimate the average overall cost of
25 capital for the sample. The ATWACC captures both the business risk and the financial
26 risk of the sample companies in one number. This allows comparison of the cost of
27 capital between two samples on a much more informed basis. If the alternative (more
28 reliable) sample is judged to have slightly different risk than the water sample, but the

1 results show wide differences in the ATWACC estimates, the analyst should carefully
2 consider the validity of the water sample estimates, whether they are materially higher or
3 lower than the alternative sample's estimates. Of course, the alternative sample could be
4 the source of the error, but that is less likely because the alternative sample has been
5 selected precisely because of its expected reliability.

6 **Q29. PLEASE COMPARE THE CHARACTERISTICS OF THE WATER UTILITY**
7 **SAMPLE AND THE GAS LDC SAMPLE.**

8 A29. The two samples differ primarily in that they operate in two different (regulated)
9 industries, but they are very similar in terms of the percentage of revenues from regulated
10 operations and the customers they serve. On average, both samples earn a large
11 percentage of their revenue from regulated activities and serve a mix of residential,
12 industrial, and other customers. In addition, both industries are characterized by large
13 capital investment and both are operating a large distribution system. However, the gas
14 LDC sample has fewer of the data and estimation issues identified above for the water
15 sample. Please refer to Appendix B for additional details on the two samples.

16 **2. Market-Value Capital Structure**

17 **Q30. WHAT CAPITAL STRUCTURE INFORMATION DO YOU REQUIRE?**

18 A30. For reasons discussed below and in Appendix E, explicit evaluation of the market-value
19 capital structures of the sample companies is vital for a correct interpretation of the
20 market evidence on the return on equity. This requires estimates of the market values of
21 common equity, preferred equity and debt, and the current market costs of preferred
22 equity and debt.

23 **Q31. PLEASE DESCRIBE HOW YOU CALCULATE THE MARKET VALUES OF**
24 **COMMON EQUITY, PREFERRED EQUITY AND DEBT.**

25 A31. I estimate the capital structure for each sample company by estimating the market values
26 of common equity, preferred equity and debt from the most recent publicly available data.
27 The details are in Appendix B.

1 Briefly, the market value of common equity is the price per share times the number of
2 shares outstanding. For the risk-positioning approach, I use the last 15 trading days of
3 each year to calculate the market value of equity for the year. I then calculate the average
4 capital structure over the corresponding five-year period used to estimate the "beta" risk
5 measures for the sample companies. This procedure matches the estimated beta to the
6 degree of financial risk present during its estimation period. In the DCF analyses, I use
7 the average stock price over 15 trading days ending on the release date of the BEst
8 growth rate forecasts utilized.⁸

9 The market value of debt is estimated at its book value adjusted by the difference
10 between the "estimated fair (market) value" and the "carrying cost" of long-term debt
11 reported in each company's 10-K.⁹ The market value of preferred stock for the samples
12 is set equal to its book value.¹⁰

13 3. Market Costs of Debt and Preferred Equity

14 Q32. HOW DO YOU ESTIMATE THE CURRENT MARKET COST OF DEBT?

15 A32. The fifteen-day average market cost of debt for each company is set equal to the yield on
16 an index of public utility bonds that have the same credit rating, as reported by
17 Bloomberg. The DCF analyses use the current credit rating whereas the risk-positioning
18 analyses use the current yield of a utility bond that corresponds to the five-year average
19 debt rating of each company so as to match consistently the horizon of information used
20 by *Value Line* to estimate each company's beta. Bond rating information was obtained
21 from Bloomberg which reports Standard & Poor's bond ratings. I calculate the after-tax
22 cost of debt using the Company's estimated marginal income tax rate of 38.6 percent.

⁸ BEst is Bloomberg's name for its earnings growth rate information. BEst growth rate forecasts are as of February 7, 2008.

⁹ 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.

¹⁰ This is unlikely to affect the results as the average percentage of preferred is less than .25 percent for both the water and gas sample.

1 **Q33. HOW DO YOU ESTIMATE THE MARKET COST OF PREFERRED EQUITY?**

2 A33. For all sample companies, the preferred rating was assumed equal to the company's bond
3 rating. The cost of a company's preferred equity was set equal to the yield on an index of
4 preferred utility stock with the same rating. The data were obtained from the Mergent
5 Bond Record.¹¹

6 **B. Cost-of-Equity Estimation Methods**

7 **Q34. HOW DO YOU ESTIMATE THE COST OF EQUITY FOR YOUR SAMPLE**
8 **COMPANIES?**

9 A34. Recall that the cost of capital is the expected rate of return in capital markets on
10 alternative investments of equivalent risk. This definition leads me to address three key
11 points in my estimation procedures. First, the cost of capital is an expected rate of return
12 – it cannot be directly observed, but must be inferred from available evidence. Second,
13 the cost of capital is determined in capital markets (such as the New York Stock
14 Exchange). Therefore, capital market data provide the best evidence from which to draw
15 inferences. Third, the cost of capital depends on the return offered by alternative
16 investments of equivalent risk. Consequently, measures of risk that matter in capital
17 markets are part of the evidence that I need to examine.

18 **Q35. HOW DOES THE ABOVE DEFINITION HELP YOU ESTIMATE THE COST OF**
19 **CAPITAL?**

20 A35. The definition of the cost of capital recognizes a tradeoff between risk and expected
21 return; this is the security market line plotted above in Figure 1 above. Cost-of-capital
22 estimation methods usually take one of two approaches: (1) they establish the location of
23 the security market line and estimate the relative risk of the security, which jointly
24 determine the cost of capital, or (2) they try to identify a comparable-risk sample of
25 companies and estimate the cost of capital directly. Looking at Figure 1, the first

¹¹ 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 revenue and international bonds, plus structured finance and equipment trust issues, medium-term notes, convertible issues, preferred stocks and commercial paper issues.

1 approach focuses directly on the vertical axis, while the second focuses both on the
2 security's position on the horizontal axis and on the position of the security market line.

3 The first type of approach is more direct, but ignores the wealth of information available
4 on securities not thought to be of precisely comparable risk. The "discounted cash flow"
5 or "DCF" model is an example. The second type of approach, sometimes known as
6 "equity risk premium approach," requires an extra step – positioning the security market
7 line. Using the second approach allows me to use information from all traded securities
8 rather than just those included in my sample. The capital asset pricing model ("CAPM")
9 is an example. While both approaches can work equally well if conditions are right, one
10 may be preferable to the other under certain circumstances. In particular, approaches that
11 rely on the entire security market line are less sensitive to deviations from the
12 assumptions that underlie the model, all else equal. In this case, I examine both DCF and
13 risk-positioning approach evidence for the water utility and gas LDC sample.

14 **1. The Risk-Positioning Approach**

15 **Q36. PLEASE EXPLAIN THE RISK-POSITIONING METHOD.**

16 **A36.** The risk-positioning method estimates the cost of equity as the sum of a current interest
17 rate and a risk premium. It is therefore sometimes also known as the "risk premium"
18 approach. This approach may sometimes be applied more or less formally. As an
19 example of an informal application, an analyst may estimate the spread between interest
20 rates and what is believed to be a reasonable estimate of the cost of capital at a specific
21 time, and then apply that spread to current interest rates to get a current estimate of the
22 cost of capital.

23 More formal applications of the risk-positioning approach take full advantage of the
24 security market line depicted in Figure 1: they use information on a large number of
25 traded securities to identify the security market line and derive the cost of capital for the
26 individual security based on that security's relative risk. This reliance on the entire
27 security market line makes the method less vulnerable to the kinds of problems that arise
28 from using one stock at a time (such as the DCF method). The risk-positioning approach

1 is widely used and underlies much of the current research published in academic journals
2 on the nature, determinants and magnitude of the cost of capital. The most commonly
3 used version of the formal risk-positioning models is the Capital Asset Pricing Model
4 (“CAPM”). The equation for the CAPM is:

$$k_s = r_f + \beta_s \times MRP \quad (2)$$

5 where k is the cost of capital, r_f is the risk-free interest rate, MRP is the market risk
6 premium, and β is the measure of relative risk.

7 Section I of Appendix C to this testimony provides more detail on the principles that
8 underlie the risk-positioning approach. Section II of Appendix C provides the details of
9 the risk-positioning approach empirical estimates I obtain.

10 **Q37. HOW ARE THE “MORE FORMAL” APPLICATIONS OF THE RISK-**
11 **POSITIONING APPROACH IMPLEMENTED?**

12 A37. The first step is to specify the current values of the benchmarks that determine the
13 security market line. The second is to determine the security’s, or investment’s, relative
14 risk. The third is to specify exactly how the benchmarks combine to produce the security
15 market line, so the company’s cost of capital can be calculated based on its relative risk.

16 **a) Security Market Line Benchmarks**

17 **Q38. WHAT BENCHMARKS ARE USED TO DETERMINE THE LOCATION OF**
18 **THE SECURITY MARKET LINE?**

19 A38. The essential benchmarks that determine the security market line are the risk-free interest
20 rate and the premium that a security of average risk commands over the risk-free rate.
21 This premium is commonly referred to as the “market risk premium” (“MRP”), i.e., the
22 excess of the expected return on the average common stock over the risk-free interest rate.
23 In the risk-positioning approach, the risk-free interest rate and MRP are common to all
24 securities. A security-specific measure of relative risk (beta) is estimated separately and
25 combined with the MRP to obtain the company-specific risk premium.

1 **Q39. WHAT BENCHMARK DO YOU USE FOR THE MRP?**

2 A39. I estimate two versions of the risk-positioning model. The first version measures the
3 market risk premium as the risk premium of average-risk common stocks over long-term
4 Government bonds. The second version measures the market risk premium over short-
5 term Treasury bills, which is the usual measure of the MRP used in capital market
6 theories.

7 **Q40. HOW DO YOU ESTIMATE THE MRP?**

8 A40. Appendix C summarizes academic and empirical research on the MRP. However, as
9 discussed in the appendix, there is currently little consensus on the "best practice" for
10 estimating the MRP. (Note: this is not the same as saying that all practices are equally
11 good). For example, the leading graduate textbook in corporate finance expresses the
12 view that a range between 5 to 8 percent is reasonable for the U.S.¹² Morningstar data
13 from 1926 to 2006, the longest period reported, show an MRP average premium of stocks
14 over Treasury bills is 8.6 percent.¹³ At the same time, Dimson, Marsh and Staunton
15 (2008) estimate the arithmetic market risk premium for the U.S. over the 1900 to 2007
16 period at 6.5%.¹⁴ In a regulatory setting, the Surface Transportation Board ("STB")
17 recently decided to rely on the Capital Asset Pricing Model ("CAPM") when determining
18 the cost of capital for major railroads in the U.S. As part of its methodology, the STB
19 decided to rely on the long-term market risk premium reported by Morningstar/Ibbotson
20 in its implementation of the CAPM.¹⁵ Currently, this approach would result in a long-
21 term MRP of 7.1%.

22 My testimony considers both the historical evidence and the results of scholarly studies
23 of the factors that affect the risk premium for average-risk stocks in order to estimate the
24 benchmark risk premium investors currently expect.

¹² Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, McGraw-Hill, 8th edition, 2006, pp. 151-154.

¹³ Morningstar, *Stocks, Bonds, Bills, and Inflation: Valuation Edition 2007 Yearbook*.

¹⁴ Dimson, Marsh and Staunton, *Global Investment Returns Yearbook 2008*, p. 48.

¹⁵ *STB Ex Parte No. 664*, Issued January 17, 2008, pp. 8-9.

1 Considering all the evidence, I conclude that S&P 500 stocks of average risk today
2 command a premium of 8.0 percent over the short-term risk-free rate and 6.5 percent over
3 the long-term Government rate. The estimation of the MRP is discussed in greater detail
4 in Appendix C.

5 **Q41. HOW DO YOU DETERMINE THE RISK-FREE RATE YOU USE?**

6 A41. Ideally, the risk-free rate is the estimated risk-free rate over the period where rates will be
7 in effect. For this proceeding, I use the current yield on long-term Government bonds
8 and 30-day T-bills as an estimate for the long-term and short-term risk-free rate,
9 respectively. Using an average of 15 trading days ending February 7, 2008, I obtain a
10 short-term risk-free rate of 2.2 percent and a long-term risk-free rate of 4.3 percent,
11 respectively.¹⁶

12 ***b) Relative Risk***

13 **Q42. WHAT MEASURE OF RELATIVE RISK DO YOU USE?**

14 A42. I examine the “beta” of the stocks in question. Beta is a measure of the “systematic” risk
15 of a stock — the extent to which a stock’s value fluctuates more or less than average
16 when the market fluctuates.

17 The basic idea behind beta is that risks that cannot be diversified away in large portfolios
18 matter more than those that can be eliminated by diversification. Beta is a measure of the
19 risks that cannot be eliminated by diversification. This concept is explored further in
20 Appendix C.

21 **Q43. WHAT DOES A PARTICULAR VALUE OF BETA MEAN?**

22 A43. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes
23 up or down by 10 percent on average when the market goes up or down by 10 percent.

¹⁶ See Table No. BV-9. Throughout the first part of 2008, short-term interest rates have been dropping rapidly as the Federal Reserve has cut interest rates and undertaken other measures to avoid more financial market distress. For example, on March 18, the Federal Reserve dropped the federal funds rate by .75 percent (Federal Reserve, Press Release, March 18, 2008) and on March 14, 2008, the Federal Reserve effectively became creditors of the financially distressed Bear Stearns bank (Craig Torres, Bernanke Discards Monetary History with Bear Stearns Bailout, *Bloomberg*, March 15, 2008).

1 Stocks with betas above 1.0 exaggerate the swings in the market. A stock with a beta of
2 2.0 tends to fall 20 percent when the market falls 10 percent, for example. Stocks with
3 betas below 1.0 understate the swings in the market. A stock with a beta of 0.5 tends to
4 rise 5 percent when the market rises 10 percent.

5 **Q44. HOW DO YOU ESTIMATE BETA?**

6 A44. I use beta estimates reported in the *Value Line* for the sample companies.

7 *c) Cost of Equity Capital Calculation*

8 **Q45. HOW DO YOU COMBINE THE PRECEDING STEPS TO ESTIMATE THE**
9 **COST OF EQUITY?**

10 A45. The most widely used approach to combine a risk measure with the benchmark market
11 risk premium on common stocks to find a risk premium for a particular firm or industry is
12 the Capital Asset Pricing Model. However, the CAPM is only one risk-positioning
13 technique.

14 In addition to the CAPM, I rely on an empirical variety of the model. Empirical research
15 has long shown that the CAPM tends to overstate the actual sensitivity of the cost of
16 capital to beta: low-beta stocks tend to have higher risk premia than predicted by the
17 CAPM and high beta stocks tend to have lower risk premia than predicted. A number of
18 variations on the original CAPM theory have been proposed to account for this finding.

19 This finding can be used directly to estimate the cost of capital, using beta to measure
20 relative risk, without simultaneously relying on the CAPM. Here I examine results from
21 both the CAPM and a version of the security market line based on the empirical finding
22 that risk premia are related to beta, but are not as sensitive to beta as the CAPM predicts,
23 to convert the betas into a risk premium. I refer to this latter model as the "ECAPM,"
24 where ECAPM stands for Empirical Capital Asset Pricing Model. The formula for the
25 ECAPM is

$$k_s = r_f + \alpha + \beta_s \times (MRP - \alpha) \quad (3)$$

1 where as before k is the cost of capital, r_f is the risk-free interest rate, MRP is the market
2 risk premium, β is the measure of relative risk, and α is the empirical adjustment factor.

3 Research supports values for α ranging from one to seven percent when using a short-
4 term interest rate. I use baseline values of α of 2 percent for the short-term risk-free rate
5 and 0.5 percent for the long-term risk-free rate. I also conduct sensitivity tests for
6 different values of α . For the short-term risk-free rate I use values for α of 1, 2 and 3
7 percent. For the long-term risk-free rate I use values for α of 0, 0.5 and 1.5 percent. See
8 Appendix C for a more detailed discussion of the ECAPM model and Table C-1 for a
9 summary of the empirical evidence on the size of the required adjustment.

10 **Q46. WHY IS IT APPROPRIATE TO USE THE ECAPM MODEL?**

11 A46. Empirical tests of the CAPM have repeatedly shown that an investment's return is related
12 to systematic risk, but that the increase in return for an increase in risk is less than is
13 predicted. The empirical tests have also shown that the theoretical intercept, as measured
14 by the return on Treasury bills, is too low to fit the data. In other words, the empirical
15 tests indicate that the slope of the CAPM is too steep and the intercept is too low. The
16 empirical data support the ECAPM. The ECAPM recognizes the consistent empirical
17 observation that the CAPM underestimates (overestimates) the cost of capital for low
18 (high) beta stocks. The ECAPM corrects the predictions of the CAPM to more closely
19 match the results of the empirical tests. Ignoring the results of CAPM tests would lead to
20 an estimate of the cost of capital that is likely to be less accurate than is possible.

21 **Q47. IS THE USE OF THE ECAPM EQUIVALENT TO ADJUSTING THE**
22 **ESTIMATED BETAS FOR THE SAMPLE COMPANIES?**

23 A47. No. Fundamentally, this is not an adjustment (increase) in beta. This can easily be seen
24 by the fact that the expected return on high beta stocks is lower with the ECAPM than
25 when estimated by the CAPM. The ECAPM model is a recognition that the actual slope
26 of the risk-return tradeoff is flatter than predicted and the intercept higher based upon

1 repeated empirical tests of the model.¹⁷ Even if the beta of the sample companies were
2 estimated accurately, the CAPM would still underestimate the required return for low
3 beta stocks. Even if the ECAPM were used, the costs of equity would be underestimated
4 if the betas were underestimated.

5 2. Discounted Cash Flow Method

6 **Q48. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW APPROACH.**

7 **A48.** The DCF model takes the first approach to cost-of-capital estimation, i.e., to attempt to
8 estimate the cost of capital in one step. The method assumes that the market price of a
9 stock is equal to the present value of the dividends that its owners expect to receive. The
10 method also assumes that this present value can be calculated by the standard formula for
11 the present value of a cash flow stream:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots + \frac{D_T}{(1+k)^T} \quad (4)$$

12 where "P" is the market price of the stock; "D_t" is the dividend cash flow expected at
13 the end of period *t* (i.e., subscript period 1, 2, 3 or *T* in the equation); "k" is the cost of
14 capital; and "T" is the last period in which a dividend cash flow is to be received. The
15 formula just says that the stock price is equal to the sum of the expected future dividends,
16 each discounted for the time and risk between now and the time the dividend is expected
17 to be received.

18 Most DCF applications go even further, and make very strong (i.e., unrealistic)
19 assumptions that yield a simplification of the standard formula, which then can be
20 rearranged to estimate the cost of capital. Specifically, if investors expect a dividend
21 stream that will grow forever at a steady state, the market price of the stock will be given
22 by a very simple formula,

¹⁷ 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.

$$P = \frac{D_1}{(k - g)} \quad (5)$$

1 where “ D_1 ” is the dividend expected at the end of the first period, “ g ” is the perpetual
2 growth rate, and “ P ” and “ k ” are the market price and the cost of capital, as before.
3 Equation (5) is a simplified version of Equation (4) that can be solved to yield the well
4 known “DCF formula” for the cost of capital:

$$\begin{aligned} k &= \frac{D_1}{P} + g \\ &= \frac{D_0 \times (1 + g)}{P} + g \end{aligned} \quad (6)$$

5 where “ D_0 ” is the current dividend, which investors expect to increase at rate g by the
6 end of the next period, and the other symbols are defined as before. Equation (6) says that
7 if Equation (5) holds, the cost of capital equals the expected dividend yield plus the
8 (perpetual) expected future growth rate of dividends. I refer to this as the simple DCF
9 model. Of course, the “simple” model is simple because it relies on very strong,
10 unrealistic, assumptions.

11 **Q49. ARE THERE OTHER VERSIONS OF THE DCF MODELS BESIDES THE**
12 **“SIMPLE” ONE?**

13 **A49.** Yes. There are many variations on the DCF models that may rely on less strong (more
14 realistic) assumptions in that they allow growth rates to vary over time. I consider a
15 variant of the DCF model that uses the companies’ individual growth rates during the
16 first five years, converges to a perpetual growth rate in years 6-10 and then uses the GDP
17 growth rate as the perpetual growth rate after year 10 for all companies. This is a variant
18 of the “multi-stage” DCF method. The DCF models are described in detail in Section I
19 of Appendix D. (Section II of Appendix D provides the details of my empirical DCF
20 results.)

21 **Q50. WHAT ARE THE MERITS OF THE DCF APPROACH?**

22 **A50.** The DCF approach is conceptually sound if its assumptions are met, but can run into
23 difficulty in practice because those assumptions are so strong, and hence so unlikely to

1 correspond to reality. Two conditions are well known to be necessary for the DCF
2 approach to yield a reliable estimate of the cost of capital: the variant of the present
3 value formula that is used must actually match the variations in investor expectations for
4 the dividend growth path; and the growth rate(s) used in that formula must match current
5 investor expectations. Less frequently noted conditions may also create problems. (See
6 Appendix D for details.)

7 **Q51. WHAT IS THE MOST DIFFICULT PART OF IMPLEMENTATING THE DCF**
8 **APPROACH?**

9 A51. Finding the right growth rate(s) is the usual "hard part" of a DCF application. The
10 original approach to estimation of the growth rate, g , relied on average historical growth
11 rates in observable variables, such as dividends or earnings, or on the "sustainable
12 growth" approach, which estimates g as the average book rate of return times the
13 fraction of earnings retained within the firm. But it is highly unlikely that these historical
14 averages over periods with widely varying rates of inflation and costs of capital will
15 equal current growth rate expectations. This is particularly true for the water sample as
16 many companies in the industry are growing fast, engaged in mergers, acquisitions or
17 other restructuring activities.

18 Moreover, the constant growth rate DCF model requires that dividends and earnings
19 grow at the same rate for companies that on average earn their cost of capital.¹⁸ It is
20 inconsistent with the theory on which the model is based to have different growth rates in
21 earnings and dividends over the period when growth is assumed to be constant. If the
22 growth in dividends and earnings were expected to vary over some number of years
23 before settling down into a constant growth period, then it would be appropriate to

¹⁸ 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.

1 estimate a multistage DCF model. In the multistage model, earnings and dividends can
2 grow at different rates, but must grow at the same rate in the final, constant growth rate
3 period. A difference between forecasted dividend and earnings rates therefore is a signal
4 that the facts do not fit the assumptions of the simple DCF model.

5 **Q52. HOW DO YOU ESTIMATE THE GROWTH RATES YOU USE IN YOUR DCF**
6 **ANALYSIS?**

7 A52. I use earnings growth rate forecasts from Bloomberg and *Value Line*. Analysts' forecasts
8 are superior to using single variables in time series forecasts based upon historical data as
9 has been documented and confirmed extensively in academic research. Please see
10 Section I in Appendix D for a detailed discussion on this issue.

11 **Q53. ARE YOU AWARE THAT THE COMMISSION STAFF TYPICALLY RELIES**
12 **ON AN AVERAGE OF HISTORICAL GROWTH RATES OF EARNINGS AND**
13 **DIVIDENDS, ALONG WITH FORECASTS OF EARNINGS AND DIVIDEND**
14 **GROWTH RATES, TO ESTIMATE THE GROWTH RATE FOR THE DCF**
15 **MODEL?**

16 A53. Yes, but I do not believe that this is the best way to estimate the growth rate for use in the
17 DCF model for the following reasons. First, as mentioned above, the model requires that
18 dividends and earnings grow at the same rate at some point in the future in order to apply
19 the model. The data on historical growth rates do not confirm this condition. Second,
20 analysts have access to historical information and include that information in their
21 forecast of earnings growth rates. In other words, using historical data provides no
22 additional information than that captured in analyst forecasts.

23 Finally, averaging wildly different growth rate estimates in the hopes of having the
24 extremes cancel out calls into question whether the DCF model is applicable at this time
25 to the sample companies.

1 **Q54. ARE YOU AWARE OF EVIDENCE THAT ANALYSTS' FORECASTS OF**
2 **EARNING GROWTH HAVE HISTORICALLY OVER-ESTIMATED EARNINGS**
3 **AND DIVIDEND GROWTH?**

4 A54. Yes. Although analyst forecasts have historically been too optimistic, this problem is less
5 acute for regulated companies.¹⁹ Further, according to a recent joint report by NASD and
6 the NYSE,

7 A55. ... the SRO Rules have been effective in helping restore integrity to research by
8 minimizing the influences of investment banking and promoting transparency of other
9 potential conflicts of interest. Evidence also suggests that investors are benefiting from
10 more balanced and accurate research to aid their investment decisions.²⁰

11 A56. In addition, the use of a two-stage DCF model, which substitutes the forecast growth of
12 GDP, mitigates analyst optimism by substituting the GDP growth rate for the potentially
13 optimistic (or pessimistic) earnings forecasts of analysts.

14 **Q55. HOW WELL ARE THE CONSTANT-GROWTH RATE CONDITIONS**
15 **NECESSARY FOR THE RELIABLE APPLICATION OF THE DCF LIKELY TO**
16 **BE MET FOR THE SAMPLE COMPANIES AT PRESENT?**

17 A57. The requisite conditions for the sample companies are not fully met at this time,
18 particularly for the water sample. Of particular concern for this proceeding is the
19 uncertainty about what investors truly expect the long-run outlook for the sample
20 companies to be. The longest time period available for growth rate forecasts of which I
21 am aware is five years. The long-run growth rate (i.e., the growth rate after the water
22 industry settles into a steady state, which may be beyond the next five years for this
23 industry) drives the actual results one gets with the DCF model. Unfortunately, this
24 implies that unless the company or industry in question is stable – so there is little doubt

¹⁹ 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.

²⁰ Joint Report by NASD and NYSE on the Operation and Effectiveness of the Research Analyst Conflict of Interest Rules, December 2005, p. 44.

1 as to the growth rate investors expect – DCF results in practice can end up being driven
2 by the subjective judgment of the analyst who performs the work.

3 Of the eight companies in the water sample, only four have growth forecasts from both
4 Bloomberg and *Value Line*, and two have only one analyst following them.²¹ The average
5 long-term earnings forecasts vary from a low of 0.6 percent to a high of 13.1 percent.
6 Additionally, the analysts' forecasts for individual companies range widely. For example,
7 the median BEst growth forecast for Southwest Water Co is 9.7 percent while the *Value*
8 *Line* forecast is 23.6 percent. The lack of sufficient analyst following and the large
9 variation in growth forecasts indicate that these forecasts are less reliable than ideal. The
10 growth rates for gas LDC sample vary less from an average of 3.0 to 7.1 percent, and are
11 more consistent with the GDP growth forecast of 4.9 percent. Of the ten companies in
12 the gas LDC sample, one has only two analysts providing a forecast (one *Value Line* and
13 one BEst). Thus, the available data are far from being ideal. As discussed above, the
14 two-stage DCF model adjusts for any overly optimistic (or pessimistic) growth rate
15 forecasts by adjusting the 5-year growth rate forecasts of the analysts toward the long-
16 term GDP growth rate in the years after year 5. See Appendix D, *Section I* for a
17 discussion of the two-stage model.

18 The DCF growth rates, whether estimated from historical data or from analyst forecasts,
19 have likely been affected by several factors: many mergers and acquisitions in the water
20 industry in recent years, significant growth in many parts of the country, and a trend
21 towards consolidation. The industry appears to be moving towards a larger degree of
22 consolidation – at least among the privately held water utilities. The consolidation of the
23 industry may well increase as the industry needs significant infrastructure investments to
24 comply with EPA water purification rules, maintain or replace old infrastructure, and deal
25 with increased threats towards the water systems.²² The American Society of Civil
26 Engineers estimated in 2005 that the drinking water infrastructure required “\$11 billion
27 annually to replace aging infrastructure [...] and to comply with safe drinking water

²¹ See Table BV-5 for details.

²² See, for example, *Value Line*, Water Utility Industry, January 25, 2008.

1 regulations," while the wastewater segment required \$390 billion in investments over the
2 following 20 years.²³ Coupled with the rising construction costs of utility infrastructure,
3 this creates uncertainty about future conditions and diverging expectations. The
4 uncertainty associated with these factors increases the industry's business risk.
5 Additionally, environmental regulations impact the industry as standards for water
6 quality evolve over time, and there is potential for new safety and security requirements
7 in the future. The industry has no federal regulator (other than for environmental and
8 health issues), and state public utility commissions regulate most investor owned water
9 utilities. Different regulatory bodies may lead to differing regulatory requirements for
10 companies operating in adjacent parts of the country. Taken together, these factors mean
11 that it may be some time before the water industry settles into anything investors will see
12 as a stable equilibrium necessary for the reliable application of the DCF model.

13 Such circumstances imply that a commission may often be faced with a wide range of
14 DCF estimates, none of which can be well grounded in objective data on true long-run
15 growth expectations, *because no such objective data now exist*. DCF for firms or
16 industries in flux is *inherently* subjective with regard to the most important parameter, the
17 long-run growth rate that drives the answer.

18 In short, the unavoidable questions about the DCF model's strong assumptions cause me
19 to view the DCF method as *inherently* less reliable than the risk-positioning approach
20 described above. This is particularly true for the water sample, because of the data
21 problems discussed above. However, because the DCF method has been widely used in
22 the past, I submit DCF evidence in this case. DCF estimates also serve as a check on the
23 values provided by the risk-positioning methods.

24 In this proceeding, I give little weight to the DCF results. However, I use the results as a
25 check on the reasonableness of my risk-positioning estimates.

²³ *Report Card for America's Infrastructure*, The American Society of Civil Engineers, 2005, pp. 15, 55.

1 **C. THE SAMPLES AND RESULTS**

2 **1. The Water Utility Sample**

3 **Q56. EARLIER YOU SAID THAT THE SAMPLE OF WATER UTILITIES HAD**
4 **SERIOUS DATA WEAKNESSES. PLEASE ELABORATE ON THESE**
5 **WEAKNESSES.**

6 **A58.** In attempting to apply the DCF model to the sample, four companies had no *Value Line*
7 growth forecasts. The size of the companies in the water sample also makes cost-of-
8 capital estimation difficult. Currently, only four companies have more than \$500 million
9 in market value of equity. More important, however, is the fact that the stock of these
10 companies trades relatively infrequently. For example, three of the eight water utilities
11 traded an average of less than 20,000 shares per trading day since January of 2007. In
12 percentage terms, these companies traded less than 0.2 percent of their shares
13 outstanding.²⁴ By contrast, each of the gas LDC sample companies had an average
14 trading volume of at least 107,000 shares per day (greater than 180,000 if Laclede Group
15 were excluded), which in percentage terms represented more than 0.45 percent of shares
16 outstanding for each company. Low trading volume causes concern because there may
17 be a delay between the release of important information and the time that this information
18 is reflected in prices. Such delay is well known to cause beta estimates to be statistically
19 insignificant and possibly biased.

20 In addition to lack of data and the small size of the companies, there are firm-specific
21 events that render the water utility sample less reliable than would be ideal. First, Aqua
22 America (the largest of the companies) has gone through several mergers and acquisitions
23 in recent years. Normally, I would not include companies with significant merger or
24 acquisition activity in a sample because the individual information about the progress of
25 the proposed merger is so much more important for the determination of the company's
26 stock price than day-to-day market fluctuations. In practice, beta estimates for such
27 companies tend to be too low. The growth rates for such companies may also be affected.

²⁴ The three companies are Connecticut Water Service Co., Middlesex Water Co., and York Water Co.

1 Second, Southwest Water Co. earns only 41 percent of its revenue from regulated
2 activities.²⁵ I therefore report my results for both the full sample and a subsample of
3 companies that do not include Southwest Water Co.

4 It is because of these weaknesses in the water sample that I also utilize a sample of
5 natural gas LDCs. The selection procedure for this sample was summarized earlier and
6 details are provided in Appendix B.

7 **2. Risk-Positioning Cost-of-Capital Estimates**

8 **Q57. HOW IS YOUR TESTIMONY ORGANIZED CONCERNING THE RISK-**
9 **POSITIONING METHOD TO ESTIMATE COST OF CAPITAL?**

10 A59. This section first describes the input data used in the CAPM and ECAPM models, then
11 reports the resulting cost-of-equity estimates for the samples. The second section of
12 Appendix C details the empirical analysis.

13 *a) Interest Rate Estimate*

14 **Q58. HOW DID YOU DETERMINE THE EXPECTED RISK-FREE INTEREST**
15 **RATE?**

16 A60. I reviewed current constant maturity U.S. Government bond yield data available from the
17 St. Louis Federal Reserve Bank. For the period January 17 to February 7, 2008, the
18 average yield on 30-day Treasury bills was 2.16 percent and the average yield on long-
19 term government bonds was 4.33 percent.²⁶

²⁵ However, the majority of the company's property, plant and equipment belongs to its regulated utilities. See Southwest Water Co. 2006 10-K p. 93.

²⁶ See Table No. BV-9.

b) Betas and the Market Risk Premium

1
2 **Q59. WHAT BETA ESTIMATES DID YOU USE IN YOUR ANALYSIS FOR THE**
3 **SAMPLES?**

4 A61. I rely upon the most recent betas estimated by *Value Line* for both the water sample and
5 for the gas LDC sample.

6 **Q60. ARE THE BETA VALUES REPORTED BY *VALUE LINE* ADJUSTED BETAS?**

7 A62. Yes. *Value Line* reports betas that are adjusted about 1/3 towards one. For this
8 proceeding, I reverse the *Value Line* adjustment. *Value Line* and many investment firms
9 adjust the estimated betas. This type of adjustment is intended to compensate for
10 sampling errors in the beta estimation, not for the empirical fact that the CAPM tends to
11 overestimate the sensitivity of the cost of capital to beta. I use adjusted betas when the
12 sample companies display statistically significant sensitivity to interest rate changes or
13 likely would do so short of measurement errors. For this proceeding I use unadjusted
14 betas as I have in past appearances before the Commission concerning water and
15 wastewater utilities.

16 **Q61. PLEASE SUMMARIZE THE BETA ESTIMATES YOU RELY ON.**

17 A63. After reversing the *Value Line* adjustment procedure, the average estimated *Value Line*
18 beta for the water sample is about .84 while the average for the gas LDC sample is
19 about .80. These beta estimates are reported in Workpaper #1 to Tables No. BV-10 and
20 BV-22.

21 **Q62. WHAT VALUE DO YOU USE FOR THE MARKET RISK PREMIUM?**

22 A64. For the premium over the short-term risk-free interest rate I use 8.0 percent, while for the
23 premium over the long-term risk-free interest rate I use 6.5 percent, for the reasons
24 discussed before and in Appendix C.

25 **Q63. PLEASE EXPLAIN THE METHOD TO ADJUST FOR DIFFERENCES IN**
26 **CAPITAL STRUCTURE.**

27 A65. Starting with the ATWACC, the cost of equity for any capital structure within a broad
28 range of capital structures can be determined by the following formula:

Table 3. Cost-of-Equity Estimates

<i>Regulatory Capital Structure:</i>		<i>46.9% Equity / 0.0% Preferred / 53.1% Debt</i>				<i>2008 Tax Rate:</i>		<i>38.6%</i>	
<i>METHODS</i>									
	<i>RISK POSITIONING (using Long-Term Risk-Free Rate)</i>			<i>RISK POSITIONING (using Short-Term Risk-Free Rate)</i>				<i>DCF</i>	
	<i>CAPM</i>	<i>$\alpha = 0.5%$</i>	<i>$\alpha = 1.5%$</i>	<i>CAPM</i>	<i>$\alpha = 1%$</i>	<i>$\alpha = 2%$</i>	<i>$\alpha = 3%$</i>	<i>Simple</i>	<i>Multi-stage</i>
[1] Water Sample*									
<i>Full Sample</i>									
Cost of Equity	13.6%	13.6%	13.7%	12.6%	12.6%	12.7%	12.8%	16.5%	10.2%
Average ATWACC	8.3%	8.4%	8.4%	7.9%	7.9%	7.9%	8.0%	9.7%	6.8%
<i>Sub-sample</i>									
Cost of Equity	13.5%	13.5%	13.6%	12.5%	12.6%	12.7%	12.8%	15.5%	10.2%
Average ATWACC	8.3%	8.3%	8.4%	7.8%	7.9%	7.9%	8.0%	9.3%	6.8%
[2] Gas LDC Sample**									
Cost of Equity	11.5%	11.6%	11.9%	10.3%	10.6%	10.8%	11.1%	10.8%	10.9%
Average ATWACC	7.4%	7.4%	7.6%	6.8%	6.9%	7.1%	7.2%	7.1%	7.1%
[3] Risk Positioning Security Market Line Parameters:					Multi-Stage DCF Parameter:				
<i>Long-Term</i>			<i>Short-Term</i>						
Risk Free Rate Estimate:	4.3%		Risk Free Rate Estimate:		2.2%		GDP Growth		
Estimated MRP:	6.5%		Estimated MRP:		8.0%		Estimate: 4.9%		
Sources and Notes:									
* For the Water Sample, Risk Positioning data from Table No. BV-12 and DCF data from Table No. BV-8.									
** For the Gas LDC Sample, Risk Positioning data from Table No. BV-22 and DCF data from Table No. BV-19.									
[1] The full water sample consists of American States Water Co, Aqua America Inc, California Water Service Group, Connecticut Water Service Inc, Middlesex Water Co, SJW Corp, Southwest Water Co, and York Water Co. The subsample excludes Southwest Water Co. Results exclude companies whose estimated cost of equity is less than their cost of debt plus 25 basis points.									
[2] The gas LDC sample consists of AGL Resources, Atmos Energy Corp, Laclede Group, New Jersey Resources, Nicor Inc., Northwest Natural Gas, Piedmont Natural Gas, South Jersey Industries, Southwest Gas, and WGL Holdings.									
[3] See Appendices C and D for details on Risk Positioning and DCF parameters used in estimates.									

Using the short-term interest rate in the two risk-positioning models (CAPM and ECAPM) and using different values for the ECAPM parameter, α , I obtain four estimates of each sample companies' cost of equity. These estimates are also displayed in Tables No. BV-12 and BV-24. As for the long-term interest rate, I summarize the cost-of-equity results above in Table 3.

Q65. PLEASE SUMMARIZE YOUR FINDINGS FROM THE RISK-POSITIONING MODEL.

A67. Focusing on the middle ECAPM ($\alpha = .50%$) for the long-term risk-positioning model, I find that the water sample's cost of equity of about 13.5 percent. I do not rely on the short-term models for reasons discussed below. However, it is more correct to say that the sample results indicate a range of values from about 13.25 to 13.75 percent for the long-term model. Looking at the gas LDC sample, the results are lower, for a range of approximately 11.5 to 12.0 percent for the long-term risk-positioning model. Because

1 short-term interest rates have been repeatedly driven down by the Federal Reserve in an
2 effort to prevent the economy from sliding into a recession and to provide liquidity in the
3 credit markets in the wake of the subprime mortgage crisis,²⁸ I assign no weight to the
4 short-term model in this proceeding. This is consistent with, for example, a recent
5 decision by the Surface Transportation Board that decided to rely on the CAPM using 20-
6 year Treasury bonds for the risk-free rate, 5-year weekly beta estimates, and Ibbotson's
7 reported long-term market risk premium when determining railroads' cost of equity.²⁹
8 Additionally, as discussed previously, I place very little weight on the water sample
9 results because of numerous data problems. Therefore, I conclude that the risk-
10 positioning model provides cost-of-equity estimates in the range of 11.5 to 12.0 percent.
11 I discuss the assessment of Arizona-American's cost of equity in the concluding section.

12 **Q66. DID YOU PERFORM ANY ADDITIONAL ANALYSIS USING THE RISK-**
13 **POSITIONING MODEL?**

14 **A68.** Yes. I repeated the analysis incorporating Arizona-American's short-term debt into the
15 capital structure, which results in a 41.6 percent equity ratio. More specifically, using the
16 same overall cost-of-capital estimates from each of the two samples (Tables No. BV-11
17 and BV-23), I included the short-term debt percentage and the corresponding cost of
18 short-term debt in the calculation of Arizona-American's cost of equity. The calculations
19 are shown in Tables No. BV-14 and BV-26 for the water and gas LDC sample
20 respectively. The results, which are summarized in Table 4 below, show that the risk-
21 positioning model yields estimates that are, on average, approximately 100 to 150 basis
22 points higher than those obtained using only long-term debt in the capital structure.

²⁸ As recently as on March 18, 2008, the Federal Reserve cut the Federal Funds rate by .75 percent, so that it now (March 18, 2008) stands at 2.25 percent. Also, on March 14, 2008 the Federal Reserve joined forces with JPMorgan to bail out the failing Bear Stearns bank. See, for example, Craig Torres, Bernanke Discards Monetary History with Bear Stearns Bailout, *Bloomberg*, March 15, 2008. See also, *Business Week*, A Sweeter Bear Bid May Sour the Fed, March 24, 2008.

²⁹ *STB Ex Parte No. 664*, Issued January 17, 2008.

Table 4. Cost-of-equity Estimates Computed Including Short-Term Debt in the Capital Structure

<i>Regulatory Capital Structure:</i>		<i>41.6% Equity / 47.4% LT Debt / 11% ST Debt</i>						<i>2008 Tax Rate:</i>		<i>38.6%</i>	
<i>METHODS</i>											
	<i>RISK POSITIONING (using Long-Term Risk-Free Rate)</i>			<i>RISK POSITIONING (using Short-Term Risk-Free Rate)</i>				<i>DCF</i>			
	<i>CAPM</i>	<i>α = 0.5%</i>	<i>α = 1.5%</i>	<i>CAPM</i>	<i>α = 1%</i>	<i>α = 2%</i>	<i>α = 3%</i>	<i>Simple</i>	<i>Multi-stage</i>		
[1] Water Sample*											
<i>Full Sample</i>											
Cost of Equity	15.1%	15.1%	15.2%	14.0%	14.1%	14.1%	14.2%	18.4%	11.3%		
Average ATWACC	8.3%	8.4%	8.4%	7.9%	7.9%	7.9%	8.0%	9.7%	6.8%		
<i>Sub-sample</i>											
Cost of Equity	15.0%	15.1%	15.2%	13.9%	14.0%	14.1%	14.2%	17.3%	11.3%		
Average ATWACC	8.3%	8.3%	8.4%	7.8%	7.9%	7.9%	8.0%	9.3%	6.8%		
[2] Gas LDC Sample**											
Cost of Equity	12.8%	12.9%	13.2%	11.4%	11.7%	12.0%	12.3%	12.0%	12.1%		
Average ATWACC	7.4%	7.4%	7.6%	6.8%	6.9%	7.1%	7.2%	7.1%	7.1%		
[3] Risk Positioning Security Market Line Parameters:											
<i>Long-Term</i>						<i>Short-Term</i>					
Risk Free Rate Estimate:	4.3%		Risk Free Rate Estimate:			2.2%		<i>Multi-Stage DCF Parameter:</i>			
Estimated MRP:	6.5%		Estimated MRP:			8.0%		GDP Growth		Estimate: 4.9%	
Sources and Notes:											
* For the Water Sample, Risk Positioning data from Table No. BV-14 and DCF data from Table No. BV-13.											
** For the Gas LDC Sample, Risk Positioning data from Table No. BV-26 and DCF data from Table No. BV-25.											
[1] The full water sample consists of American States Water Co, Aqua America Inc, California Water Service Group, Connecticut Water Service Inc, Middlesex Water Co, SJW Corp, Southwest Water Co, and York Water Co. The subsample excludes Southwest Water Co. Results exclude companies whose estimated cost of equity is less than their cost of debt plus 25 basis points.											
[2] The gas LDC sample consists of AGL Resources, Atmos Energy Corp, Laclede Group, New Jersey Resources, Nicor Inc., Northwest Natural Gas, Piedmont Natural Gas, South Jersey Industries, Southwest Gas, and WGL Holdings.											
[3] See Appendices C and D for details on Risk Positioning and DCF parameters used in estimates.											

3. The DCF Cost-of-Capital Estimates

Q67. WHAT STEPS DO YOU TAKE IN YOUR DCF ANALYSES?

A69. 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's 46.9 percent equity ratio.

a) Growth Rates

Q68. WHAT GROWTH RATE INFORMATION DO YOU USE?

A70. 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.

1 The ideal in a DCF application would be a detailed forecast of future dividends, year by
2 year well into the future until a true steady state (constant) dividend growth rate was
3 reached, based on a large sample of investment analysts' expectations. I know of no
4 source of such data. Dividends are ultimately paid from earnings, however, and earnings
5 forecasts from a number of analysts are available for a few years. Investors do not expect
6 dividends to grow in lockstep with earnings, but for companies for which the DCF
7 approach can be used reliably (*i.e.*, for relatively stable companies whose prices do not
8 include the option-like values described in Appendix D), they do expect dividends to
9 track earnings over the long-run. Thus, use of earnings growth rates as a proxy for
10 expectations of dividend growth rates is a common practice.

11 Accordingly, the first step in my DCF analysis is to examine a sample of investment
12 analysts' forecast earnings growth rates from Bloomberg and *Value Line* to the degree
13 such forecasts are available. The details are in Appendix D. At present, *Value Line* data
14 run through a 2010-2012 horizon, representing an average of about four years from the
15 current earning forecasts available for 2007. Bloomberg also provides a long-term
16 earnings growth rate estimate. The longest-horizon forecasted growth rates from these
17 sources underlie the simple DCF model (*i.e.*, the standard perpetual-growth model
18 associated with the "DCF formula," dividend yield plus growth). Unfortunately, the
19 longest growth forecast data only go out four to five years, which is too short a period to
20 make the DCF model completely reliable.

21 ***b) Dividend and Price Inputs***

22 **Q69. WHAT VALUES DO YOU USE FOR DIVIDENDS AND STOCK PRICES?**

23 A71. Dividends are either for the 4th quarter of 2007, or for the first quarter of 2008,
24 depending on the most recent dividend information available at the time of estimation for
25 each company.³⁰ This dividend is grown at the estimated growth rate and divided by the
26 price described below to estimate the dividend yield for the simple DCF model.

³⁰ The dividend information was obtained from Bloomberg.

1 Stock prices are an average of closing stock prices for the 15-day trading period ending
2 on the day the BEst forecast was obtained from Bloomberg. A 15-day stock price
3 average is used to guard against anomalous price changes in any single day.

4 *c) DCF Results*

5 **Q70. WHAT ARE THE DCF ESTIMATES FOR THE SAMPLES?**

6 A72. The data are used in the two versions of the DCF method to get sample company
7 estimates at the sample company's capital structure. The resulting cost of equity at
8 Arizona-American's 46.9 percent equity estimates are shown in Table 3 above. There is
9 a very large difference between the simple and multi-stage DCF results for the water
10 sample (16.5 versus 10.2 percent), confirming the conclusion drawn above that the water
11 industry is not in a stable equilibrium. As a result, DCF results from the water sample are
12 unreliable, and I therefore do not put any weight on them in arriving at my final estimate.
13 However, for the gas LDC sample both DCF models yields similar results (10.8 and 10.9
14 percent), suggesting that the gas LDC sample is indeed of better quality than the water
15 sample at this time. In addition, DCF estimates for the gas LDC sample are not too
16 different from risk-positioning results, albeit on average lower than them. As with the
17 risk-positioning model, I repeated the analysis including short-term debt in the
18 Company's capital structure. The calculations for the DCF analysis are shown in Tables
19 No. BV-13 and BV-25 for the water and gas LDC sample respectively. The results are
20 summarized in Table 4 above, and are about 120 basis points higher in the case of the gas
21 LDC sample, and between 110 and 190 basis points higher in the case of the water
22 sample.

1 **IV. ARIZONA-AMERICAN'S COST OF EQUITY**

2 **Q71. WHAT CONCLUSIONS DO YOU DRAW FROM THE ABOVE DATA**
3 **REGARDING EACH SAMPLE'S COST OF EQUITY AT ARIZONA-**
4 **AMERICAN'S 46.9 PERCENT EQUITY RATIO?**

5 A73. For the gas LDC sample, the estimated costs of equity from the risk-positioning model
6 and from the DCF model are reasonably in line. For the water sample, estimates vary
7 more significantly between different methods, and the DCF results are particularly
8 variable. Although I do not rely upon the DCF model results for the water sample, I
9 believe that DCF cost-of-capital estimates provide a useful check on the risk-positioning
10 results for the gas LDC sample. The consistency of the multi-stage DCF and the risk-
11 positioning cost-of-equity estimates for the gas LDC sample indicate that those estimates
12 are reasonable.

13 **Q72. DO YOU HAVE ANY COMMENTS REGARDING THE RESULTS OF THE**
14 **RISK-POSITIONING MODELS?**

15 A74. The estimated cost of equity displayed in Panel B of Table No. BV-12 compared to Table
16 No. BV-24 is significantly higher on average for the water sample. The risk-positioning
17 results are summarized above in Table 3. Of those results, the CAPM values deserve the
18 least weight, because this method does not adjust for the empirical finding that the cost of
19 capital is less sensitive to beta than predicted by the CAPM (which my testimony
20 considers by using the ECAPM). Conversely, the ECAPM numbers deserve the most
21 weight, because this method adjusts for the empirical findings.

22 Additionally, the estimates based upon the short-term risk-free rate are currently not very
23 reliable for reasons discussed above. If the Fed believes further action is necessary,
24 short-term rates are likely to fall further. On the other hand, if inflation becomes a
25 concern, as it appears to be the case,³¹ then short-term rates could remain constant or
26 even start increasing. Because of this uncertainty, I give more weight to the estimates

³¹ "Rising Inflation Limits the Fed as Growth Lags," *The New York Times*, February 21, 2008.

1 using the long-term risk-free rate at this time, because long-term interest rates are
 2 generally less responsive to Fed actions than short-term rates.

3 **Q73. DID YOU CONSIDER ANY OTHER EVIDENCE WHEN ASSESSING THE**
 4 **REASONABLENESS OF ARIZONA-AMERICAN'S REQUESTED 11.75**
 5 **PERCENT RETURN ON EQUITY?**

6 A75. Yes. I reviewed recent water utility decisions from the Arizona Corporation Commission
 7 and compared the rates of return on equity and the capital structures to Arizona-
 8 American's regulatory capital structure.

9 **Q74. PLEASE EXPLAIN THIS PROCEDURE.**

10 A76. I obtained data on seventeen recent Arizona decisions on water and wastewater utilities
 11 from the Company. This data is summarized in Table 5 below.

12 **Table 5. Capital Structure and Allowed Rate of Return on Equity in Recent Arizona Water Decisions**
 13

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%
Average			75.9%	9.2%
Average *			62.2%	9.2%

Sources and Notes:

[1]-[4]: Provided by Arizona-American Water Company.

Key: * Excluding Companies with 100% of common equity and Arizona-American Water Co.

1 Arizona-American's requested target regulatory capital structure consists of 46.9 percent
2 equity which is significantly lower than that of all companies in the table (excluding
3 Arizona-American itself). Therefore, Arizona-American's equity has more financial risk
4 than most of the companies listed in Table 5. Consequently, the allowed return on equity
5 for Arizona-American should be higher. To determine exactly how much higher, I
6 calculate the ATWACC that corresponds to the capital structures and cost of equity in
7 Table 5 using Arizona-American's current cost of debt and tax rate. I then determine the
8 cost of equity that corresponds to the calculated ATWACC at Arizona-American's 46.9
9 percent equity, as well as at 41.6 percent equity, the value obtained if short-term debt is
10 included in the calculation.³² The result of this calculation is shown in Table 6 below.

11 **Q75. WHAT ARE THE IMPLICATIONS OF TABLE 6 BELOW?**

12 **A77.** Ignoring companies with no debt and Arizona-American, the average rate of return on
13 equity was 11.1 percent when measured at 46.9 percent equity, and 12.3 percent when
14 measured at 41.6 percent equity. The average for all water utilities was substantially
15 higher.

³² In performing this calculation, I assume that the rate base equals net book value. I understand that this is not true in Arizona but believe rates are calculated in a manner that produces similar results.

Table 6. Rate of Return on Equity that Provides the Same Cost to Customers at Arizona-American's Equity Ratio as Allowed in Recent Arizona Water Decisions

Decision [1]	Date [2]	Common Equity [3]	Allowed Rate of Return on Equity [4]	Implied ATWACC [5]	Implied Rate of Return at 46.9% Equity [6]	Implied Rate of Return at 41.6% Equity [7]
65350	11/1/2002	68.1%	9.1%	7.4%	11.5%	12.7%
66782	2/13/2004	100.0%	9.1%	9.1%	15.2%	16.9%
66849	3/19/2004	70.1%	9.2%	8.0%	12.8%	14.3%
67093	6/30/2004	39.9%	9.0%	5.4%	7.2%	7.9%
67279	10/5/2004	100.0%	8.7%	8.7%	14.3%	15.9%
67455	1/4/2005	100.0%	8.1%	8.1%	13.0%	14.5%
67983	7/18/2005	100.0%	8.1%	8.1%	13.0%	14.5%
67989	7/18/2005	51.0%	8.9%	6.2%	8.9%	9.9%
68176	9/30/2005	58.8%	9.3%	6.8%	10.2%	11.3%
68302	11/14/2005	73.4%	9.1%	8.1%	12.9%	14.4%
68858	7/28/2006	36.7%	10.4%	5.9%	8.4%	9.3%
69164	12/5/2006	100.0%	9.6%	9.6%	16.2%	18.1%
69335	2/20/2007	56.0%	9.3%	6.8%	10.2%	11.3%
69404	4/16/2007	100.0%	9.3%	9.3%	15.6%	17.4%
69440	5/1/2007	40.0%	10.7%	6.4%	9.4%	10.4%
69664	6/28/2007	100.0%	9.2%	9.2%	15.4%	17.1%
70140	1/23/2008	100.0%	8.9%	8.9%	14.7%	16.4%
Average		76.1%	9.2%	7.8%	12.3%	13.7%
Average*		62.9%	9.2%	7.2%	11.1%	12.3%

Sources and Notes: Columns [1] through [4] - provided by Arizona-American. Column [5] was computed using Arizona-American's current cost of debt and tax rate. Columns [6] and [7] were calculated using the ATWACC in column [5] and Arizona-American's cost of debt, tax rate, and regulatory capital structure, excluding and including short-term debt respectively.

Key: * Excludes the eight companies with 100% equity, and Arizona-American decisions (67093, 68858 and 69440).

Q76. BASED ON THE EVIDENCE WHAT IS YOUR CONCLUSION REGARDING ARIZONA-AMERICAN'S REQUEST 11.75 PERCENT RETURN ON EQUITY?

A78. Based on the results from my cost-of-capital estimation procedures and recent Arizona decision on water utilities' cost of equity, I conclude that an 11.75 percent return on equity is reasonable.

Q77. DOES THIS CONCLUDE YOUR TESTIMONY?

A79. Yes.

APPENDIX A

RESUME OF DR. BENTE VILLADSEN

Bente Villadsen's work concentrates in the areas of accounting and regulatory finance. She has extensive experience in cost of capital and credit issues in the utility industry as well the impact of regulatory initiatives. Further, Dr. Villadsen works on issues related to accounting disclosure and principles. Her recent work has included cost-of-capital analysis, energy efficiency issues, accounting issues pertaining to contract disputes in the petroleum, energy, and materials industries. Her work has included valuation, accounting disclosure and principles including impairment testing, leases, mark-to-market accounting, accounting for hybrid securities, accounting for equity investments, cash flow estimation etc. She has testified on accounting issues, cost of capital, 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

- In a recent international arbitration matter, Dr. Villadsen filed expert testimony 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.
- On behalf of senior management, Dr. Villadsen evaluated the performance of segments of regulated entities. In addition, she has reviewed and evaluated the methods used for in overhead allocation.
- 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.
- For a company in the energy sector, she modeled cash flows to evaluate the company's need for additional funds over time and to assess its viability.
- 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

"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

"Evaluating Alternative Business / Inventive Models," (with Joe Wharton). *EEl 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). *EEl Electric Rates Advanced Course*, Madison, 2005.

"Issues for Cost of Capital Estimation," (with M.J. Vilbert). *EEl 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

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 and Supplemental Expert Report 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 and April 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, August 2007.

Docket Nos. W-01303A-08-____ and SW-01303A-08-____

Appendix A: Resume of Dr. Bente Villadsen

Page A-5 of A-5

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.....	2
A.	THE WATER SAMPLE.....	2
B.	THE GAS LOCAL DISTRIBUTION COMPANIES SAMPLE.....	4
II.	MARKET VALUE CAPITAL STRUCTURE, COSTS OF DEBT & COSTS OF PREFERRED EQUITY	7

1 **I. SAMPLE SELECTION AND THE CHARACTERISTICS OF EACH SAMPLE**

2 **A. The Water Sample**

3 **Q1. How did you select your sample of water utilities?**

4 A1. The goal was to create a sample of companies whose primary business is as a regulated
5 water utility with business risk generally similar to that of Arizona-American Water. To
6 construct this sample, I started with the universe of nine water utility companies listed as
7 such in the *Value Line Investment Survey - Plus Edition*. I then eliminated Sun
8 Hydraulics because, although listed as a water utility, its operations consist mainly of
9 producing industrial equipment.¹

10 Normally, I would apply several additional selection criteria to eliminate companies with
11 unique circumstances that may affect the cost of capital estimates. For example, I would
12 normally eliminate companies with annual revenues lower than \$300 million in 2006,² no
13 or low bond ratings, lack of growth estimates or Bloomberg data, and all companies with
14 announced dividend cuts or that were involved in significant merger activity over the last
15 five years (2003 to today). However, applying these procedures to the eight water
16 utilities followed by *Value Line* would result in a sample of at most two companies. (The
17 areas of concern associated with the companies included in the sample are detailed
18 below.) I try to balance my standard criteria against the need to have a reasonable sample
19 size. This results in the use of all eight companies to form a full sample, as well as the
20 use of seven companies to form a subsample with a high percentage of regulated
21 revenues.³ The eight companies that form the full sample of water utilities are American
22 States Water Co., Aqua America Inc., California Water Service Group, Connecticut

¹ Bloomberg lists it in the "metal fabricate/hardware" industry group, which is a subset of the "industrial" sector.

² Table No. BV-2 and its associated workpapers report the share of operating revenues from different lines of business in 2006 for these companies. (Table No. BV-1 provides an index to the other tables.)

³ Southwest Water Company is dropped from the subsample because it only earns an estimated 41 percent of its 2006 revenues from regulated activities. The remaining companies in the subsample earn at least an estimated 89 percent of their 2006 revenues through regulated activities.

1 Water Service Inc., Middlesex Water Co., SJW Corp., Southwest Water Co., and York
2 Water Co.

3 **Q2. Why do you usually eliminate companies currently involved in a merger from your**
4 **samples?**

5 A2. The stock prices of companies involved in mergers are often more affected by news
6 relating to the merger than to movements in the stock market. In other words, the stock
7 price “decouples” from its normal relationship to the stock market (the economy) which
8 is the basis upon which a company’s relative risk is calculated. Instead the stock price of
9 a merger candidate is more affected by the latest speculation on the terms and probability
10 of the merger.

11 **Q3. What are some of the water sample’s data problems?**

12 A3. First, of the eight water utilities followed by *Value Line*, three companies (Connecticut
13 Water, Middlesex Water, and York Water) have 2006 revenues below \$100 million. If I
14 were to consider the threshold of \$300 million I usually rely on, then six of the eight
15 companies would fall under it. The stocks of small companies frequently exhibit “thin
16 trading” which means that their stock trades infrequently. Indeed, since January of 2007,
17 the three companies listed above have traded an average of less than 20,000 shares per
18 trading day. In percentage terms, these companies traded less than 0.2 percent of their
19 shares outstanding. By contrast, each of the gas LDC sample companies had an average
20 trading volume of at least 107,000 shares per day (180,000 if Laclede Group were
21 excluded), which in percentage terms represented more than 0.45 percent of shares
22 outstanding for each company. Greater trading volume gives the expert more confidence
23 in the estimates since there is less likelihood of a delay between the release of important
24 information and the time that this information is reflected in prices. Such delay is well
25 known to cause beta estimates to be statistically insignificant and possibly biased.

26 Second, four companies lack long-term earnings forecasts from *Value Line*, and two
27 companies only have one analyst providing BEst growth rate forecasts. In addition, the
28 existing growth rates estimates are highly variable, ranging from a low of 0.6 percent to a
29 high of 13.1 percent. Such highly variable growth rates are not indicative of an industry

1 that is stable and cast doubt on the applicability of the DCF model to this industry at this
2 time.

3 Third, only two companies have significant revenue, have stocks with substantial trading,
4 have a bond rating and have more than one long-term growth forecast from BEst.

5 Fourth, many companies have significant merger activity over the last five years, leading
6 *Value Line* to note that "mergers and acquisitions activity has remained at a feverishly
7 high pace."⁴ For example, Aqua America acquired more than two dozen smaller
8 companies in 2007, while Southwest Water Co. completed six small acquisitions in the
9 last three years, the most recent of which in February 2008.⁵ The large number of
10 mergers and acquisitions is an indication of an industry in flux which will certainly affect
11 the DCF estimates and perhaps the risk positioning estimates as well.

12 These factors may all potentially affect the cost of equity estimates in ways not
13 completely predictable. Because of the substantial data problems and the lack of a large
14 number of publicly traded water utilities, without considering the gas LDC sample I
15 would be forced to rely either on a sample with significant data problems, or on a sample
16 with at most two companies (Aqua America Inc., and California Water Services Group).⁶

17 **B. The Gas Local Distribution Companies Sample**

18 **Q4. How do you select your gas local distribution company sample?**

19 **A4.** To select this sample, I started with the universe of publicly traded natural gas utilities
20 covered by *Value Line Investment Survey – Plus Edition*. This resulted in an initial group
21 of 20 companies. I then eliminated companies by applying additional selection criteria

⁴ *Value Line Investment Survey*, Water Utility Industry, January 25, 2008.

⁵ Sources: *Value Line Investment Survey*, January 25, 2008, Bloomberg mergers and acquisitions historical search, performed February 5, 2008.

⁶ Several companies have multiple problems. For example, Connecticut Water has revenues below \$100 million, exhibits thin trading and lacks *Value Line* long-term earnings growth forecasts. Middlesex Water has revenues below \$100 million and no long-term *Value Line* earnings forecast. York Water has revenues below \$100 million, exhibits thin trading and has no long-term *Value Line* earnings forecast.

1 designed to eliminate companies with unique circumstances which may bias the cost of
2 capital estimates.

3 **Q5. What are the selection criteria you applied?**

4 A5. I eliminated all companies whose regulated assets are not greater than 50 percent of their
5 total assets as reported in each company's 2006 10-K form, because one goal for this
6 sample was for the companies to derive the majority of their revenues from regulated
7 activities. I also eliminated all companies whose bond rating was less than BBB- as rated
8 by S&P, and companies that had a large merger during the period February 2003 to
9 February 2008.⁷ Merger activity is obtained from Bloomberg, which provides a history
10 of past acquisitions and divestitures for each company, and also the size of each
11 transaction, if such information is available.⁸ To guard against measurement bias caused
12 by "thin trading," I also restricted the sample to companies with total operating revenues
13 greater than \$300 million in 2006.

14 Finally, I required that the companies have historical data available from Bloomberg and
15 that they had no dividend cuts or restatement of financial statements in the past five years,
16 since the latter can be signs of financial distress.

17 The final sample consists of ten gas LDC companies: AGL Resources Inc., Atmos
18 Energy Corp., Laclede Group Inc., Nicor Inc., New Jersey Resources Corp., Northwest
19 Natural Gas Co., Piedmont Natural Gas Co., South Jersey Industries Inc., Southwest Gas
20 Corp., and WGL Holdings Inc.

21 **Q6. What companies did you eliminate before arriving at the final sample?**

22 A6. I eliminated three companies because they had no bond rating and their annual revenues
23 were less than \$300 million (Chesapeake Utilities Corp., EnergySouth Inc., and RGC
24 Resources Inc.), one company because it had no bond rating available (Energy West Inc.),
25 four companies because their credit ratings were below investment grade (Amerigas

⁷ One company included in the sample (Atmos Energy Corp.) did undertake an acquisition in 2004. I discuss below the reasons for keeping it in the sample.

⁸ 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.

1 Partners LP, Ferrellgas Partners LP, Markwest Hydrocarbon Inc., and Star Gas Partners
2 LP), and lastly two companies because they had significant M&A activity in the last five
3 years (Southern Union Co. and UGI Corp.).

4 **Q7. Are there any issues with the remaining companies in your sample?**

5 A7. Possibly. Atmos Energy acquired TXU Gas Company in 2004 for \$1.925 billion, making
6 it a candidate for exclusion from the sample because of significant M&A activity. In
7 balancing the goal to have a larger sample with the desire to have a problem-free sample,
8 I decided to include Atmos in the gas LDC sample because the acquisition occurred
9 relatively close to the five-year threshold that I consider relevant for this criterion.
10 However, excluding Atmos Energy from the sample would raise cost of equity estimates
11 by approximately 10 basis points. As a result, my estimates are conservative, and the
12 inclusion of Atmos Energy is not a source of concern about sample quality.

13 **Q8. Please compare the characteristics of the water utility sample and the gas LDC**
14 **sample.**

15 A8. Both samples consist of companies with substantial capital investments in distribution
16 facilities. Also, companies in both samples earn a large percentage of their revenue from
17 regulated activities and serve a mix of residential, industrial, and other customers. The
18 water subsample includes only those companies with a higher percent of their revenues
19 from regulated utilities and fewer data problems which was at least 89 percent of
20 revenues from regulated activities in 2006. Companies in the gas LDC sample had at
21 least 65 percent of their assets attributable to regulated activities. (See Table No. BV-2
22 and Table No. BV-13).⁹ All companies in the water utility sample and the gas LDC
23 sample are regulated by one or more states.

⁹ 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 2006 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.)

1 For both the water/wastewater industry and the gas distribution industry, environmental
2 compliance costs and infrastructure investments are of importance. Many gas LDC
3 companies discuss environmental clean-up requirements in their 10-K. Similarly, the
4 companies in the water industry also face regulatory requirements from federal and local
5 authorities through, for example, the Clean Water Act of 1974 and EPA enforcement,
6 which will likely require the water industry to invest substantial amounts in infrastructure
7 going forward.¹⁰

8 **Q9. What do you conclude from the comparison of the water utility and the gas LDC**
9 **samples?**

10 **A9.** The two samples differ primarily in that they operate in two different (regulated)
11 industries, but they are very similar in terms of the percentage of revenues from regulated
12 operations and the customers they serve. The gas LDC sample provides a reasonable
13 comparison sample for the water utility industry but without the substantial data issues.

14 **II. MARKET VALUE CAPITAL STRUCTURE, COSTS OF DEBT & COSTS OF PREFERRED**
15 **EQUITY**

16 **Q10. What capital structure information do you require?**

17 **A10.** For reasons discussed in my written evidence and explained in detail in Appendix E,
18 explicit evaluation of the market-value capital structures of the sample companies versus
19 the capital structure used for rate making is vital for a correct interpretation of the market
20 evidence. This requires estimates of the market values of common and preferred equity
21 and debt, and the current market costs of preferred equity and debt.

¹⁰ The *Value Line Investment Survey* (Water Utility Industry, January 25, 2008) mentions "elevated infrastructure costs that should persist for years to come." More specifically, Value Line analysts "[...] suspect that many systems are still outdated and require additional renovations. That observation, coupled with more stringent water purification standards due to greater fear of bioterrorism, will result in high costs for the foreseeable future."

1 **Q11. How do you calculate the market-value capital structures of the sample companies?**

2 A11. I estimate the capital structure for each company by estimating the market values of
3 common equity, preferred equity and debt from publicly available data. The calculations
4 are in Panels A to H of Table No. BV-3 and Panels A to J of Table No. BV-16 for the
5 water and gas LDC sample, respectively.

6 The market value of equity is straightforward: the price per share times the number of
7 shares outstanding. The market value of preferred equity is set equal to its book value
8 because the portion of the capital structure financed with preferred equity is generally
9 small. The market value of debt is estimated at the book value of debt reported by
10 Bloomberg plus or minus the difference in the estimated fair (market) value and book
11 value of long-term debt as reported in the companies' 10-Ks or annual reports.¹¹

12 For purposes of assessing financial risk to common shareholders, I add an adjustment for
13 short-term debt to the debt portion of the capital structure. This adjustment is used only
14 for those companies whose short-term (current) liabilities exceed their short-term
15 (current) assets. I add an amount equal to the minimum of the difference between short-
16 term liabilities and short-term assets or the amount of short-term debt. The reason for
17 this adjustment is to recognize that when current liabilities exceed current assets, a
18 portion of the company's long-term assets are being financed, in effect, by short-term
19 debt.

20 The market value capital structure is calculated to be consistent with the time period over
21 which the cost of capital is estimated for each sample. The capital structure is determined
22 over the historical period over which the relevant risk positioning parameters were
23 determined and as of the date analysts provide forward looking growth forecasts.

24 Therefore, Tables No. BV-3 and BV-16 report the market value capital structure at year

¹¹ See Panels A through H in Table No. BV-3 and Panels A through J in Table BV-16 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.

1 end for the years ending 2002 – 2006, and the third quarter of 2007.¹² The output of each
2 of these tables is the market equity-to-value, debt-to-value, and preferred equity-to-value
3 ratios. The overall cost of capital calculation for the risk positioning estimates rely on the
4 average of the market value capital structure computed for the years 2002 through third
5 quarter of 2007, as shown in Tables No. BV-4 and BV-17, respectively. The results in
6 columns [1]-[3] are used in the DCF model calculations, while columns [4]-[6] are for the
7 risk positioning models.

8 **Q12. How do you estimate the current market cost of preferred equity?**

9 A12. For companies with preferred equity, the cost of preferred equity for each company was
10 set equal to the yield on an index of preferred stock as reported in the *Mergent Bond*
11 *Record* corresponding to the S&P rating of that company's debt. The yields from
12 *Mergent Bond Record* were as of January 2008. In general, the average amount of
13 preferred equity in the sample companies' capital structures is very small and frequently
14 zero. No company in either sample has more than one percent on average.

15 **Q13. How do you estimate the current market cost of debt?**

16 A13. The market cost of debt for each company in the DCF analysis is the current yield
17 reported by Bloomberg for a public utility company bond corresponding to the sample
18 company's current debt rating as classified by S&P. The risk positioning analysis, on the
19 other hand, uses the current yield of a utility bond that corresponds to the five-year
20 average debt rating of each company so as to match consistently the horizon of
21 information used by *Value Line* to estimate company betas. The current S&P debt ratings
22 were obtained from Bloomberg.¹³

23 The fifteen day average yield on A-rated Public Utility bonds was 6.09 percent as of
24 February 7, 2008, and 6.31 percent on average for BBB-rated Public Utility bonds. (See
25 Panel A of Workpaper #1 to Table No. BV-11 for the yields on utility bonds and

¹² This was the most current information on the capital structures for the sample companies at the time this testimony was prepared.

¹³ Southwest Water Co.'s debt rating was not available. I used a rating of A, which is the same as that of all other water utilities in the sample.

1 preferred stock by credit rating.) Calculation of the after-tax cost of debt uses the
2 marginal tax rate 38.6 percent provided by the company.

APPENDIX C

**RISK POSITIONING METHODOLOGY AND
EMPIRICAL RESULTS**

I.	EQUITY RISK PREMIUM METHODOLOGY	2
A.	THE BASIC EQUITY RISK PREMIUM MODEL	2
B.	MARKET RISK PREMIUM	3
C.	RELATIVE RISK.....	10
D.	INTEREST RATE ESTIMATE	14
E.	COST OF CAPITAL MODELS.....	14
II.	EMPIRICAL EQUITY RISK PREMIUM RESULTS	16
A.	RISK-FREE INTEREST RATE	16
B.	BETAS AND THE MARKET RISK PREMIUM	17
1.	Beta Estimation Procedures	17
2.	Market Risk Premium Estimation.....	18
C.	COST OF CAPITAL ESTIMATES.....	18

1 **Q1. What is the purpose of this appendix?**

2 A1. This appendix reviews the principles behind the risk positioning methodologies,
3 describes the estimation of the parameters used in the models, and details the cost of
4 capital estimates obtained from these methodologies. This appendix intentionally repeats
5 portions of my direct testimony, because I want the reader to be able to have a full
6 discussion of the issues addressed here, rather than having to continually turn back to the
7 corresponding section of the testimony.

8 **I. EQUITY RISK PREMIUM METHODOLOGY**

9 **Q2. How is this section of the appendix organized?**

10 A2. It first reviews the basic nature of the equity risk premium approach. It then discusses the
11 individual components of the model: the benchmark risk premium, the relative risk of
12 the company or line of business in question, the appropriate interest rate, and the
13 combination of these elements in a particular equity risk premium model.

14 **A. THE BASIC EQUITY RISK PREMIUM MODEL**

15 **Q3. How does the equity risk premium model work?**

16 A3. The equity risk premium approach estimates the cost of equity as the sum of a current
17 interest rate and a risk premium. (It therefore is sometimes also known as the "risk
18 premium" or the "risk positioning" approach.)

19 This approach may sometimes be applied informally. For example, an analyst or a
20 commission may check the spread between interest rates and what is believed to be a
21 reasonable estimate of the cost of capital at one time, and then apply that spread to
22 changed interest rates to get a new estimate of the cost of capital at another time.

23 More formal applications of the equity risk premium method implement theoretical
24 finance models of cost of capital. They use information on all securities to identify the
25 security market line (Figure 1 in the body of the testimony) and derive the cost of capital
26 for the individual security based on that security's relative risk. This equity risk premium

1 approach is widely used and underlies most of the current scholarly research on the
2 nature, determinants and magnitude of the cost of capital.

3 **Q4. How are “more formal applications” put into practice?**

4 A4. The essential benchmarks that determine the security market line are the risk-free interest
5 rate and the premium that a security of average risk commands over the risk-free rate.
6 This premium is commonly referred to as the “market risk premium” (“MRP”), i.e., the
7 excess of the expected return on the average common stock over the risk-free interest rate.
8 In the equity risk premium approach the risk-free interest rate and MRP are common to
9 all securities. A security-specific measure of relative risk (beta) is estimated separately
10 and combined with the MRP to obtain the company-specific risk premium.

11 In principle, there may be more than one factor affecting the expected stock return, each
12 with its own security-specific measure of relative risk and its own benchmark risk
13 premium. For example, the “arbitrage pricing theory” and other “multi-factor” models
14 have been proposed in the academic literature. These models estimate the cost of capital
15 as the sum of a risk-free rate and several security-specific risk premia. However, none of
16 these alternative models has emerged in practice as “the” improvement to use instead of
17 the original, single-factor model. I use the traditional single-factor model in this
18 testimony.

19 Accordingly, the required elements in my formal equity risk premium approach are the
20 market risk premium, an objective measure of relative risk, the risk-free rate that
21 corresponds to the measure of the market risk premium, and a specific method to
22 combine these elements into an estimate of the cost of capital.

23 **B. MARKET RISK PREMIUM**

24 **Q5. Why is a risk premium necessary?**

25 A5. Experience (e.g., the U.S. market's October Crash of 1987) demonstrates that
26 shareholders, even well diversified shareholders, are exposed to enormous risks. By
27 investing in stocks instead of risk-free Government bills, investors subject themselves not

1 only to the risk of earning a return well below those they expected in any year but also to
2 the risk that they might lose much of their initial capital. This is why investors demand a
3 risk premium.

4 I estimate and show two versions of the Capital Asset Pricing Model ("CAPM"). The
5 first version measures the market risk premium as the risk premium of average risk
6 common stocks over the long-term risk-free rate. Because short-term risk-free rates
7 currently are influenced substantially by monetary policy, I do not rely on the numbers
8 from this version of the CAPM. Specifically, the short-term risk-free rates are unusually
9 low and likely driven by the Federal Reserve's recent interest rate cuts.¹ It is also
10 noteworthy that the Surface Transportation Board ("STB") in a recent decision decided to
11 rely exclusively on long-term risk-free rates in the implementation of the CAPM.²

12 **Q6. Please discuss some of the issues involved in selecting the appropriate MRP.**

13 **A6.** To determine the cost of capital in a regulatory proceeding, the MRP should be used with
14 an estimate of the same interest rate used to calculate the MRP (i.e., the short-term
15 Treasury bill rate or the long-term Government rate). For example, it would be
16 inconsistent to utilize a short-term risk-free with an estimate of the MRP derived from
17 comparisons to long-term interest rates. In addition, the appropriate measure of the MRP
18 should be based upon the arithmetic mean not the geometric mean return.³ The
19 arithmetic mean is the simple average while the geometric mean is the compound rate of
20 return between two periods.

21 **Q7. How do you estimate the MRP?**

22 **A7.** There is presently little consensus on "best practice" for estimating the MRP, which does
23 not mean that each approach is equally valid. For example, the latest edition of the
24 leading graduate textbook in corporate finance, after recommending use of the arithmetic

¹ According to the Federal Reserve Board: *Monetary Policy, Open Market Operations*, March 25, 2008, the Federal Reserve has cut interest rates 6 times for a total of 250 basis points since September 2007, so that the Federal Funds Rate now (March 25, 2008) stands at 2.25%.

² See, *STB Ex Parte No. 664*, issued January 17, 2008, p. 7.

³ See, for example, Morningstar, *Stocks, Bonds, Bills, and Inflation: Valuation Edition 2007 Yearbook*, pp. 75-77.

1 average realized excess return on the market for many years (which for a while was
2 noticeably over 9 percent), now reviews the current state of the research and expresses
3 the view that the a range between 5 to 8 percent is reasonable for the U.S.^{4,5} At the same
4 time, Dimson, Marsh, and Staunton 2008 estimate that the average arithmetic risk
5 premium of stocks over bonds in the U.S. was 6.5% for the period 1900 to 2007.⁶ In a
6 recent proceeding the Surface Transportation Board ("STB") decided to switch from a
7 DCF model to the CAPM model when estimating the cost of equity for U.S. railroads.
8 The STB further decided to rely on the arithmetic risk premium of stocks over long-term
9 bonds as reported in Morningstar / Ibbotson.⁷

10 My written testimony considers both the historical evidence and the results of scholarly
11 studies of the factors that affect the risk premium for average-risk stocks in order to
12 estimate the benchmark risk premium investors currently expect. I consider the historical
13 difference in returns between the Standard and Poor's 500 Index ("S&P 500") and the
14 risk-free rate, recent academic literature on the MRP and the results of recent surveys to
15 estimate the market risk premium.

16 **Q8. Please summarize the recent literature on the MRP and the conclusions you draw**
17 **from it.**

18 **A8.** Some recent research based upon U.S. data challenges the conventional wisdom of using
19 the arithmetic average historical excess returns to estimate the MRP. However, after
20 reviewing the issues in the debate, I remain skeptical for several reasons that the market
21 risk premium has declined in the U.S. as much as is claimed in some of the literature.

⁴ Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, McGraw-Hill, 8th edition, 2006, pp. 151-154.

⁵ In past editions, the authors expressed the view that they are "most comfortable" with values toward the upper end of that range, but this language does not appear in the 8th edition. Although Professor Myers still holds this view, this language and other sections were dropped to accommodate a request to reduce the length of the text.

⁶ Dimson, Marsh and Staunton, *Global Investment Returns Yearbook 2008*, p. 48.

⁷ *STB Ex Parte No. 664*, Issued January 17, 2008, pp. 8-9.

1 First, despite eye-catching claims like “equity risk premium as low as three percent,”⁸
2 and “the death of the risk premium,”⁹ not all recent research arrives at the same
3 conclusion. In his presidential address to the American Finance Association in 2001,
4 Professor Constantinides seeks to estimate the unconditional equity premium based on
5 average historical stock returns.¹⁰ (Note that this address was based upon evidence just
6 before the major fall in market value.) He adjusts the average returns downward by the
7 change in price-earnings ratio because he assumes no change in valuations in an
8 unconditional state. His estimates for 1926 to 2000 and 1951 to 2000 are 8.0 percent and
9 6.0 percent, respectively, over the 3-month T-bill rate. In another published study in
10 2001, Professors Harris and Marston use the DCF method to estimate the market risk
11 premium for the U.S. stocks.¹¹ Using analysts’ forecasts to proxy for investors’
12 expectation, they conclude that over the period 1982-1998 the MRP over the *long-term*
13 risk-free rate is 7.14 percent. As yet another example, the paper by Drs. Ibbotson and
14 Chen (2003) adopts a supply side approach to estimate the forward looking long-term
15 sustainable equity returns and equity risk premium based upon economic fundamentals.
16 Their equity risk premium over the *long-term* risk-free rate is estimated to be 3.97
17 percent in geometric terms and 5.90 percent on an arithmetic basis. They conclude their
18 paper by stating that their estimate of the equity risk premium is “far closer to the
19 historical premium than being zero or negative.”¹² Morningstar has in recent years
20 updated part of the Ibbotson and Chen analysis and found in the 2007 edition that the
21 arithmetic MRP was approximately 6.35 percent over government bonds.¹³

⁸ 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.

⁹ Arnott, R. and R. Ryan, (2001), “The Death of the Risk Premium,” *Journal of Portfolio Management* 27(3):61-84.

¹⁰ Constantinides, G.M. (2002), “Rational Asset Prices,” *Journal of Finance* 57:1567-1591.

¹¹ 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.

¹² 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.

¹³ Morningstar, Morningstar, SBBI Valuation Edition 2007 Yearbook, p. 97.

1 Second, Professor Ivo Welch surveyed a large group of financial economists in 1998 and
2 1999. The average of the estimated MRP was 7.1 percent in Prof. Welch's first survey
3 and 6.7 percent in his second survey which was based on a smaller number of individuals.
4 A subsequent survey¹⁴ by Prof. Welch reported only a 5.5 percent MRP.¹⁵ In
5 characterizing these results Prof. Welch notes that "[T]he equity premium consensus
6 forecast of finance and economics professors seems to have dropped during the last 2 to 3
7 years, a period with low realized equity premia."¹⁶

8 The above quotation from Prof. Welch emphasizes the caution that must attend survey
9 data even from knowledgeable survey participants: the outcome is likely to change
10 quickly with changing market circumstances. Regulatory commissions should not, in my
11 opinion, attempt to keep pace with such rapidly changing opinions.

12 Third, some of the evidence for negative or close to zero market risk premium simply
13 does not make sense. Despite the relatively high valuation levels, stock returns remain
14 much more volatile than Treasury bond returns. I am not aware of any empirical or
15 theoretical evidence showing that investors would rationally hold equities and not expect
16 to earn a positive risk premium for bearing their higher risk.

17 Fourth, I am unaware of a convincing theory for why the future MRP should have
18 substantially declined. At the height of the stock market bubble in the U.S., many
19 claimed that the only way to justify the high stock prices would be if the MRP had
20 declined dramatically,¹⁷ but this argument was heard less frequently after the market
21 declined substantially from its tech bubble high. All else equal, a high valuation ratio
22 such as price-earnings ratio implies a low required rate of return, hence a low MRP.
23 However, there is considerable debate about whether the high level of stock prices

¹⁴ 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.

¹⁵ Ivo Welch (2001), "The Equity Premium Consensus Forecast Revisited," School of Management at Yale University working paper. The cited figure is in Table 2.

¹⁶ *Ibid*, p. 8.

¹⁷ See Robert D. Amott and Peter L. Bernstein, "What Risk Premium is 'Normal'?", *Financial Analysts Journal* 58:64-85, for an example.

1 (despite the burst of the internet bubble from its high in the summer of 2000) represents
2 the transition to a new economy or is simply an “irrational exuberance,” which cannot be
3 sustained for the long term. If the former case is true, then the MRP may have decreased
4 permanently. Conversely, the long-run MRP may remain the same even if expected
5 market returns in the short-term are smaller.

6 Another common argument for a lower expected MRP is that the U.S. experienced very
7 remarkable growth in the 20th century that was not anticipated at the start of the century.
8 As a result, the average realized excess return is overestimated meaning the standard
9 method of estimating the MRP would be biased upward. However, one recent study by
10 Professors Jorion and Goetzmann finds, under some simplifying assumptions, that the so-
11 called “survivorship bias” is only 29 basis points.¹⁸ Furthermore, “[I]f investors have
12 overestimated the equity premium over the second half of the last century, Constantinides
13 (2002) argues that ‘we now have a bigger puzzle on our hands’ Why have investors
14 systematically biased their estimates over such a long horizon?”¹⁹

15 To sum up the above, I cite two passages from Profs. Mehra and Prescott’s review of the
16 theoretical literature on equity premium puzzle:²⁰

17 Even if the conditional equity premium given current market conditions is
18 small, and there appears to be general consensus that it is, this in itself
19 does not imply that it was obvious either that the historical premium was
20 too high or that the equity premium has diminished.

21
22 In the absence of this [knowledge of the future], and based on what we
23 currently know, we can make the following claim: over the long horizon
24 the equity premium is likely to be similar to what it has been in the past
25 and the returns to investment in equity will continue to substantially
26 dominate that in T-bills for investors with a long planning horizon.

¹⁸ 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.

¹⁹ 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

²⁰ *Ibid*, p. 926.

1 **Q9. Is there other scholarly support for the conclusion?**

2 A9. Yes. Another line of research was pursued by Steven N. Kaplan and Richard S. Ruback.
3 They estimate the market risk premium in their article, "The Valuation of Cash Flow
4 Forecasts: An Empirical Analysis."²¹ Professors Kaplan and Ruback compare published
5 cash flow forecasts for management buyouts and leveraged recapitalization over the 1983
6 to 1989 period against the actual market values that resulted from these transactions. One
7 of their results is an estimate of the market risk premium over the long-term Treasury
8 bond yield that is based on careful analysis of actual major investment decisions, not
9 realized market returns. Their median estimate is 7.78 percent and their mean estimate is
10 7.97 percent.²² This is considerably higher than my estimate of 6.5 percent. Even if the
11 maturity premium of Treasury bonds over Treasury bills were only 1 percent, well below
12 the best estimate of 1.5 percent the resulting estimate of the market risk premium over
13 Treasury bills is higher than my estimate of 8.0 percent.

14 **Q10. In addition to the scholarly articles and survey evidence you discussed in Section I**
15 **of your Direct Testimony, what other evidence do you consider to estimate the**
16 **MRP?**

17 A10. I also consider the long-run realized equity premia reported in Morningstar *SBBI*
18 *Valuation Edition 2007 Yearbook*. The data provided cover the period 1926 through
19 2006. The results are discussed below.

20 **Q11. What is the "long-run realized risk premium" in the U.S.?**

21 A11. From 1926 to 2006, the full period reported, Morningstar's data show that the average
22 premium of stocks over Treasury bills is 8.6 percent. I also examine the "post-War"
23 period. The risk premium for 1947-2006 is 8.4 percent.²³ (I exclude 1946 because its
24 economic statistics are heavily influenced by the War years; e.g., the end of price controls
25 yielded an inflation rate of 18 percent. It is not really a "post-War" year, from an

²¹ *Journal of Finance*, 50, September 1995, pp. 1059-1093.

²² *Ibid*, p. 1082.

²³ Morningstar, *SBBI Valuation Edition 2007 Yearbook*, Appendix A.

1 economic viewpoint.) These averages often change slightly when another year of data is
2 added to the Ibbotson series. The average premium of stocks over the income returns on
3 long-term Government bonds is 7.1 percent for the 1926 to 2006 period and 7.1 for the
4 1947 to 2006 period.

5 Recently there has been a great deal of academic research on the MRP. This research has
6 put practitioners in a dilemma: there is nothing close to a consensus about how the MRP
7 should be estimated, but a general agreement in the academic community seems to be
8 emerging that the old approach of using the average realized return over long periods
9 gives too high an answer.

10 **Q12. What is your conclusion regarding the MRP?**

11 A12. Estimation of the MRP remains controversial. There is no consensus on its value or even
12 how to estimate it. Given a careful review of all of the information, I estimate the risk
13 premium for average risk stocks to be 8.0 percent over Treasury bills and 6.5 percent
14 over long-term Government bonds.

15 **C. RELATIVE RISK**

16 **Q13. How do you measure relative risk?**

17 A13. The risk measure I examine is the "beta" of the stocks in question. Beta is a measure of
18 the "systematic" risk of a stock — the extent to which a stock's value fluctuates more or
19 less than average when the market fluctuates. It is the most commonly used measure of
20 risk in capital market theories.

21 **Q14. Please explain beta in more detail.**

22 A14. The basic idea behind beta is that risks that cannot be diversified away in large portfolios
23 matter more than those that can be eliminated by diversification. Beta is a measure of the
24 risks that *cannot* be eliminated by diversification.

25 Diversification is a vital concept in the study of risk and return. (Harry Markowitz won a
26 Nobel Prize for work showing just how important it was.) Over the long run, the rate of
27 return on the stock market has a very high standard deviation, on the order of 15 - 20

1 percent per year. But many individual stocks have much higher standard deviations than
2 this. The stock market's standard deviation is "only" about 15 - 20 percent because when
3 stocks are combined into portfolios, some of the risk of individual stocks is eliminated by
4 diversification. Some stocks go up when others go down, and the average portfolio
5 return — positive or negative — is usually less extreme than that of individual stocks
6 within it.

7 In the limiting case, if the returns on individual stocks were completely uncorrelated with
8 one another, the formation of a large portfolio of such stocks would eliminate risk
9 entirely. That is, the market's long-run standard deviation would be not 15-20 percent per
10 year, but virtually zero.

11 The fact that the market's actual annual standard deviation is so large means that, in
12 practice, the returns on stocks are correlated with one another, and to a material degree.
13 The reason is that many factors that make a particular stock go up or down also affect
14 other stocks. Examples include the state of the economy, the balance of trade, and
15 inflation. Thus some risk is "non-diversifiable". Single-factor equity risk premium
16 models derive conditions in which all of these factors can be considered simultaneously,
17 through their impact on the market portfolio. Other models derive somewhat less
18 restrictive conditions under which several of them might be individually relevant.

19 Again, the basic idea behind all of these models is that risks that cannot be diversified
20 away in large portfolios matter more than those that can be eliminated by diversification,
21 because there are a large number of large portfolios whose managers actively seek the
22 best risk-reward tradeoffs available. Of course, undiversified investors would like to get
23 a premium for bearing diversifiable risk, but they cannot.

24 **Q15. Why not?**

25 **A15.** Well-diversified investors compete away any premium rates of return for diversifiable
26 risk. Suppose a stock were priced especially low because it had especially high
27 diversifiable risk. Then it would seem to be a bargain to well diversified investors. For
28 example, suppose an industry is subject to active competition, so there is a large risk of

1 loss of market share. Investors who held a portfolio of all companies in the industry
2 would be immune to this risk, because the loss on one company's stock would be offset
3 by a gain on another's stock. (Of course, the competition might make the whole industry
4 more vulnerable to the business cycle, but the issue here is the diversifiable risk of shifts
5 in market share among firms.)

6 If the shares were priced especially low because of the risk of a shift in market shares,
7 investors who could hold shares of the whole industry would snap them up. Their buying
8 would drive up the stocks' prices until the premium rates of return for diversifiable risk
9 were eliminated. Since all investors pay the same price, even those who are not
10 diversified can expect no premium for bearing diversifiable risk.

11 Of course, substantial non-diversifiable risk remains, as the October Crash of 1987
12 demonstrates. Even an investor who held a portfolio of all traded stocks could not
13 diversify against that type of risk. Sensitivity to such market-wide movements is what
14 beta measures. That type of sensitivity, whether considered in a single- or multi-factor
15 model, determines the risk premium in the cost of equity.

16 **Q16. What does a particular value of beta signify?**

17 A16. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk: it goes
18 up or down by 10 percent on average when the market goes up or down by 10 percent.
19 Stocks with betas above 1.0 exaggerate the swings in the market: stocks with betas of 2.0
20 tend to fall 20 percent when the market falls 10 percent, for example. Stocks with betas
21 below 1.0 are less volatile than the market. A stock with a beta of 0.5 will tend to rise 5
22 percent when the market rises 10 percent.

23 **Q17. How is beta measured?**

24 A17. The usual approach to calculating beta is a statistical comparison of the sensitivity of a
25 stock's (or a portfolio's) return to the market's return. Many investment services report
26 betas, including Merrill Lynch's quarterly Security Risk Evaluation, Bloomberg and the
27 *Value Line Investment Survey*. Betas are not always calculated the same way, and
28 therefore must be used with a degree of caution, but the basic point that a high beta

1 indicates a risky stock has long been widely accepted by both financial theorists and
2 investment professionals.

3 **Q18. Are there circumstances when the “usual approach to calculating beta” should not**
4 **be used?**

5 A18. There are at least two cases where the standard estimate of beta should be viewed
6 skeptically.

7 First, companies in serious financial distress seem to “decouple” from their normal
8 sensitivity to the stock market. The stock prices of financially distressed companies tend
9 to change based more on individual news about their particular circumstances than upon
10 overall market movements. Thus, a risky stock could have a low estimated beta if the
11 company was in financial distress. Other circumstances that may cause a company's
12 stock to decouple include an industry restructuring or major changes in a company's
13 supply or output markets.

14 Second, similar circumstances seem to arise for companies “in play” during a merger or
15 acquisition. Once again, the individual information about the progress of the proposed
16 takeover is so much more important for that stock than day-to-day market fluctuations
17 that, in practice, beta estimates for such companies seem to be too low.

18 **Q19. How reliable is beta as a risk measure?**

19 A19. Scholarly studies have long confirmed the importance of beta for a stock's required rate
20 of return. It is widely regarded as the best single risk measure available. The merits of
21 beta seemed to have been challenged by widely publicized work by Professors Eugene F.
22 Fama and Kenneth R. French.²⁴ However, despite the early press reports of their work as
23 signifying that “beta is dead,” it turns out that beta is still a potentially important
24 explanatory factor (albeit one of several) in their work. Thus, beta remains alive and well
25 as the best single measure of relative risk.

²⁴ 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 **D. INTEREST RATE ESTIMATE**

2 **Q20. What interest rates do your procedures require?**

3 A20. Modern capital market theories of risk and return use the short-term risk-free rate of
4 return as the starting benchmark. My measures of the MRP incorporate this approach,
5 since they represent the excess of the expected return on the market over the 30-day U.S.
6 Treasury bill rate and over the long-term U.S. Government bond rate. Accordingly,
7 implementation of my procedures requires use of an estimate of the 30-day Treasury bill
8 rate and the long-term Government bond rate. I use the average over the most recent 15
9 trading days ending on February 7, 2008.

10 **E. COST OF CAPITAL MODELS**

11 **Q21. How do you combine the above components into an estimate of the cost of capital?**

12 A21. By far the most widely used approach to estimation of the cost of capital is the "Capital
13 Asset Pricing Model," and I do calculate CAPM estimates. However, the CAPM is only
14 one equity risk premium approach technique, and I also use another.

15 **Q22. Please start with the CAPM, by describing the model.**

16 A22. As noted above, the modern models of capital market equilibrium express the cost of
17 equity as the sum of a risk-free rate and a risk premium. The CAPM is the longest-
18 standing and most widely used of these theories. The CAPM states that the cost of
19 capital for investment s (e.g., a particular common stock) is given by the following
20 equation:

$$k_s = r_f + \beta_s \times MRP \qquad \qquad \qquad \text{(C-1)}$$

21 where k_s is the cost of capital for investment s ; r_f is the risk-free rate, β_s is the beta risk
22 measure for the investment s ; and MRP is the market risk premium.

23 The CAPM relies on the empirical fact that investors price risky securities to offer a
24 higher expected rate of return than safe securities do. It says that the security market line
25 starts at the risk-free interest rate (that is, that the return on a zero-risk security, the y-axis

1 intercept in Figure 1 in the body of my testimony, equals the risk-free interest rate).
2 Further, it says that the risk premium over the risk-free rate equals the product of beta and
3 the risk premium on a value-weighted portfolio of all investments, which by definition
4 has average risk.

5 **Q23. What other equity risk premium approach model do you use?**

6 A23. Empirical research has long shown that the CAPM tends to overstate the actual
7 sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premia
8 than predicted by the CAPM and high-beta stocks tend to have lower risk premia than
9 predicted. A number of variations on the original CAPM theory have been proposed to
10 explain this finding. The difference between the CAPM and the type of relationship
11 identified in the empirical studies is depicted in Figure BV-C1.

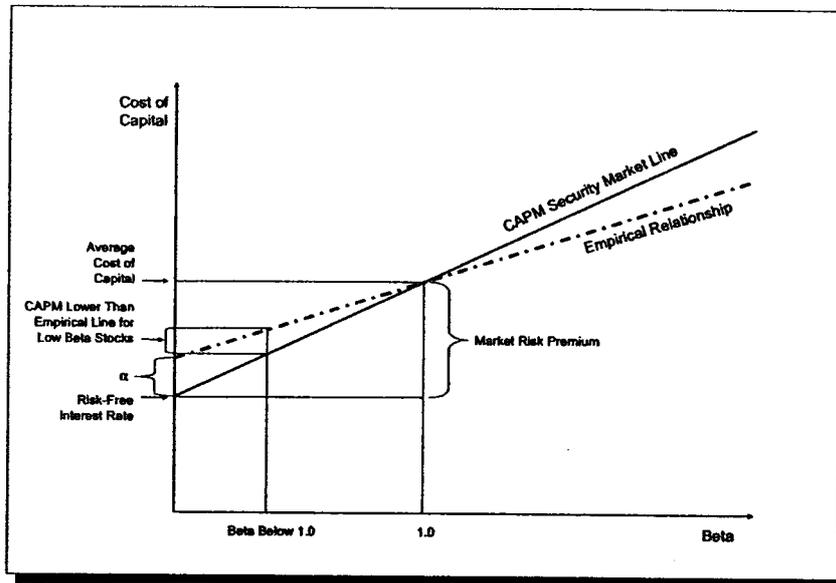


Figure BV-C1: The Empirical Security Market Line

12 The second model makes use of these empirical findings. It estimates the cost of capital
13 with the equation,

$$k_s = r_f + \alpha + \beta_s \times (MRP - \alpha) \quad (C-2)$$

14 where α is the "alpha" of the risk-return line, a constant, and the other symbols are
15 defined as above. I label this model the Empirical Capital Asset Pricing Model, or

1 “ECAPM.” For the short-term risk-free rate models, I set alpha equal to 1, 2, and 3
2 percent which are values somewhat lower than that estimated empirically. For low-beta
3 stocks such as regulated utilities, the use of a lower value for alpha leads to a lower
4 estimate of the cost of capital. For the long-term risk-free rate models, I set alpha equal
5 to both 0.5 percent and 1.5 percent, but I rely more heavily on the 0.5 percent results.
6 The use of a long-term risk-free rate incorporates some of the desired effect of using the
7 ECAPM. That is, the long-term risk-free rate version of the Security Market Line has a
8 higher intercept and a flatter slope than the short-term risk-free version which has been
9 tested. Thus, it is likely that I do not need to make the same degree adjustment when I
10 use the long-term risk-free rate. A summary of the empirical evidence on the magnitude
11 of alpha is provided in Table No. BV-C1 below.

12 **II. EMPIRICAL EQUITY RISK PREMIUM RESULTS**

13 **Q24. How is this part of the appendix organized?**

14 A24. This section presents the full details of my equity risk premium approach analyses, which
15 are summarized in the body of my testimony. Details behind the estimates of the short-
16 term and the long-term risk-free interest rates are discussed. Next, the beta estimates, and
17 the estimates of the MRP I use in the models are addressed. Finally, this section reports
18 the CAPM and ECAPM results for the sample’s costs of equity, and then describes the
19 results of adjusting for differences between the benchmark sample and Arizona-
20 American’s regulated capital structures.

21 **A. RISK-FREE INTEREST RATE**

22 **Q25. How do you obtain estimates of the risk-free interest rates over the period the utility**
23 **rates set here are to be in effect?**

24 A25. I obtain these rates using data provided by Bloomberg. In particular, I use their reported
25 government debt yields from the “constant maturity series”. This information is
26 displayed in Table No. BV-9.

1 **Q26. What values do you use for the short-term and long-term risk-free interest rates?**

2 A26. I use a value of 2.2 percent for the short-term risk-free interest rate and a value of 4.3
3 percent for the long-term risk-free interest rate as the benchmark interest rates in the
4 equity risk premium analyses. These values represent the average yields on 30-day and
5 long term (20-year) Treasury securities respectively, over the 15-trading day period
6 ending on February 7, 2008.

7 **B. BETAS AND THE MARKET RISK PREMIUM**

8 **1. Beta Estimation Procedures**

9 **Q27. Which betas do you use in your risk positioning models?**

10 A27. I obtained estimates from the *Value Line Investment Survey* for the sample companies.²⁵

11 **Q28. How does *Value Line* estimate the reported betas?**

12 A28. *Value Line* estimates the reported betas using weekly data for a five year period. As a
13 market index, *Value Line* uses the New York Stock Exchange. Also *Value Line* reports
14 so-called adjusted betas, i.e. the betas reported by *Value Line* are calculated as follows:

$$\beta_{Value\ Line} = .67 \times \beta + 0.35 \quad (C-3)$$

15 where β is the standard beta estimate. To obtain standard betas, I reverse the adjustment
16 to obtain standard betas, β . *Value Line* and many investment firms adjust the estimated
17 betas using a procedure similar to the one described in equation (C-3). This type of
18 adjustment is intended to compensate for sampling errors in the beta estimation. It
19 adjusts betas below one upwards and betas above one downwards.

20 **Q29. Please summarize the beta estimates you rely on.**

21 A29. After reversing the *Value Line* adjustment procedure, the estimates range from 0.22 to
22 1.19 for the water sample and from 0.75 to 0.97 for the gas LDC sample, with an average

²⁵ For each sample I used the *Value Line* beta estimates most recently available. For the water sample, estimates are as of January 25, 2008, while for the gas LDC sample estimates are as of either December 14 or December 28, 2008, depending on the company.

1 of 0.84 and 0.80 respectively. The beta estimates for individual sample companies are
2 reported in Workpaper #1 to Tables No. BV-10 and BV- 22.

3 **Q30. What are the characteristics of recent beta estimates?**

4 A30. Betas for both water and gas utilities have increased in recent years. For example, Value
5 Line betas for water utilities averaged approximately .60 in 2002 while they now stand at
6 approximately .91 for an increase of about 50% over the last six years. Similarly, the
7 average beta for the gas LDC sample has increased from approximately 0.65 to
8 approximately .89 for an increase of almost 37% over six years. Thus, at least in Value
9 Line's judgment, the water and gas LDC companies are exposed to more systematic risk
10 today than they were a few years back.

11 **2. Market Risk Premium Estimation**

12 **Q31. Given all of the evidence, what MRP do you use in your analysis?**

13 A31. It is clear that market return information is volatile and difficult to interpret, but based on
14 the collective evidence, the MRP I use for the short-term risk-free rate is 8 percent and
15 for the long-term risk-free rate is 6.5 percent.

16 **C. COST OF CAPITAL ESTIMATES**

17 **Q32. Based on these data, what are the values you calculate for the overall cost of capital
18 and the corresponding cost of equity for the water utility sample?**

19 A32. Panels A and B of Table No. BV-10 present the cost of equity results using the equity
20 risk positioning methods at the sample companies' market value capital structures. Panel
21 A uses the long-term risk-free rate estimate while Panel B uses the short-term risk-free
22 rate.

23 **Q33. What does the water market data imply about the sample's cost of equity at the
24 proposed 46.9 percent equity ratio for Arizona-American Water?**

25 A33. The return on equity and the overall cost of capital for the various equity risk positioning
26 methods are reported in Table No. BV-11, Panels A to G. Panels A through C utilize the

1 long-term risk-free rate while Panels D through G use the short-term risk free rate. Panel
2 A reports the cost of capital estimates using the CAPM results for the long-term risk-free
3 rate, while Panels B and C report these estimates for the ECAPM cost of equity results
4 using ECAPM parameters of 0.5 and 1.5 percent, respectively. Panel D reports the
5 CAPM estimates using the short-term risk free rate, while Panels E, F and G report
6 ECAPM results using ECAPM parameters of 1, 2 and 3 respectively. In each panel,
7 column [8] reports the overall cost of capital for each company. The last two rows of
8 each panel report the sample and the subsample averages. The first is for all companies
9 in the water sample (average [a]), and the second is for the subsample of companies with
10 significant revenue from regulated activities (average [b]).

11 The sample average ATWACC from each panel of Table No. BV-11 is reproduced in
12 column [1] of Table No. BV-12, which then reports the cost of equity for each of the risk
13 positioning methods that is consistent with the sample information and the capital
14 structure of Arizona-American. Panel A of Table No. BV-12 reports the results for all
15 sample companies. Panel B of the table summarizes the results for the subsample of
16 companies that have a large percentage of revenues from regulated activities. The sample
17 average ATWACCs and corresponding costs of equity at a 46.9 percent equity ratio are
18 also displayed in Table 2 of my testimony. Similar data at 41.6 percent equity are
19 displayed in Table No. BV-13 and Table 3 of my testimony.

20 **Q34. What cost of equity values do you calculate for the gas LDC sample?**

21 A34. The cost of equity estimates for the gas LDC sample are displayed on Panels A and B of
22 Table No. BV-22. As with the water utility sample results, Panel A uses the long-term
23 risk-free rate, and Panel B uses the short-term risk-free rate.

24 **Q35. What does the gas LDC market data imply about the sample's cost of equity at the
25 proposed 46.9 percent equity ratio for Arizona-American Water?**

26 A35. The sample average ATWACC from each panel of Table No. BV-23 is reproduced in
27 column [1] of Table No. BV-24, which then reports the cost of equity for each of the risk
28 positioning methods that is consistent with the sample information and the capital
29 structure of Arizona-American. The sample average ATWACCs and corresponding costs

1 of equity at a 46.9 percent equity ratio are also displayed in Table 2 of my testimony.
2 Similar data at 41.6 percent equity are displayed in Table No. BV-23 and Table 3 of my
3 testimony.

4 **Q36. What are the implications of the risk positioning results for Arizona-American's**
5 **estimated cost of equity?**

6 I discuss the implications of the risk positioning results for the two samples in the main
7 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.

APPENDIX D

DISCOUNTED CASH FLOW METHODOLOGY:

DETAILED PRINCIPLES AND RESULTS

I.	DISCOUNTED CASH FLOW METHODOLOGY PRINCIPLES	2
A.	SIMPLE AND MULTI-STAGE DISCOUNTED CASH FLOW MODELS	2
B.	CONCLUSIONS ABOUT DCF	9
II.	EMPIRICAL DCF RESULTS	9
A.	PRELIMINARY MATTERS	10
B.	GROWTH RATES	10
C.	DIVIDEND AND PRICE INPUTS	13
D.	COMPANY-SPECIFIC DCF COST-OF-CAPITAL ESTIMATES	14

1 **Q1. What is the purpose of this appendix?**

2 A1. This appendix reviews the principles behind the discounted cash flow or "DCF"
3 methodology and the details of the cost-of-capital estimates obtained from this
4 methodology.

5 **I. DISCOUNTED CASH FLOW METHODOLOGY PRINCIPLES**

6 **Q2. How is this section of the appendix organized?**

7 A2. The first part discusses the general principles that underlie the DCF approach. The
8 second portion describes the strengths and weaknesses of the DCF model and why it is
9 generally less reliable for estimating the cost of capital for the sample companies at the
10 present time than the risk positioning method discussed in Appendix C.

11 **A. SIMPLE AND MULTI-STAGE DISCOUNTED CASH FLOW MODELS**

12 **Q3. Please summarize the DCF model.**

13 A3. The DCF model takes the first approach to cost-of-capital estimation discussed with
14 Figure 1 in Section II-A of my direct testimony. That is, it attempts to measure the cost
15 of equity in one step. The method assumes that the market price of a stock is equal to the
16 present value of the dividends that its owners expect to receive. The method also
17 assumes that this present value can be calculated by the standard formula for the present
18 value of a cash flow stream:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots + \frac{D_T}{(1+k)^T} \quad (\text{D-1})$$

19 where "P" is the market price of the stock; " D_t " is the dividend cash flow expected at
20 the end of period t ; " k " is the cost of capital; and " T " is the last period in which a
21 dividend cash flow is to be received. The formula just says that the stock price is equal to
22 the sum of the expected future dividends, each discounted for the time and risk between
23 now and the time the dividend is expected to be received.

1 Most DCF applications go even further, and make very strong (*i.e.*, unrealistic)
2 assumptions that yield a simplification of the standard formula, which then can be
3 rearranged to estimate the cost of capital. Specifically, if investors expect a dividend
4 stream that will grow forever at a steady rate, the market price of the stock will be given
5 by a very simple formula,

$$P = \frac{D_1}{(k - g)} \quad (\text{D-2})$$

6 where " D_1 " is the dividend expected at the end of the first period, " g " is the perpetual
7 growth rate, and " P " and " k " are the market price and the cost of capital, as before.
8 Equation D-2 is a simplified version of Equation D-1 that can be solved to yield the well
9 known "DCF formula" for the cost of capital:

$$\begin{aligned} k &= \frac{D_1}{P} + g \\ &= \frac{D_0 \times (1 + g)}{P} + g \end{aligned} \quad (\text{D-3})$$

10 where " D_0 " is the current dividend, which investors expect to increase at rate g by the
11 end of the next period, and the other symbols are defined as before. Equation D-3 says
12 that if Equation D-2 holds, the cost of capital equals the expected dividend yield plus the
13 (perpetual) expected future growth rate of dividends. I refer to this as the simple DCF
14 model. Of course, the "simple" model is simple because it relies on very strong (*i.e.*,
15 very unrealistic) assumptions.

16 **Q4. Are there other versions of the DCF models besides the "simple" one?**

17 **A4.** Yes. If Equation D-2 and its underlying assumptions do not hold, sometimes other
18 variations of the general present value formula, Equation D-1, can be used to solve for k
19 in ways that differ from Equation D-3. For example, if there is reason to believe that
20 investors do *not* expect a steady growth rate forever, but rather have different growth rate
21 forecasts in the near term (e.g., over the next five or ten years as compared with
22 subsequent periods), these forecasts can be used to specify the early dividends in
23 Equation D-1. Once the near-term dividends are specified, Equation D-2 can be used to

1 specify the share price value at the end of the near-term (e.g., at the end of five or ten
2 years), and the resulting cash flow stream can be solved for the cost of capital using
3 Equation D-1.

4 More formally, the "multistage" DCF approach solves the following equation for k :

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots + \frac{D_T + P_{TERM}}{(1+k)^T} \quad (\text{D-4})$$

5 The terminal price, P_{TERM} is estimated as

$$P_{TERM} = \frac{D_{T+1}}{(k - g_{LR})} \quad (\text{D-5})$$

6 where T is the last of the periods in which a near term dividend forecast is made and g_{LR}
7 is the long-run growth rate. Thus, Equation D-4 defers adoption of the very strong
8 perpetual growth assumptions that underlie Equation D-2 — and hence the simple DCF
9 formula, Equation D-3 — for as long as possible, and instead relies on near term
10 knowledge to improve the estimate of k . I examine both simple and multistage DCF
11 results below.

12 **Q5. Please describe the multi-stage DCF model you use.**

13 **A5.** The multi-stage model I use is presented in Equations D-4 and D-5 above, and assumes
14 that the long-term perpetual growth rate for all companies in the two samples is the
15 forecast long-term growth rate of the GDP. This model allows growth rates to differ
16 across companies during the first ten years before settling down to a single long-term
17 growth rate. The growth rate for the first five years is the long-term growth rate derived
18 from analysts' reports. After year five, the growth rate is assumed to converge linearly to
19 the GDP growth rate. In other words, the growth rate in year 6 is adjusted by 1/6th of the
20 difference between each company's 5-year growth rate forecast and the GDP forecast.
21 The growth rates in years 7 to 10 are adjusted by an additional 1/6th so that the earning
22 growth rate pattern converges on the long-term GDP growth rate forecast.

1 **Q6. Why do you assume that the long-term growth rate of the sample companies will**
2 **converge to the long-term growth rate of GDP?**

3 A6. Recall that the DCF model assumes that dividends grow at a constant rate literally forever.
4 If the growth rate of earnings (and therefore, dividends) were greater than (less than) the
5 long-term growth rate of the economy, mathematically it would mean that the company
6 (and the industry) would become an ever increasing (or decreasing) proportion of the
7 economy. Therefore, the most logical assumption is that the company's earnings grow at
8 the same rate as the economy on average over the long run.

9 **Q7. What are the merits of the DCF model?**

10 A7. The DCF approach is conceptually sound only if its assumptions are met. In actual
11 practice one can run into difficulty because those assumptions are so strong, and hence so
12 unlikely to correspond to reality. Two conditions are well-known to be necessary for the
13 DCF approach to yield a reliable estimate of the cost of capital: the variant of the present
14 value formula, Equation D-1, that is used must actually match the variations in investor
15 expectations for the dividend growth path; and the growth rate(s) used in that formula
16 must match current investor expectations. Less frequently noted conditions may also
17 create problems.

18 The DCF model assumes that investors expect the cost of capital to be the same in all
19 future years. Investors may not expect the cost of capital to be the same, which can bias
20 the DCF estimate of the cost of capital in either direction.

21 The DCF model only works for companies for which the standard present value formula
22 works. The standard formula does *not* work for companies that operate in industries or
23 markets options (*e.g.*, puts and calls on common stocks), and so it will not work for
24 companies whose stocks behave as options do. Option-pricing effects will be important
25 for companies in financial distress, for example, which implies the DCF model will
26 *understate* their cost of capital, all else equal.

27 In recent years even the most basic DCF assumption, that the market price of a stock in
28 the absence of growth options is given by the standard present value formula (*i.e.*, by

1 Equation D-1 above), has been called into question by a literature on market volatility.¹
2 In any case, it is still too early to throw out the standard formula, if for no other reasons
3 than that the evidence is still controversial and no one has offered a good replacement.
4 But the evidence suggests that it must be viewed with more caution than financial
5 analysts have traditionally applied. Simple models of stock prices may not be consistent
6 with the available evidence on stock market volatility.

7 **Q8. Normally DCF debates center on the right growth rate. What principles underlie**
8 **that choice?**

9 **A8.** Finding the right growth rate(s) is indeed the usual "hard part" of a DCF application. The
10 original approach to estimation of g relied on average historical growth rates in
11 observable variables, such as dividends or earnings, or on the "sustainable growth"
12 approach, which estimates g as the average book rate of return times the fraction of
13 earnings retained within the firm. But it is highly unlikely that historical averages over
14 periods with widely varying rates of inflation, interest rates and costs of capital, such as
15 in the relatively recent past, will equal current growth rate expectations.

16 A better approach is to use the growth rates currently expected by investment analysts, if
17 an adequate sample of such rates is available. Analysts' forecasts are superior to time
18 series forecasts based upon single variable historical data as has been documented and
19 confirmed extensively in academic research.² If this approach is feasible and if the

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

1 person estimating the cost of capital is able to select the appropriate version of the DCF
2 formula, the DCF method should yield a reasonable estimate of the cost of capital for
3 companies not in financial distress and without material option-pricing effects (always
4 subject to recent concerns about the applicability of the basic present value formula to
5 stock prices as well as issues of optimism bias). However, for the DCF approach to work,
6 the basic stable-growth assumption must become reasonable and the underlying stable-
7 growth rate must become determinable *within the period for which forecasts are*
8 *available.*

9 **Q9. What is the so called “optimism bias” in the earnings growth rate forecasts of**
10 **security analysts and what is its effect on the DCF analysis?**

11 A9. Optimism bias is related to the observed tendency for analysts to forecast earnings
12 growth rates that are higher than are actually achieved. This tendency to over estimate
13 growth rates is perhaps related to incentives faced by analysts that provide rewards not
14 strictly based upon the accuracy of the forecasts. To the extent optimism bias is present
15 in the analysts’ earnings forecasts, the cost-of-capital estimates from the DCF model
16 would be too high.

17 **Q10. Does optimism bias mean that the DCF estimates are completely unreliable?**

18 A10. No. The effect of optimism bias is least likely to affect DCF estimates for large, rate
19 regulated companies in relatively stable segments of an industry. Furthermore, the
20 magnitude of the optimism bias (if any) for regulated companies is not clear. This issue
21 is addressed in a paper by Chan, Karceski, and Lakonishok (2003)³ who sort companies
22 on the basis of the size of the I/B/E/S forecasts to test the level of optimism bias. Utilities
23 constitute 25 percent of the companies in lowest quintile, and by one measure the level of
24 optimism bias is 4 percent. However, the 4 percent figure does not represent the
25 complete characterization of the results in the paper. Table IX of the paper shows that

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.

1 the median I/B/E/S forecast for the first (lowest) quintile averages 6.0 percent. The
2 realized "Income before Extraordinary Items" is 2.0 percent (implying a four percent
3 upward bias in I/B/E/S forecasts), but the "Portfolio Income before Extraordinary Items"
4 is 8.0 percent (implying a two percent downward bias in I/B/E/S forecasts).

5 The difference between the "Income before Extraordinary Items" and "Portfolio Income
6 before Extraordinary Items" is whether individual firms or a portfolio are used in
7 estimating the realized returns. The first is a simple average of all firms in the quintile
8 while the second is a market value weighted-average. Although both measures of bias
9 have their own drawbacks according to the authors,⁴ the Portfolio Income measure gives
10 more weight to the larger firms in the quintile such as regulated utilities. In addition, the
11 paper demonstrates that "analysts' forecasts as well as investors' valuations reflect a
12 wide-spread belief in the investment community that many firms can achieve streaks of
13 high growth in earnings."⁵ Therefore, it is not clear how severe the problem of optimism
14 bias may be for regulated utilities or even whether there is a problem at all.

15 Finally, the two-stage DCF model also adjusts for any over optimistic (or pessimistic)
16 growth rate forecasts by substituting the long-term GDP growth rate for the 5-year
17 growth rate forecasts of the analysts in the years beginning in year 11. I linearly trend the
18 5-year forecast growth rate to the GDP forecast growth rate in years 6 to 10.

19 **Q11. What about the reforms by the National Associate of Security Dealers (NASD) that**
20 **were designed to reduce the conflicts of interest and pressures brought against**
21 **security analysts? Have those reforms been generally successful?**

22 **A11. Yes. The conclusion from the Joint Report by NASD and the New York Stock Exchange**
23 **("NYSE") on the reforms states**

24 ... the SRO Rules have been effective in helping restore integrity to
25 research by minimizing the influences of investment banking and
26 promoting transparency of other potential conflicts of interest. Evidence

⁴ Chan, Karceski, and Lakonishok, *op. cit.*, p. 675.

⁵ Chan, Karceski, and Lakonishok, *op. cit.*, p. 663.

1 also suggests that investors are benefiting from more balanced and
2 accurate research to aid their investment decisions.⁶

3 The report does note additional reforms are advisable, but the situation is far different
4 today than during the height of the tech bubble when analyst objectivity was clearly
5 suspect.

6 **B. CONCLUSIONS ABOUT DCF**

7 **Q12. Please sum up the implications of this part of the appendix.**

8 A12. The unavoidable questions about the DCF model's strong assumptions — whether the
9 basic present value formula works for stocks, whether option pricing effects are
10 important for the company, whether the right variant of the basic formula has been found,
11 and whether the true growth rate expectations have been identified — cause me to view
12 the DCF method as *inherently* less reliable than equity risk premium approach, the other
13 approach I use.

14 **II. EMPIRICAL DCF RESULTS**

15 **Q13. How is this part of the appendix organized?**

16 A13. This section presents the details of my DCF analyses for the water and gas LDC samples,
17 which are summarized in my written testimony.

18 Implementation of the simple DCF models described above requires an estimate of the
19 current price, the dividend, and near-term and long-run growth rate forecasts. The simple
20 DCF model relies only on a single growth rate forecast, while the multistage DCF model
21 employs both near-term individual company forecasts and long-run GDP growth rate
22 forecasts. The remaining parts of this section describe each of these inputs in turn.

⁶ Joint Report by NASD and NYSE on the Operation and Effectiveness of the Research Analyst Conflict of Interest Rules, December 2005, p. 44.

1 A. **PRELIMINARY MATTERS**

2 **Q14. In Appendix C you discuss estimating cost of capital and implied cost of equity**
3 **using the risk positioning methodology. What, if anything, is different when you use**
4 **the DCF method?**

5 A14. First, the timing of the market value capital structure calculations is different in the DCF
6 method than in the equity risk premium method. The equity risk premium method relies
7 on the average capital structure over the five-year period *Value Line* uses to estimate beta
8 while the DCF approach uses only current data, so the relevant market value capital
9 structure measure is the most recent that can be calculated. This capital structure for the
10 water sample companies is reported in columns [1]-[3] of Table No. BV-4, and for the
11 gas LDC sample companies in columns [1]-[3] of Table No. BV-17.

12 B. **GROWTH RATES**

13 **Q15. What growth rates do you use?**

14 A15. For reasons discussed above, historical growth rates today are not useful as forecasts of
15 current investor expectations for the water utility industry. I therefore use rates
16 forecasted by security analysts.

17 The ideal in a DCF application would be a detailed forecast of future dividends, year by
18 year well into the future, based on a large sample of investment analysts' expectations. I
19 know of no source of such data. Dividends are ultimately paid from earnings, however,
20 and earnings forecasts are available for a few years. Investors do not expect dividends to
21 grow in lockstep with earnings, but for companies for which the DCF approach can be
22 used reliably (*i.e.*, for relatively stable companies whose prices do not include the option-
23 like values described previously), they do expect dividends to track earnings over the
24 long-run. Thus, use of earnings growth rates as a proxy for expectations of dividend
25 growth rates is a common practice.

26 Accordingly, the first step in my DCF analysis is to examine a sample of investment
27 analysts' forecasted earnings growth rates. In particular, I utilize Bloomberg's BEst and

1 *Value Line's* forecasted earnings growth.⁷ The projected earnings growth rates for the
2 water sample companies are in Table No. BV-5, and those for the gas LDC sample
3 companies are in Table No. BV-18. Column [1] reports Bloomberg's BEst analysts'
4 forecasts of the long-term earnings growth for the sample companies. Column [2] reports
5 the number of analysts that provided a forecast. Columns [3] and [4] report *Value Line's*
6 forecasted earnings per share ("EPS") value for each company for 2007 and 2010-2012
7 respectively. Column [5] provides *Value Line's* implied long-term growth rate forecast,
8 and column [6] provides a weighted average growth rate for each company across the two
9 sources. (I treat the *Value Line* forecasts as though they overlap exactly with the
10 forecasts from Bloomberg.) These growth rates underlie my simple and multistage DCF
11 analyses.

12 In the simple DCF, I use the five-year average annual growth rate as the perpetual
13 growth.⁸ In the multistage model, I rely on the company-specific growth rate until 2012
14 and on the long-term GDP forecast for year 2018 onwards. During the years from 2013
15 to 2017, I assume the growth rate converges linearly towards the long-term GDP
16 forecast.⁹

17 **Q16. Do these growth rates correspond to the ideal you mentioned above?**

18 A16. No. While forecasted growth rates are the quantity required in principle, the forecasts
19 need to go far enough out into the future so that it is reasonable to believe that investors
20 expect a stable growth path afterwards. As can be seen from Table No. BV-5 and Table
21 No. BV-18, the growth rate forecasts vary widely from company to company. For
22 example the BEst growth forecast for Southwest Water is 9.7 percent while the *Value*
23 *Line* growth forecast is 23.6 percent.¹⁰ While the differences between BEst and *Value*

⁷ The BEst growth rates were downloaded from Bloomberg on February 7, 2008. *Value Line* estimates are from the most recent report available, dated January 25, 2008 for the water sample utilities, and December 14, 2007 for the gas LDCs.

⁸ This growth rate is in column [6] of Table No. BV-5 (Table No. BV-18 for the gas LDC sample).

⁹ I use the long-term U.S. GDP growth forecast from *Blue Chip Economic Indicators* (October 10, 2007).

¹⁰ See Table No. BV-5.

1 *Line* forecasts are lower for the gas LDC sample, there is still significant variation.¹¹

2 Also, for some companies, the five-year growth rate forecasts are significantly above or
3 below the long-term GDP growth rate forecast, indicating lack of stability in growth rates.
4 Overall, the growth rates indicate that some companies and maybe the industries have yet
5 to reach a stable equilibrium which is required for the correct application of the DCF
6 method.

7 **Q17. How well are the conditions needed for DCF reliability met at present?**

8 A17. The requisite conditions for the sample companies are not fully met at this time. Of
9 particular concern for this proceeding is the uncertainty about what investors truly expect
10 the long-run outlook for the sample companies to be. The longest time period available
11 for growth rate forecasts of which I am aware is five years. The long-run growth rate (*i.e.*,
12 the growth rate after the industry settles into a steady state, which is certainly *beyond* the
13 next five years for water industry) drives the actual results one gets with the DCF model.
14 Unfortunately, this implies that unless the company or industry in question is stable, so
15 there is little doubt as to the growth rate investors expect. DCF results in practice can end
16 up being driven by the subjective judgment of the analyst who performs the work.

17 This is a problem at present because it is hard to imagine that today's water industry
18 would accurately be described as stable. There is great uncertainty about the costs
19 required to undertake the large investments in infrastructure forecasted for the industry.
20 Indeed, *Value Line* notes the need for investments aimed at replacing the aging
21 infrastructure and complying with increasingly stringent water safety regulations,
22 partially driven by increased fear of bioterrorism. Additionally, American Society of
23 Civil Engineers estimated in 2005 that the drinking water infrastructure requires \$11
24 billion of annual investments, while the wastewater segment requires \$390 billion in
25 investments over the following 20 years.¹² The water industry is also going through a
26 series of mergers and acquisitions, which affects the companies' earnings growth rate
27 estimates. This is one reason why companies heavily involved in mergers and

¹¹ See table No. BV-18.

¹² Report Card for America's Infrastructure, The American Society of Civil Engineers, 2005.

1 acquisitions are normally excluded from the sample. Taken together, these factors mean
2 that it may be some time before the water industry settles into anything investors will see
3 as a stable equilibrium.

4 Such circumstances imply that a regulator may often be faced with a wide range of DCF
5 numbers, none of which can be well grounded in objective data on true long-run growth
6 expectations, *because no such objective data now exist*. DCF for firms or industries in
7 flux is *inherently* subjective with regard to a parameter (the long-run growth rate) that
8 drives the answer one gets.

9 It is clear that much longer detailed growth rate forecasts than currently available from
10 Bloomberg and Value Line would be needed to implement the DCF model in a
11 completely reliable way for the water sample at this time; however, the general stability
12 of the 5-year growth rate forecasts for the gas LDC sample indicates a higher degree of
13 reliability than for the water sample at this time.

14 **C. DIVIDEND AND PRICE INPUTS**

15 **Q18. What values do you use for dividends and stock prices?**

16 **A18.** Dividends are the most recent recorded dividend payments as reported by Bloomberg.
17 For some companies this is the 4th quarter 2007 dividend, while for others it is the 1st
18 quarter 2008 dividend. This dividend is grown at the estimated growth rate and divided
19 by the price described below to estimate the dividend yield for the simple and multistage
20 DCF models.

21 Stock prices are the average of the closing stock prices for the 15 trading days ending on
22 the day the BEst forecasts were released (February 7, 2008). Using these dates ensures
23 that the information in growth rates and stock prices are contemporaneous. I use a 15-
24 day average as a compromise. Using a longer period would be inconsistent with the
25 principles that underlie the DCF formula. The DCF approach assumes the stock price is
26 the present value of future expected dividends. Stock prices six months or a year ago
27 reflect expectations at that time, which are different from those that underlie the currently

1 available growth forecasts. At the same time, use of an average over a brief period helps
2 guard against a company's price on a particular day price being unduly influenced by
3 mistaken information, differences in trading frequency, and the like.

4 The closing stock price is used because it is at least as good as any other measure of the
5 day's outcome, and may be better for DCF purposes. In particular, if there were any
6 single price during the day that would affect investors' decisions to buy or sell a stock, I
7 would suspect that it would be each day's closing price, not the high or low during the
8 day. The daily price changes reported in the financial pages, for example, are from close
9 to close, not from high to high or from low to low.

10 **D. COMPANY-SPECIFIC DCF COST-OF-CAPITAL ESTIMATES**

11 **Q19. What DCF estimates do these data yield?**

12 A19. The cost-of-equity results for the simple and multistage DCF models are shown in Table
13 No. BV-6 for the water utility sample and in Table No. BV-19 for the gas LDC sample.
14 In both tables, Panel A reports the results for the simple DCF method while Panel B
15 reports the results for the multistage DCF method using the long-term GDP growth rate
16 as the perpetual growth rate.

17 **Q20. What overall cost-of-capital estimates result from the DCF cost-of-equity estimates?**

18 A20. The capital structure, DCF cost of equity, and cost of debt estimates are combined to
19 obtain the overall after-tax weighted-average cost of capital for each sample company.
20 These results are presented in Table No. BV-7 for the water sample and in Table No. BV-
21 20 for the gas LDC sample. Again, Panel A relies on the simple DCF cost-of-equity
22 results while Panel B relies on the multistage DCF cost-of-equity results.

23 **Q21. What information do you report in Table No. BV-8 and in Table No. BV-21?**

24 A21. These tables report, for each sample, the return on equity consistent with that sample's
25 estimated overall after-tax weighted-average cost of capital and the proposed equity
26 thickness of 46.9 percent for Arizona-American. For both the simple DCF and
27 multistage DCF methods, the sample's average ATWACC is reported in column [1].

1 Column [6] reports the return on equity as if the sample companies' average market value
2 capital structure had been that currently proposed for Arizona-American. Similar data at
3 41.6 percent equity are presented in Tables No. BV-13 and BV-25, and in Table 3 of my
4 testimony.

5 **Q22. What are the implications of these results?**

6 **A22.** The implication of these numbers is discussed in my direct testimony, along with the
7 findings of the equity risk premium approach.

APPENDIX E

EFFECT OF DEBT ON THE COST OF EQUITY

I.	AN OVERVIEW OF THE ECONOMIC LITERATURE.....	2
A.	TAX EFFECTS.....	2
1.	Base Case: No Taxes, No Risk to High Debt Ratios.....	3
2.	Corporate Tax Deduction for Interest Expense.....	4
3.	Personal Tax Burden on Interest Expense.....	5
B.	NON-TAX EFFECTS.....	8
II.	EXPANDED EXAMPLE.....	12
A.	DETAILS OF DIFFERENT LEVELS OF DEBT.....	12
B.	THE IMPACT OF INCOME AND INTEREST.....	14
C.	THE EFFECT OF TAXES.....	16
D.	COMBINED EFFECTS.....	21

1 **Q1. What is the purpose of this Appendix?**

2 A1. In this appendix, I provide details on the effects of debt on the cost of equity. First, I
3 summarize a fairly large body of financial research on capital structure. Second, I
4 provide an extended example to illustrate the effect of debt on the cost of equity.

5 **I. AN OVERVIEW OF THE ECONOMIC LITERATURE**

6 **Q2. What is the focus of the economic literature on the effects of debt?**

7 A2. The economic literature focuses on the effects of debt on the value of a firm. The
8 standard way to recognize one of these effects, the impact of the fact that interest expense
9 is tax-deductible, is to discount the all-equity after-tax operating cash flows generated by
10 a firm or an investment project at a weighted average cost of capital, typically known in
11 textbooks as the "WACC." The textbook WACC equals the *market*-value weighted
12 average of the cost of equity and the *after-tax, current* cost of debt. However, rate
13 regulation in North America has a legacy of working with another weighted-average cost
14 of capital, the *book*-value weighted average of the cost of equity and the *before-tax,*
15 *embedded* cost of debt. To distinguish the concepts, I refer to the after-tax weighted-
16 average cost of capital as ATWACC.

17 **Q3. How is this section of the appendix organized?**

18 A3. It starts with the tax effects of debt. It then turns to other effects of debt.

19 **A. TAX EFFECTS**

20 **Q4. What are the key findings in the literature regarding tax effects?**

21 A4. Three seminal papers are vital for this literature. The first assumes no taxes and risk-free
22 debt. The second adds corporate income taxes. The third adds personal income taxes.

1 1. **Base Case: No Taxes, No Risk to High Debt Ratios**

2 **Q5. Please start by explaining the simplest case of the effect of debt on the value of a**
3 **firm.**

4 A5. The "base case," no taxes and no costs to excessive debt, was worked out in a classic
5 1958 paper by Franco Modigliani and Merton Miller, two economists who eventually
6 won Nobel Prizes in part for their body of work on the effects of debt.¹ Their 1958 paper
7 made what is in retrospect a very simple point: if there are no taxes and no risk to the use
8 of excessive debt, use of debt will have no effect on a company's operating cash flows
9 (i.e., the cash flows to investors as a group, debt plus equity combined). If the operating
10 cash flows are the same regardless of whether the company finances mostly with debt or
11 mostly with equity, then the value of the firm cannot be affected at all by the debt ratio.
12 In cost-of-capital terms, this means the overall cost of capital is constant regardless of the
13 debt ratio, too.

14 In the base case, issuing debt merely divides the cash flows into two pools, one for
15 bondholders and one for shareholders. If the divided pools have different priorities in
16 claims on the cash flows, the risks and costs of capital will differ for each pool. But the
17 risk and overall cost of capital of the entire firm, the sum of the two pools, is constant
18 regardless of the debt ratio. Thus,

$$r_1^* = r_{A1} \qquad (E-1a)$$

19 where r_1^* is the overall after-tax cost of capital at any particular capital structure and r_{A1} is
20 the all-equity cost of capital for the firm. (The "1" subscripts distinguish the case where
21 there are no taxes from subsequent equations that consider first corporate and then both
22 corporate and personal taxes.) With no taxes and no risk to debt, the overall cost of
23 capital does not change with capital structure.

24 This implies that the relationship of the overall cost of capital to the component costs of
25 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.

$$r_{E1} \times \left(\frac{E}{V} \right) + r_{D1} \times \left(\frac{D}{V} \right) = r_1^* \quad (\text{E-1b})$$

1 with the overall cost of capital (r^*) on the *right* side, as the *independent* variable, and the
2 costs of equity (r_E) and debt (r_D) on the left side, as *dependent* variables determined by
3 the overall cost of capital and by the capital structure (i.e., the shares of equity (E) and
4 debt (D) in overall firm value ($V = E + D$) that the firm happens to choose. Note that if
5 equation (E-1a) were correct, the equation that solved it for the cost of equity would be,

$$r_{E1} = r_1^* + (r_1^* - r_D) \times \left(\frac{D}{E} \right) \quad (\text{E-1c})$$

6 Note also that (D/E) gets exponentially higher in this equation as the debt-to-value ratio
7 increases² i.e., the cost of equity increases exponentially with leverage.

8 2. Corporate Tax Deduction for Interest Expense

9 Q6. What happens when you add corporate taxes to the discussion?

10 A6. If corporate taxes exist with risk-free debt (and if only taxes at the corporate level matter,
11 not taxes at the level of the investor's personal tax return), the initial conclusion changes.
12 Debt at the corporate level reduces the company's tax liability by an amount equal to the
13 marginal tax rate times the interest expense. All else equal, this will add value to the
14 company because more of the operating cash flows will end up in the hands of investors
15 as a group. That is, if only corporate taxes mattered, interest would add cash to the firm
16 equal to the corporate tax rate times the interest expense. This increase in cash would
17 increase the value of the firm, all else equal. In cost-of-capital terms, it would reduce the
18 overall cost of capital.

19 *How much* the value of the firm would rise and *how far* the overall cost of capital would
20 fall would depend in part on how often the company adjusts its capital structure, but this
21 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 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.

1 issue riskless perpetual debt, an assumption Profs. Modigliani and Miller explored in
2 1963, in the second seminal paper;³ this assumption could *not* be true for a real
3 company.) Prof. Robert A. Taggart provides a unified treatment of the main papers in
4 this literature and shows how various cases relate to one another.⁴ Perhaps the most
5 useful set of benchmark equations for the case where only corporate taxes matter are:

$$r_2^* = r_{A2} - r_D \times t_C \times \left(\frac{D}{V}\right) \quad (\text{E-2a})$$

$$r_2^* = r_{E2} \times \left(\frac{E}{V}\right) + r_D \times \left(\frac{D}{V}\right) \times (1 - t_C) \quad (\text{E-2b})$$

6 which imply for the cost of equity,

$$r_{E2} = r_{A2} + (r_{A2} - r_D) \times \left(\frac{D}{E}\right) \quad (\text{E-2c})$$

7 where the variables have the same meaning as before but the "2" subscripts indicate the
8 case that considers corporate but not personal taxes.

9 Note that Equation (E-2a) implies that when only corporate taxes matter, the overall
10 after-tax cost of capital declines steadily as more debt is added, until it reaches a
11 minimum at 100 percent debt (i.e., when $D/V = 1.0$). Note also that Equation (E-2c)
12 still implies an exponentially increasing cost of equity as more and more debt is added.
13 In fact, except for the subscript, Equation (E-2c) looks just like Equation (E-1c).
14 However, whether any value is added and whether the cost of capital changes at all also
15 depends on the effect of taxes at the personal level.

16 3. Personal Tax Burden on Interest Expense

17 **Q7. How do personal taxes affect the results?**

18 **A7. Ultimately, the purpose of investment is to provide income for consumption, so personal**
19 **taxes affect investment returns. For example, in the U.S., municipal bonds have lower**

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.

1 interest rates than corporate bonds because their income is taxed less heavily at the
2 personal level. In general, capital appreciation on common stocks is taxed less heavily
3 than interest on corporate bonds because (1) taxes on unrealized capital gains are deferred
4 until the gains are realized, and (2) the capital gains tax rate is lower. Dividends are
5 taxed less heavily than interest, also, under current tax law.⁵ The effects of personal taxes
6 on the cost of common equity are hard to measure, however, because common equity is
7 so risky.

8 Professor Miller, in his Presidential Address to the American Finance Association,⁶
9 explored the issue of how personal taxes affect the overall cost of capital. The paper
10 pointed out that personal tax effects could offset the effect of corporate taxes entirely.

11 **Q8. Is it likely that the effect of personal taxes will completely neutralize the effect of**
12 **corporate taxes?**

13 **A8.** I do not believe so, although the likelihood of such a result would be increased if the
14 current federal tax reductions on dividends and capital gains became permanent rather
15 than expiring in 2010. However, personal taxes are important even if they do not make
16 the corporate tax advantage on interest vanish entirely. Capital gains and dividend tax
17 advantages definitely convey some personal tax advantage to equity, and even a partial
18 personal advantage to equity reduces the corporate advantage to debt.

19 The Taggart paper explores the case of a partial offset, also. With personal taxes, the
20 risk-free rate on the security market line is the after-personal-tax rate, which must be
21 equal for risk-free debt and risk-free equity.⁷ Therefore, the pre-personal-tax risk-free

⁴ Robert A. Taggart, Jr. (1991), "Consistent Valuation and Cost of Capital Expressions with Corporate and Personal Taxes," *Financial Management* 20, pp. 8-20.

⁵ The current maximum personal tax rate on dividend income was extended to the end of 2010 by the President on May 17, 2006. It is uncertain whether the reduced rates on dividend income will be further extended.

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.

1 rate for equity will generally not be equal to the pre-personal-tax risk-free rate for debt.
2 In particular, $r_{JE} = r_{JD} \times [(1 - t_D)/(1 - t_E)]$, where r_{JE} and r_{JD} are the risk-free costs of
3 equity and debt and t_E and t_D are the personal tax rates for equity and debt, respectively.
4 In terms of the cost of debt, the Taggart paper's results imply that a formal statement of
5 these effects can be written as:⁸

$$r_3^* = r_{A3} - r_D \times t_N \times \left(\frac{D}{V}\right) \quad (\text{E-3a})$$

$$= r_{E3} \times \left(\frac{E}{V}\right) + r_D \times \left(\frac{D}{V}\right) \times (1 - t_C) \quad (\text{E-3b})$$

7 which imply

$$r_{E3} = r_{A3} + \left[r_{A3} - r_D \times \left(\frac{1 - t_D}{1 - t_E}\right) \right] \times \left(\frac{D}{E}\right) \quad (\text{E-3c})$$

8 Suppose, for example, that $t_C = 35$ percent, $t_E = 7.7$ percent and $t_D = 40$ percent. Then
9 $[(1 - t_D)/(1 - t_E)] = 0.65 = (1 - t_C)$. That condition corresponds to Miller's 1977 paper, in
10 which the net personal tax advantage of equity fully offsets the net corporate tax
11 advantage of debt. Note also that in that case, $t_N = 0$.⁹ Therefore, if the personal tax
12 advantage on equity fully offsets the corporate tax advantage on debt, Equation (E-3a)
13 confirms that the overall after-tax cost of capital is a constant.

14 However, it is unlikely that the personal tax advantage of equity fully offsets the
15 corporate tax advantage of debt. If taxes were all that mattered (i.e., if there were no
16 other costs to debt), the overall after-corporate-tax cost of capital would still fall as debt
17 was added, just not as fast.

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, $t_N = \{[0.35 + 0.077 - 0.4(0.35 \times 0.077)] / (1 - 0.077)\} = 0.0/0.923 = 0$.

1 Finally, note that the overall after-tax cost of capital, Equation (E-3b), still uses the
2 corporate tax rate even when personal taxes matter. Equations (E-2b) and (E-3b) both
3 correspond to the usual formula for the ATWACC. Personal taxes affect the way the cost
4 of equity changes with capital structure – Equation (E-3c) – but not the formula for the
5 overall after-tax cost of capital given that cost of equity.

6 **B. NON-TAX EFFECTS**

7 **Q9. Please describe the non-tax effects of debt.**

8 **A9.** If debt is truly valuable, firms should use as much as possible, and competition should
9 drive firms in a particular industry to the same, optimal capital structure for the industry.
10 If debt is harmful on balance, firms should avoid it. Neither picture corresponds to what
11 we actually see. A large economic literature has evolved to try to explain why.

12 Part of the answer clearly is the costs of excessive debt. Here the results cannot be
13 reduced to equations, but they are no less real for that fact. As companies add too much
14 debt, the costs come to outweigh the benefits. Too much debt reduces or eliminates
15 financial flexibility, which cuts the firm's ability to take advantage of unexpected
16 opportunities or weather unexpected difficulty. Use of debt rather than internal financing
17 may be taken as a negative signal by the market.

18 Even if the company is generally healthy, more debt increases the risk that the company
19 cannot use all of the interest tax shields in a bad year. As debt continues to grow, this
20 problem grows and others may crop up. Management begins to worry about meeting
21 debt payments instead of making good operating decisions. Suppliers are less willing to
22 extend trade credit, and a liquidity shortage can translate into lower operating profits.
23 Ultimately, the firm might have to go through the costs of bankruptcy and reorganization.
24 Collectively, such factors are known as the costs of "financial distress."¹⁰

25 The net tax advantage to debt, if positive, is affected by costs such as a growing risk that
26 the firm might have to bear the costs of financial distress. First, the expected present

¹⁰ See, for example, Section 18.3 of Brealey, Myers and Allen, 2006, *Principles of Corporate Finance*, 8th Edition, McGraw-Hill/Irwin, 2006.

1 value of these costs offsets the value added by the interest tax shield. Second, since the
2 likelihood of financial distress is greater in bad times when other investments also do
3 poorly, the possibility of financial distress will increase the risks investors bear. These
4 effects increase the variability of the value of the firm. Thus, firms that use too much
5 debt can end up with a higher overall cost of capital than those that use none.

6 Other parts of the answer include the signals companies send to investors by the decision
7 to issue new securities, and by the type of securities they issue. Other threads of the
8 literature explore cases where management acts against shareholder interests, or where
9 management attempts to "time" the market by issuing specific securities under different
10 conditions. For present purposes, the important point is that no theory, whether based on
11 taxes or on some completely different issue, has emerged as "the" explanation for capital
12 structure decisions by firms. Nonetheless, despite the lack of a single "best" theory, there
13 is a great deal of relevant empirical research.

14 **Q10. What does that research show?**

15 **A10.** The research does not support the view that debt makes a material difference in the value
16 of the firm, at least not once a modest amount of debt is in place. If debt were truly
17 valuable, competitive firms should use as much debt as possible short of producing
18 financial distress, and competitive firms that use less debt ought to be less profitable.
19 The research shows exactly the opposite.

20 For example, Kester¹¹ found that firms in the same industry in both the U.S. and Japan do
21 not band around a single, "optimal" capital structure, and the most profitable firms are the
22 ones that use the *least* debt. This finding comes despite the fact that both countries at the
23 time (unlike the U.S. currently) had fully "classical" tax systems, in which dividends are
24 taxed fully at both the corporate and personal level. Wald¹² confirms that high
25 profitability implies low debt ratios in France, Germany, Japan, the U.K., and the U.S.

¹¹ Carl Kester (1986), "Capital and Ownership Structure: A Comparison of United States and Japanese Manufacturing Concerns," *Financial Management*, 15:5-16.

¹² John K. Wald (1999), "How Firm Characteristics Affect Capital Structure: An International Comparison," *Journal of Financial Research*, 22:161-167.

1 Booth *et al.* find the same result for a sample of developing nations.¹³ Fama and French¹⁴
2 analyze over 2000 firms for 28 years (1965-1992, inclusive) and conclude, "Our tests
3 thus produce no indication that debt has net tax benefits."¹⁵ A paper by Graham¹⁶
4 carefully analyzes the factors that might have led a firm not to take advantage of debt. It
5 confirms that a large proportion of firms that ought to benefit substantially from use of
6 additional debt, including large, profitable, liquid firms, appear not to use it "enough."

7 This research leaves us with only three options: either (1) apparently good, profit-
8 generating managers are making major mistakes or deliberately acting against
9 shareholder interests, (2) the benefits of the tax deduction on debt are less than they
10 appear, or (3) the non-tax costs to use of debt offset the potential tax benefits. Only the
11 first of these possibilities is consistent with the view that the tax deductibility of debt
12 conveys a material cost advantage. Moreover, if the first explanation were interpreted to
13 mean that otherwise good managers are acting against shareholder interests, either
14 deliberately or by mistake, it would require the additional assumption that their
15 competitors (and potential acquirers) let them get away with it.

16 **Q11. Are there any explanations in the financial literature for this puzzle other than**
17 **stupid or self-serving managers at the most profitable firms?**

18 A11. Yes. For example, Stewart C. Myers, a leading expert on capital structure, made it the
19 topic of his Presidential Address to the American Finance Association.¹⁷ The poor
20 performance of tax-based explanations for capital structure led him to propose an entirely
21 different mechanism, the "pecking order" hypothesis. This hypothesis holds that the net
22 tax benefits of debt (i.e., corporate tax advantage over personal tax disadvantage) are at

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.

1 most of a second order of importance relative to other factors that drive actual debt
2 decisions.¹⁸ Similarly, Baker and Wurgler (2002)¹⁹ observe a strong and persistent
3 impact that fluctuations in market value have on capital structure. They argue that this
4 impact is not consistent with other theories. The authors suggest a new capital structure
5 theory based on market timing -- capital structure is the cumulative outcome of attempts
6 to time the equity market.²⁰ In this theory, there is no optimal capital structure, so market
7 timing financing decisions just accumulate over time into the capital structure outcome.
8 (Of course, this theory only makes sense if investors do not recognize what managers are
9 doing.)

10 **Q12. Do inter-firm differences within an industry explain the wide variations in capital**
11 **structure across the firms in an industry?**

12 A12. No. This view is contradicted by the empirical research. As mentioned before, it has
13 long been found that the most profitable firms in an industry, i.e., those in the best
14 position to take advantage of debt, use the least.²¹ Graham (2000) carefully examines
15 differences in firm characteristics as possible explanations for why firms use "too little"
16 debt and concludes that such differences are *not* the explanation: firms that ought to
17 benefit substantially from more debt by all measurable criteria, if the net tax advantage of
18 debt is truly valuable, voluntarily do not use it.²²

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.*

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

1 Nor does the research support the view that firms are constantly trying to adjust their
2 capital structures to optimal levels. Additional research on the pecking order hypothesis
3 demonstrates that firms do not tend towards a target capital structure, or at least do not do
4 so with any regularity, and that past studies that seemed to show the contrary actually
5 lacked the power to distinguish whether the hypothesis was true or not.²³ In the words of
6 the Shyam-Sunder - Myers paper p. 242, "If our sample companies did have well-defined
7 optimal debt ratios, it seems that their managers were not much interested in getting
8 there."

9 **II. EXPANDED EXAMPLE**

10 **Q13. What topics do you cover in this section?**

11 A13. The discussion in my testimony did not detail the impact of different starting points for
12 the level of debt nor did it address income earned on the investment, interest expense, or
13 taxes. This section covers these topics. First, it discusses how the level of debt affects
14 the cost of equity. Second, it addresses the influence of income and interest on the
15 investment. Third, it explains the impact of taxes on capital structure decisions. The
16 final topic covered in this section is the combined consequence of tax and non-tax effects
17 of debt.

18 **A. DETAILS OF DIFFERENT LEVELS OF DEBT**

19 **Q14. Please repeat briefly the setup in the example discussed in the direct testimony.**

20 A14. The example considered an investor who purchases \$100,000 in real estate. The future
21 value of the real estate is uncertain. Figures 2 and 3 in my direct testimony show how the
22 return on equity to the investor differs if he finances the purchase with 100 percent equity,

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.

1 and if he finances it with 50 percent equity and 50 percent mortgage debt. The lesson
2 from the example is that debt adds risk to equity.

3 **Q15. What happens if the investor finances the real estate purchase with different**
4 **proportions of debt?**

5 A15. The equity return becomes more variable when the mortgage percentage is a greater
6 proportion of the initial price. Table E-1 below calculates the return on equity when real
7 estate prices increase by 10 percent when mortgages are 0 percent, 30 percent, 50 percent,
8 and 70 percent of the initial price.

Table E-1: The Impact of Leverage on the Return on Equity

	100%	70% Equity	50% Equity	30% Equity
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%

9 Note that going from 70 percent equity down to 50 percent equity increases the return on
10 the equity investment by 5.7 percent while going from 50 percent equity to 30 percent
11 equity increases the return on equity by 13.3 percent. This illustrates a general point; the
12 rate of return on equity increases more quickly at higher levels of debt than at lower
13 levels. Investors demand a higher equity rate of return to bear more risk and debt
14 magnifies equity's risk at an ever increasing rate. Therefore, the required equity rate of
15 return goes up at an ever increasing rate as debt is added. This is not only basic finance
16 theory, it is the everyday experience of anyone who buys a home. The bigger the
17 mortgage, the more percentage risk the equity faces from changes in housing prices.

1 **B. THE IMPACT OF INCOME AND INTEREST**

2 **Q16. How does earning income from the investment and paying interest on debt affect the**
3 **results?**

4 A16. In the following explanation, I ignore income taxes which I deal with in Section C below.
5 Assume the investor is receiving income, e.g., rent, from the real estate. Specifically,
6 assume the investor receives \$500 per month in income after all non-interest expenses
7 (\$6,000 per year). Also, assume that the expected appreciation is 5 percent per year, so
8 the expected market value is \$105,000 after one year. Then the expected rate of return
9 from the real estate with all equity financing is:

$$\begin{aligned} \text{Expected Return on} \\ \text{Equity @ 0\% debt} &= \frac{\text{Expected Net Income} + \text{Expected Appreciation}}{\text{Initial Investment}} \\ &= \frac{\$6,000 + (\$105,000 - \$100,000)}{\$100,000} \\ &= 11\% \end{aligned}$$

10 Now suppose that the mortgage interest rate were 5 percent. Then at a mortgage equal to
11 50 percent, or \$50,000, interest expense would be (\$50,000 x 0.05), or \$2,500. The
12 expected equity rate of return would be:

$$\begin{aligned} \text{Expected Return on} \\ \text{Equity @ 50\% debt} &= \frac{\text{Expected (Net Income} + \text{Appreciation)} - \text{Int. Expense}}{\text{Initial Equity Investment}} \\ &= \frac{\$6,000 + \$5,000 - \$2,500}{\$50,000} \\ &= 17\% \end{aligned}$$

13 Notice that the expected return on equity is higher as is the risk carried by equity.

14 **Q17. Can you provide a more general illustration?**

15 Yes. Figure E-1 uses these assumptions at different mortgage levels to plot both (i) the
16 expected rate of return on the equity in the real estate, and (ii) the realized rate of return

1 on that equity in a year if the real estate value increases by 10 percent more than the
2 expected 5 percent rate (i.e., if the value increases by 15 percent) or by 10 percent less
3 than expected (i.e., if it decreases by 5 percent).²⁴

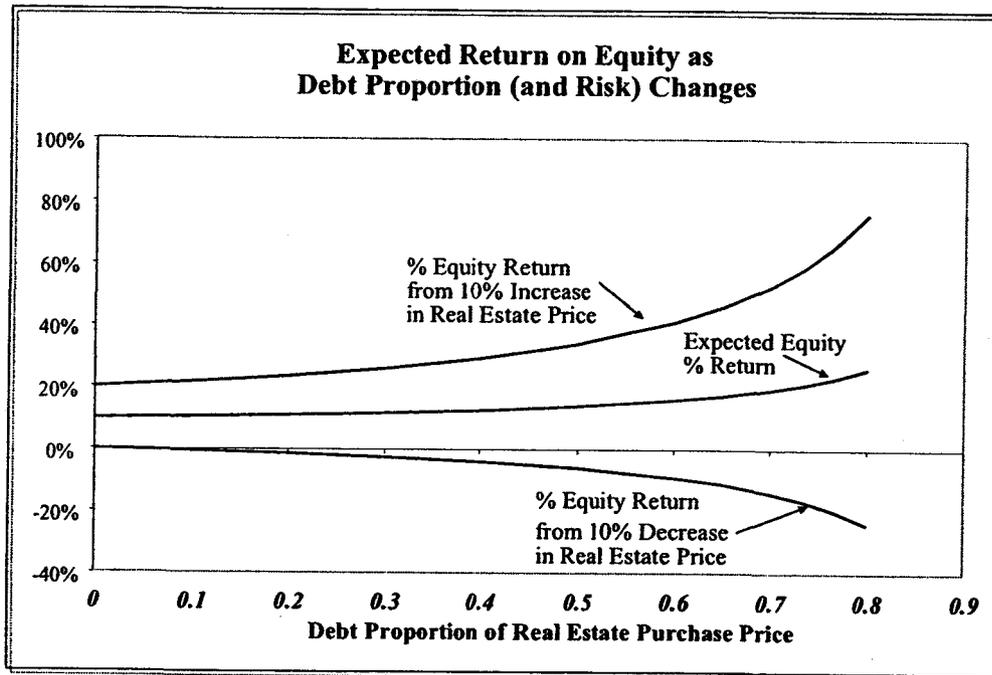


Figure E-1

4 The expected rate of return on equity increases at an increasing rate as the investor
5 finances more and more of the real estate through loans (e.g., with a mortgage). Since
6 equity bears all the risk of increases or decreases in real estate values (absent financial
7 distress or bankruptcy), the amount of risk the buyer bears grows at an ever increasing
8 rate as the mortgage percentage also increases.

9 **Q18. What are the implications of this example?**

10 **A17.** Any time an individual or a company uses debt to finance part an investment, the same
11 risk magnifies. For example, if an investor buys stocks "on margin" -- by borrowing part
12 of the money used to buy the stock -- the expected rate of return will be higher as will the

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.

1 risks the investor carries. As an everyday example, imagine investing your retirement
2 savings in a stock portfolio bought with as much margin as possible. If you were lucky,
3 you could end up living very well in retirement. But you would be taking a lot of risk on
4 the opposite outcome, since your portfolio could decline by more than 100 percent of
5 your initial investment.

6 The same risk-magnifying effects happen when companies borrow to finance part of their
7 investments.

8 **C. THE EFFECT OF TAXES**

9 **Q19. What is the impact of taxes?**

10 A18. Analyzing the net effect of taxes in capital structure decisions by corporations is an
11 important part of the financial research. (Other parts of that research address such issues
12 as the risk of financial distress or bankruptcy, and the signals corporations send investors
13 by the choice of how to finance new investments.) The bottom line is that taxes
14 complicate the picture without changing the basic conclusion.

15 **Q20. Please describe the potential impact of taxes.**

16 A19. Interest expense is tax-deductible for corporations. That increases the pool of cash the
17 corporation gets to keep out of its operating earnings (i.e., its earnings before interest
18 expense). With no debt, 100 percent of operating income is subject to taxes. With debt,
19 only the equity part of the operating income is subject to taxes.

20 All else equal, the extra money kept from operating income increases the value of the
21 corporation. The standard way to recognize that increase in value is to use an after-tax
22 weighted-average cost of capital as a discount rate when valuing a company's operating
23 cash flows.

24 **Q21. Do personal taxes affect the value of debt, too?**

25 A20. Yes, but in the other direction. One offset to debt's tax benefits at the corporate level is
26 its higher tax burden at the personal level. Investors care about the money they get to
27 keep after all taxes are paid, and while the corporation saves taxes by opting for debt over

1 equity, individuals pay more taxes on interest than on capital gains from equity (and for
2 now, on dividends as well).

3 **Q22. Are there factors other than taxes matter?**

4 A21. Absolutely, "all else" does not remain equal as more debt is added. The more debt, the
5 more the non-tax effects of debt offset the tax benefits. Other costs include such effects
6 as a loss of flexibility, the possibility of sending negative signals to investors, and a host
7 of costs and risks associated with the danger of financial distress.

8 **Q23. Does the tradeoff between the tax and non-tax effects of debt mean that firms have
9 well-defined, optimal capital structures?**

10 A22. No, this sort of "tradeoff" model does not explain actual corporate behavior. A
11 substantial body of economic research confirms that real-world corporations act as if,
12 after a moderate amount of debt is in place, the tax benefits of debt are not worth debt's
13 other costs. In country after country and in industry after industry, the most profitable
14 corporations in an industry tend to use the least debt. The research on this point is quite
15 thorough, and the finding that the most profitable companies tend to use the least debt in
16 a given industry is robust. Yet these are the companies with the most operating income
17 to shield from taxes, who would benefit most if interest tax shields were truly valuable
18 net of debt's other costs. They also presumptively are the best-managed on average (else
19 why are they the most profitable?). This means it is unrealistic to suppose that more debt
20 is always better, or that greater tax savings due to higher interest expense always add
21 value to the firm on balance.

22 **Q24. If the tradeoff model doesn't explain capital structure decisions by firms, is there a
23 model that does?**

24 A23. No single model has (yet) emerged as "the" explanation of capital structure. However,
25 several alternative models attempt to model the tradeoff (e.g., the "pecking order"
26 hypothesis and "agency cost" explanations).

1 **Q25. What does the absence of an agreed theory of capital structure in the financial**
2 **literature imply about the overall effect of debt on the value of the firm?**

3 **A24.** The findings of the financial literature mean that within an industry, there is no well-
4 defined optimal capital structure. The use of some debt does convey some value
5 advantage in most industries, but that advantage is offset by other costs as firms add more
6 debt.²⁵ The range of capital structures over which the value of the firm in any industry is
7 maximized is wide and should be treated as flat. The location and level of that range,
8 however, does vary from industry to industry, just as the overall cost of capital varies
9 from industry to industry.

10 Figure E-2 illustrates the picture that emerges from the research. This figure shows the
11 present value of an investment in each of four different industries. For simplicity, the
12 investment is expected to yield \$1.00 per year forever. For firms in relatively high-risk
13 industries (Industry 1 in the graph, the lowest line), the \$1.00 perpetuity is not worth
14 much and any use of debt decreases firm value. For firms in relatively low-risk industries
15 (Industry 4 in the graph), the perpetuity is worth more and substantial amounts of debt
16 make sense. Industries 2 and 3 are intermediate cases.

17 The maximum net rate at which taxes can increase value in this figure equals 20 percent
18 of interest expense, representing a balance between the corporate tax advantage to debt
19 and the personal tax disadvantage. The figure plots the maximum possible impact of
20 taxes on value as a separate line, starting at the all-equity value of the lowest-risk industry
21 (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.

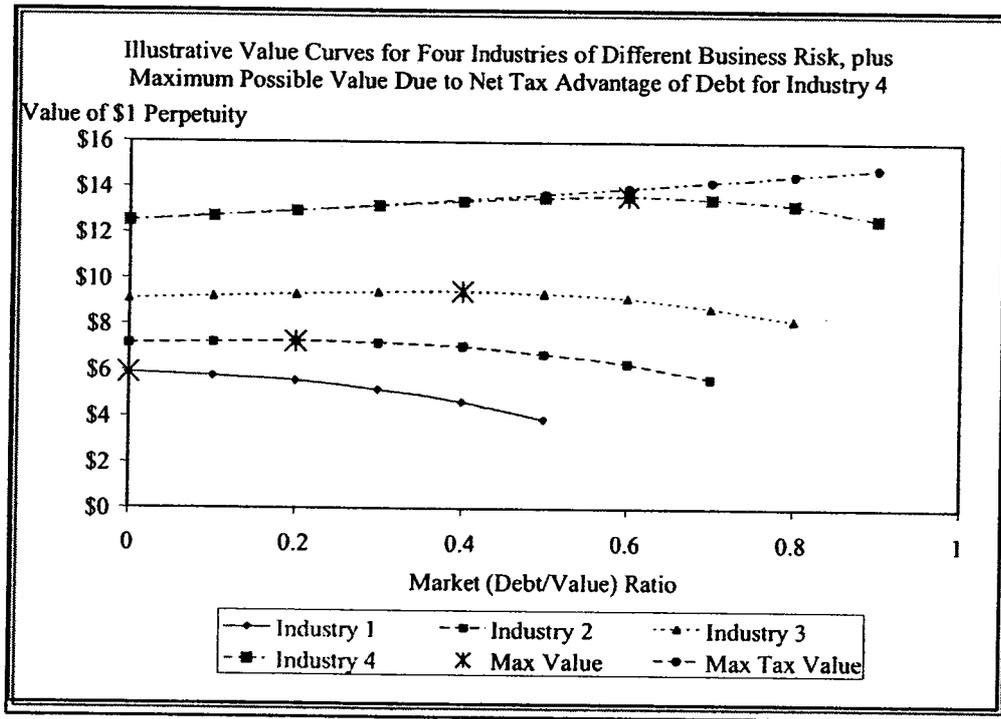


Figure E-2

1 Figure E-2 identifies a particular point as the maximum value on each of the four curves.
 2 However, the research shows that reliable identification of this maximum point, except in
 3 the extreme case where no debt should be used, is impossible. In accord with the
 4 research, the graph is prepared so that in none of the industries does a change in capital
 5 structure make much difference near the top of the curve. Even Industry 4, which
 6 increases in value at the maximum rate as quite a lot of debt is added, eventually must
 7 reach a broad range where changes in the debt ratio make little difference to firm value,
 8 given the research. For Industry 4, debt makes less than a 2 percent difference in the total
 9 value of the firm for debt-to-value ratios between 40 and 70 percent. (While these
 10 particular values are illustrative, numbers of this order of magnitude are the only ones
 11 consistent with the research.)

12 Q26. What does this imply for the overall cost of capital?

13 A25. Figure E-3 plots the after-tax weighted-average costs of capital ("ATWACCs") that
 14 correspond to the value curves in Figure E-2. This picture just turns Figure E-2 upside

1 down.²⁶ All the same conclusions remain, except that they are stated in terms of the
 2 overall cost of capital instead of the overall firm value. In particular, except for high-risk
 3 industries, the overall cost of capital is essentially flat across a broad middle range of
 4 capital structures for each industry, which is the only outcome consistent with the
 5 research. For Industry 4, for example, the ATWACC changes by less than 15 basis
 6 points for debt-to-value ratios between 40 and 70 percent.

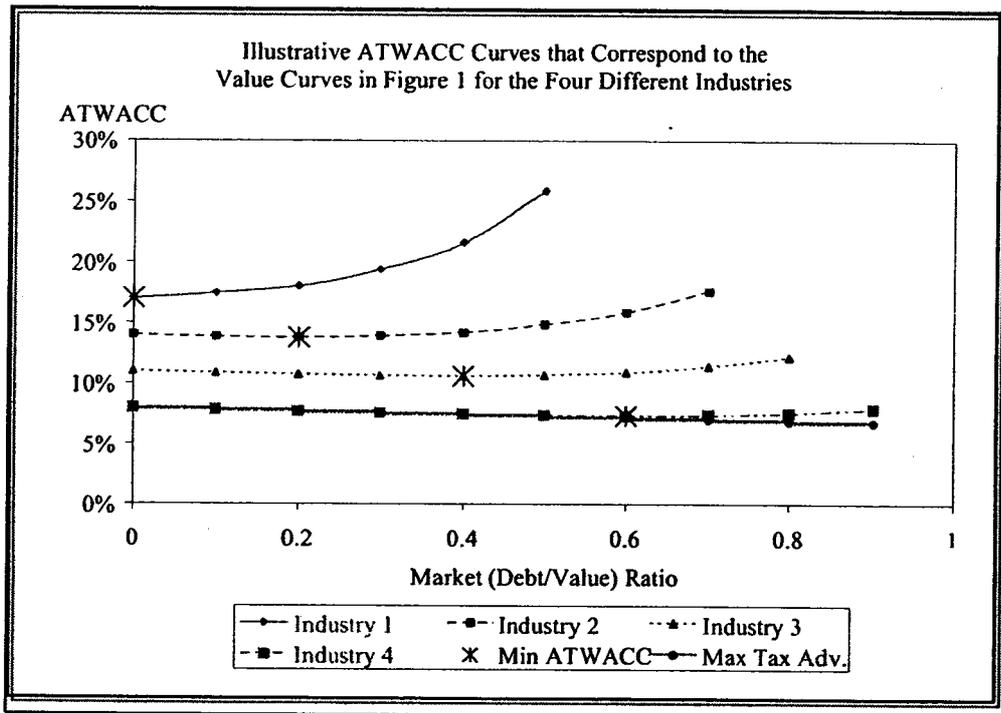


Figure E-3

7 **Q27. How does this discussion relate to estimation of the right cost of equity for**
 8 **ratemaking purposes?**

9 **A26.** When an analyst estimates the cost of equity for a sample of companies, s/he does so at
 10 the sample's actual market-value capital structure. That is, the sample evidence
 11 corresponds to ATWACCs that are already out somewhere in the broad middle range in

²⁶ Note that the actual estimated ATWACC at higher debt ratios will tend to underestimate the ATWACC that corresponds to the value curves in Figure E-2, which are depicted in Figure E-3, and so will tend to overestimate the value of debt to the firm. The reason is that some of the non-tax effects of excessive debt, such as a loss of financial flexibility, may be hard to detect and not show up in cost-of-capital measurement.

1 which changes in the debt ratio have little or no impact on the overall value of the firm or
2 the ATWACC.

3 An analyst therefore should assume the ATWACCs for the sample companies are
4 literally flat. This assumption always provides the exact tradeoff between the cost of
5 equity and capital structure at the literal minimum of the company's ATWACC curve.
6 The research shows that this minimum is actually a broad, flat region, as depicted above.
7 If the company happens to be somewhat to one side or the other of the literal minimum
8 within this region, the recommended procedure may lead to a small understatement or
9 overstatement of the amount that the cost of equity will change as capital structure
10 changes. The degree of this under- or overstatement, however, is very small compared to
11 the inherent uncertainty in estimating the cost of equity in the first place. Otherwise, the
12 financial research would have found very different results about the existence of a
13 narrowly defined optimal capital structure.

14 **D. COMBINED EFFECTS**

15 **Q28. Please summarize the implications for the combined impact of the tax and non-tax**
16 **effects of debt.**

17 **A27.** The most profitable firms do not behave as if the precise amount of debt they use makes
18 any material difference to value, and competition does not force them into an alternative
19 decision, as it would if debt were genuinely valuable. The explanation that fits the facts
20 and the research is that within an industry, there is no well-defined optimal capital
21 structure. Use of some debt does convey an advantage in most industries, but that
22 advantage is offset by other costs as firms add more debt. The range of capital structures
23 over which the value of the firm in any industry is maximized is wide and should be
24 treated as flat. The location and level of that range, however, does vary from industry to
25 industry, just as the overall cost of capital varies from industry to industry. To conclude
26 that more debt does add more value, once the firm is somewhere in the normal range for
27 the industry, is to conclude that corporate management in general is either blind to an

1 easy source of value or otherwise incompetent (and that their competitors let them get
2 away with it).

3 The finding that there is no narrowly defined optimal capital structure implies that
4 analysts should estimate the ATWACCs for a sample of companies in a given industry
5 and treat the average ATWACC value as independent of capital structure (at least within
6 a broad middle range of capital structures). The right cost of equity for a rate-regulated
7 company in the same industry is the number that yields the same ATWACC at the capital
8 structure used to set the revenue requirement, since that is the cost of equity that
9 (estimation problems aside) the sample companies would have had if their market-value
10 capital structures had been equal to the regulatory capital structure.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

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 AGUA FRIA WATER DISTRICT, HAVASU WATER DISTRICT, MOHAVE WATER DISTRICT, PARADISE VALLEY WATER DISTRICT, SUN CITY WEST WATER DISTRICT, AND TUBAC WATER DISTRICT.

DOCKET NO. W-01303A-08-0227

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 MOHAVE WASTEWATER DISTRICT

DOCKET NO. SW-01303A-08-0227

**REVISED DIRECT TESTIMONY
OF
PAUL R. HERBERT
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

**REVISED DIRECT TESTIMONY
OF
PAUL R. HERBERT
ON BEHALF OF
ARIZONA-AMERICAN WATER COMPANY
JUNE 20, 2008**

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	iii
I	INTRODUCTION AND QUALIFICATIONS	1
II	PURPOSE OF TESTIMONY	2
III	COST OF SERVICE	3
IV	RATE DESIGN	6

1 **EXECUTIVE SUMMARY**
2

3 Mr. Herbert testifies as follows:
4

5 Mr. Herbert explains the cost-of-service and rate-design studies prepared for each of the
6 operating districts submitted in this case. The purpose of the cost-allocation studies is to
7 determine and allocate the total district cost of service to the several service classifications
8 served by the Agua Fria, Havasu, Mohave, Paradise Valley, Sun City West and Tubac Water
9 Districts and by the Mohave Wastewater District. The studies provide a basis for determining
10 the extent to which the revenues to be derived from each classification are commensurate with
11 the cost of serving that classification, within each district.
12

13 Mr. Herbert sponsors Schedules G-1 through G-9, and the proposed-rates portion of the H
14 schedules.

1 **I INTRODUCTION AND QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME AND ADDRESS**

3 A. My name is Paul R. Herbert. My business address is 207 Senate Avenue, Camp Hill,
4 Pennsylvania.

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

6 A. I am employed by Gannett Fleming, Inc.

7 **Q. PLEASE DESCRIBE YOUR POSITION WITH GANNETT FLEMING, INC. AND**
8 **BRIEFLY STATE YOUR GENERAL DUTIES AND RESPONSIBILITIES.**

9 A. I am President of the Valuation and Rate Division. My duties and responsibilities include
10 the preparation of accounting and financial data for revenue requirement and cash
11 working capital claims, the allocation of cost of service to customer classifications, and
12 the design of customer rates in support of public utility rate filings.

13 **Q. HAVE YOU PRESENTED TESTIMONY IN RATE PROCEEDINGS BEFORE A**
14 **REGULATORY AGENCY?**

15 A. Yes. I have testified before the Pennsylvania Public Utility Commission, the New Jersey
16 Board of Public Utilities, the Public Utilities Commission of Ohio, the Public Service
17 Commission of West Virginia, the Kentucky Public Service Commission, the Iowa State
18 Utilities Board, the Virginia State Corporation Commission, the Tennessee Regulatory
19 Authority, a The California Public Utilities Commission, the New Mexico Public
20 Regulation Commission, the Illinois Commerce Commission and the Missouri Public
21 Service Commission concerning revenue requirements, cost of service allocation, rate
22 design and cash working capital claims. A list of the cases in which I have testified is
23 provided at the end of my direct testimony.

24 **Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?**

1 A. I have a Bachelor of Science Degree in Finance from the Pennsylvania State University,
2 University Park, Pennsylvania.

3 **Q. WOULD YOU PLEASE DESCRIBE YOUR PROFESSIONAL AFFILIATIONS?**

4 A. I am a member of the American Water Works Association and have served as a member
5 of the Management Committee for the Pennsylvania Section. I am also a member of the
6 Pennsylvania Municipal Authorities Association. In 1998, I became a member of the
7 National Association of Water Companies as well as a member of its Rates and Revenue
8 Committee.

9 **Q. BRIEFLY DESCRIBE YOUR WORK EXPERIENCE.**

10 A. I joined the Valuation Division of Gannett Fleming Corddry and Carpenter, Inc.,
11 predecessor to Gannett Fleming, Inc., in September 1977, as a Junior Rate Analyst.
12 Since then, I advanced through several positions and was assigned the position of
13 Manager of Rate Studies on July 1, 1990. On June 1, 1994, I was promoted to Vice
14 President and on November 1, 2003, I was promoted to Senior Vice President. On July 1,
15 2007, I was promoted to my current position as President.

16 While attending Penn State, I was employed during the summers of 1972, 1973 and 1974
17 by the United Telephone System - Eastern Group in its accounting department. Upon
18 graduation from college in 1975, I was employed by Herbert Associates, Inc., Consulting
19 Engineers (now Herbert Rowland and Grubic, Inc.), as a field office manager until
20 September 1977.

21 **II PURPOSE OF TESTIMONY**

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

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

1 **III COST OF SERVICE**

2 **Q. WHAT METHOD OF COST ALLOCATION WAS USED IN THE STUDIES?**

3 A. I used the Commodity Demand Method which is described in AWWA Manual M1,
4 "Principles of Water Rates, Fees and Charges" published in 2000 and prior additions of
5 the manual. It is the method prescribed by Schedule G of the Commission filing
6 requirements.

7 **Q. PLEASE BRIEFLY DESCRIBE THE COMMODITY DEMAND METHOD.**

8 A. The commodity demand method allocates each item of the cost of providing water
9 service to the several cost functions – commodity, demand, which is further separated
10 into maximum day and maximum hour costs, customer facilities, and customer
11 accounting functions. These functional costs are then allocated to the several customer
12 classifications served by the system.

13 Commodity costs are those that vary directly with the amount of water sold. Typical
14 commodity costs include the use of power and chemicals purchased to treat and pump
15 water to the distribution system.

16 Demand costs include operating and capital costs associated with facilities that provide
17 peak demands on the system. These facilities include wells, pumping plant, transmission
18 and distribution mains, and storage tanks. Demand costs are further separated into those
19 facilities serving a maximum day function and those serving a maximum hour function.

20 Customer facilities costs are those associated with serving each customer at the point of
21 the customer's connection to the system. These costs are further separated to include
22 costs associated with the customer's service line and the customer's meter.

1 Customer accounting costs are those associated with meter reading, billing, and customer
2 accounting and collections.

3 The functional costs are then allocated to customer classifications based on each
4 classification's use of the commodities and facilities.

5 **Q. PLEASE DESCRIBE THE CONTENTS OF YOUR EXHIBITS.**

6 A. A cost of service allocation and rate design study was conducted for each operating
7 district. Each study was prepared in response to Schedules G-1 through G-7 of the
8 Commission's filing requirements which I sponsor. Each study used the test year
9 revenue requirements developed by the Company in Schedules A through F and H.
10 Schedules G-8 and G-9 are also provided to present a comparison of the allocated cost of
11 service with revenues under present and proposed rates.

12 For each district, costs were allocated to each of the cost functions described earlier and
13 then to the residential, commercial, other water utilities and private fire protection
14 classifications.

15 **Q. PLEASE DESCRIBE EACH OF THE SCHEDULES IN YOUR EXHIBITS.**

16 A. I will use the Agua Fria Water District study and the test period revenue requirements to
17 describe each of the schedules.

18 Schedule G-5 allocates the total original cost rate base by account to the several cost
19 functions. The source of the utility plant in service by account and other rate base
20 elements was taken from Schedules B-1 and B-2 prepared by the Company. The amount
21 of rate base by account shown in column 3 was allocated to the several cost functions
22 using the allocation factors referenced in column 2. The allocation factors were
23 developed in Schedule G-7, which I will describe later.

1 The results of the allocated rate base to cost functions are allocated to customer
2 classifications on Schedule G-3. The rate base by function in column 3 is allocated to
3 classes using the allocation factors referenced in column 2. The allocation factors were
4 developed in Schedule G-7, which I will describe later.

5 Schedules G-4 and G-6, are similar to Schedules G-3 and G-5. Schedule G-6 allocates
6 operation and maintenance expenses, depreciation expense and taxes to cost functions in
7 the same manner as the rate base allocation. Schedule G-4 allocates the total expenses by
8 function to customer classifications. The detailed cost of service used in Schedules G-4
9 and G-6 was taken from Schedules C-1 and C-2 prepared by the Company.

10 Schedule G-7, describes the basis for allocating the cost of service by function to
11 customer classifications. Factor A, on page 2 of Schedule G-7, allocates commodity
12 costs based on the average daily usage of each classification. Factors B and C allocate
13 Maximum Day and Hour Demand costs to classes based on each classes' estimated peak
14 day and hour demands. Factors D and E allocate meter and services costs to classes
15 based on the relative capacity of meters and services. Factor F allocates customer
16 accounting to classes based on the number of customers.

17 The factors used to allocate the cost of service to cost functions in Schedules G-5 and G-6
18 are presented on the first page of Schedule G-7. Factors 1 through 5, allocate costs
19 directly to the appropriate cost function. Factors 6 through 13 are composite factors
20 which are developed internally based on the results of allocating other costs.

21 Schedule G-2 sets forth the rate of return and relative rate of return by classification
22 under proposed rate revenues. Lines 4 and 10 of Schedule G-2 are brought forward from
23 Schedules G-3 and G-4. Schedule G-1 is calculated in a similar manner using revenues
24 under present rates.

1 Schedule G-8, provides a comparison of the results of the cost of service allocation study
2 with revenues under present and proposed rates for each classification. The cost of
3 service by classification in column 2 was developed on Schedule G-9. The revenues
4 under present and proposed rates are shown in columns 4 and 6 which are brought
5 forward from Schedules G-1 and G-2. A comparison of the relative cost and revenue
6 responsibility can be performed by comparing the percent of total in columns 3, 5 and 7
7 of the schedule. The increase in revenue and the percentage increase are shown in
8 columns 8 and 9.

9 **IV RATE DESIGN**

10 **Q. PLEASE DESCRIBE THE DESIGN OF THE PROPOSED RATE STRUCTURE**
11 **FOR THE DISTRICTS.**

12 A. The rate structure was based on the results of the cost allocation, the existing rate
13 structure and guidelines set forth by Company management.

14 **Q. PLEASE DESCRIBE THE GUIDELINES FROM COMPANY MANAGEMENT.**

15 A. The Company instructed me to consider the following: 1) Maintain the same basic
16 conservation-oriented rate structure effective under existing rates which includes a
17 customer charge and inclining block rates for each classification and meter size; 2)
18 increase customer charges and block rates so that revenues under proposed rates are more
19 aligned with the cost of providing service; and 3) increase private fire service rates to
20 recover a greater share of the cost of service.

21 **Q. DOES THE PROPOSED RATE STRUCTURE COMPLY WITH THE**
22 **GUIDELINES PROVIDED TO YOU?**

1 A. Yes, they do. The same basic structure under present rate has been maintained and the
2 revenues under proposed rates generally move toward the indicated cost of service by
3 classification within each operating district.

4 **Q. PLEASE EXPLAIN THE BASIC WATER RATE STRUCTURE.**

5 A. The basic water rate structure includes a customer charge by meter size and a three-tier
6 inclining block structure for the 5/8-inch residential customers and a two-tier inclining
7 block structure for the remaining classes and meter sizes. The customer charges increase
8 by size and are generally designed to recover the cost of meter reading, billing and
9 collecting as well as the operating and capital costs of the meter and service line.

10 The three-tier block structure for 5/8-inch residential customers includes a first block of
11 4,000 gallons per month to cover a typical household's basic needs and is priced at rate
12 that is below the average consumption rate. The second block ranges from the next 9,000
13 to 16,000 gallons and is generally priced at or just above the average rate. The third tier
14 is for all usage above the second block and is priced at the highest rate to send the
15 appropriate price signal to encourage conservation.

16 The two-tier block structure for the remaining residential customers and the non-
17 residential customers includes a first block that increases by meter size and is priced at a
18 rate that is equal to the second block rate for the 5/8-inch residential rate schedule. The
19 second block is priced at a rate that is equal to the third block rate for the 5/8-inch
20 residential rate schedule.

21 The exception to this basic rate structure is the proposed structure for Paradise Valley.
22 The blocking structure for Paradise Valley includes 5 tiers which are designed to address
23 the wide range of consumption patterns in this District. Please refer to Mr. Broderick's
24 testimony for further explanation.

1 Certain other customers such as the irrigation customers, the State Prison, and Sales to
2 other Water Utilities have a single block consumption rate.

3 **Q. PLEASE DESCRIBE THE BASIC MOHAVE WASTEWATER TARIFF.**

4 A. The rates for Mohave Wastewater are primarily flat rate charges per month except for
5 two commercial customers that have metered usage. These rates also were increased to
6 recover the proposed cost of service.

7 **Q. HAVE YOU PREPARED A COMPARISON OF PRESENT AND PROPOSED**
8 **RATES AND PROOF OF REVENUE?**

9 A. The H Schedules compare present and proposed rates and prove revenues. Ms. Gutowski
10 is responsible for the present-rates portions of the H schedules and I am responsible for
11 the proposed-rates portions.

12 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

13 A. Yes.