NEW APPLICATION
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BEFORE THE ARIZONA CORPORATION CC

COMMISSIONERS

JEFF HATCH-MILLER, Chairman
WILLIAM A. MUNDELL
MARC SPITZER
MIKE GLEASON
KRISTIN K. MAYES

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR AUTHORITY TO IMPLEMENT ARSENIC COST RECOVERY MECHANISMS FOR ITS AGUA FRIA WATER, SUN CITY WEST WATER, HAVASU WATER, AND TUBAC WATER DISTRICTS	DOCKET NO. W-1303A-05-___ W-01303A-05-0280
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 SUN CITY WEST WATER AND WASTEWATER DISTRICTS.	DOCKET NO. WS-01303A-02-0867
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 WATER DISTRICT AND ITS HAVASU WATER DISTRICT.	DOCKET NO. W-1303A-02-0869

APPLICATION

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IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT, ITS AGUA FRIA WATER DISTRICT, AND ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT.	DOCKET NO. WS-01303A-02-0870
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 TUBAC WATER DISTRICT.	DOCKET NO. W-01303A-02-0908

APPLICATION OF
ARIZONA AMERICAN WATER COMPANY
TO IMPLEMENT ARSENIC COST RECOVERY MECHANISMS FOR ITS
AGUA FRIA WATER, SUN CITY WEST WATER,
HAVASU WATER, AND TUBAC WATER DISTRICTS

Background

1. Arizona-American Water Company ("Arizona American" or the "Company") is an Arizona corporation engaged in the business of providing water and wastewater utility service to customers in its various water and wastewater districts located in portions of Maricopa, Mohave, and Santa Cruz counties in Arizona under authority granted by the Commission. Arizona American is a wholly-owned subsidiary of American Water Works, Inc. Arizona-American's ultimate parent is RWE AG.

2. **Company's Contact Information.**

2.a. Management

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3. Arsenic is a naturally occurring element, widely prevalent in the western United States. It is found in several mineral compounds, as part of surface and underground rock formations. Ground water often contains trace amounts of dissolved arsenic from adjacent underground arsenic-containing rock formations.

4. The federal Environmental Protection Agency has promulgated new water quality regulations that reduce the allowable concentration of arsenic in drinking water from 50 to 10 ppb, effective January 23, 2006.

5. Estimates are that universal compliance with this new standard could require $5 billion in capital investment, and annual costs of $600 million. These costs will be disproportionately borne by Western states, such as Arizona, which rely more on groundwater than do Eastern states. Yet, only very limited federal funds are available to assist water providers comply with this new federal mandate.

6. The Arizona Department of Environmental Quality (ADEQ), regulates water quality for all water companies in Arizona and will enforce compliance with the new EPA standards.

7. The Arizona Corporation Commission requires companies to be in compliance with ADEQ and EPA standards.

8. ADEQ, with input from the Commission and water utilities, has developed the Arsenic Master Plan to help Arizona's public water systems comply with the new federal standard for arsenic in drinking water. The Master Plan provides water systems with cost-effective solutions tailored to their individual needs.

9. Arizona American has created an arsenic remediation plan that conforms to ADEQ's Arsenic Master Plan.

10. Arizona American's arsenic remediation plan will require significant investment in new arsenic remediation facilities. Arizona American estimates that it will spend over $42 million to construct new facilities to comply with the new EPA rules—$25 million for its Agua Fria Water, Havasu Water, Tubac Water, and Sun City West Water Districts, and $17 million for its Paradise Valley Water District. Annual operating costs will also significantly increase.

Procedural History

11. On December 17, 2001, Arizona - American filed an application with the Arizona Corporation Commission ("Commission") requesting a Commission declaration that the Commission's Public Utility Holding Companies and Affiliated Interests Rules, A.A.C. R14-2-801, et seq. ("Affiliated Interests Rules") were not applicable to the transaction described in the application, or alternatively, requesting a limited waiver of the requirements of the Affiliated

Interests Rules with respect to the described transaction. The Commission issued Decision No. 65453 in that docket on December 12, 2002.

12. On November 22, and December 13, 2002, Arizona-American filed with the Commission applications for rate increases in its above-captioned water and wastewater districts. The Commission issued Decision No. 67093 in those dockets on June 30, 2004.

13. On December 15, 2004, Arizona-American filed a request to: 1) reopen the record in Decision No. 67093 for the limited purpose of serving as the evidentiary basis for future Arsenic Cost Recovery Mechanism ("ACRM") filings for the concerned Arizona-American water and wastewater districts, and 2) waive Condition No. 15 in Decision No. 65453 for Arizona-American's Paradise Valley Water District.

14. On February 15, 2005, the Commission issued Decision No. 67593, granting Arizona-American's requests, expressly conditioned on dismissal of Arizona-American's pending appeals of Decision No. 67093 and Decision No. 65453 within 30 days of the Decision. Those appeals have now been dismissed.

15. By Procedural Order issued February 22, 2005, a Procedural Conference was scheduled for March 10, 2005, for the purpose of discussing the schedule applicable to this proceeding. The Procedural Conference was held as scheduled on March 10, 2005.

16. By Procedural Order issued March 29, 2005, Arizona American was ordered, to file, no later than April 15, 2005, a new application indicating the specific relief it requests concerning an ACRM. The filing is to be accompanied by direct testimony in support of the application and include a proposed form of public notice of the hearing on the requested relief. This application is submitted to comply with the requirements of the March 29, 2005, Procedural Order.

Request

17. Attached to this application is the testimony of Thomas M. Broderick, the Company's Manager, Government and Regulatory Affairs. Mr. Broderick provides the specifics of the Company's request. A summary follows:

17.a. In Commission Decision No. 66400 dated October 14, 2003, an ACRM was approved for Arizona Water's Northern Division. Arizona American is asking approval, by August 31, 2005, of an ACRM that is essentially identical to the mechanism approved in that Decision for four of its Water Districts: Aqua Fria; Sun City West; Havasu; and Tubac.

17.b. The Company's only additional request is for a new hook-up fee for its Tubac and Havasu water districts, to be effective upon an order in this proceeding. The purpose of this request is to offset capital costs associated with arsenic remediation, which will reduce the magnitude of the necessary surcharge.

17.c. Once approved, Arizona American will subsequently make a series of filings for each district for specific ACRM surcharge step increases based on actual capital costs and recoverable deferred and recurring operating and maintenance expenses. Eligible capital costs include depreciation expense and gross return.

17.d. New arsenic-removal facilities are required because of the new federal arsenic standard, which reduces the allowable drinking-water concentration from 50 to 10 parts per billion. Presently, Arizona American delivers water in each of these four districts at levels below the current standard but in excess of the new standard. The construction of the new arsenic-removal facilities in these four districts will require approximately $25 million in capital investment. Arizona American estimates that

average monthly ACRM surcharges for capital costs and recurring O&M will range from $5.61 to $71.47, depending on the water district.

17.e. In 2004, Arizona American earned less than its authorized return in all four of these districts and earnings will further erode in 2005 and beyond. The ACRM helps mitigate this financial harm.

17.f. A generic timeline for ACRM proceedings and implementation is included in Mr. Broderick's testimony. Arizona American intends to file permanent new rate cases for Agua Fria and Sun City West not later than April 30, 2008, and for Havasu and Tubac not later than April 30, 2009. The ACRM surcharge would cease upon the effective date of permanent new rates in each district.

17.g. The Company has held several community outreach meetings with its Tubac customers, has received extensive additional community input, and is responding to that input. The Company recently held community outreach meetings in Havasu.

17.h. Mr. Broderick's testimony is supported by pro forma schedules 1-10 in the form required in Decision No. 66400, and by schedule 11, which derives the requested hook-up fees for the Company's Havasu Water and Tubac Water Districts.

18. Also attached to this application is the testimony of Joseph E. Gross, P. E., the Company's Project Delivery and Development Services Manager.

18.a. Mr. Gross discusses the arsenic treatment facilities currently planned by Arizona American Water Company to comply with the new federal mandate. Arizona American plans to construct three facilities in its Agua Fria Water District, two in its Sun City West Water District, and one each in its Tubac and Havasu Water Districts.

18.b. Mr. Gross discusses the technologies chosen for each site, together with a functional description and cost estimate. He then describes how compliance will be verified.

18.c. Mr. Gross next discusses how the contracts were awarded for each project and how the contracts will be administered.

18.d. Finally, Mr. Gross forecasts operation and maintenance costs for each facility.

18.e. Mr. Gross' testimony is supported by Exhibits A-C.

Attachments

19. This application is supported by three attachments:

19.a. Form of Notice;

19.b. Testimony of Thomas M. Broderick, including Schedules 1-11; and

19.c. Testimony of Joseph E. Gross, P.E., including Exhibits A-C.

Requested Relief

20. As described more specifically above, Arizona American Water Company asks the Commission to authorize the Company to implement arsenic cost recovery mechanisms for its Agua Fria, Sun City West, Havasu, and Tubac Water Districts.

Respectfully submitted,

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Form of Notice

(To be included as a text message in the next bills provided to customers in Agua Fria, Sun City West, Havasu, and Tubac Water Districts)

Effective January 23, 2006, the federal government has imposed a strict new standard on the amount of arsenic allowed in your drinking water—no more than 10 parts per billion. To comply with this new standard, Arizona American Water must install expensive new water treatment facilities. On April 15, 2005, the Company filed a request at the Arizona Corporation Commission for a surcharge to recover the cost of these new facilities which, if approved by the Commission, will increase water bills approximately $__ per month per customer. The Company asks that an initial rate increase become effective in early 2006, once the new facilities are operational.

Details of the Company's request are contained it its application. If you would like to obtain a copy of the application, please contact your local office at: [Insert local contact information], or Tom Broderick, by phone at 623-445-2420, or e-mail at Thomas.Broderick@amwater.com.

Information about your rights to be heard in this matter may be obtained by contacting the Arizona Corporation Commission by phone at (800) 345-5819 or from the Commission's web site: www.cc.state.az.us.

TESTIMONY OF THOMAS M. BRODERICK

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

JEFF HATCH-MILLER, Chairman
WILLIAM A. MUNDELL
MARC SPITZER
MIKE GLEASON
KRISTIN K. MAYES

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR AUTHORITY TO IMPLEMENT ARSENIC COST RECOVERY MECHANISMS FOR ITS AGUA FRIA WATER, SUN CITY WEST WATER, HAVASU WATER, AND TUBAC WATER DISTRICTS	DOCKET NO. W-1303A-05-___
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 SUN CITY WEST WATER AND WASTEWATER DISTRICTS.	DOCKET NO. WS-01303A-02-0867
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 WATER DISTRICT AND ITS HAVASU WATER DISTRICT.	DOCKET NO. W-1303A-02-0869

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT, ITS AGUA FRIA WATER DISTRICT, AND ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT.	DOCKET NO. WS-01303A-02-0870
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 TUBAC WATER DISTRICT.	DOCKET NO. W-01303A-02-0908

DIRECT TESTIMONY
OF
THOMAS M. BRODERICK.
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
APRIL 15, 2005

DIRECT TESTIMONY
OF
THOMAS M. BRODERICK.
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
APRIL 15, 2005

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EXECUTIVE SUMMARY

Thomas M. Broderick testifies that:

Arizona American Water Company is requesting that the Commission approve by August 31, 2005, an Arsenic Cost Recovery Mechanism ("ACRM") for its Agua Fria, Havasu, Sun City West, and Tubac Water Districts. This request includes both the mechanism and the procedure for its use. Once approved, Arizona American will subsequently make a series of filings for each district for specific ACRM surcharge step increases based on actual capital costs and recoverable deferred and recurring operating and maintenance expenses. Eligible capital costs include depreciation expense and gross return.

New arsenic-removal facilities are required because of the new federal arsenic standard, which reduces the allowable drinking-water concentration from 50 to 10 parts per billion. Presently, Arizona American delivers water in each of these four districts at levels below the current standard but in excess of the new standard. The construction of the new arsenic-removal facilities in these districts will require approximately $25 million in capital investment. Arizona American estimates that average monthly ACRM surcharges for capital costs and recurring O&M will range from $5.61 to $71.47, depending on the water district.

In Commission Decision No. 66400 dated October 14, 2003, an ACRM was approved for Arizona Water's Northern Division. Arizona American's request for the ACRM is essentially identical to the mechanism approved in that Decision. The only exception is that Arizona American requests a new hook-up fee for its Tubac and Havasu water districts, to be effective upon an order in this portion of the proceeding.

In 2004, Arizona American earned less than its authorized return in all four of these districts and earnings will further erode in 2005 and beyond. The ACRM helps mitigate this financial harm.

A generic timeline for ACRM proceedings and implementation is included in the testimony. Arizona American intends to file permanent new rate cases for Agua Fria and Sun City West not later than April 30, 2008, and for Havasu and Tubac not later than April 30, 2009. The ACRM surcharge would cease upon the effective date of permanent new rates in each district.

The Company has held several community outreach meetings with its Tubac customers, has received extensive additional community input, and is responding to that input. The Company recently held community outreach meetings in Havasu.

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A. My name is Thomas M. Broderick. I hold the position of Manager, Government & Regulatory Affairs for American Water, Western Region. Arizona American Water Company ("Arizona American" or the "Company") is a wholly owned subsidiary of American Water. My business address is 19820 N. 7th St, Suite 201, Phoenix, Arizona 85024-1694.

Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES FOR THE COMPANY.

A. I am responsible for Arizona American's day-to-day relations with the Arizona Corporation Commission ("Commission") and for community relations in Arizona. I also support regulatory activities in Arizona and occasionally in other jurisdictions. These are all shared responsibilities with other Arizona American employees.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. Over the past 20 years I have held various management positions in the electric-utiltity industry with responsibilities for regulatory and government affairs, corporate economics, planning, load forecasting, finance and budgeting with Arizona Public Service Company, PG&E National Energy Group, PG&E Energy Services, and the United States Agency for International Development. I was employed at APS for nearly 14 years as Supervisor, Regulatory Affairs, then Supervisor, Forecasting, and then Manager, Planning. I was APS' Chief Economist in the early 1990's. For PG&E National Energy Group, I was Director, Western Region, External Relations. I was hired by Arizona American in 2004.

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

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. Yes, on several occasions on behalf of APS, PG&E, and once on behalf of the Arizona School Boards Association.

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

A. The scope of my testimony is as set forth in my Executive Summary, above.

II. REQUEST FOR ARSENIC COST RECOVERY MECHANISM ("ACRM")

Q. WHAT IS THE COMPANY'S REQUEST IN THIS PART OF THE PROCEEDING?

A. Arizona American Water requests Commission approval by August 31, 2005, of an Arsenic Cost Recovery Mechanism ("ACRM") for its Agua Fria, Havasu, Sun City West and Tubac Water Districts. This request includes both the mechanism and the procedure for its use. Once approved, Arizona American will subsequently make a series of filings for each district for specific ACRM surcharge step-increases based on actual capital costs and recoverable deferred and recurring operating and maintenance expenses. Eligible capital costs include depreciation expense and gross return.

Q. WHY IS THE COMPANY MAKING THIS REQUEST?

A. The United States Environmental Protection Agency requires that by January 23, 2006, all potable water deliveries, including Arizona American's contain not more than 10 parts per billion ("ppb") of arsenic. The present standard is substantially higher—50 ppb.

Presently, Arizona American delivers water in each of these four districts at levels below the present standard but in excess of the new standard. Compliance with the new arsenic standard will require very costly new capital additions with significant on-going operating and maintenance expenses. The construction of the new facilities in these four districts will require approximately $25 million in capital investment which will erode the financial integrity of Arizona American in these districts. Absent the approval of the ACRM, our financial integrity will rapidly erode until new permanent rates can be established in two to three years.

Q. HAVE YOU PROVIDED FINANCIAL DATA WHICH SHOW PRESENT EARNINGS?

A. Yes. I have attached ten schedules, including Schedule 6 which indicates that Arizona American did not earn its authorized return in any of these four districts in 2004. In other words, even before Arizona American begins construction of these new facilities, it is already under-earning in these districts. Earnings are anticipated to erode even further in 2005 while we are constructing the new facilities.

Q. WHAT FACILITIES WILL ACTUALLY NEED TO BE CONSTRUCTED?

A. Joseph Gross is testifying concerning technical details of the facilities Arizona American needs to construct to comply with the new federal standard. In addition to the four districts discussed in my testimony, Arizona American will also be building facilities to remove arsenic in its Paradise Valley Water District, but that will be the subject of a separate Commission proceeding.

Q. IS ARIZONA AMERICAN COUNTING ON THE ACRM TO SIGNIFICANTLY REDUCE REGULATORY LAG?

A. Yes. The Company is requesting approval of the ACRM based on the assumption that, by design, ACRM step increases can be effective on customer bills within 45 to 90 days following each filing for a step increase. Otherwise, the value of the ACRM to Arizona American and its customers is significantly reduced, because, although the ACRM does recover the majority of the increased costs of the new facilities, it will not recover many increased operating costs, which will go unrecovered until another rate case. If ACRM recovery were also delayed, then the only alternative would be to file rate cases as soon as possible.

III. FEATURES OF THE REQUESTED ACRM

Q. HOW DOES ARIZONA AMERICAN'S REQUESTED ACRM COMPARE TO THE ACRM GRANTED FOR ARIZONA WATER COMPANY'S NORTHERN DIVISION?

A. In Commission Decision No. 66400 dated October 14, 2003, an ACRM was approved for Arizona Water's Northern Division. Arizona American's request for the ACRM is identical to what the Commission approved in that Decision, with two exceptions:

- Arizona American also requests a new hook-up fee contribution in Tubac and Havasu water districts as described in Section VII of my testimony.
- Arizona American anticipates presenting to the Commission, as part of the Tubac Waster District's Step 1 filing, a partial consolidation proposal.

In all other respects, Arizona American's request is identical to the Arizona Water precedent including:

1. The ACRM is based solely on actual costs and costs eligible for recovery are depreciation, gross return, and recoverable O&M.
2. Actual rate recovery via the ACRM commences after new arsenic facilities are in service and are in compliance with the new US EPA standard for arsenic.
3. Establishment of deadlines for filing the next rate cases for these districts, without limit on Arizona American's ability to file earlier as per existing Commission orders.
4. An ACRM rate design composed of a 50/50 split of the recovery between monthly minimum charges and volumetric charges.
5. A financial presentation composed of ten standard schedules for each of the districts with the ACRM.
6. Recoverable O&M costs include only media replacement or regeneration, media replacement or regeneration service, and waste disposal.
7. A deferral for future recovery of up to 12 months of recoverable O&M without return commencing with the in-service of facility(s) within each district.
8. Two step-rate increases in each district with an ACRM.
9. No true-up of the ACRM for over or under collection.
10. Gross return included in the ACRM based upon earlier rate of return and return on equity findings (for Arizona American this is Commission Decision No 67093 dated June 30, 2004, which authorized a 9% ROE).

Q. HOW IS ARIZONA AMERICAN FINANCING THE FACILITIES?

A. Arizona American's parent American Water is financing these facilities with debt and equity. Arizona American considered borrowing from the Arizona Water Infrastructure Finance Authority ("WIFA"), but concluded that WIFA's borrowing rate did not offer

savings over American Water. Arizona American is temporarily able to borrow from its parent company at a rate of 70 basis points over US Treasury rates— a rate much better than Arizona American, or any other Arizona water company, could borrow on its own. Further, it does not appear that Arizona American would meet the times interest coverage test in WIFA's requirements.

Q. WHY IS ARIZONA AMERICAN REQUESTING A NEW HOOK-UP FEE CONTRIBUTION IN TUBAC AND HAVASU?

A. In order to reduce the capital costs of arsenic removal facilities, the Company asks the Commission to approve a hook-up fee for new connections in Tubac and Havasu water districts. Revenues raised would be treated as contributions in aid of construction. A number of existing customers in these two districts have told Arizona American representatives that they would like new customers to pay such a hook-up fee. In Section VII of my testimony, I support a $2,912 hook-up fee for new Tubac Water connections and a $781 hook-up fee for new Havasu Water connections. The Company requests that these hook-up fees be approved effective with the order issued in this generic ACRM proceeding without further filings. The hook-up fees will remain in effect at least until the next rate cases in Tubac and Havasu at which time the Company may request they continue or cease. Revenues raised from the hook-up fees will be used to offset the actual capital costs of the arsenic removal facilities in each community and, thus, will reduce the ACRM surcharges.

Q. ARIZONA AMERICAN WATER HAS STATED THAT IT ANTICIPATES REQUESTING CONSOLIDATION OF ACRM SURCHARGES FOR SOME OF ITS DISTRICTS. IS THAT STILL THE COMPANY'S POSITION?

A. Yes, Arizona American anticipates requesting a partial and temporary consolidation of the Tubac and Agua Fria ACRM surcharges at the time of Tubac's Step 1 filing, so long as it makes sense to do so at that time based on then-known actual costs of the completed facility and its actual completion date. Each arsenic facility has its own unique circumstances and completion dates. For several reasons, the arsenic facilities in Tubac may be completed later than most of the facilities Arizona American is constructing. At the time of the Tubac Step 1 filing, the Company presently intends to file two surcharge proposals, one a Tubac stand-alone surcharge, the other a consolidated one. This will allow the parties to evaluate the options, based on the information available at that time, and make informed recommendations to the Commission for its consideration.

For clarity, the Company is only seeking approval in this current proceeding for **un**consolidated ACRMs in all four water districts including Tubac. Therefore, after the ACRM Step 1 filing for Tubac, the unconsolidated surcharge should become effective after 45 to 90 days, unless a consolidated surcharge has been approved. The unconsolidated surcharge would remain in effect until, if ever, a consolidated ACRM surcharge is approved.

IV. PROCEDURE FOR THE ACRM & SURCHARGE ESTIMATES

Q. WHAT FINANCIAL SCHEDULES IS THE COMPANY FILING IN CONNECTION WITH THE ACRM?

A. Illustrative Schedules 1 through 10 are attached to my testimony. These schedules provide the required information in the format approved for Arizona Water's Northern

Division in Decision No. 66400. The Company will re-submit Schedules 1-10 each time it makes an ACRM filing. This will amount to up to eight more submittals (four water districts with two step increases each).

The illustrative Schedules use actual data for 2004 and Arizona American witness Joseph Gross' most recent cost estimates for the Company's arsenic facilities. They include:

- Schedule 1: Arizona American's most recent balance sheet at the time of a filing for an ACRM step increase.

- Schedule 2: The most recent income statement for Arizona American and for those districts the Company is requesting an ACRM step increase.

- Schedule 3: An earnings test schedule for each district where the Company is requesting an ACRM step increase. The earnings test will reflect the Company's most recent financial data.

- Schedule 4: A rate review schedule for each district showing the incremental and pro forma effects of the rate increase associated with arsenic removal capital and recoverable O&M costs on the financial data provided in Schedules 2 and 3.

- Schedule 5: A revenue requirement schedule showing the calculation of the required rate increase related to arsenic removal capital and recoverable recurring O&M costs for each district. The schedule will also indicate the current, incremental increase, and proposed commodity rates and monthly minimums for a 5/8-inch equivalent meter.

- Schedule 6: A schedule showing the surcharge calculation for arsenic removal capital and recurring recoverable O&M costs for each district. Fifty percent of the total capital and recurring recoverable O&M costs will be in the form of a monthly minimum surcharge and fifty percent will be in the form of a commodity surcharge. The monthly minimum surcharge will be scaled to each customer class based on the current approved ratio between monthly meter size minimum. The schedule will also provide information related to number of customers by meter size and number of gallons sold. When the Company seeks recovery of deferred recoverable O&M costs, a similar schedule will be provided showing the calculation of the 12-month deferred recoverable O&M surcharge, calculated in the same manner as the recurring recoverable O&M surcharge.

- Schedule 7: A rate base schedule for each district showing the rate base determined in Decision No. 67093 as well as the most recent rate base calculated as of the date of the information provided in Schedules 1 and 2, both adjusted to

reflect the inclusion of completed and in-service facilities related to arsenic treatment.

- Schedule 8: A CWIP Ledger showing monthly charges related to the construction of arsenic removal facilities by project.

- Schedule 9: A schedule showing the calculation of the Company's four-factor allocation methodology, similar to the three-factor ratios provided by Arizona Water Company in Docket No. 01445A-00-0962, at the request of Commission Staff.

- Schedule 10: A bill analysis comparing typical bills for customers on a 5/8-inch meter under present and proposed rates.

Q. WHY HAS ARIZONA AMERICAN SUBMITTED THESE ILLUSTRATIVE SCHEDULES?

A. To avoid any misunderstandings and delays to the actual filings, the Company wants all parties to know the anticipated amount of the ACRM surcharges. Some of the anticipated ACRM surcharges are large, especially for the Tubac Water District. Estimated total ACRM monthly surcharge for the average residential 5/8-inch equivalent meter customer bill before taxes can be calculated as the difference between present and proposed rates on Schedule 10, line 20:

District	Present Rates	Proposed Rates	ACRM Increase
Havasu	$ 21.67	$ 39.73	$ 18.06
Sun City West	$ 22.71	$ 31.68	$ 8.97
Agua Fria	$ 20.78	$ 26.39	$ 5.61
Tubac	$ 53.39	$ 124.86	$ 71.47

Please note that these figures assume an average bill at the consumption level determined in the rate case. For each specific ACRM filing, the average bill calculations will be based on average consumption and customer levels at that time. Please also note that the figures above include both capital and recoverable O&M. Step 1 increases will only include capital costs, with recoverable O&M included in Step 2.

The estimated capital costs required in each of these districts to remove arsenic are displayed in Schedule 5, line 1:

Havasu	$	1.7 million
Sun City West	$	10.3 million
Agua Fria	$	10.0 million
Tubac	$	2.5 million
Total	$	24.5 million

The 2004 pro forma actual returns on equity for each of these districts for 2004 are displayed in schedule 3, line 17:

Havasu	(4.48) %
Sun City West	1.26 %
Agua Fria	6.77 %
Tubac	7.82 %

This compares to an authorized return on equity of 9%. Please note that the pro forma actual return on equity figures actually annualize the 2004 rate increase, which was not effective until July. Without annualizing, the reported returns would be even lower for the Havasu, Sun City West, and Tubac districts.

V. EXAMPLE OF ACRM TIMELINE

Q. WHAT IS ARIZONA AMERICAN'S ANTICIPATED TIMELINE FOR THE ENTIRE RATE PROCESS OF A SPECIFIC DISTRICT'S ACRM?

A. Each district will be somewhat unique, but we anticipate the following timeline after a Commission order is issued in this generic ACRM proceeding before August 31, 2005: (This example assumes a January 23, 2006, filing date for a water district with arsenic removal facilities already in service which are in compliance with the new arsenic standard.)

1) Arizona American compiles Schedules 1-10 using actual data and files them at the Commission on January 23, 2006, requesting a specific step 1 ACRM rate increase in that district. Step 1 does not include recoverable O&M. Rather, recoverable O&M for up to the first 12 months is deferred.

2) The parties review the filing and at an Open Meeting in late February 2006 the Commission approves a specific ACRM surcharge for that district which is effective on customer bills in March 2006.

3) Arizona American again compiles Schedules 1-10 using actual data and files them at the Commission on January 23, 2007, requesting a specific step 2 ACRM rate increase in that district. The step 2 increase includes recoverable O&M, both the deferred and recurring. Again, the amount of recurring O&M included in the mechanism is identical to the amount deferred, as set forth in the Arizona Water ACRM case. Like that case, recovery of the O&M deferral will occur via a separate line within the ACRM on customers' bills.

4) The parties review the filing and later at an Open Meeting in late February 2007 the Commission approves a step 2 specific ACRM surcharge for that district which is effective on customer bills in March 2007.

5) Next, after one year (March 2008), recovery of the deferred O&M will be complete, the separate line item for this recovery will disappear, and the total ACRM surcharge will

decrease by this amount. The Company will continue to recover the recurring O&M and capital costs.

6) The ACRM surcharge will then remain on customer bills until the effective date of new permanent rates in that district, at which time the ACRM will end. It is possible that the effective date of new rates may happen in some instances during the timeframe outlined above.

Again, note that the above time frame is only illustrative and each Step 1 ACRM filing in a district will occur following successful construction and operation of arsenic removal facilities in each district.

VI. NEXT RATE CASE FILINGS

Q. WHAT IS ARIZONA AMERICAN'S PROPOSED SCHEDULE FOR FILING THE NEXT PERMANENT RATE CASES FOR THESE FOUR DISTRICTS?

A. Arizona American proposes to file Agua Fria Water and Sun City West Water rate cases by April 30, 2008, and Havasu Water and Tubac Water rate cases by April 30, 2009. Since the ACRM is only a partial cost recovery mechanism and Arizona American is under earning in these districts, it is possible that Arizona American may file rate cases sooner rather than later.

VII. NEW HOOK-UP FEE CONTRIBUTION

Q. PLEASE DESCRIBE THE COMPANY'S PROPOSAL FOR NEW HOOK-UP FEE CONTRIBUTIONS IN TUBAC AND HAVASU.

A. Schedule 11 displays the Company's calculations and proposal for a new hook-up fee to be treated as a contribution in aid of construction. The fee would become effective immediately upon an order by the Commission in this current proceeding. The fee is based on the estimated cost of the arsenic facilities and the existing and maximum number of water connections. The Company recently received approval to expand its CC&N in Tubac. The proposed hook-up fee for a Tubac residential 5/8-inch meters is $2,912 and in Havasu it is $781.

VIII. TUBAC AND HAVASU COMMUNITY OUTREACH

Q. WHAT HAS ARIZONA AMERICAN WATER DONE TO REACH OUT TO THE TUBAC AND HAVASU COMMUNITIES ABOUT ARSENIC REMOVAL FACILITIES?

A. The Company has had direct contact with several hundred Tubac residents over the past six months. The Company has just over 500 water connections in Tubac. The community is represented by the Santa Cruz Valley Citizens Council and Company representatives have had at least five meetings with the Council and additional meetings with committees of the Council since November 2004. The community largely reacted negatively upon learning from the Company in November 2004 that the anticipated average rate impact from arsenic treatment was $70 or more per month. Furthermore, the community provided specific criticisms and suggestions for improvements of various

design and aesthetic features of the project. Many of these criticisms and suggestions resulted in changes to the project itself. While the Company and the community have worked closely to address and resolve many of the physical aspects of the project, there is still widespread concern over the potential rate impact. Such concern continues to result in Tubac residents suggesting alternative methods and technologies for removing arsenic.

On March 1, 2005, at the request of Tubac residents, the Company sent the Arizona Department of Environmental Quality a letter requesting a 12-month exemption in order to provide time to attempt to identify less costly arsenic treatment options. On April 4, 2005, the Department sent the Company a response indicating that the Company's request did not provide all of the necessary information for the Department to process an exemption application and that it would be necessary for the Company to submit the information listed in the reply letter including a compliance schedule that details steps and associated time frames that will ultimately result in compliance. The Company will shortly send a second application for exemption to the Department which contains all the information sought by the Department. The Company cannot predict the outcome of this effort but seeks a timely preliminary decision from the Department.

Arizona American has over 1,600 water connections in its Havasu Water District. The Company held community outreach meetings on March 21 and March 22, 2005. The Company advertised the meetings via press release and community bulletin boards known to our local employees. Approximately 25 people attended these two meetings. Concerns expressed at the meeting included the rate impact and other unrelated aspects of

our existing water supply and water quality which our local employees are already addressing. We have not received any concerns from the community concerning the physical aspects of the project in Havasu. Several members of the Havasu community expressed an interest in attending Commission-sponsored public comment meetings in Havasu.

A number of residents of both Tubac and Havasu suggested to Company representatives that they would like new customers to pay a new hook-up fee to help defray the cost of the arsenic facilities to existing customers.

There has been fairly extensive local media coverage of construction related activities in Sun City West and Agua Fria. To-date, our only inquiries have been from just a few people in the immediate vicinity of the construction projects.

IX. CONCLUSION

Q. PLEASE SUMMARIZE YOUR REQUEST.

A. I have provided an Executive Summary at the beginning of my testimony.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 1

BALANCE SHEET

Line No.	[A] Description	[B] Dec-04 Total Company	[C] Dec-04 Havasu Water[1]	[D] Dec-04 Sun City West Water[1]	[E] Dec-04 Aqua Fria Water[1]	[F] Dec-04 Tubac Water[1]
ASSETS						
1.	Utility Plant	463,942,604				
2.	Construction work in progress	22,709,998				
3.	Accumulated depreciation	93,569,772				
4.	Utility plant acquisition adjustment	31,318,414				
5.	Sub-total Utility Plant	424,401,244				
6.	Non-Utility property	111,151				
7.	Other investments	37,086,285				
	Current Assets					
8.	Cash and cash equivalents	6,124,265				
9.	Temporary investments	2,502,379				
10.	Customer accounts receivable	(52,276)				
11.	Allowance for uncollectible accounts	3,894,041				
12.	Unbilled revenues	2,598,985				
13.	FIT refund due from assoc. companies	5,609,079				
14.	Miscellaneous receivables	337,424				
15.	Materials and supplies	761,579				
16.	Other					
17.	Sub-total	21,775,476				
	Deferred debits					
18.	Debt and preferred stock	476,809				
19.	Expense of rate proceeding	351,603				
20.	Prelim survey & invest charges	611,878				
21.	Reg Asset - income tax recovery	1,017,069				
22.	Other	5,732,557				
23.	Sub-total	8,189,916				
24.	Total Assets	491,564,072				
CAPITAL AND LIABILITIES						
25.	Common Stock	522,880				
26.	Paid in capital	114,468,228				
27.	Retained Earnings	419,248				
28.	Total common equity	115,410,356	405,511	5,340,376	10,887,473	515,222
29.	Long term debt	198,772,252	610,808	8,044,026	16,399,426	776,061
30.	Total capitalization	314,182,608	1,016,319	13,384,402	27,286,899	1,291,283
	Current liabilities					
31.	Bank debt					
32.	Current portion of LTD	23,803				
33.	Accounts Payable	10,542,623				
34.	Taxes accrued	1,632,830				
35.	Interest accrued	1,276,936				
36.	Customer deposits	53,134				
37.	Other	8,431,114				
38.	Sub-total	21,960,440				
	Deferred credits					
39.	Customer adv. For construction	131,427,883				
40.	Deferred income taxes	4,600,193				
41.	Deferred invstment tax credits	71,266				
42.	reg. liab-inc.tax.refund thru rates	285,882				
43.	Other	2,562,194				
44.	Sub-total	138,947,418				
45.	Contributions in aid of construction	16,473,607				
46.	Total Capital and Liabilities	491,564,073				

[1]Allocated on basis of capital structure authorized in Decision No. 67093:
60.1 percent debt and 39.9 percent equity.
Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 2

INCOME STATEMENT

[A]		[B]	[C]	[D]	[E]	[F]
		Dec-04	Dec-04	Dec-04	Dec-04	Dec-04
Line No.	Description	Total Company	Havasu Water	Sun City West Water	Aqua Fria Water	Tubac Water
OPERATING REVENUES						
1.	Utility Revenues	49,796,524	582,028	4,156,498	9,413,099	384,982
2.	Other Revenues	6,389,206	15,461	52,640	1,082,624	2,741
3.	Total Revenues	56,185,730	597,489	4,209,138	10,495,723	387,723
OPERATING EXPENSES						
4.	Operations and Maintenance Expense	33,063,436	429,901	2,657,304	5,398,424	186,599
5.	Depreciation and Amortization	13,201,502	138,503	852,926	2,798,873	71,771
6.	General Taxes	2,290,074	29,183	200,966	307,256	26,253
7.	Income Taxes	(295,099)	(11,414)	42,379	463,125	25,341
8.	Total Operating Expenses	48,259,913	586,173	3,753,575	8,967,679	309,965
9.	Utility Operating Income	7,925,817	11,316	455,563	1,528,044	77,758
OTHER INCOME & DEDUCTIONS						
10.	Other Income	1,734,569	-	-	-	-
11.	Other Deductions	339,892			-	-
12.	Total Other Income & Deductions	1,394,677	-	-	-	-
13.	Income Before Interest Charges	9,320,494	11,316	455,563	1,528,044	77,758
INTEREST CHARGES						
14.	Interest Expense	8,555,689	29,473	388,148	791,320	37,447
15.	Net Inocme	764,805	(18,157)	67,415	736,724	40,311
16.	Corporate Division Allocator		1.50%	8.44%	19.49%	0.65%
17.	Cent. Div Corporate District Allocator		0.00%	9.64%	21.58%	0.76%
18.	W. Div Corporate District Allocator		13.94%	0.00%	0.00%	0.00%

[1]Synchronized interest applied to individual districts.
Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 3

EARNINGS TEST

[A]	[B]	[C]	[D]	[E]
	Havasu Water	Sun City West Water	Aqua Fria Water	Tubac Water
Revenue:				
1. Total Operating Revenue	597,489	4,209,138	10,495,723	387,723
Operating Expenses:				
2. Operations and Maintenance Expense	429,901	2,657,304	5,398,424	186,599
3. Depreciation and Amortization	138,503	852,926	2,798,873	71,771
4. General Taxes	29,183	200,966	307,256	26,253
5. Income Taxes	(11,414)	42,379	463,125	25,341
6. Total Operating Expenses	586,173	3,753,575	8,967,679	309,965
7. Operating Income/(Loss)	11,316	455,563	1,528,044	77,758
8. Rate Base O.C.L.D. (From Schedule 7 Line 13)	1,016,319	13,384,402	27,286,899	1,291,283
9. Authorized Rate of Return - O.C.L.D. (Dec. 67093)	6.50%	6.50%	6.50%	6.50%
10. Actual Rate of Return - O.C.L.D. (Line 7 divided by Line 8)	1.11%	3.40%	5.60%	6.02%
11. Operating Margin (Line 7 divided by Line 1)	1.89%	10.82%	14.56%	20.06%
12. Interest Expense	29,473	388,148	791,320	37,447
13. Interest Coverage (Line 7 plus Line 5 divided by Line 12)	0.00	1.28	2.52	2.75
14. Other Income and Deductions	-	-	-	-
15. Allocated Equity	405,511	5,340,376	10,887,473	515,222
16. Authorized Return on Equity (Dec. 67093)	9.00%	9.00%	9.00%	9.00%
17. Actual Return on Equity (Line 7 less Line 12 plus Line 14 divided by Line 15)	-4.48%	1.26%	6.77%	7.82%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE REVIEW FILING - HAVASU DISTRICT

[A]	[B]	[C]	[D]	[E]
	Per Decision No. 67093	12-Months Ended 12/31/04	Increase	Adjusted Return
Revenue:				
1. Total Operating Revenue	486,087	597,489	391,920	989,408
Operating Expenses:				
2. Operations and Maintenance Expense	351,995	429,901	156,724	586,625
3. Depreciation and Amortization	41,554	138,503	53,274	191,776
4. General Taxes	30,887	29,183		29,183
5. Income Taxes	8,209	(11,414)	70,220	58,805
6. Total Operating Expenses	432,645	586,173	280,217	866,389
7. Operating Income/(Loss)	53,442	11,316	111,703	123,019
8. Rate Base O.C.L.D. (From Schedule 7, Line 13)	822,117	1,016,319	1,718,501	2,734,820
9. Authorized Rate of Return - O.C.L.D. (Per decision No. 67093)	6.5%	6.5%	6.5%	6.5%
10. Actual Rate of Return - O.C.L.D. (Line 7 divided by Line 8)	6.5%	1.1%	6.5%	4.5%
11. Operating Margin (Line 7 divided by Line 1)	10.99%	1.89%	28.50%	12.43%
12. Interest Expense	23,841	29,473	49,837	79,310
13. Interest Coverage (Line 7 plus Line 5 divided by Line 12)	2.59	0.00	3.65	2.29
14. Other Income and Deductions	-	-	-	-
15. Allocated Equity	328,025	405,511	685,682	1,091,193
16. Authorized Return on Equity	9.0%	9.0%	9.0%	9.0%
17. Actual Return on Equity (Line 7 less Line 12 plus Line 14 divided by Line 15)	9.0%	-4.5%	9.0%	4.0%
18. Corporate Division Allocator	1.50%	1.50%	1.50%	1.50%
19. W. Div Corporate District Allocator	13.94%	13.94%	13.94%	13.94%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE REVIEW FILING - SUN CITY WEST WATER DISTRICT

[A]	[B]	[C]	[D]	[E]
	Per Decision No. 67093	12-Months Ended 12/31/04	Increase	Adjusted Return
Revenue:				
1. Total Operating Revenue	$3,928,204	4,209,138	1,624,685	5,833,823
Operating Expenses:				
2. Operations and Maintenance Expense	2,039,720	2,657,304	270,277	2,927,580
3. Depreciation and Amortization	756,584	852,926	267,058	1,119,985
4. General Taxes	142,220	200,966		200,966
5. Income Taxes	212,028	42,379	419,702	462,081
6. Total Operating Expenses	3,150,552	3,753,575	957,037	4,710,612
7. Operating Income/(Loss)	777,652	455,563	667,648	1,123,211
8. Rate Base O.C.L.D. (From Schedule 7, Line 13)	11,971,281	13,384,402	10,271,481	23,655,883
9. Authorized Rate of Return - O.C.L.D. (Per decision No. 67093)	6.5%	6.5%	6.5%	6.5%
10. Actual Rate of Return - O.C.L.D. (Line 7 divided by Line 8)	6.5%	3.4%	6.5%	4.7%
11. Operating Margin (Line 7 divided by Line 1)	19.80%	10.82%	41.09%	19.25%
12. Interest Expense	347,167	388,148	297,873	686,021
13. Interest Coverage (Line 7 plus Line 5 divided by Line 12)	2.85	1.28	3.65	2.31
14. Other Income and Deductions	-	-	-	-
15. Allocated Equity	4,776,541	5,340,376	4,098,321	9,438,697
16. Authorized Return on Equity	9.0%	9.0%	9.0%	9.0%
17. Actual Return on Equity (Line 7 less Line 12 plus Line 14 divided by Line 15)	9.0%	1.3%	9.0%	4.6%
18. Corporate Division Allocator	8.44%	8.44%	8.44%	8.44%
19. Cent. Div Corporate District Allocator	9.64%	9.64%	9.64%	9.64%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE REVIEW FILING - AGUA FRIA WATER DISTRICT

[A]	[B]	[C]	[D]	[E]
	Per Decision No. 67093	12-Months Ended 12/31/04	Increase	Adjusted Return
Revenue:				
1. Total Operating Revenue	$5,916,460	10,495,723	2,082,153	12,577,876
Operating Expenses:				
2. Operations and Maintenance Expense	2,950,869	5,398,424	781,879	6,180,303
3. Depreciation and Amortization	1,157,575	2,798,873	240,307	3,039,180
4. General Taxes	323,468	307,256		307,256
5. Income Taxes	401,131	463,125	409,132	872,257
6. Total Operating Expenses	4,833,043	8,967,679	1,431,319	10,398,997
7. Operating Income/(Loss)	1,083,417	1,528,044	650,834	2,178,878
8. Rate Base O.C.L.D. (From Schedule 7, Line 13)	16,665,182	27,286,899	10,012,806	37,299,705
9. Authorized Rate of Return - O.C.L.D. (Per decision No. 67093)	6.5%	6.5%	6.5%	6.5%
10. Actual Rate of Return - O.C.L.D. (Line 7 divided by Line 8)	6.5%	5.6%	6.5%	5.8%
11. Operating Margin (Line 7 divided by Line 1)	18.31%	14.56%	31.26%	17.32%
12. Interest Expense	483,290	791,320	290,371	1,081,691
13. Interest Coverage (Line 7 plus Line 5 divided by Line 12)	3.07	2.52	3.65	2.82
14. Other Income and Deductions	-	-	-	-
15. Allocated Equity	6,649,408	10,887,473	3,995,109	14,882,582
16. Authorized Return on Equity	9.0%	9.0%	9.0%	9.0%
17. Actual Return on Equity (Line 7 less Line 12 plus Line 14 divided by Line 15)	9.0%	6.8%	9.0%	7.4%
18. Corporate Division Allocator	19.49%	19.49%	19.49%	19.49%
19. Cent. Div Corporate District Allocator	21.58%	21.58%	21.58%	21.58%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE REVIEW FILING - TUBAC DISTRICT

[A]	[B]	[C]	[D]	[E]
	Per Decision No. 67093	12-Months Ended 12/31/04	Increase	Adjusted Return
Revenue:				
1. Total Operating Revenue	$335,920	387,723	480,136	867,859
Operating Expenses:				
2. Operations and Maintenance Expense	187,527	186,599	146,391	332,990
3. Depreciation and Amortization	37,365	71,771	69,810	141,582
4. General Taxes	21,469	26,253		26,253
5. Income Taxes	16,288	25,341	101,875	127,216
6. Total Operating Expenses	262,649	309,965	318,076	628,041
7. Operating Income/(Loss)	73,271	77,758	162,060	239,818
8. Rate Base O.C.L.D. (From Schedule 7, Line 13)	1,127,661	1,291,283	2,493,217	3,784,500
9. Authorized Rate of Return - O.C.L.D. (Per decision No. 67093)	6.5%	6.5%	6.5%	6.5%
10. Actual Rate of Return - O.C.L.D. (Line 7 divided by Line 8)	6.5%	6.0%	6.5%	6.3%
11. Operating Margin (Line 7 divided by Line 1)	21.81%	20.06%	33.75%	27.63%
12. Interest Expense	32,702	37,447	72,303	109,751
13. Interest Coverage (Line 7 plus Line 5 divided by Line 12)	2.74	2.75	3.65	3.34
14. Other Income and Deductions	-	-	-	-
15. Allocated Equity	449,937	515,222	994,794	1,510,016
16. Authorized Return on Equity	9.0%	9.0%	9.0%	9.0%
17. Actual Return on Equity (Line 7 less Line 12 plus Line 14 divided by Line 15)	9.0%	7.8%	9.0%	8.6%
18. Corporate Division Allocator	0.65%	0.65%	0.65%	0.65%
19. Cent. Div Corporate District Allocator	0.76%	0.76%	0.76%	0.76%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SURCHARGE CALCULATION FOR ARSENIC CAPITAL & RECURRING O&M COSTS
SUN CITY WEST WATER DISTRICT

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]

Growth	Customers	Gallons Sold (000) Total	Gallons Sold (000) Per Customer
1. 12/31/2003 (Year 1)	15,533	2,027,497	130.53
2. 12/31/2004 (Year 2)	15,581	2,114,591	135.72
3. Year 2 minus Year 1	48	87,094	5.19
4. Percentage Change	0.31%	4.30%	3.97%
5. Year 1 Plus Year 2		4,142,088	
6. Avg Gallons (Col. D. Line 5 /2)		2,071,044	

Meter Size	Average Customers at 12/31/2004	Estimated Customers at 12/31/2005	Estimated Average Customers	Monthly Minimum	Minimum Multiples	Equivalent Meters	Fixed Increment Monthly	Fixed Increment Annual Total
7. Resid. 5/8-inch	14,463	14,508	14,485	$ 5.87	1.0	14,485	3.29	$ 572,208
8. Resid. 3/4-inch	-	-	-	$ 5.87	1.0	-	3.29	$ -
9. Commerc. 5/8-inch	73	73	73	$ 5.87	1.0	73	3.29	$ 2,888
10. Commerc. 3/4-inch	1	1	1	$ 5.87	1.0	1	3.29	$ 40
11. 1-inch	181	182	181	$ 14.97	2.6	462	8.40	$ 18,262
12. 1.5-inch	529	531	530	$ 32.08	5.5	2,895	17.99	$ 114,379
13. 2-inch	251	252	251	$ 47.05	8.0	2,015	26.39	$ 79,596
14. 3-inch	15	15	15	$ 81.26	13.8	208	45.57	$ 8,215
15. 4-inch	2	2	2	$ 120.82	20.6	41	67.76	$ 1,629
16. 6-inch	1	1	1	$ 165.73	28.2	28	92.94	$ 1,117
17. 8-inch	-	-	-	$ 374.23	63.8	-	209.87	$ -
18. 4-inch Fire Protect.	12	12	12	$ 35.22	6.0	72	19.75	$ 2,849
19. 6-inch Fire Protect	22	22	22	$ 52.84	9.0	198	29.63	$ 7,835
20. 8-inch Fire Protect	7	7	7	$ 70.45	12.0	84	39.51	$ 3,324
21. 10-inch Fire Protect	-	-	-	$ 131.72	22.4	-	73.87	$ -
22. Total	15,557	15,605	15,581			20,564		$ 812,342

						Minimum Surcharge Calculation	Commodity Surcharge Calculation
23. Costs To Be Recovered (Return & Recurring O&M)			$ 1,624,685				
24. Minimum Revenue	$ 1,624,685	x	50%	=		$ 812,342	
25. Commodity Revenue	$ 1,624,685	x	50%	=			$ 812,342

Monthly Increment Per Equivalent Meter

26. Equivalent Meters	20,564	x	12 Months	=	246,772

27. Minimum Surcharge	(Column D, Line 24 / Column D, Line 26)	$ 3.29
28. Average Gallons	(Column D, Line 6)	2,071,044
29. Commodity Surcharge	(Column E, Line 25 / Column E, Line 28)	$ 0.3922

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 5

ARSENIC COMPLIANCE REVENUE REQUIREMENT

[A]	[B]	[C]	[D]	[E]
	Havasu Water	Sun City West Water	Aqua Fria Water	Tubac Water
Arsenic Compliance Revenue Requirement:				
PLANT IN SERVICE EXPENDITURES:				
Test Year Data:				
1. Arsenic MCL Rate Base	1,718,501	10,271,481	10,012,806	2,493,217
2. Depreciation Rate	3.1%	2.6%	2.4%	2.8%
3. Depreciation Expense	53,274	267,058	240,307	69,810
4. Depreciation Expense net of tax savings[1]	32,711	163,978	147,552	42,864
5. Recoverable O&M Costs	156,724	270,277	781,879	146,391
6. Recoverable O&M Costs net of tax savings[2]	96,230	165,954	480,085	89,886
7. Arseic MCL Operating Income	(128,941)	(329,931)	(627,637)	(132,751)
8. Current Rate of Return	-7.50%	-3.21%	-6.27%	-5.32%
9. Required Operating Income	111,703	667,646	650,832	162,059
10. Required Rate of Return (Dec. No. 67093)	6.50%	6.50%	6.50%	6.50%
11. Operating Income Deficiency	240,644	997,578	1,278,469	294,810
12. Gross Revenue Conversion Factor (Decision No. 67093)	1.62863	1.62863	1.62863	1.62863
13. Revenue Deficiency	391,920	1,624,685	2,082,153	480,136
Authorized Rates (Decision No. 67093)				
14. Minimum 5/8" Meter	$ 11.78	$ 5.87	$ 9.08	$ 19.68
15. Commodity Rate 0 to 4,000 gallons	1.0500	0.8500	1.3800	1.8900
16. Commodity Rate 4,000 to 13,000 gallons	1.5550		2.0600	
17. Commodity Rate 4,000 to 15,000 gallons		1.2850		
18. Commodity Rate 4,000 to 20,000 gallons				2.8500
19. Commodity Rate 13,000 gallons and over	1.8700		2.4800	
20. Commodity Rate 15,000 gallons and over		1.5510		
21. Commodity Rate 20,000 gallons and over				3.4100
Arsenic Cost Recovery Mechanism Surcharge				
22. ACRM Minimum Surcharge 5/8" Meter	$ 10.07	$ 3.29	$ 3.07	$ 37.30
23. ACRM Commodity Surcharge	1.0434	0.3922	0.3618	2.5922
Total (Proposed Rates)				
24. Minimum 5/8" Meter	$ 21.85	$ 9.16	$ 12.15	$ 56.98
25. Commodity Rate 0 to 4,000 gallons	2.0934	1.2422	1.7418	4.4822
26. Commodity Rate 4,000 to 13,000 gallons	2.5984		2.4218	
27. Commodity Rate 4,000 to 15,000 gallons		1.6772		
28. Commodity Rate 4,000 to 20,000 gallons				5.4422
29. Commodity Rate 13,000 gallons and over	2.9134		2.8418	
30. Commodity Rate 15,000 gallons and over		1.9432		
31. Commodity Rate 20,000 gallons and over				6.0022

[1]38.5986% tax rate
[2]Includes cost of media and media disposal
Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SURCHARGE CALCULATION FOR ARSENIC CAPITAL & RECURRING O&M COSTS
HAVASU DISTRICT

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]

Growth	Customers	Gallons Sold (000) Total	Gallons Sold (000) Per Customer
1. 12/31/2003 (Year 1)	1,087	167,537	154.13
2. 12/31/2004 (Year 2)	1,189	208,094	175.02
3. Year 2 minus Year 1	102	40,557	20.89
4. Percentage Change	9.38%	24.21%	13.55%
5. Year 1 Plus Year 2		375,631	
6. Avg Gallons (Col. D. Line 5 /2)		187,816	

Meter Size	Average Customers at 12/31/2004	Estimated Customers at 12/31/2005	Estimated Average Customers	Monthly Minimum	Minimum Multiples	Equivalent Meters	Fixed Increment Monthly	Fixed Increment Annual Total
7. Resid. 5/8-inch	1,082	1,184	1,133	$ 11.78	1.0	1,133	10.07	136,939
8. Commer. 5/8-inch	33	36	35	$ 11.78	1.0	35	10.07	4,177
9. 1-inch	5	5	5	$ 20.27	1.7	9	17.33	1,089
10. 1.5-inch	-	-	-	$ 28.76	2.4	-	24.60	-
11. 2-inch	3	3	3	$ 39.88	3.4	11	34.10	1,285
12. 3-inch	4	4	4	$ 54.26	4.6	19	46.40	2,332
13. 4-inch	2	2	2	$ 68.64	5.8	12	58.70	1,475
14. 6-inch	-	-	-	$ 236.59	20.1	-	202.33	-
15. 8-inch	-	-	-	$ 457.50	38.8	-	391.25	-
16. Multi-family 044 1"	1	1	1	$ 259.16	22.0	23	221.63	2,784
17. Multi-family 056 2"	1	1	1	$ 329.84	28.0	29	282.08	3,544
18. Multi-family 064 4"	1	1	1	$ 376.96	32.0	34	322.37	4,050
19. Multi-family 065 2"	1	1	1	$ 382.85	32.5	34	327.41	4,113
20. Multi-family 067 4"	1	1	1	$ 394.63	33.5	35	337.48	4,240
21. Multi-family 089 1"	1	1	1	$ 524.21	44.5	47	448.30	5,632
22. Multi-family 102 2"	1	1	1	$ 600.78	51.0	53	513.78	6,455
23. Multi-family 129 4"	1	1	1	$ 759.81	64.5	68	649.78	8,163
24. Multi-family 153 4"	1	1	1	$ 901.17	76.5	80	770.67	9,682
25. Total	1,138	1,245	1,191			1,621		195,960

							Minimum Surcharge Calculation	Commodity Surcharge Calculation
26. Costs To Be Recovered (Return & Recurring O&M)				$ 391,920				
27. Minimum Revenue	$	391,920	x	50%	=		$ 195,960	
28. Commodity Revenue	$	391,920	x	50%	=			$ 195,960

Monthly Increment Per Equivalent Meter

29. Equivalent Meters	1,621	x	12 Months	=	19,452	
30. Minimum Surcharge	(Column D, Line 27 / Column D, Line 29)				$ 10.07	
31. Average Gallons	(Column D, Line 6)					187,816
32. Commodity Surcharge	(Column E, Line 28 / Column E, Line 31)					$ 1.0434

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SURCHARGE CALCULATION FOR ARSENIC CAPITAL & RECURRING O&M COSTS
AGUA FRIA DISTRICT

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
				Gallons Sold (000)					
Growth		Customers		Total	Per Customer				
1.	12/31/2003 (Year 1)	15,214		2,389,670	157.07				
2.	12/31/2004 (Year 2)	21,373		3,365,872	157.48				
3.	Year 2 minus Year 1	6,159		976,202	0.41				
4.	Percentage Change	40.48%		40.85%	0.26%				
5.	Year 1 Plus Year 2			5,755,542					
6.	Avg Gallons (Col. D. Line 5 /2)			2,877,771					

Meter Size		Average Customers at 12/31/2004	Estimated Customers at 12/31/2005	Estimated Average Customers	Monthly Minimum	Minimum Multiples	Equivalent Meters	Fixed Increment Monthly	Fixed Increment Annual Total
7.	Resid. 5/8-inch	16,602	23,323	19,962	$ 9.08	1.0	19,962	3.07	$ 736,396
8.	Resid. 3/4-inch	-	-	-	$ 9.08	1.0	-	3.07	$ -
9.	Commerc. 5/8-inch	36	51	43	$ 9.08	1.0	43	3.07	$ 1,597
10.	Commerc. 3/4-inch	-	-	-	$ 9.08	1.0	-	3.07	$ -
11.	1-inch	1,112	1,562	1,337	$ 23.24	2.6	3,422	7.87	$ 126,243
12.	1.5-inch	125	175	150	$ 48.58	5.4	803	16.45	$ 29,617
13.	2-inch	260	365	313	$ 72.86	8.0	2,509	24.67	$ 92,540
14.	3-inch	72	101	87	$ 142.55	15.7	1,359	48.26	$ 50,138
15.	4-inch	1	1	1	$ 191.75	21.1	25	64.92	$ 937
16.	6-inch	2	3	2	$ 369.55	40.7	98	125.11	$ 3,611
17.	8-inch	-	-	-	$ 726.26	80.0	-	245.88	$ -
18.	Total	18,210	25,582	21,896			28,222		$ 1,041,077

							Minimum Surcharge Calculation	Commodity Surcharge Calculation
19.	Costs To Be Recovered (Return & Recurring O&M)			$ 2,082,153				
20.	Minimum Revenue	$ 2,082,153	x	50%	=		$ 1,041,077	
21.	Commodity Revenue	$ 2,082,153	x	50%	=			$ 1,041,077

Monthly Increment Per Equivalent Meter

22.	Equivalent Meters	28,222	x	12 Months	=	338,662
23.	Minimum Surcharge	(Column D, Line 20 / Column D, Line 22)				$ 3.07
24.	Average Gallons	(Column D, Line 6)				2,877,771
25	Commodity Surcharge	(Column E, Line 21 / Column E, Line 24)				$ 0.3618

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SURCHARGE CALCULATION FOR ARSENIC CAPITAL & RECURRING O&M COSTS
TUBAC DISTRICT

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]

Growth	Customers	Gallons Sold (000) Total	Gallons Sold (000) Per Customer
1. 12/31/2003 (Year 1)	486	90,713	186.65
2. 12/31/2004 (Year 2)	494	94,509	191.31
3. Year 2 minus Year 1	8	3,796	4.66
4. Percentage Change	1.65%	4.18%	2.50%
5. Year 1 Plus Year 2		185,222	
6. Avg Gallons (Col. D. Line 5 /2)		92,611	

Meter Size	Average Customers at 12/31/2004	Estimated Customers at 12/31/2005	Estimated Average Customers	Monthly Minimum	Minimum Multiples	Equivalent Meters	Fixed Increment Monthly	Fixed Increment Annual Total
7. Resid. 5/8-inch	401	408	404	$ 19.68	1.0	404	37.30	$ 180,986
8. Resid. 3/4-inch	-	-	-	$ 19.68	1.0	-	37.30	$ -
9. Commerc. 5/8-inch	53	54	53	$ 19.68	1.0	53	37.30	$ 23,921
10. Commerc. 3/4-inch	-	-	-	$ 19.68	1.0	-	37.30	$ -
11. 1-inch	28	28	28	$ 29.63	1.5	43	56.16	$ 19,027
12. 1.5-inch	3	3	3	$ 59.26	3.0	9	112.33	$ 4,077
13. 2-inch	3	3	3	$ 97.49	5.0	15	184.80	$ 6,707
14. 3-inch	2	2	2	$ 116.65	5.9	12	221.11	$ 5,350
15. 4-inch	-	-	-	$ 169.18	8.6	-	320.69	$ -
16. 6-inch	-	-	-	$ 231.30	11.8	-	438.44	$ -
17. 8-inch	-	-	-	$ 1,577.08	80.1	-	2,989.42	$ -
18. Total	490	498	494			536		$ 240,068

							Minimum Surcharge Calculation	Commodity Surcharge Calculation
19. Costs To Be Recovered (Return & Recurring O&M)			$ 480,136					
20. Minimum Revenue	$	480,136	x	50%	=		$ 240,068	
21. Commodity Revenue	$	480,136	x	50%	=			$ 240,068

Monthly Increment Per Equivalent Meter

22. Equivalent Meters		536	x	12 Months	=	6,435
23. Minimum Surcharge	(Column D, Line 20 / Column D, Line 22)					$ 37.30
24. Average Gallons	(Column D, Line 6)					92,611
25. Commodity Surcharge	(Column E, Line 21 / Column E, Line 24)					$ 2.5922

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE BASE - HAVASU DISTRICT

	[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Per Decision No. 67093	Increase	Decision Plus Increase [B] + [C]	Actual Balances 12/31/04	Increase	Actual Balances Plus Increase 12/31/04 [E] + [F]
1.	New Arsenic Treatment Plant	-	1,718,501	1,718,501		1,718,501	1,718,501
2.	Other Utility Plant in Service	2,070,165	-	- 2,070,165	4,773,856	-	4,773,856
3.	Plant in Service	2,070,165	1,718,501	3,788,666	4,773,856	1,718,501	6,492,357
Less:							
4.	Accumulated Depreciation	537,411	-	537,411	829,958	-	829,958
5.	Net Plant	1,532,754	1,718,501	3,251,255	3,943,898	1,718,501	5,662,399
Less:							
6.	Advances	-	-	-	2,369,777	-	2,369,777
7.	Regulatory Advances	418,704		418,704	289,872	-	289,872
8.	Contributions	-	-	-	1,009	-	1,009
9.	Regulatory Contributions	280,867		280,867	224,693	-	224,693
10.	Meter Advances	11,066		11,066	24,853	-	24,853
11.	Deferred Income Tax	-	-	-	17,375	-	17,375
Add:							
12.	Working Capital Allowance	-	-	-	-	-	-
13.	Total Rate Base	822,117	1,718,501	2,540,618	1,016,319	1,718,501	2,734,820

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE BASE - SUN CITY WEST WATER DISTRICT

	[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Per Decision No. 67093	Increase	Decision Plus Increase [B] + [C]	Actual Balances 12/31/04	Increase	Actual Balances Plus Increase 12/31/04 [E] + [F]
1.	New Arsenic Treatment Plant	-	10,271,481	10,271,481		10,271,481	10,271,481
2.	Other Utility Plant in Service	31,390,379	-	31,390,379	31,498,383	-	31,498,383
3.	Plant in Service	31,390,379	10,271,481	41,661,860	31,498,383	10,271,481	41,769,864
Less:							
4.	Accumulated Depreciation	6,295,135	-	6,295,135	8,092,892	-	8,092,892
5.	Net Plant	25,095,244	10,271,481	35,366,725	23,405,492	10,271,481	33,676,973
Less:							
6.	Advances	-	-	-	624,282	-	624,282
7.	Regulatory Advances	12,151,160		12,151,160	8,412,342	-	8,412,342
8.	Contributions	-	-	-	3,661	-	3,661
9.	Regulatory Contributions	971,578		971,578	777,262	-	777,262
10.	Meter Advances	1,225		1,225	15,916	-	15,916
11.	Deferred Income Tax	-	-	-	187,627	-	187,627
Add:							
12.	Working Capital Allowance	-	-	-	-	-	-
13.	Total Rate Base	11,971,281	10,271,481	22,242,762	13,384,402	10,271,481	23,655,883

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

RATE BASE - TUBAC DISTRICT

	[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Per Decision No. 67093	Increase	Decision Plus Increase [B] + [C]	Actual Balances 12/31/04	Increase	Actual Balances Plus Increase 12/31/04 [E] + [F]
1.	New Arsenic Treatment Plant	-	2,493,217	2,493,217		2,493,217	2,493,217
2.	Other Utility Plant in Service	2,010,064	-	2,010,064	2,701,194	-	2,701,194
3.	Plant in Service	2,010,064	2,493,217	4,503,281	2,701,194	2,493,217	5,194,411
Less:							
4.	Accumulated Depreciation	568,057	-	568,057	658,180	-	658,180
5.	Net Plant	1,442,007	2,493,217	3,935,224	2,043,014	2,493,217	4,536,232
Less:							
6.	Advances	-	-	-	501,607	-	501,607
7.	Regulatory Advances	170,081		170,081	117,749	-	117,749
8.	Contributions	-	-	-	125	-	125
9.	Regulatory Contributions	143,675		143,675	114,939	-	114,939
10.	Meter Advances	590		590	11,264	-	11,264
11.	Deferred Income Tax	-	-	-	6,048	-	6,048
Add:							
12.	Working Capital Allowance	-	-	-	-	-	-
13.	Total Rate Base	1,127,661	2,493,217	3,620,878	1,291,283	2,493,217	3,784,500

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 8

CWIP LEDGER

IP	Work Order	Description	April 04	May 04	June 04	July 04	August 04	September 04	October 04	November 04	December 04	January 05	February 05	March 05	Year to Date
23020203	50008453	CANCELLED	8,199.89	10,899.60	15,059.28	11,062.66	13,139.57	23,508.38	4,423.31	14,955.54	3,865.45	24,668.83	(281,414.71)	(5,167.19)	(156,799.39)
	50008455	PV Arsenic - Engr. Design	-	-	176,835.42	3,504.96	129,219.79	215,049.11	136,596.38	139,412.03	278,740.03	8,216.94	434,349.81	213,912.22	1,735,836.69
	50008456	CANCELLED	-	-	-	-	-	-	-	6,021.83	309.73	46.05	18,184.09	292.75	24,854.45
	50051112	Accrual Work Order Job IP	457,814.56	471,320.40	290,325.30	493,152.38	365,360.64	(2,077,973.28)	-	40,260.42	(40,260.42)	4,082,509.00	(4,082,509.00)	-	-
	50051251	Jackrabbit & Invergordon	-	-	-	-	-	-	-	-	-	219.45	-	-	219.45
	50070288	N.40 Booster Station	-	-	-	-	-	-	-	-	-	-	-	64.57	64.57
	50073241	304 - PV Arsenic Removal Fac	-	-	-	-	-	-	-	-	-	-	-	50,172.80	50,172.80
23020203	Arsenic Removal Facilities		466,014.45	482,220.00	482,220.00	507,720.00	507,720.00	(1,839,415.79)	141,019.69	200,649.82	242,654.79	4,115,660.27	(3,911,389.81)	259,275.15	1,654,348.57
23610301	50028302	AF Arsenic - Engr. Design	10,994.06	8,877.67	12,327.90	10,766.33	8,366.44	40,297.94	32,437.64	45,157.38	115,901.26	11,447.50	4,594.74	4,943.06	306,111.92
	50028304	ENG - SCW WP1 Arsenic Remova	-	-	251.44	122.67	170.86	-	-	-	-	-	-	-	544.97
	50051116	Accrual Work Order Job IP	258,555.94	314,222.33	310,520.66	307,111.00	360,462.70	(1,749,649.33)	14,432.09	110,649.27	(125,081.36)	3,670,125.00	(3,670,125.00)	-	(196,776.70)
	50066419	AF WP5 Arsenic - Engineering	-	-	-	-	-	-	61.33	126.02	51,731.32	7,101.53	(25,320.52)	1,001.45	34,701.13
	50067913	ENG - AF WP 2 Arsenic Remova	-	-	-	-	-	-	-	61.33	72,957.13	(43,725.38)	1,252.71	1,072.14	31,617.93
	50072320	304 - AF WP1 Arsenic Removal	-	-	-	-	-	-	-	-	-	-	-	37,071.43	37,071.43
	50072321	320 - AF WP1 Arsenic Removal	-	-	-	-	-	-	-	-	-	-	109,127.56	2,557.23	111,684.79
23610301	AF WP 1 Arsenic Treatment		269,550.00	323,100.00	323,100.00	318,000.00	369,000.00	(1,709,351.39)	46,931.06	155,994.00	115,508.35	3,644,946.65	(3,580,470.51)	46,645.31	322,955.47
23610502	50067913	ENG - AF WP 2 Arsenic Remova	-	-	-	-	-	-	-	-	-	48,526.00	878.32	1,745.45	51,149.77
	50072338	304 - AF WP 2 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	69,879.30	39,780.37	109,659.67
23610502	AF WP 2 Arsenic Treatment		-	-	-	-	-	-	-	-	-	48,526.00	70,757.62	41,525.82	160,809.44
23610503	50066419	AF WP5 Arsenic - Engineering	-	-	-	-	-	-	-	-	-	-	28,624.30	6,345.79	34,970.09
	50072462	304 - AF WP 5 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	-	43,071.43	43,071.43
	50072463	320 - AF WP 5 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	49,544.59	1,161.00	50,705.59
23610503	AF WP 5 Arsenic Treatment		-	-	-	-	-	-	-	-	-	-	78,168.89	50,578.22	128,747.11
23640301	50028304	ENG - SCW WP1 Arsenic Remova	12,668.28	14,461.80	89,714.98	14,668.17	63,535.42	116,923.62	123,954.34	81,818.69	119,626.28	14,438.05	10,113.33	81,231.63	743,154.59
	50051120	Accrual Work Order Job IP	266,965.12	265,171.61	189,918.42	264,965.24	216,097.98	(1,447,115.25)	-	-	-	2,531,190.00	(2,531,190.00)	-	(243,996.88)
	50064058	ENG - SCW WP2 Arsenic Remova	-	-	-	-	-	247.71	382.92	640.70	60,594.10	5,690.20	(32,081.42)	1,198.86	36,673.07
	50072958	304 - SCW WP1 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	-	143,018.42	143,018.42
23640301	SCW WP 1 Arsenic Treatment		279,633.40	279,633.41	279,633.40	279,633.41	279,633.40	(1,329,943.92)	124,337.26	82,459.39	180,220.38	2,551,318.25	(2,553,158.09)	225,448.91	678,849.20
23640501	50064058	ENG - SCW WP2 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	35,252.13	3,295.82	38,547.95
	50064059	320 - SCW WP2 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	58,008.27	1,359.32	59,367.59
	50072182	304 - SCW WP2 Arsenic Remova	-	-	-	-	-	-	-	-	-	-	-	42,642.86	42,642.86
23640501	SCW WP 2 Arsenic Treatment		-	-	-	-	-	-	-	-	-	-	93,260.40	47,298.00	140,558.40
23730301	50028305	Havasu Arsenic-Engr. Design	7,269.67	3,059.34	10,412.69	4,869.56	8,454.45	11,116.37	10,296.65	11,594.16	36,651.73	6,935.47	3,767.87	13,285.22	127,713.18
	50051122	Accrual Work Order Job IP	80,252.54	94,761.21	87,407.87	92,950.99	89,366.10	(444,738.71)	54,217.98	1,625.84	(55,843.82)	926,974.00	(926,974.00)	-	-
	50066421	Havasu Arsenic - Equipment	-	-	-	-	-	-	-	-	-	-	-	37,285.72	37,285.72
	50072458	320-Havasu WP 4 Arsenic Remo	-	-	-	-	-	-	-	-	-	-	34,621.49	811.29	35,432.78
23730301	Arsenic Removal Facilities		87,522.21	97,820.55	97,820.56	97,820.55	97,820.55	(433,622.34)	64,514.63	13,220.00	(19,192.09)	933,909.47	(888,584.64)	51,382.23	200,431.68
23890301	50028303	Tubac Arsenic - Engr. Design	5,134.80	(1,641.51)	5,792.78	4,125.14	10,858.97	4,866.30	7,975.41	4,422.18	66,947.88	4,451.15	4,388.73	4,416.66	121,738.49
	50054913	Accrual Work Order Job IP	40,358.20	(67,205.49)	18,955.60	(30,587.00)	-	-	-	13,891.86	(13,891.86)	-	-	-	(38,478.69)
	50059139	PIPE 8" DI 880' GREENFIELD 6	-	-	-	-	138.25	(136.52)	(3.46)	1.73	-	-	-	-	(0.00)
	50059639	Arsenic Removal/Storage/BstP	-	-	251.62	358.28	7,301.24	18,031.87	4,120.08	665.63	(32,275.37)	593.74	62.64	(5.61)	(895.88)
	50059653	Tubac Chlorination Equipment	-	-	-	-	20,551.60	407.32	154.32	160.26	32,116.71	-	-	-	53,390.23
	50072776	320 - Tubac WP 1 Arsenic Rem	-	-	-	-	-	-	-	-	-	-	18,863.00	442.50	19,325.50
23890301	Arsenic Removal Facilities/Storage/Booster Pumps		45,493.00	(68,847.00)	25,000.00	(26,103.58)	38,850.06	23,168.97	12,246.35	19,141.68	52,897.36	5,044.89	23,334.37	4,853.55	155,079.65
Grand Total			2,250,933.12	2,296,700.92	2,390,547.92	2,380,244.34	2,547,197.96	(10,601,497.91)	765,851.63	923,788.10	1,091,280.22	22,593,770.17	(21,359,497.91)	1,449,160.83	6,728,479.39

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

SCHEDULE 9

CALCULATION OF FOUR-FACTOR ALLOCATION

LINE NO.	[A] DISTRICT/CO.	[B] PLANT IN SERVICE	[C] GENERAL METERED CUSTOMERS	[D] SALARIES & WAGES	[E] DIRECT O&M EXPENSES (EXCLUDE PR)	[F] 4 Factor Allocation % (CORPORATE)	[G] 4 Factor Allocation % (CENT. DIV. CORP.)	[H] 4 Factor Allocation % (W. DIV. CORP.)
1.	SUN CITY SEWER	13,475,955	21,604	53,066	2,066,401			
2.	DISTRICT/CO.	3.6550%	16.5942%	1.4767%	13.6628%	8.85%	9.80%	0.00%
3.	SUN CITY WEST WASTE WATER	24,829,451	14,936	132,360	385,171			
4.	DISTRICT/CO.	6.7344%	11.4725%	3.6833%	2.5467%	6.11%	6.89%	0.00%
5.	MOHAVE WASTEWATER	2,378,275	775	63,800	125,779			
6.	DISTRICT/CO.	0.6451%	0.5953%	1.7754%	0.8316%	0.96%	0.00%	10.10%
7.	DISTCO/TREATCO SEWER	69,552,302	6,700	289,194	1,560,611			
8.	DISTRICT/CO.	18.8645%	5.1463%	8.0476%	10.3186%	10.59%	11.71%	0.00%
9.	SUN CITY WATER	26,955,518	22,461	731,749	1,792,604			
10.	DISTRICT/CO.	7.3111%	17.2525%	20.3628%	11.8525%	14.19%	16.35%	0.00%
11.	SUN CITY WEST WATER	23,216,558	15,356	341,300	935,720			
12.	DISTRICT/CO.	6.2970%	11.7951%	9.4975%	6.1869%	8.44%	9.64%	0.00%
13.	TUBAC VALLEY	2,036,924	495	47,020	54,419			
14.	DISTRICT/CO.	0.5525%	0.3802%	1.3084%	0.3598%	0.65%	0.76%	0.00%
15.	MOHAVE WATER	14,660,501	14,495	527,748	591,839			
16.	DISTRICT/CO.	3.9763%	11.1337%	14.6859%	3.9132%	8.43%	0.00%	75.96%
17.	HAVASU	3,922,379	1,422	114,452	100,850			
18.	DISTRICT/CO.	1.0639%	1.0922%	3.1849%	0.6668%	1.50%	0.00%	13.94%
19.	AGUA FRIA	100,454,167	21,375	461,641	3,235,160			
20.	DISTRICT/CO.	27.2459%	16.4183%	12.8463%	21.3906%	19.49%	21.58%	0.00%
21.	DISTCO/TREATCO WATER	67,690,853	5,876	348,602	2,742,431			
22.	DISTRICT/CO.	18.3596%	4.5134%	9.7007%	18.1327%	12.68%	13.97%	0.00%
23.	PARADISE VALLEY	19,522,020	4,695	482,633	1,533,249			
24.	DISTRICT/CO.	5.2949%	3.6063%	13.4305%	10.1377%	8.12%	9.30%	0.00%
25.	ARIZONA TOTAL	368,694,903	130,190	3,593,565	15,124,234	100.0%	100.0%	100.0%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

TYPICAL BILL ANALYSIS - HAVASU DISTRICT
PRESENT AND PROPOSED 5/8" RATES WITHOUT TAXES

	[A]	[B]	[C]	[D]
Line No.	Gallons Consumption	Present Rates	Proposed Rates	Percent Increase
1.	-	$ 11.78	$ 21.85	85.5%
2.	1,000	$ 12.83	$ 23.95	86.7%
3.	2,000	$ 13.88	$ 26.04	87.6%
4.	3,000	$ 14.93	$ 28.13	88.4%
5.	4,000	$ 15.98	$ 30.23	89.2%
6.	5,000	$ 17.54	$ 32.83	87.2%
7.	6,000	$ 19.09	$ 35.42	85.6%
8.	7,000	$ 20.65	$ 38.02	84.2%
9.	8,000	$ 22.20	$ 40.62	83.0%
10.	9,000	$ 23.76	$ 43.22	81.9%
11.	10,000	$ 25.31	$ 45.82	81.0%
12.	11,000	$ 26.87	$ 48.42	80.2%
13.	12,000	$ 28.42	$ 51.01	79.5%
14.	13,000	$ 29.98	$ 53.61	78.9%
15.	14,000	$ 31.85	$ 56.53	77.5%
16.	15,000	$ 33.72	$ 59.44	76.3%
17.	20,000	$ 43.07	$ 74.01	71.8%
18.	25,000	$ 52.42	$ 88.57	69.0%
19.	Average Residential Consumption	7,659	7,659	
20.	Average Residential Bill	$ 21.67	$ 39.73	83.4%
21.	Minimum Rate	$ 11.78	$ 21.85	85.5%
22.	Commodity Rate 0 to 4,000 gallons	$ 1.0500	$ 2.0934	99.4%
23.	Commodity Rate 4,000 to 13,000 gallons	$ 1.5550	$ 2.5984	67.1%
24.	Commodity Rate 13,000 gallons and over	$ 1.8700	$ 2.9134	55.8%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

TYPICAL BILL ANALYSIS - SUN CITY WEST WATER DISTRICT
PRESENT AND PROPOSED 5/8" RATES WITHOUT TAXES

Line No.	[A] Gallons Consumption	[B] Present Rates	[C] Proposed Rates	[D] Percent Increase
1.	-	$ 5.87	$ 9.16	56.1%
2.	1,000	$ 6.72	$ 10.40	54.8%
3.	2,000	$ 7.57	$ 11.65	53.8%
4.	3,000	$ 8.42	$ 12.89	53.1%
5.	4,000	$ 9.27	$ 14.13	52.4%
6.	5,000	$ 10.56	$ 15.81	49.8%
7.	6,000	$ 11.84	$ 17.49	47.7%
8.	7,000	$ 13.13	$ 19.16	46.0%
9.	8,000	$ 14.41	$ 20.84	44.6%
10.	9,000	$ 15.70	$ 22.52	43.5%
11.	10,000	$ 16.98	$ 24.19	42.5%
12.	11,000	$ 18.27	$ 25.87	41.6%
13.	12,000	$ 19.55	$ 27.55	40.9%
14.	13,000	$ 20.84	$ 29.23	40.3%
15.	14,000	$ 22.12	$ 30.90	39.7%
16.	15,000	$ 23.41	$ 32.58	39.2%
17.	20,000	$ 29.61	$ 40.35	36.3%
18.	25,000	$ 37.36	$ 50.07	34.0%
19.	Average Residential Consumption	14,463	14,463	
20.	Average Residential Bill	$ 22.71	$ 31.68	39.5%
21.	Minimum Rate	$ 5.87	$ 9.16	56.1%
22.	Commodity Rate 0 to 4,000 gallons	$ 0.8500	$ 1.2422	46.1%
23.	Commodity Rate 4,000 to 15,000 gallons	$ 1.2850	$ 1.6772	30.5%
24.	Commodity Rate 15,000 gallons and over	$ 1.5510	$ 1.9432	25.3%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

TYPICAL BILL ANALYSIS - AGUA FRIA WATER DISTRICT
PRESENT AND PROPOSED 5/8" RATES WITHOUT TAXES

	[A]	[B]	[C]	[D]
Line No.	Gallons Consumption	Present Rates	Proposed Rates	Percent Increase
1.	-	$ 9.08	$ 12.15	33.9%
2.	1,000	$ 10.46	$ 13.90	32.8%
3.	2,000	$ 11.84	$ 15.64	32.1%
4.	3,000	$ 13.22	$ 17.38	31.5%
5.	4,000	$ 14.60	$ 19.12	31.0%
6.	5,000	$ 16.66	$ 21.54	29.3%
7.	6,000	$ 18.72	$ 23.96	28.0%
8.	7,000	$ 20.78	$ 26.39	27.0%
9.	8,000	$ 22.84	$ 28.81	26.1%
10.	9,000	$ 24.90	$ 31.23	25.4%
11.	10,000	$ 26.96	$ 33.65	24.8%
12.	11,000	$ 29.02	$ 36.07	24.3%
13.	12,000	$ 31.08	$ 38.50	23.9%
14.	13,000	$ 33.14	$ 40.92	23.5%
15.	14,000	$ 35.62	$ 43.76	22.8%
16.	15,000	$ 38.10	$ 46.60	22.3%
17.	20,000	$ 50.50	$ 60.81	20.4%
18.	25,000	$ 62.90	$ 75.02	19.3%
19.	Average Residential Consumption	7,002	7,002	
20.	Average Residential Bill	$ 20.78	$ 26.39	27.0%
21.	Minimum Rate	$ 9.08	$ 12.15	33.9%
22.	Commodity Rate 0 to 4,000 gallons	$ 1.3800	$ 1.7418	26.2%
23.	Commodity Rate 4,000 to 13,000 gallons	$ 2.0600	$ 2.4218	17.6%
24.	Commodity Rate 13,000 gallons and over	$ 2.4800	$ 2.8418	14.6%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

TYPICAL BILL ANALYSIS - TUBAC WATER DISTRICT
PRESENT AND PROPOSED 5/8" RATES WITHOUT TAXES

	[A]	[B]	[C]	[D]
Line No.	Gallons Consumption	Present Rates	Proposed Rates	Percent Increase
1.	-	$ 19.68	$ 56.98	189.6%
2.	1,000	$ 21.57	$ 61.47	185.0%
3.	2,000	$ 23.46	$ 65.95	181.1%
4.	3,000	$ 25.35	$ 70.43	177.8%
5.	4,000	$ 27.24	$ 74.91	175.0%
6.	5,000	$ 30.09	$ 80.36	167.1%
7.	6,000	$ 32.94	$ 85.80	160.5%
8.	7,000	$ 35.79	$ 91.24	154.9%
9.	8,000	$ 38.64	$ 96.68	150.2%
10.	9,000	$ 41.49	$ 102.12	146.1%
11.	10,000	$ 44.34	$ 107.57	142.6%
12.	11,000	$ 47.19	$ 113.01	139.5%
13.	12,000	$ 50.04	$ 118.45	136.7%
14.	13,000	$ 52.89	$ 123.89	134.2%
15.	14,000	$ 55.74	$ 129.34	132.0%
16.	15,000	$ 58.59	$ 134.78	130.0%
17.	20,000	$ 72.84	$ 161.99	122.4%
18.	25,000	$ 89.89	$ 192.00	113.6%
19.	Average Residential Consumption	13,177	13,177	
20.	Average Residential Bill	$ 53.39	$ 124.86	133.8%
21.	Minimum Rate	$ 19.68	$ 56.98	189.6%
22.	Commodity Rate 0 to 4,000 gallons	$ 1.8900	$ 4.4822	137.2%
23.	Commodity Rate 4,000 to 20,000 gallons	$ 2.8500	$ 5.4422	91.0%
24.	Commodity Rate 20,000 gallons and over	$ 3.4100	$ 6.0022	76.0%

Numbers for illustrative purposes only.

Company Name: ARIZONA AMERICAN WATER COMPANY
Docket Number: WS-01303A-02-0867, et al
Period Ending: December 31, 2004

Calculation of Arsenic New Hook-up Fee

[A]		[B]		[C]
Tubac				
1. Total estimated cost of arsenic facilities	$	2,493,217		
2. Maximum number of connections		856		
3. Current number of connections		517		
4. Average cost per connection	$	2,912		
		Minimum Multiple		Impact Fee
5. Resid. 5/8-inch		1.0	$	2,912
6. Resid. 3/4-inch		1.0	$	2,912
7. Commerc. 5/8-inch		1.0	$	2,912
8. Commerc. 3/4-inch		1.0	$	2,912
9. 1-inch		1.5	$	4,385
10. 1.5-inch		3.0	$	8,769
11. 2-inch		5.0	$	14,426
12. 3-inch		5.9	$	17,262
13. 4-inch		8.6	$	25,035
14. 6-inch		11.8	$	34,227
15. 8-inch		80.1	$	233,374
Havasu				
16. Total cost of arsenic facilities	$	1,718,501		
17. Maximum number of connections		2,200		
18. Current number of connections		1,627		
19. Average cost per connection	$	781		
		Minimum Multiple		Impact Fee
20. Resid. 5/8-inch		1.0	$	781
21. Commer. 5/8-inch		1.0	$	781
22. 1-inch		1.7	$	1,344
23. 1.5-inch		2.4	$	1,907
24. 2-inch		3.4	$	2,644
25. 3-inch		4.6	$	3,598
26. 4-inch		5.8	$	4,552
27. 6-inch		20.1	$	15,688
28. 8-inch		38.8	$	30,337
29. Multi-family 044 1"		22.0	$	17,185
30. Multi-family 056 2"		28.0	$	21,872
31. Multi-family 064 4"		32.0	$	24,996
32. Multi-family 065 2"		32.5	$	25,387
33. Multi-family 067 4"		33.5	$	26,168
34. Multi-family 089 1"		44.5	$	34,761
35. Multi-family 102 2"		51.0	$	39,838
36. Multi-family 129 4"		64.5	$	50,383
37. Multi-family 153 4"		76.5	$	59,757

Arizona American Water
Arsenic Treatment Program
Capacity Analysis

District	Arsenic Treatment Capacity (gpm)	Number of Existing Connections	Capacity/ Connection (gpm)	Maximum No. of Connections (ERUs)	Capacity/ Connection, ERU (gpm)
Tubac	500	517	0.97	856	0.58
Havasu	1,100	1,627	0.68	3,300	0.33

Notes: 1. ERU = Equivalent Residential Unit
2. One ERU = 3.2 persons with a demand of 150 gpcd or 480 gpd/ERU
3. Maximum number of connections (ERUs) is based on treatment plant capacity (gpd) ÷ 480 gpd/ERU
4. This analysis assumes that the maximum number of connections can be supported by the source of supply. The treatment plant capacity may exceed the actual source of supply capacity, depending on well yields.

TESTIMONY OF JOSEPH E. GROSS, P.E.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

JEFF HATCH-MILLER, Chairman
WILLIAM A. MUNDELL
MARC SPITZER
MIKE GLEASON
KRISTIN K. MAYES

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR AUTHORITY TO IMPLEMENT ARSENIC COST RECOVERY MECHANISMS FOR ITS AGUA FRIA WATER, SUN CITY WEST WATER, HAVASU WATER, AND TUBAC WATER DISTRICTS	DOCKET NO. W-1303A-05-___
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 SUN CITY WEST WATER AND WASTEWATER DISTRICTS.	DOCKET NO. WS-01303A-02-0867
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 WATER DISTRICT AND ITS HAVASU WATER DISTRICT.	DOCKET NO. W-1303A-02-0869

IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES BASED THEREON FOR UTILITY SERVICE BY ITS ANTHEM WATER DISTRICT, ITS AGUA FRIA WATER DISTRICT, AND ITS ANTHEM/AGUA FRIA WASTEWATER DISTRICT.	DOCKET NO. WS-01303A-02-0870
IN THE MATTER OF THE APPLICATION OF ARIZONA-AMERICAN WATER COMPANY, INC., 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 TUBAC WATER DISTRICT.	DOCKET NO. W-01303A-02-0908

DIRECT TESTIMONY
OF
JOSEPH E. GROSS. P. E.
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
APRIL 15, 2005

DIRECT TESTIMONY
OF
JOSEPH E. GROSS. P. E.
ON BEHALF OF
ARIZONA AMERICAN WATER COMPANY
APRIL 15, 2005

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EXECUTIVE SUMMARY

Mr. Gross discusses the arsenic treatment facilities currently planned by Arizona American Water Company to comply with the new federal mandate to reduce the arsenic concentration in drinking water from the currently allowed 50 parts per billion ("ppb") to 10 ppb. Arizona American plans to construct three facilities in its Agua Fria Water District, two in its Sun City West Water District, and one each in its Tubac and Havasu Water Districts.

Mr. Gross discusses the technologies chosen for each site, together with a functional description and cost estimate. He then describes how compliance will be verified.

Mr. Gross next discusses how the contracts were awarded for each project and how the contracts will be administered. Finally, Mr. Gross forecasts operation and maintenance costs for each facility.

I. INTRODUCTION AND QUALIFICATIONS

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

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

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

A. I am employed by Arizona-American Water Company. ("Arizona American") as Project Delivery and Development Services Manager ("Engineering Manager") for Arizona.

Q. PLEASE BRIEFLY OUTLINE YOUR RESPONSIBILITIES AS THE ENGINEERING MANAGER.

A. I am responsible for project delivery of Arizona American's capital program and for development services, incorporating private development infrastructure into the company's production and distribution systems.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science degree from the United States Military Academy in civil engineering in 1962 and a Master of Science degree from the Ohio State University in Geodetic Science in 1968.

Q. DID YOU SERVE IN THE MILITARY FOLLOWING YOUR GRADUATION FROM THE UNITED STATES MILITARY ACADEMY?

A. Yes. I served as an officer in the United States Army for 28 years, including 12 months in Vietnam as a combat engineer battalion advisor to the Vietnamese; and 18 months as a battalion commander in the 101st Airborne Division. In 1979, I began a number of

assignments with the US Army Corps of Engineers, where I served until retirement in 1990.

Q. HAVE YOU HAD ANY OTHER FORMAL TRAINING?

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

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I joined Arizona American in October 2004. I was previously employed by the City of Scottsdale for 14 years in the positions of Capital Project Management Director, Water Campus Project Director, and Water Resources Director. Before that, I had extensive field-level and executive-level experience in the US Army Corps of Engineers, including large projects located in the United States, Iran and Saudi Arabia. Among other responsibilities, I supervised the Corps' extensive flood-control projects in the Phoenix metropolitan area from 1979 to 1982. This included the construction of the Indian Bend Wash flood control facilities in Scottsdale, construction of Cave Buttes and Adobe Dams in north Phoenix, and design of the Arizona Canal Diversion Channel.

Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?

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

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE UTILITY REGULATORY COMMISSIONS?

A. No.

II. PURPOSE OF TESTIMONY

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

A. The purpose of my testimony is to summarize the planning, programming, and budgeting processes required to comply with the unfunded Federal mandate to reduce arsenic levels in drinking water from the current standard of 50 parts per billion (ppb) to 10 ppb by January, 23, 2006. Five of Arizona-American's water districts will require arsenic treatment. I will also address the design requirements leading to the current construction of arsenic treatment facilities in four of Arizona American's water districts. The fifth district, Paradise Valley, will be addressed by me in separate testimony as part of the upcoming Paradise Valley general rate case.

III. ARSENIC REMEDIATION PROGRAM

Q. PLEASE BRIEFLY DESCRIBE ARIZONA AMERICAN'S ARSENIC-REMEDIATION PROGRAM?

A. Our arsenic-remediation program will consist of eight treatment facilities in five Arizona-American districts. Three facilities will be required in our Agua Fria Water District, two in our Sun City West Water District, one each in our Havasu Water and Tubac Water Districts, and one in our Paradise Valley Water District. I have attached as Exhibit A to my testimony a map, which shows the location of each facility.

IV. ARSENIC TREATMENT TECHNOLOGY

Q. WHAT TREATMENT PROCESS HAS ARIZONA AMERICAN SELECTED FOR THE SEVEN ARSENIC REMEDIATION FACILITIES, WHICH ARE THE SUBJECT OF THIS CASE?

A. For six of the facilities, we have selected a granular-iron media-adsorption process as the most cost-effective method for arsenic remediation. As the incoming water passes through the contactor vessels, the arsenic ions are chemically attracted to the ferric ions and therefore adhere to the iron-based media. Water with very low levels of arsenic then flows out of the vessels for blending with other water sources, chlorination, and distribution. To insure a cost-effective process, only 60-70% of the influent water is actually treated. The treated water, containing very low levels of arsenic, is then blended with other source water; with the resultant arsenic level maintained at or below eight ppb. We used a competitive-bid process to select the manufacturer of the treatment vessels and awarded the contract to Severn Trent, Inc.

The Sun City West #1 site will utilize a coagulation-filtration process, where the arsenic ions are attracted by a ferric chloride solution added to the incoming water. The combined iron/arsenic precipitate is then removed via filtration, dewatered, and deposited in a landfill as non-hazardous material. The treated water proceeds to blending with other water sources, chlorination, and distribution. The blending process is the same as described above, which minimizes actual treatment costs. This procedure is more cost-

effective than the granular-iron process for facilities treating larger volumes of water, such as the Sun City West #1 site and our Paradise Valley site.

Exhibit B includes a functional description and cost estimate of each facility, again except for the Paradise Valley Water District facility.

V. VALIDATION OF PLANT PERFORMANCE

Q. WHAT TESTING AND VALIDATION PROCEDURES WILL ARIZONA AMERICAN USE TO INSURE COMPLIANCE WITH THE NEW ARSENIC STANDARD.

A. Each construction contract contains specifications requiring startup procedures and testing to insure arsenic levels do not exceed eight ppb, two ppb below the EPA's maximum contaminant level. We target a slightly lower arsenic level in the blended water to provide a margin of safety for compliance. To insure initial and continued compliance, samples will be taken at intervals specified by EPA and analyzed by a certified commercial-testing laboratory. Additionally, we will daily monitor various online instrument readings to insure proper operation of the facilities. If necessary, because of fluctuations in influent arsenic or other water quality parameters, we can readily adjust the percentage of the total flow so that we can satisfy our internal eight ppb standard.

VI. ARSENIC TREATMENT PROJECT STATUS

Q. WHAT IS THE STATUS OF THE TUBAC ARSENIC-REMEDIATION PROJECT?

A. Arizona American has requested a one-year exemption from ADEQ for its Tubac Water District, to allow time for us to evaluate point-of-use treatment technology, which could ease the rate impact on Tubac's small customer base (approximately 500 customers). The request is currently being considered by ADEQ. If granted, the project, as currently envisioned, would be placed on hold until a point-of-use alternative can be evaluated. For the record, it should be noted that if the point-of-use treatment technology does not prove to be more cost effective, and the current planned technology is determined to be the most cost effective, the overall cost for arsenic treatment in the Tubac system may prove to cost more than the original estimate. This is because construction and material costs typically go up over time, not down.

Q. HAVE YOU AWARDED CONSTRUCTION CONTRACTS FOR THE REMAINING PROJECTS?

A. Yes. Again we used a competitive-bid process to select our construction contractors, based upon qualifications and low bids. In our Sun City West District, we analyzed proposals submitted by four firms and then awarded a design-build contract for the coagulation-filter project to D. L. Norton Company.

The remaining projects use a construction-manager-at-risk approach. Contractors were chosen based upon bids submitted by firms after examination of 30% plans. The design

contracts for these projects were awarded after examination of cost and scope proposals by three qualified construction firms. Garney Construction was selected as the contractor for the remaining sites in Maricopa County and for the Havasu Water District project. We have selected Felix Construction for the Tubac project, if that project is constructed using a granular-iron, media-adsorption process, as originally contemplated.

VII. CONTRACT ADMINISTRATION

Q. PLEASE DESCRIBE THE WORK AUTHORIZATION AND INVOICE MANAGEMENT PROGRAM FOR THESE FACILITIES.

A. Each firm will submit monthly invoices, which an Arizona-American project manager will examine for accuracy and completeness of work. Upon approval, invoices will be submitted to the corporate accounting office for payment. To insure satisfactory completion, we will withhold a ten-percent retainage from each invoice, payable only when the project has been completed, inspected and accepted. The ten-percent retainage is a standard practice for Arizona-American on all but the smallest construction projects.

VIII. OPERATIONS AND MAINTENANCE COSTS

Q. WHAT IS ARIZONA AMERICAN'S O&M FORECAST FOR THESE ARSENIC-REMEDIATION FACILITIES.

A. New dedicated O&M costs consist of ferric chloride and other chemical costs and media replacement. These costs were considered in the evaluation of treatment methods for each site; and are extracted in the table shown as Exhibit C. Consistent with the

Commission's approved ACRM for Arizona Water Company's Northern and Eastern Districts, we have not included in these forecasts the costs of additional, non-dedicated, staffing, or the costs of the increased power needed to operate these facilities. The ferric chloride and media used in the treatment process are currently not used anywhere else in Arizona-American's system and are unique to the treatment process.

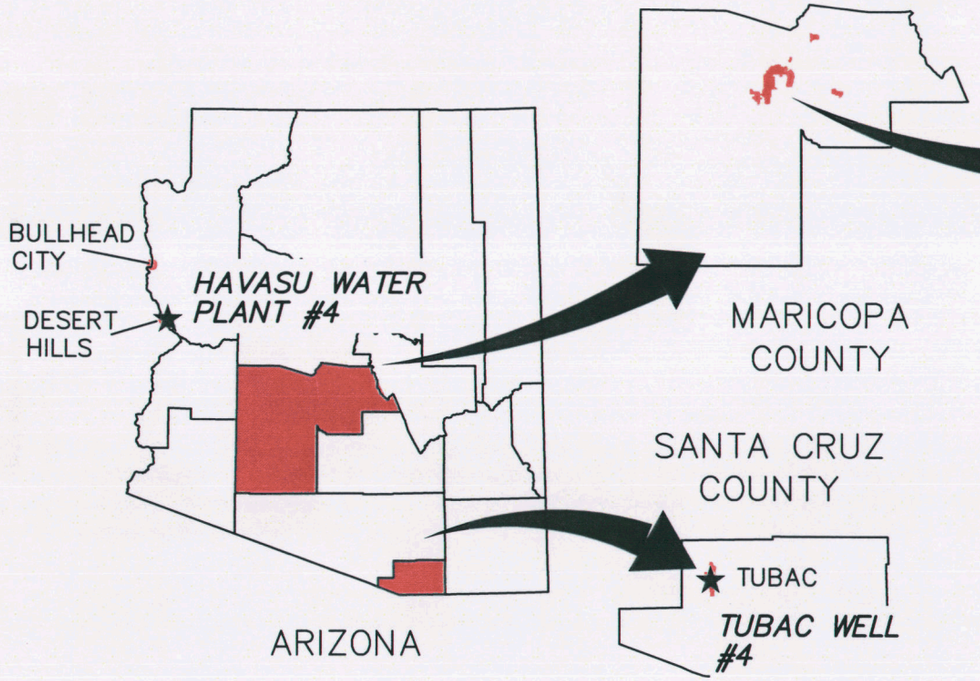
Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes it does.

Exhibit A

Arizona American Water

ARIZONA AMERICAN ARSENIC TREATMENT SITES



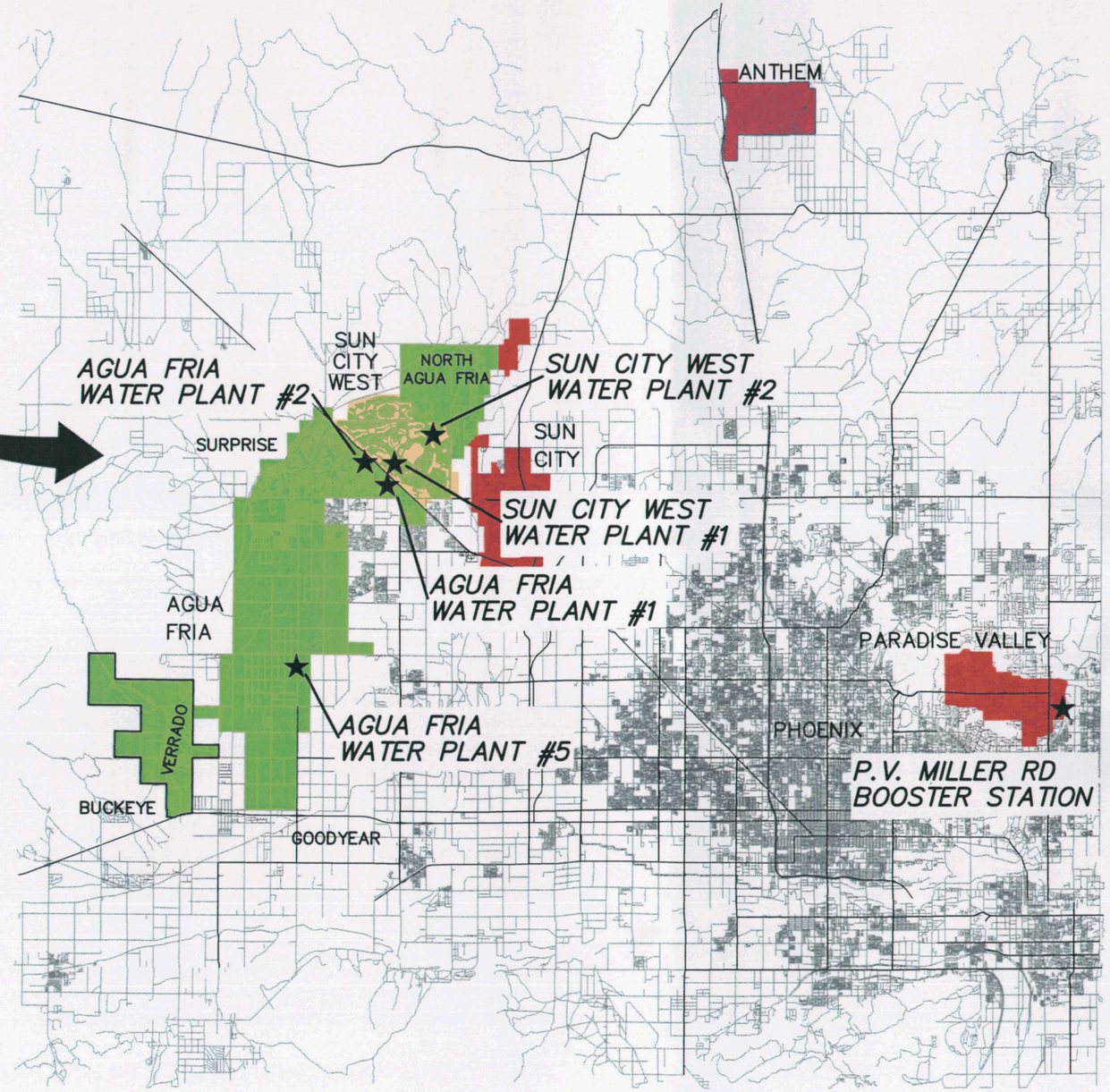


Exhibit B

ARIZONA AMERICAN WATER
AGUA FRIA DISTRICT
WATER PLANT NO. 1

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Agua Fria District supplies potable water to approximately 12,000 customers in the City of Surprise, the City of Goodyear, the Town of Buckeye, and several unincorporated sections of Maricopa County. The service area encompasses a 70 square mile area in the west-central portion of Maricopa County. The district obtains its water supplies from groundwater wells distributed throughout the service area. Arsenic has been detected in several of the wells at levels exceeding the 0.010-milligram per liter (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). This includes the four wells that supply water to Agua Fria Water Plant No. 1 (formerly known as Sun Village Water Plant). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in November of 2003 to determine which treatment alternative(s) would be most appropriate for the Agua Fria District, including Water Plant No. 1. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. It was concluded that granular iron media was the most cost-effective alternative for Agua Fria Water Plant No. 1.

B. EXISTING SYSTEM CONFIGURATION

Agua Fria Water Plant No. 1 occupies a 1.8-acre parcel at the end of a cul-de-sac on North White Feather Path in the City of Surprise. The western portion of the property is occupied by a 2.65 million gallon (MG) reservoir. The remainder of the site contains Well No. 1.1, booster pumps, a chlorine storage/feed and electrical/control building, and a stormwater retention basin. All four wells pump directly to the concrete reservoir, from which three booster pumps feed the Agua Fria District distribution system. A hydropneumatic tank is used to balance system pressures and prevent surges during pump starting and stopping. Chlorine is the only chemical that is currently added to the groundwater supplies at Agua Fria Water Plant No. 1.

C. WATER QUALITY

Table 1 presents summary information about each of the wells that serve Agua Fria Water Plant No. 1. The table shows that the average concentration of arsenic in each of the wells exceeds the 10 ug/L MCL. Table 2 presents additional water quality data from the Agua Fria Water Plant No. 1 wells.

Table 1
Summary of Well Characteristics
Agua Fria Water Plant No. 1

Well ID	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)	
				Average	Maximum
1.1	1,000	250	1,200	14	22
1.2	1,200	250	1,200	18	28
1.4	1,000	250	1,200	29	34
1.5	950	250	1,200	14	22

Table 2
Groundwater Quality Data
Agua Fria Water Plant No. 1

Parameter[1]	Well			
	1.1	1.2	1.4	1.5
pH	7.8	8.0	8.2	7.9
Alkalinity (as $CaCO_3$)	135	132	112	1161
Temperature (°C)	36	36	36	36
Iron	ND	ND	ND	ND
Manganese	ND	ND	ND	ND
Fluoride	1.2	1.4	3.8	0.9
Silica	ND	ND	ND	ND
Sulfate	52	45	94	33
TDS	365	279	368	271

1. All units in mg/L except pH and temperature.
2. ND = Non-detect

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the granular iron media treatment facility should be located at the Agua Fria Water Plant No. 1 site. It is proposed that the facilities be located in the northeast corner of the 1.8-acre site to minimize obstructions to existing booster pump station facilities/equipment, as well as reduce the visual impacts to adjoining and nearby properties. The existing stormwater management basin that currently occupies this site will be relocated behind the Operations Building. Yard piping modifications will be required to route raw and treated water to/from the proposed treatment facility, and some site work will be necessary to ensure adequate access is maintained to existing facilities/equipment.

E. DISTRIBUTION SYSTEM

The proposed granular iron treatment facility will be located upstream of the existing reservoir. As a result, the existing booster pumping facilities and distribution transmission mains will not be reconfigured, unless minor onsite relocations are required to accommodate the proposed granular iron media treatment facilities.

F. FUTURE DEMANDS AND SUPPLIES

The wells that serve Agua Fria Water Plant No. 1 have adequate capacity to meet current demands reliably. The long-term maximum day demand is projected to be 5.25

mgd, which marginally exceeds the reliable capacity of the four existing wells. Therefore, a fifth well is planned for development in the future, which will ensure that the reliable capacity will fully meet the projected demand. However, based on the levels of arsenic in the wells, a total capacity of 3,600 gpm will be sufficient to meet the projected maximum day demand.

The standard design practice for water treatment systems is to provide a sufficient number of trains or treatment units at each POE to meet the maximum day demand with one unit/train out of service. However, in the Agua Fria District there are interconnections with other POEs that can supply water if a treatment unit were unavailable. In addition, the groundwater supplies and treatment facilities are slated to become backup sources when the proposed White Tanks Regional Water Treatment Plant is completed. Therefore, inclusion of a spare treatment unit/train is not required for the proposed arsenic treatment facility at Agua Fria Water Plant No. 1.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Agua Fria District. The costs for the recommended improvements at Agua Fria Water Plant No. 1 included the granular iron media facilities, raw and finished water piping modifications, chemical feed modifications, backwash handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $2.71 million. This cost does not include engineering, permits, AFUDC, and land acquisition costs.

Arizona-American Water Company - Agua Fria P.O.E. No. 1 (Sun Village)
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$240,887
3	Concrete	$337,721
4	Masonry	$33,513
5	Structural Misc. Metals	$40,745
7	Insulation/Caulking	$1,402
8	Doors and Windows	$0
9	Painting	$86,037
10	Signs	$2,658
11	Equipment	$198,381
	Filter Vessels & Media	$1,087,320
15	Mechanical	$413,158
16	Electrical	$231,601
	Instrumentation	$38,345
	CONSTRUCTION SUBTOTAL	**$2,711,768**
	Engineering	
	DLEC	$23,627
	Heerup Design	$2,200
	Structural Shop Drgs	$2,000
	Special Inspections	$79,000
	AWS Design	$92,367
	AWS Construction Admin	$15,000
	AW Design (2% construction)	$54,235
	Construction Admin./Inspection	$75,000
	Engineering Total	$343,429
	Contingency (5% of construction)	$135,588
	AFUDC (7% of construction)	$189,824
	PROJECT TOTAL	**$3,380,610**

5-Apr-05

ARIZONA AMERICAN WATER
AGUA FRIA DISTRICT
WATER PLANT NO. 2

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Agua Fria District supplies potable water to approximately 12,000 customers in the City of Surprise, the City of Goodyear, the Town of Buckeye, and several unincorporated sections of Maricopa County. The service area encompasses a 70 square mile area in the west-central portion of Maricopa County. The district obtains its water supplies from groundwater wells distributed throughout the service area. Arsenic has been detected in several of the wells at levels exceeding the 0.010-milligram per liter (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). This includes two of the three wells that supply water to Agua Fria Water Plant No. 2 (formerly known as Sun City Grand Water Plant No. 1). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in November of 2003 to determine which treatment alternative(s) would be most appropriate for the Agua Fria District, including Water Plant No. 2. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. It was concluded that granular iron media would be the most cost-effective alternative for Agua Fria Water Plant No. 2.

B. EXISTING SYSTEM CONFIGURATION

Agua Fria Water Plant No. 2 is a storage and booster pumping facility located on West Santa Fe Avenue in the City of Surprise. Wells 2.1, 2.2, and 2.3 pump directly to two 1.0 million gallon (MG) steel reservoirs, from which eight booster pumps feed the Agua Fria District distribution system. Hydropneumatic tanks are used to balance system pressures and prevent surges during pump starting and stopping. Chlorine is the only chemical that is currently added to the groundwater supplies at Agua Fria Water Plant No. 2.

C. WATER QUALITY

Table 1 presents summary information about each of the wells that serve Agua Fria Water Plant No. 2. The table shows that the average concentration of arsenic in Wells 2.1 and 2.3 exceeds the 10 ug/L MCL. Although arsenic levels in Well 2.2 are below the MCL, the well is currently used infrequently due to declining yield. Table 2 presents additional water quality data from Wells 2.1 and 2.3.

Table 1
Summary of Well Characteristics
Agua Fria Water Plant No. 2

Well ID	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)	
				Average	Maximum
2.1	1,060	250	1,200	9	14
2.2	1,170	250	1,200	7	9
2.3	1,140	250	1,200	16	25

Table 2
Groundwater Quality Data
Agua Fria Water Plant No. 2

Parameter[1]	Well	
	2.1	2.3
pH	7.9	7.8
Alkalinity (as $CaCO_3$)	133	124
Temperature (°C)	34	34
Iron	0.09	ND
Manganese	<0.02	<0.02
Fluoride	1.6	1.2
Silica	30	29
Sulfate	68	72
TDS	314	297

1. All units in mg/L except pH and temperature.
2. ND = Non-detect

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the granular iron media treatment facility should be located at the Agua Fria Water Plant No. 2 site. It is proposed that the facilities be located in the northeast corner of the 3.2-acre site to minimize obstructions to existing booster pump station facilities/equipment, as well as reduce the visual impacts to adjoining and nearby properties. Yard piping modifications would be required to route raw and treated water to/from the proposed treatment facility, and some site work will be necessary to ensure adequate access is maintained to existing facilities/equipment.

E. DISTRIBUTION SYSTEM

The proposed granular iron treatment facility will be located upstream of the existing storage reservoirs. As a result, the existing booster pumping facilities and distribution transmission mains will not be reconfigured, unless minor onsite relocations are required to accommodate the proposed granular iron media treatment facilities.

F. FUTURE DEMANDS AND SUPPLIES

The wells that serve Agua Fria Water Plant No. 2 have adequate capacity to meet current demands reliably. As was indicated previously, even though the arsenic concentration in Well 2.2 is below the MCL, the well can only be used on an infrequent

basis due to declining yield. AAW plans to construct a new well adjacent to Well 2.2 to replace the capacity that has been lost. For the purposes of this evaluation, it was assumed that arsenic levels in the future Well 2.2 would also be below the MCL. A fourth well is also planned to meet future demands, but the arsenic concentration in this future well is unknown at this time.

Based on the above, it is recommended that the proposed treatment facility be sized for a total capacity of 2,400 gpm, corresponding to the capacity of the existing wells requiring treatment. Provisions should also be included in the design for future expansion of the proposed treatment system capacity to 3,600 gpm, should either of the proposed wells also require treatment.

The standard design practice for water treatment systems is to provide a sufficient number of trains or treatment units at each POE to meet the maximum day demand with one unit/train out of service. However, there are a number of wells within the District that do not require treatment, and there are interconnections with other POEs that can supply water if a treatment unit were unavailable. In addition, the groundwater supplies and treatment facilities are slated to become backup sources when the proposed White Tanks Regional Water Treatment Plant is completed. Therefore, inclusion of a spare treatment unit/train is not required for the proposed arsenic treatment facility at Agua Fria Water Plant No. 2.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Agua Fria District. The costs for the recommended improvements at Agua Fria Water Plant No. 2 included the granular iron media facilities, raw and finished water piping modifications, chemical feed modifications, backwash handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $1.93 million. This cost does not include engineering, permits, AFUDC, and land acquisition costs.

Arizona-American Water Company - Agua Fria P.O.E. No. 2 (Sun City Grand No. 1)
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$124,767
3	Concrete	$172,819
4	Masonry	$0
5	Structural Misc. Metals	$20,673
7	Insulation/Caulking	$731
8	Doors and Windows	$0
9	Painting	$59,827
10	Signs	$2,773
11	Equipment	$163,168
	Filter Vessels & Media	$696,260
15	Mechanical	$450,089
16	Electrical	$201,443
	Instrumentation	$36,006
	CONSTRUCTION SUBTOTAL	**$1,928,556**
	Engineering	
	DLEC	$23,627
	Heerup Design	$2,200
	Structural Shop Drgs	$2,000
	Special Inspections	$36,000
	AWS Design	$92,367
	AWS Construction Admin	$15,000
	AW Design (2% construction)	$38,571
	Construction Admin./Inspection	$75,000
	Engineering Total	$284,765
	Contingency (5% of construction)	$96,428
	AFUDC (7% of construction)	$134,999
	PROJECT TOTAL	**$2,444,748**

5-Apr-05

ARIZONA AMERICAN WATER
AGUA FRIA DISTRICT
WATER PLANT NO. 5

CLEARWATER FARMS WATER PLANT
ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Agua Fria District supplies potable water to approximately 12,000 customers in the City of Surprise, the City of Goodyear, the Town of Buckeye, and several unincorporated sections of Maricopa County. The service area encompasses a 70 square mile area in the west-central portion of Maricopa County. The district obtains its water supplies from groundwater wells distributed throughout the service area. Arsenic has been detected in several of the wells at levels exceeding the 0.010-milligram per liter (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). This includes two of the three wells that supply water to Agua Fria Water Plant No. 5 (formerly known as Clearwater Farms Water Plant). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in November of 2003 to determine which treatment alternative(s) would be most appropriate for the Agua Fria District, including Water Plant No. 5. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. It was concluded that granular iron media was the most cost-effective alternative for Agua Fria Water Plant No. 5.

B. EXISTING SYSTEM CONFIGURATION

Agua Fria Water Plant No. 5 occupies a 2-acre parcel located at Cotton Lane and North Avenue. The site contains Well 5.1, plus a new 1.25 MG clearwell, booster pump/operations building, and a stormwater retention basin. Wells 5.1, 5.2, and 5.3 pump to the concrete clearwell, from which seven booster pumps feed the Agua Fria District distribution system. A hydropneumatic tank is used to balance system pressures and prevent surges during pump starting and stopping. In addition, an interconnection is available that allows Well 5.3 to discharge directly into the distribution system if necessary. Chlorine is the only chemical that is currently added to the groundwater supplies in the Agua Fria District.

C. WATER QUALITY

Table 1 presents summary information about each of the wells that serve Agua Fria Water Plant No. 5. The table shows that the average concentration of arsenic in two of the wells exceeds the 10 ug/L MCL. Table 2 presents additional water quality data from the Agua Fria Water Plant No. 5 wells.

Table 1
Summary of Well Characteristics
Agua Fria Water Plant No. 5

Well ID	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)	
				Average	Maximum
5.1	1,000	150	800	28	56
5.2	888	125	600	67	99
5.3	1,000	200	800	6	6

Table 2
Groundwater Quality Data
Agua Fria Water Plant No. 5

Parameter[1]	Well		
	5.1	5.2	5.3
pH	8.5	9.0	8.0
Alkalinity (as $CaCO_3$)	83	113	108
Temperature (°C)	33	41	27
Iron	0.23	0.5	ND
Manganese	<0.02	0.03	ND
Fluoride	1.4	5.5	1.1
Silica	5.3	10.8	ND
Sulfate	27	33	21
TDS	271	221	250

1. All units in mg/L except pH and temperature.
2. ND = Non-detect

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the granular iron media treatment facility should be located at the Agua Fria Water Plant No. 5 site. However, due to the limited space available, the proposed granular iron media facilities would need to be located in a portion of the space reserved for the future construction of a second clearwell. Based on the conceptual layout developed as part of this design concept, the footprint and volume of the future clearwell may need to be reduced by approximately 20 percent to accommodate the proposed treatment facilities. Alternatively, the stormwater management basin at the east end of the site can be replaced by a deep well, yielding more space for the ARF. Yard piping modifications would be required to route raw and treated water to/from the proposed treatment facility, and some site work will be necessary to ensure adequate access is maintained to both existing and proposed facilities/equipment.

E. DISTRIBUTION SYSTEM

The proposed granular iron treatment facility will be located upstream of the existing clearwell. As a result, the existing booster pumping facilities and distribution transmission mains will not be reconfigured, unless minor onsite relocations are required to accommodate the proposed granular iron media treatment facilities. As can be seen in Table 1, the Well 5.3 supply does not require treatment. Therefore, 8,000 ft of transmission line will be provided to keep the Well 5.2 supply separate from Well 5.3 so that the Well 5.3 interconnection to the distribution system can continued to be used on

an as needed basis. It is anticipated that Well 5.3 will serve as the primary supply for Agua Fria Water Plant 5, supplemented by treated water from Wells 5.1 and 5.2.

F. FUTURE DEMANDS AND SUPPLIES

The three wells that serve Agua Fria Water Plant No. 5 have adequate capacity to meet current demands reliably. However, if Well 5.3 were unavailable, both Wells 5.1 and 5.2 may be needed to meet maximum day demands. Therefore, it is recommended that the arsenic treatment facilities at Agua Fria POE 5 be sized for a nominal treatment capacity of 2 mgd, which corresponds to the combined capacity of Wells 5.1 and 5.2.

The standard design practice for granular iron media systems is to provide a sufficient number of trains or treatment units at each POE to meet the maximum day demand with one unit/train out of service. However, there are interconnections with other POEs in the Agua Fria District that can supply water if a treatment unit were unavailable. In addition, the groundwater supplies and treatment facilities at Agua Fria Water Plant No. 5 are slated to become backup sources when the proposed White Tanks Regional Water Treatment Plant is completed. Therefore, inclusion of a spare treatment unit/train is not required for the proposed arsenic treatment facility at Agua Fria Water Plant No. 5.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Agua Fria District. The costs for the recommended improvements at Agua Fria Water Plant No. 5 included the granular iron media facilities, raw and finished water piping modifications, chemical feed modifications, backwash handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $1.84 million. This cost does not include engineering, permits, and AFUDC.

Arizona-American Water Company - Agua Fria P.O.E. No. 5 (Clearwater Farms)
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$152,594
3	Concrete	$218,510
4	Masonry	$37,698
5	Structural Misc. Metals	$47,319
7	Insulation/Caulking	$2,164
8	Doors and Windows	$0
9	Painting	$58,999
10	Signs	$2,734
11	Equipment	$182,715
	Filter Vessels & Media	$493,650
15	Mechanical	$389,793
16	Electrical	$222,399
	Instrumentation	$35,095
	CONSTRUCTION SUBTOTAL	**$1,843,670**
	Engineering	
	DLEC	$24,207
	Heerup Design	$2,200
	Structural Shop Drgs	$2,000
	Special Inspections	$92,000
	AWS Design	$92,367
	AWS Construction Admin	$15,000
	AW Design (2% construction)	$36,873
	Construction Admin./Inspection	$75,000
	Engineering Total	$339,647
	Contingency (5% of construction)	$92,184
	AFUDC (7% of construction)	$129,057
	PROJECT TOTAL	**$2,404,558**

5-Apr-05

ARIZONA AMERICAN WATER
SUN CITY WEST DISTRICT
WATER PLANT NO. 1

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
December 2003

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Sun City West District supplies potable water to approximately 15,300 customers in the community of Sun City West. The service area encompasses a 7,000 acre planned development community located approximately 14 miles northwest of the City of Phoenix in an unincorporated area of Maricopa County. The district obtains its water supplies from a total of ten wells distributed throughout the service area. Arsenic has been detected in all of the wells, with most exceeding the 0.010-milligram per liter (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in October of 2003 to determine which treatment alternative(s) would be most appropriate for the Sun City West District. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. The US EPA has not yet designated iron-based adsorbent media as a BAT.

The Sun City West District service area is divided into two separate zones, each of which is served by five wells that feed into the distribution system through a single point of entry (POE). It was concluded through a preliminary screening of alternatives that the ferric chloride coagulation/filtration (CF) and disposable iron-based adsorbent media processes were the most feasible alternatives for the Sun City West District. It was subsequently determined based on the results of pilot testing and a more detailed economic analysis, that a single, centralized CF treatment facility would be the most cost-effective alternative for Sun City West POE No. 1. Installation of iron-based adsorbent media at select wellheads would be the most cost effective alternative for Sun City West POE No. 2. This document summarizes the criteria to be used in the design of the proposed centralized CF treatment facility for SCW POE No. 1 only. Criteria for the iron-based adsorbent media treatment facilities for wells in Sun City West POE No. 2 are not included herein, as those facilities will be designed and constructed under a separate contract.

B. EXISTING SYSTEM CONFIGURATION

The five wells that serve Sun City West POE No. 1 are routed to two 1.25-million gallon (MG) ground storage reservoirs located at Sun City West Water Plant No. 1. The water plant is equipped with seven booster pumps that draw water from the reservoirs and pump it into the distribution system. Hydropneumatic tanks are used to balance system pressures and prevent surges during pump starting and stopping. Chlorine is the only chemical that is added to the groundwater supplies in Sun City West at the present time.

Figure 1 is a schematic showing how the wells and booster pump station are currently configured at POE No. 1.

C. WATER QUALITY

Table 1 presents summary information about each of the five wells that serve Sun City West POE No. 1. The table shows that the concentration of arsenic in all of the wells exceeds the 10 ug/L MCL, with a flow-weighted average of approximately 23 ug/L. Table 2 presents additional water quality data from each of the groundwater supply wells serving Sun City West POE No. 1.

Table 1
Summary of Select Well Characteristics – Sun City West POE No. 1

Well ID	Year Drilled	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)[1] Average	Arsenic (ug/L)[1] Maximum
1.1	1995	1,190	250	1,200	25.7	34
1.2	1982/86	716	200	1,060	21.0	22
1.3	1955	1,032	200	800	15.2	20
1.4	1982	1,176	200	1,000	27.8	34
1.5	1947	1,000	200	1,200	25.0	30
POE 1 – TOTAL / AVERAGE[2]				**5,260**	**23.4**	**29**

1. Arsenic data are based on approximately 10 water quality samples collected between 1995 and 2002.
2. The overall average and maximum concentrations for each POE were calculated based on the flow-weighted capacity of each well.

Table 2
Groundwater Quality Data – Sun City West POE No. 1

Parameter[1]	Well 1.1	Well 1.2	Well 1.3	Well 1.4	Well 1.5
pH	7.9	7.9	7.9	8.0	8.1
Alkalinity (as $CaCO_3$)	158	151	129	148	146
Hardness (as $CaCO_3$)	114	117	52	29	28
Temperature (°C)	32	32	34	N/A	33
Nitrate (as N)	1.3	5.7	3.3	3.9	4.0
Iron	0.04	0.1	0.1	0.15	0.1
Manganese	0.02	0.05	0.05	0.05	0.05
Fluoride	2.5	1.1	0.9	1.8	2.6
Silica[2]	----------	----------	12.9	----------	----------
Sulfate	49	34	39	36	69
TDS	264	337	306	322	355

1. All units in mg/L except pH and temperature.
2. Value represents blended well supplies, based on data from "Sun City West Water Plant No. 1 Arsenic Treatment Pilot Study Draft Report" prepared by NCS, February 2003.

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the proposed centralized CF treatment facility should be located at Sun City West Water Plant No. 1. The plant occupies a 3.5-acre parcel on West Meeker Boulevard. Most of the area along the eastern edge of the property is currently vacant, and is proposed as the

location for the arsenic treatment facilities. Yard piping modifications would be required to move existing raw and finished water pipelines out of the footprint of the proposed structures, as well as to route raw and treated water to/from the proposed treatment facility. A zoning variance may be required to allow structures to be located less than 40 feet from the property boundary, particularly along the eastern side of the property.

E. DISTRIBUTION SYSTEM

The proposed CF treatment facility will be located upstream of the existing storage reservoirs. As a result, the existing booster pumping facilities and distribution transmission mains will not be reconfigured, unless minor onsite relocations are required to accommodate the proposed CF treatment facilities.

F. FUTURE DEMANDS AND SUPPLIES

The Sun City West system is made up entirely of residential and commercial customers. In recent years, daily demands have been averaging in the range of 6 million gallons per day (mgd), with maximum day demands ranging between 8.1 and 8.9 mgd. According to the Sun City West Property Owners and Residents Association website, build-out of the development was completed in 1998. As a result, only modest increases in average and maximum daily demands are expected for the foreseeable future. Projections of future average and maximum day demands were developed in 2002 as part of an evaluation of supply adequacy for each of American Water's service areas. For the Sun City West District, it was projected that average and maximum daily demands will not exceed 7 mgd and 10 mgd, respectively, through the year 2012.

The wells serving Sun City West POE No. 1 have a combined production capacity of 5260 gpm, which equals approximately 7.6 mgd. The wells in POE No. 2 can supply up to 7.8 mgd. Combined, the two POEs have sufficient reliable supply capacity to meet the projected maximum day demand with the largest well in each POE out of service. Sufficient arsenic treatment capacity needs to be provided to meet the projected maximum day demand with the largest process unit or treatment train out of service. Based on the individual well capacities listed in Table 1, a nominal reliable treatment capacity of 6 mgd will be required to match the capacity of the POE No. 1 wells assuming the largest well is out of service.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Sun City West District. The cost included the proposed CF facilities, raw and finished water transmission mains, chemical storage and feed facilities, residuals handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $7.24 million. This cost does not include engineering, permits, and AFUDC.

Arizona-American Water Company - Sun City West Plant #1
Coagulation/Filtration Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	
	Yard Piping	$704,379
	Structural Excavation/Backfill	$312,754
	Demolition	$22,870
	Driveways/Pavement	$131,919
3	Concrete	$994,287
4 thru 10	Buildings	$1,110,607
11/15	Equipment/ Mechanical	
	Backwash	$276,980
	Blower	$90,588
	Chemical Feed	$425,083
	Clarifiers	$92,200
	Decant Pump Station Mech.	$105,078
	Filter Mechanical	$930,884
	Sludge Thickner	$369,475
	Misc. Mechanical	$163,661
16	Electrical	
	Electrical	$1,074,748
	Instrumentation	$438,843
	CONSTRUCTION SUBTOTAL	**$7,244,355**
	Engineering	
	DSWA Design	$599,597
	DSWA Construction Admin.	$125,014
	DSWA Changes	$30,000
	Special Inspections	$47,700
	AW Design (2% construction)	$144,887
	Construction Admin./Inspection	$235,000
	Engineering Total	$1,182,198
	Contingency (5% of construction)	$362,218
	AFUDC (7% of construction)	$507,105
	PROJECT TOTAL	**$9,295,875**

5-Apr-05

ARIZONA AMERICAN WATER
SUN CITY WEST DISTRICT
WATER PLANT NO. 2

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Sun City West District supplies potable water to approximately 15,300 customers in the community of Sun City West. The service area encompasses a 7,000 acre planned development community located approximately 14 miles northwest of the City of Phoenix in an unincorporated area of Maricopa County. The district obtains its water supplies from a total of ten wells distributed throughout the service area. Arsenic has been detected in all of the wells, with most exceeding the 0.010-milligram per liter (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in October of 2003 to determine which treatment alternative(s) would be most appropriate for the Sun City West District. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan.

The Sun City West District service area is served by ten wells that feed into the distribution system through two separate points of entry (POEs). It was concluded through a preliminary screening of alternatives that the ferric chloride coagulation/filtration (CF) and disposable iron-based adsorbent media processes were the most feasible alternatives for the Sun City West District. It was subsequently determined based on the results of pilot testing and a more detailed economic analysis, that a single, centralized CF treatment facility would be the most cost-effective alternative for Sun City West POE No. 1. Centralized iron-based adsorbent media treatment would be the most cost effective alternative for Sun City West POE No. 2. This document summarizes the criteria to be used in the design of the proposed centralized granular iron media treatment facility for SCW POE No. 2 only. Criteria for the CF treatment facilities for the wells in Sun City West POE No. 1 are not included herein, as those facilities are being designed and constructed under a separate contract.

B. EXISTING SYSTEM CONFIGURATION

The five wells that serve Sun City West POE No. 2 are routed to two 0.76-million gallon (MG) ground storage reservoirs located at Sun City West Water Plant No. 2. The water plant is equipped with eight booster pumps that draw water from the reservoirs and pump it into the distribution system. The service area is divided into two pressure zones, and the booster pumps at each water plant are divided into two banks. One bank of pumps at each plant pumps into the low pressure zone and the other bank pumps into the high pressure zone, thereby providing two POEs into each pressure zone. A normally-closed valved interconnection is provided between each pump bank to allow either bank to back feed the other pressure zone if necessary. Hydropneumatic tanks are used to balance system pressures and prevent surges during pump starting and

stopping. Chlorine is the only chemical that is added to the groundwater supplies in Sun City West at the present time. Figure 1 is a schematic showing how the wells and booster pump station are currently configured at POE No. 2.

C. WATER QUALITY

Table 1 presents summary information about each of the five wells that serve Sun City West POE No. 2. The table shows that the average concentration of arsenic in three of the five wells exceeds the 10 ug/L MCL, with a flow-weighted average of approximately 11.3 ug/L. Table 2 presents additional water quality data from each of the groundwater supply wells serving Sun City West POE No. 2.

Table 1
Summary of Select Well Characteristics – Sun City West POE No. 2

Well ID	Year Drilled	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)[1] Average	Arsenic (ug/L)[1] Maximum
2.1	1995	1,186	200	1,200	6.6	10
2.2	1982	904	200	1,200	11.6	20
2.3	1982	852	200	1,200	8.3	10
2.4	1988	1,060	200	800	19.3	25
2.5	1958	963	200	990	13.7	17
POE 1 – TOTAL / AVERAGE[2]				**5,390**	**11.3**	**16**

1. Arsenic data are based on approximately 10 water quality samples collected between 1995 and 2002.
2. The overall average and maximum concentrations for each POE were calculated based on the flow-weighted capacity of each well.

Table 2
Groundwater Quality Data – Sun City West POE No. 2

Parameter[1]	Well 2.1	Well 2.2	Well 2.3	Well 2.4	Well 2.5
PH	7.5	7.8	7.5	7.8	7.7
Alkalinity (as $CaCO_3$)	189	163	162	142	148
Hardness (as $CaCO_3$)	N/A	138	270	137	N/A
Temperature (°C)	28	N/A	29	34	33
Nitrate (as N)	1.6	9.5	10.4	3.0	1.2
Iron	0.07	0.14	0.10	0.18	0.14
Manganese	0.02	0.05	0.01	0.01	0.05
Fluoride	0.5	0.4	0.7	1.7	1.4
Silica	11.3	36	N/A	30	N/A
Sulfate	36	50	113	74	53
TDS	275	374	463	373	282

1. All units in mg/L except pH and temperature.

D. RAW WATER TRANSMISSION

Currently, a single raw water transmission main conveys supplies from the four offsite wells to Water Plant No. 2. The main begins at Well 2.5 as a 10-inch diameter line, and increases in size as it connects with each of the other wells enroute to Water Plant No. 2. Well 2.1 ties into the raw water transmission main near its location onsite at Water Plant No. 2. As was shown in Table 1, the arsenic levels in supplies from Wells

2.1 and 2.3 do not currently exceed the MCL. Therefore, a new raw water main will be installed between Well 2.3 and Water Plant No. 2 so that the low arsenic supply from Well 2.3 can be kept separate from the Well 2.2, 2.4, and 2.5 supplies. The proposed raw water transmission main from Well 2.3 will connect onsite with the low arsenic supply from Well 2.1, where the combined flows will blend with effluent from the proposed treatment system.

It is possible that the concentration of arsenic in Well 2.3 may increase in the future. Therefore, the connection between Well 2.3 and the existing raw water transmission main will be retained if future treatment of Well 2.3 becomes necessary. At the same time, the concentration of arsenic in Well 2.2 is low enough that its supply should be able to by-pass treatment most of the time. Only during periods when both Wells 2.4 and 2.5 are out of service is it likely that Well 2.2 would require treatment. Therefore, an interconnection will be provided between Well 2.2 and the proposed raw water main from Well 2.3 so that the supply from Well 2.2 can also be kept separate from the Well 2.4 and 2.5 supplies if desired.

E. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the proposed centralized granular iron media treatment facility should be located at Sun City West Water Plant No. 2. The plant occupies a 2.5-acre parcel at the corner of Stardust Boulevard and Aurora Drive. Due to the size and positioning of the storage reservoirs and booster pumps, only limited space is available for installation of arsenic treatment facilities at this site. The existing masonry wall that encloses the northern side of the property is located approximately 40 feet inside of the actual property line. It is proposed that the section of wall to the east of the existing driveway entrance be relocated to the property line along Stardust Boulevard. Doing so will create sufficient space for the proposed facility. A zoning variance may be required to relocate the masonry wall and to allow structures to be located less than 40 feet from the property boundary.

Yard piping modifications would be required on site to move an existing finished water pipeline out of the footprint of the proposed structures, as well as to route raw and treated water to/from the proposed treatment facility.

F. DISTRIBUTION SYSTEM

The proposed granular iron media treatment facility will be located upstream of the existing storage reservoirs. As a result, the existing booster pumping facilities and distribution transmission mains will not be reconfigured, unless minor onsite relocations are required to accommodate the proposed treatment facilities.

G. FUTURE DEMANDS AND SUPPLIES

The Sun City West system is made up entirely of residential and commercial customers. In recent years, daily demands have been averaging in the range of 6 million gallons per day (mgd), with maximum day demands ranging between 8.1 and 8.9 mgd. According to the Sun City West Property Owners and Residents Association website, build-out of the development was completed in 1998. As a result, only modest increases in average and maximum daily demands are expected for the foreseeable future. Projections of future average and maximum day demands were developed in 2002 as part of an

evaluation of supply adequacy for each of American Water's service areas. For the Sun City West District, it was projected that average and maximum daily demands will not exceed 7 mgd and 10 mgd, respectively, through the year 2012.

The wells serving Sun City West POE No. 2 have a combined production capacity of 5390 gpm, which equals approximately 7.8 mgd. The wells in POE No. 1 can supply up to 7.6 mgd. Combined, the two POEs have sufficient reliable supply capacity to meet the projected maximum day demand with the largest well in each POE out of service.

Based on the evaluation of alternatives completed previously, it was concluded that the proposed arsenic treatment facility could be sized to treat the arsenic from Wells 2.4 and 2.5 only. If either of these wells was unavailable, Well 2.2 could be treated to increase the volume of low arsenic supply for blending. Under a worst case scenario if one of the low arsenic wells were out of service at the same time that one of the treatment trains was unavailable, Water Plant No. 1 should have adequate spare capacity to meet system demands. Based on the above, the system will be designed for a nominal treatment capacity of 2.6 mgd (1800 gpm). Space will also be reserved for the future addition of another train to provide a total treatment capacity of 4.3 mgd (3,000 gpm) if treatment of one of the existing 1,200-gpm wells becomes necessary.

H. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Sun City West District. The cost included the proposed granular iron media treatment system, raw and finished water transmission mains, residuals handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $3.101 million. This cost does not include engineering, permits, contingency or AFUDC.

Arizona-American Water Company - Sun City West POE No. 2
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$255,283
3	Concrete	$358,970
4	Masonry	$65,488
5	Structural Misc. Metals	$47,269
7	Insulation/Caulking	$5,936
8	Doors and Windows	$7,644
9	Painting	$55,147
10	Signs	$2,556
11	Equipment	$301,275
	Filter Vessels & Media	$577,980
	Emergency Generator	$450,000
15	Mechanical	$438,326
16	Electrical	$399,629
	Instrumentation	$135,866
	CONSTRUCTION SUBTOTAL	**$3,101,369**
	Engineering	
	DLEC	$43,243
	Heerup Design	$2,300
	Structural Shop Drgs	$2,500
	Special Inspections	$161,000
	AWS Design	$90,500
	AWS Construction Admin	$15,000
	AW Design (2% construction)	$62,027
	Construction Admin./Inspection	$75,000
	Engineering Total	$451,570
	Contingency (5% of construction)	$155,068
	AFUDC (7% of construction)	$217,096
	PROJECT TOTAL	**$3,925,104**

5-Apr-05

ARIZONA AMERICAN WATER
LAKE HAVASU DISTRICT

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Lake Havasu District supplies potable water to approximately 1100 customers in the community of Lake Havasu City. The District currently obtains its water supplies from a total of three wells distributed around the service area. A fourth well is currently under development. Arsenic is present in one of the existing wells, as well as the proposed supply, at levels exceeding the 0.01 mg/L maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in December of 2003 to determine which treatment alternative(s) would be most appropriate for the Lake Havasu District. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. It was concluded that granular iron media was the most cost-effective alternative for the Lake Havasu District.

B. EXISTING SYSTEM CONFIGURATION

The existing wells providing service to the Lake Havasu District are Well 3, Well 7, and Well 8. A fourth well, Well 9, is currently in development on the Well 8 site. Five other wells located throughout the district have been removed from service due to declining water quality and/or yield.

Four booster stations currently feed the system from reservoirs with a combined storage volume totaling 600,000 gallons. An additional 500,000-gallon storage tank and new booster pumping facilities is proposed at the Well 8/9 site. Hydropneumatic tanks are used to balance system pressures and prevent surges during pump starting and stopping. Chlorine is the only chemical that is currently added to the groundwater supplies at the Lake Havasu Well 8/9 site.

C. WATER QUALITY

Table 1 presents summary information about each of the wells that serve the Lake Havasu District. The table shows that the average concentration of arsenic in Well 8 exceeds the 10 ug/L MCL. Limited water quality testing has been performed on the Well 9 supply, although preliminary tests indicate that the arsenic concentration in this well also exceeds the MCL. Table 2 presents additional water quality data from both of the groundwater supply wells that exceed the MCL.

Table 1
Summary of Well Characteristics – Lake Havasu District

Well ID	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)[1]	
				Average	Maximum
3	160	15	150	<10	<10
7	150	50	500	<10	<10
8	380	15	100	18	27
9[2]	700	TBD	500[3]	23	35

1. Well 9 arsenic data based on pump testing samples collected in 2003.
2. Well 9 is currently under development.
3. Well has sufficient capacity to supply 1000 gpm in the future; however, it is currently planned to equip this well with a pump rated at 500 gpm.

Table 2
Groundwater Quality Data – Lake Havasu District

Parameter[1]	Well	
	8	9
pH	7.6	8.4
Alkalinity (as $CaCO_3$)	85	98
Hardness (as $CaCO_3$)	N/A	91
Temperature (°C)	32	32
Iron	<0.1	<0.1
Manganese	<0.02	<0.02
Fluoride	3.0	1.9
Silica	N/A	33
Sulfate	128	120
TDS	N/A	780

1. All units in mg/L except pH and temperature.
2. N/A = Not available

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the granular iron media treatment facility should be located at the Well 8/9 booster plant site. The plant occupies a 0.52-acre parcel on Highway 95. The evaluation recommends the acquisition of a portion of a vacant adjacent parcel. Subsequent inquiries with the landowner have been unsuccessful. Therefore, the available space on the site will be utilized. Yard piping modifications would be required to route raw and treated water to/from the proposed treatment facility.

E. DISTRIBUTION SYSTEM

The proposed granular iron treatment facility will be located upstream of the existing storage reservoirs. As a result, the existing booster pumping facilities and distribution transmission mains will not need to be reconfigured, unless minor onsite relocations are required to accommodate the proposed granular iron media treatment facilities.

F. FUTURE DEMANDS AND SUPPLIES

The Lake Havasu system is made up entirely of residential and commercial customers. In recent years, demands in the Lake Havasu District have averaged 0.58 mgd, with maximum day demands reaching 1.04 mgd. When the development of Well 9 is complete, the combined capacity of the wells serving the Lake Havasu District will total 1.80 mgd (1,250 gpm), with a reliable production capacity of 1.08 mgd (750 gpm) assuming one of the District's largest wells is out of service. Thus, the District will have adequate supplies to meet demands in the near term.

Projections of future average and maximum day demands were developed in 2002 as part of an evaluation of supply adequacy for each of American Water's service areas. According to this study, average and maximum day demands in the Lake Havasu District may reach 1.8 mgd and 3.24 mgd, respectively, by the year 2012. It is likely that the capacity of Well 9 will be expanded to 1000 gpm to help meet these increased demands, although additional sources of supply will also need to be developed.

Because it is likely that the capacity of Well 9 will need to be increased in the relatively near future, upsizing the treatment vessels, and associated pipe and fittings to accommodate this additional flow would be cost effective. Therefore, the proposed system will be designed to treat 1,100 gpm, which is the future total capacity of both wells requiring treatment. Treatment for other future sources of supply will be considered as separate projects.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Lake Havasu District. The cost included the proposed granular iron media facilities, raw and finished water piping modifications, chemical feed modifications, backwash handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost is estimated to be $1.42 million. This cost does not include engineering, permits, and AFUDC.

Arizona-American Water Company - Lake Havasu Plant 4
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$151,733
3	Concrete	$116,414
4	Masonry	$0
5	Structural Misc. Metals	$5,855
7	Insulation/Caulking	$90
8	Doors and Windows	$0
9	Painting	$30,638
10	Signs	$2,840
11	Equipment	$111,824
	Filter Vessels & Media	$344,960
15	Mechanical	$454,293
16	Electrical	$161,559
	Instrumentation	$35,095
	CONSTRUCTION SUBTOTAL	**$1,415,301**
	Engineering	
	DLEC	$24,207
	Heerup Design	$2,120
	Structural Shop Drgs	$3,000
	Special Inspections	$72,000
	AWS Design	$83,458
	AWS Construction Admin	$15,000
	AW Design (2% construction)	$28,306
	Construction Admin./Inspection	$100,000
	Engineering Total	$328,091
	Contingency (5% of construction)	$70,765
	AFUDC (7% of construction)	$99,071
	PROJECT TOTAL	**$1,913,228**

5-Apr-05

ARIZONA AMERICAN WATER
TUBAC DISTRICT

ARSENIC REMOVAL FACILITY
DESIGN CONCEPT

AMERICAN WATER WORKS SERVICE COMPANY, INC.
SYSTEM ENGINEERING
1025 Laurel Oak Road
Voorhees, New Jersey 08043
June 2004

PART I
PROJECT BACKGROUND

A. INTRODUCTION

Arizona American Water's (AAW) Tubac District supplies potable water to approximately 550 customers in the community of Tubac. The District currently obtains its water supplies from three wells distributed throughout the service area. A fourth well is currently planned for development. Arsenic is present in these four wells at levels exceeding the 0.010 mg/L (10 ug/L) maximum contaminant level (MCL) that was recently promulgated by the US Environmental Protection Agency (EPA). Arsenic removal facilities will need to be installed and in service by the Arsenic Rule's effective date of January 23, 2006 to comply with the pending MCL.

An evaluation of treatment alternatives was completed in December of 2003 to determine which treatment alternative(s) would be most appropriate for the Tubac District. The evaluation took into consideration the seven treatment technologies identified by the US EPA as Best Available Technologies (BAT) for the removal of arsenic from drinking water supplies. Consideration was also given to the use of disposable, iron-based adsorbent media, which has been shown through numerous pilot studies to be an effective alternative, and is identified as an approved technology in the Arizona Department of Environmental Quality's (AZDEQ) Arizona Arsenic Master Plan. It was concluded that granular iron media was the most cost-effective alternative for the Tubac District.

B. EXISTING SYSTEM CONFIGURATION

The existing wells providing service to the Tubac District are Well 2, Well 3, and Well 4. All three wells pump directly into the distribution system. Well 2 and Well 3 are used primarily as back up sources to Well 4. A fourth well, Well 5 (Garrett Well) is currently in development. Well 1 was removed from service due to declining water quality and/or yield.

The Palo Parado Water Plant is a booster pump station that provides 50,000 gallons of storage for the Tubac system. An additional 500,000-gallon storage tank and new booster pumping facilities are proposed at the Well 4 site. Hydropneumatic tanks at each well site are used to balance system pressures and prevent surges during pump starting and stopping.

C. WATER QUALITY

Table 1 presents summary information about each of the wells that serve the Tubac District. The table shows that the average concentration of arsenic in Well 2 and Well 4 exceeds the 10 ug/L MCL. Limited water quality testing performed on the Well 5 supply indicate that the arsenic concentration in this well exceeds the MCL. Table 2 presents additional water quality data from Well 4 and Well 5, which will be the primary sources for the Tubac District in the future.

Table 1
Summary of Well Characteristics – Tubac District

Well ID	Depth (ft)	Motor (HP)	Capacity (gpm)	Arsenic (ug/L)[1]	
				Average	Maximum
2	140	40	300	21	22
3	202	25	180	8	23
4	650	75	500	34	42
5[1]	TBD	TBD	500	20[1]	30

0. Well 5 is currently under development. Arsenic data based on one pump testing sample collected in 2003. Maximum level assumed to be 50% higher.

Table 2
Groundwater Quality Data – Tubac District

Parameter[1]	Well	
	4	5
pH	7.7	7.7
Alkalinity (as $CaCO_3$)	108	98
Hardness (as $CaCO_3$)	67	41
Iron	<0.1	0.4
Manganese	<0.1	<0.1
Fluoride	2.1	1.8
Silica	40	38
Sulfate	18.4	N/A
TDS	197	167

0. All units in mg/L except pH and temperature.
0. N/A = Not available

D. TREATMENT FACILITY SITE

As part of the evaluation of treatment alternatives, it was determined that the granular iron media treatment, storage, and booster pumping facilities should be centrally located at the Well 4 site. A new transmission main connecting Well 5 to the new booster facility will be provided. Currently, it appears as though AAW will be able to purchase approximately 3 acres adjacent to the Well 5 site to accommodate these facilities. The booster pumping facilities and transmission main will be designed under a separate contract. The engineer shall incorporate the proposed arsenic removal facility (ARF) into the design of the booster pump station (BPS)

E. DISTRIBUTION SYSTEM

The proposed granular iron treatment facility will be located between the well supplies and the proposed storage reservoir. The proposed booster pumping facilities will draw treated water from the storage reservoir and pump it into the system, similar to AAW's other BPS facilities.

F. FUTURE DEMANDS AND SUPPLIES

The Tubac system is made up entirely of residential and commercial customers. In recent years, demands in the Tubac District have averaged 0.26 mgd, with maximum

day demands reaching 0.47 mgd. In 2002, a Source of Supply Study (SOSS) was completed for the Tubac District that included projections of average and maximum daily demands through the year 2012. According to the SOSS, average and maximum day demands in the Tubac District may reach 0.38 mgd and 0.69 mgd, respectively, by the year 2012. When the development of Well 5 is complete, the combined capacity of the wells serving the Tubac District will total 2.13 mgd (1,480 gpm), with a reliable production capacity of 0.98 mgd (980 gpm) assuming one of the largest wells is out of service.

The permanent arsenic treatment facilities are planned to treat the Well 4 and Well 5 supplies only. Should the Well 2 and Well 3 supplies be required, AAW will provide a temporary treatment system as needed. It should be noted that the district will have adequate supply capacity to meet the future maximum day demands while operating either Well 4 or Well 5.

G. PRELIMINARY CONSTRUCTION COST ESTIMATE

A preliminary construction cost estimate was developed as part of the evaluation of alternatives for the Tubac District. The cost included the proposed granular iron media facilities, raw and finished water piping manifolds, backwash handling facilities, and associated electrical, instrumentation and site improvements. The total construction cost for the ARF is estimated to be $1.808 million. This cost does not include engineering, permits, AFUDC, land acquisition costs, and costs associated with construction of the proposed booster station facility.

Arizona-American Water Company - Tubac
Granular Iron Media Treatment Facility
Estimate of Probable Construction Costs

	Division/Item	Total
2	Sitework	$56,900
3	Concrete	$497,000
4	Masonry	$76,000
5	Structural Misc. Metals	$35,000
7	Insulation/Caulking	$6,000
8	Doors and Windows	$8,000
9	Painting	$23,000
10	Signs	$3,000
11	Equipment	$345,000
	Filter Vessels & Media	$188,000
15	Mechanical	$415,000
16	Electrical	$120,000
	Instrumentation	$35,000
	CONSTRUCTION SUBTOTAL	**$1,807,900**
	Engineering	
	Stanley Consultants	$203,479
	Esquema Architecture	$13,199
	Landscaping Consultant	$5,499
	Co. Labor / Const. Admin	$87,991
	Public Meetings / Relations	$49,495
	AW Design / RFP	$38,496
	Engineering Total	$398,158
	Contingency (10% of construction)	$180,790
	AFUDC (7% of construction)	$126,553
	PROJECT TOTAL	**$2,513,401**

5-Apr-05

Arizona American Water Arsenic Removal Facilities
Estimated Operation Costs[1]

Item	Granular Iron Media Facilities						Coagulation/Filtration Facilities	
	AF WP No. 1	AF WP No. 2	AF WP No. 5[2]	SCW WP No. 2	Lake Havasu	Tubac	PV (MRBS)[3]	SCW WP No. 1[4]
Power	$11,800	$10,500	$5,100	$6,215	$5,200	$1,400	$330,000	$26,600
Equipment Repair Allowance[5]	$40,500	$39,900	$21,000	$27,000	$22,400	$10,400	$109,900	$34,600
Chemicals/Media	$438,600	$215,700	$95,500	$222,400	$150,300	$140,500	$67,600	$33,900
Sludge/Media Disposal	$8,500	$4,200	$1,800	$5,000	$2,900	$2,600	$20,200	$2,900
Total	**$499,400**	**$270,300**	**$123,400**	**$260,615**	**$180,800**	**$154,900**	**$527,700**	**$98,000**
Lead Vessel Media Life (months)	6	7	3	6	14	6	-	-
# Trains	3	2	2	2	1	1	-	-

Notes

1. Labor and allowance for equipment repair not included.
2. AF WP No. 5 Wells requiring treatment (5.1 & 5.2) will be used for peaking only. Assumed that arsenic treatment system will operate a total of 3 months annually.
3. Disposal costs assume hauling dewatered solids to a landfill.
4. Disposal costs assume discharge of thickened sludge to sewer.
5. Assumed 2.5% of equipment capital cost.

note sewer disposal