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DISPOSITION OF ORIGINAL EXHIBITS

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April 20, 2004

Mr. Dwight D. Nodes
Assistant Chief Administrative Law Judge
ACC – HEARING DIVISION
1200 West Washington, 1st Floor
Phoenix, AZ 85007

Arizona Corporation Commission
DOCKETED
APR 2 0 2004
DOCKETED BY

Case: Pine Water Company – Volumes I through VI
Number: W-03512A-03-0279
Dates: March 9 – 12, 19, and April 2, 2004

Dear ACALJ Nodes:

With copy of this letter the original exhibits in this matter have been distributed, as follows:

Docket Control	A-1 through A-8, A-10, and A-12	B-1 and B-2
	C-1 and C-2	JE-1
	PS-1 through PS-6, PS-8, PS-12, and PS-13	S-1 through S-14
Returned to Applicant	A-9	

Exhibit A-9 is being returned to the applicant because it was not moved for admission on the record either inadvertently or by design.

Exhibits A-11, PS-7, and PS-9 through PS-11 were not utilized and not provided to the court reporter.

Please let us know if you have any questions or if we may be of any further assistance.

Very truly yours,

Marta T. Hetzer
Administrator/Owner

COPY FOR YOUR INFORMATION

Copy to: Pine Water Company
Pine-Strawberry Water Improvement District
John O. Breninger, Intervenor
Robert M. Cassaro, Intervenor
Staff
Docket Control

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Attorneys for Pine Water Company, Inc.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-

DIRECT TESTIMONY OF

ROBERT T. HARDCASTLE

EXHIBIT
A-1
admitted

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I. INTRODUCTION AND QUALIFICATIONS

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

A. Robert T. Hardcastle, 3101 State Rd., Bakersfield, California 93308. My telephone number is (661) 633-7526.

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

A. I am the President of Brooke Utilities, Inc. Brooke Utilities is the sole shareholder of the Applicant, Pine Water Company, Inc. ("Pine Water" or the "Company").

Q. PLEASE BRIEFLY OUTLINE YOUR RESPONSIBILITIES AS PRESIDENT.

A. As the Executive Officer, I am generally responsible for managing all operational, administrative, financial, and regulatory matters of Brooke Utilities and its subsidiaries, Pine Water, Strawberry Water Co., Inc., Payson Water Co., Inc., Tonto Basin Water Co., Inc., Navajo Water Co., Inc., Brooke Water, L.L.C., and Circle City Water Co., L.L.C. Each of these subsidiaries is a public service corporation providing water utility service under regulation by the Arizona Corporation Commission ("Commission").

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE ARIZONA CORPORATION COMMISSION?

A. Yes, on several occasions. Most recently, I testified before the Commission on April 18, 2003 in support of Pine Water's request for approval of a revised Curtailment Tariff and an interim rate surcharge.

II. BACKGROUND ON PINE WATER COMPANY

Q. WHEN DID BROOKE UTILITIES ACQUIRE THE PINE WATER SYSTEM?

A. In August 1996, Brooke Utilities acquired E&R Water Co., Inc. and Williamson

Waterworks, Inc. At that time, the plant serving what is now Pine Water's service area was in a state of nearly total disrepair following years of inadequate investment and neglect. There were literally hundreds of line leaks, storage was woefully inadequate and many of the system's wells were inoperative. These problems served to exacerbate the impacts of water supply shortages in the area.

Q. WHAT HAPPENED TO E&R AND WILLIAMSON WATERWORKS?

A. A few years ago Brooke Utilities reorganized some seven separate water companies and systems it acquired in 1996 into five separate subsidiaries, including Pine Water and Strawberry Water. The operational and geographical reorganization was approved by the Commission in Decision No. 60972 (July 1998).

Q. HOW MANY CUSTOMERS DOES PINE WATER PRESENTLY SERVE?

A. Presently the Company has just under 2,000 customers, although the number was approximately 1850 during the test year. I should note that this recent growth is the result of recent changes in the Commission's orders prohibiting new connections in Pine Water's CC&N, which changes allowed a significant number of new connections from the Company's so-called Waiting Lists. It is not reflective of typical growth rates in the certificated service area.

Q. WHEN DID THE CURRENT RATES GO INTO EFFECT?

A. The Company's current rates were approved in Decision No. 62400 (E&R Water Co., Inc.) on March 28, 2000 and went into effect on April 1, 2000; and Decision No. 62363 (Williamson Waterworks, Inc.) on March 6, 2000, and went into effect on April 1, 2000.

III. <u>PURPOSE OF TESTIMONY, SUMMARY AND CONCLUSIONS</u>

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

A. To support Pine Water's application for permanent rate relief and financing approval. This application, like the Company's February 2003 requests for approval of an interim rate surcharge and a revised Curtailment Tariff, are essential to Pine Water's financial viability. The Company has experienced operating losses in each of the last three years. Those losses are due primarily to two factors: (1) increased water purchase costs since the implementation of Project Magnolia in 2001, subsequent to the Company's last rate proceeding; and (2) unrecovered water hauling expenses due to critical water supply shortages in three of the last four years. As a consequence, the Company is in substantial need of permanent rate relief.

Q. WHAT DO YOU MEAN BY "CRITICAL WATER SUPPLY SHORTAGES"?

A. It is no secret, nor can there be any legitimate dispute, that the Pine, Arizona area is now and for decades has been plagued by water supply limitations. I have attached to my testimony a hydrologist's report prepared for the Company that clearly illustrates the long-standing nature of the problems. *See* Exhibit A, Clear Creek Associates *Water Resources Study Strawberry/Pine, Arizona* dated March 27, 2002. Since the Company's current rates went into effect, Arizona's ongoing drought conditions have served to worsen the typical water supply limitations that prevail in the area. At the same time, Gila County has undertaken a concerted effort to promote growth in the Pine-Strawberry area in order to enhance the County's tax base, further straining the area's limited water supplies. As a result, although Pine Water has made great strides in improving and expanding infrastructure, as the Commission has recognized, water supplies remain limited.

Q. IN DECISION NO. 65435, THE COMMISSION ORDERED PINE WATER TO INCLUDE A DETAILED PLAN CONCERNING HOW IT WOULD

ADDRESS THESE WATER SHORTAGE PROBLEMS. IS SUCH A PLAN INCLUDED IN THIS FILING?

A. Yes, attached to my testimony as Exhibit B is the Company's *Water Supply Augmentation Plan*. In this plan, the Company outlines several steps that can and should be considered as part of an overall plan to further minimize the impact of the region's chronic water shortages on Pine Water's ratepayers by enhancing available supplies and constructing related infrastructure, as well as improving existing infrastructure. Unfortunately, however, there is simply no viable, or inexpensive, solution that will eliminate the water supply problems facing Pine Water and its customers.

Q. ARE YOU SAYING THAT PINE WATER WILL ALWAYS FACE WATER SUPPLY PROBLEMS?

A. As a practical matter, I am afraid the answer is yes. There have been numerous calls by, among others, Gila County, developers, customers, and to some extent this Commission, for massive capital investment by Brooke Utilities to solve the water supply problems that impact the Company and its ratepayers. But our customers cannot drink or bathe in money, and to a large extent the lack of water is a hydrological reality no amount of capital investment can eradicate. Additionally, there are numerous legal constraints to many of the potential measures to minimizing the impacts of supply shortages, such as prohibitions on inter-basin transfers under Arizona law and restrictions on uses of CAP water. But, most importantly, there are certain financial realities that must be accepted. There simply are no cheap or quick fixes.

Q. WHAT "FINANCIAL REALITIES" ARE YOU REFERRING TO MR. HARDCASTLE?

A. Even assuming unlimited capital investment would eliminate the water supply

shortages, and further assuming that Brooke, or someone else, has unlimited capital to invest to find new water sources and construct infrastructure – two very questionable assumptions in my view – can the Company's customers really be expected to pay the costs of such investment? In other words, the massive financial investment that would be required to solve the water supply shortages Pine Water faces may not be feasible on the backs of less than 2,000 ratepayers. Certainly a capital and operational solution to the problem that creates an economic impossibility is no solution at all.

Let me give an example. Intervenor John Breninger testified during the interim rate proceeding that it would cost as much as $4,000,000 for Pine Water to drill some unknown number of so-called "deep wells" to access as yet untapped aquifers lying well below the surface. Initially, I should point out that we believe such an estimate is extremely conservative given the need for infrastructure, delivery systems, pumping capability, and related equipment to make such a deep well even minimally productive. In any event, adding $4,000,000 to the Company's rate base, at an extremely conservative rate of return of 10% for a Company with this level of risk, would add approximately $400,000 to the Company's return on rate base, plus an estimated $260,000 for income taxes and $100,000 for depreciation expense. Consequently, a one time $4,000,000 investment in deep wells would add approximately $760,000 to the Company's annual revenue requirement, resulting in an average impact on residential customers of approximately $32 per month--just to provide the Company a return **on** and return **of** such an investment. This does not include the increased operating expenses, which would be significant given the pumping costs associated with pumping water found at much lower levels than the Company's existing supplies, or the costs of any other necessary capital investment by Pine Water.

Put bluntly, it cannot be overstated that the problems facing Pine Water are not easily solved, and any measures must be considered in the broader hydrological, legal, regulatory and economic framework.

Q. DOESN'T THIS MAKE CONSERVATION AN IMPORTANT TOOL IN MINIMIZING THE IMPACTS OF WATER SUPPLY SHORTAGES ON PINE WATER AND ITS RATEPAYERS?

A. Absolutely, and the revised Curtailment Tariff and interim rate surcharge under consideration by the Commission as this testimony is being written and filed are key components of the overall conservation plan. Right now, there is little consequence to customers who fail to meet mandatory conservation measures. Furthermore, in the past it has been easy for customers and, frankly, the Commission, to insist that Pine Water haul water to customers at tremendous expense during times of critical supply shortages because there is absolutely no financial impact on the customers. These circumstances undermine conservation efforts and exacerbate the supply and financial problems faced by Pine Water.

Q. WHAT ADDITIONAL CONSERVATION STEPS ARE BEING PROPOSED BY THE COMPANY IN THIS PROCEEDING?

A. There are several. First, as explained in Tom Bourassa's direct testimony, the rate design proposed by the Company is intended to make those who place a greater demand on the system pay a greater share of the costs through, among other things, a seasonal rate design that requires rate payers to pay more in the summer months when historically increased water demand typically outstrips the available supply. These rate design characteristics will send a strong price signal to enhance conservation efforts. Next, as Mr. Bourassa also explains, the Company is seeking a permanent means of recovering the costs of augmenting supplies during periods of critical shortages, costs that are always likely to exceed recovery through rates.

A permanent water augmentation surcharge, like the interim surcharge currently pending Commission approval, will send another strong conservation price signal, especially when coupled with the proposed, revised Curtailment Tariff also pending before the Commission. Lastly, the Company proposes a Customer Education Program, as illustrated in Exhibit C attached to my testimony.

IV. PINE WATER'S PAST, PRESENT AND FUTURE EFFORTS TO IMPROVE ITS WATER SYSTEM AND SUPPLIES

Q. WHAT STEPS HAVE BEEN TAKEN TO AUGMENT THE WATER SUPPLIES AVAILABLE TO SERVE CUSTOMERS SINCE BROOKS UTILITIES ACQUIRED THE PINE WATER SYSTEM?

A. Since August 1996, Brooke Utilities has drilled five new wells in Pine and six new wells in Strawberry. Two of the wells in Pine and four in Strawberry were developed under long-term water sharing agreements with local property owners and remain in production. Two other existing wells were re-drilled to greater depths where increased sources of water supply were believed to be available. Another well in Strawberry was "straight-bored" to correct an original drilling problem, deepened, and also remains productive. Brooke Utilities' efforts to repair and maintain the existing water system infrastructure as well as new well exploration has produced a dramatic increase in water production as compared to pre-1996 levels.

We have also worked diligently to recapture water from the leaking infrastructure we inherited from our predecessor. The infrastructure is primarily comprised of materials used and approved in the 1970's and 1980's that are not preferred today. This has the same general effect as exploring for new water. Since 1996, more than 700 leaks have been repaired in the water systems in Pine and Strawberry, with the majority of these leaks located in Pine. We estimate that

these efforts have produced an additional 250,000 gallons per day and the Company remains diligent in its leak repair program.

Further, since 1996, approximately 170,000 gallons of additional water storage capacity has been developed in Strawberry and more than 100,000 gallons of water storage capacity has been developed in Pine. This additional water storage capacity allows Pine Water to better manage its operational needs. Additionally, Pine Water has completely interconnected its water facilities so that water movement within the Company's certificated service to meet fluctuating demand can be more efficiently accomplished.

Q. ANY OTHER SIGNIFICANT EFFORTS?

A. Yes, perhaps the most important effort undertaken was the construction of "Project Magnolia" in early 2001. This 10,800-foot pipeline constructed, owned and operated by Brooke Utilities, connects the water systems of Pine Water and Strawberry Water and can deliver up to 700,000 gallons per day between the two systems. The water supply available to Strawberry Water is greater and more stable than that of Pine Water and Project Magnolia transports large quantities of water from Strawberry to Pine to supplement deficient water supplies.

Q. DESPITE THESE EFFORTS, PINE WATER CONTINUES TO FACE WATER SUPPLY PROBLEMS?

A. That is correct. The explanation to Pine Water's limited water supply is primarily hydrological and geological. There has never been proof of an aquifer below Pine, Arizona. Rather, geological research suggests that water travels from north to south and from east to west in the Mogollon Rim area through fractured rock. These fractures create fissures in which small and limited amounts of water can collect. If a well is drilled in a fissure it is likely to be a limited production well. If a well is drilled outside of a geological fissure the water supply is even more limited or

non-existent. Since 1996, Pine Water Co. has drilled four wells in Pine that were economically unproductive.

Frankly, another reason for the limited water supply is Gila County's obsession with increased levels of residential and commercial development in the area. The County has ignored the fundamental fact that the water supply in Pine is inherently limited, conditions known and acknowledged by many observers, including Gila County, for decades. Gila County has nevertheless allowed the population of Pine, Arizona to increase to a level that exceeds the additional supplies resulting from the many improvements made by Brooke Utilities. Yet, the County has never implemented a water conservation program in Northern Gila County. These acts and omissions by the County have contributed substantially to the water supply problems.

Q. WHAT STEPS IS PINE WATER CURRENTLY TAKING IN AN EFFORT TO FURTHER IMPROVE ITS SYSTEM AND ADDRESS THESE WATER SUPPLY LIMITATIONS?

A. The current steps being taken by Pine Water are described in greater detail in the Augmentation Plan attached to my testimony as Exhibit B. Of course, Pine Water is in the midst of the proceeding before the Commission concerning the revised Curtailment Tariff and interim surcharge mechanism to recover costs of water supply augmentation during periods of critical water supply shortages. These are two very important steps in the overall plan to address the water supply problems prevailing in Pine, Arizona because together these measures promote and enforce conservation as well as protect the Company's financial viability.

Additionally, Pine Water commenced drilling three new water wells in Strawberry in April 2003. This water can be moved from the far reaches of Strawberry to any area of Pine through Project Magnolia. The Company has also

recently installed telemetry tank monitoring devices on all critical water storage tanks in Pine and Strawberry to allow for more accurate, timely, and regular electronic reporting of water storage levels. This information will assist Pine Water in forecasting future water storage levels, monitoring conservation stages, and managing the available water supplies in Pine and Strawberry in a much more timely fashion.

Q. WHAT STEPS IS PINE WATER CONSIDERING IN THE FUTURE TO ADDRESS THE WATER SUPPLY PROBLEMS IT FACES?

A. Again, the attached Augmentation Plan provides a detailed discussion of alternatives that <u>might</u> be pursued to address chronic water supply shortages. In the short-term, Plan alternatives under consideration include increased water storage, condemnation of water supplies, and further water exploration and water sharing arrangements, in addition to those efforts already underway. Beyond the near-term future, Plan alternatives being considered include the possibility of an exchange of Pine Water's Central Arizona Project water allocation and implementation of an increasingly progressive rate design structured to promote conservation and allocate more of the cost burden on those placing a greater demand on the system. Other such mid-range alternative measures discussed in the Augmentation Plan include well exploration on public lands, increased hydrological studies and perhaps the possibility of legislative changes that would protect the Pine, Arizona region's scarce water resources while improving Pine Water's ability to meet ever increasing customer demand.

Q. THE AUGMENTATION PLAN ALSO DISCUSSES SOME LARGER PROJECT ALTERNATIVES. COULD YOU IDENTIFY THOSE ALTERNATIVES?

A. Sure. One of the projects that has been under discussion for some time is the Pine

Reservoir Project, theoretically a massive water storage reservoir intended to store supplies available during non-peak times for use during periods of peak demand. Another alternative discussed in the Plan is the possibility of so-called deep well exploration, an effort to tap water resources that are believed to exist up to or even beyond 2000 feet below ground.

Q. HOW DOES PINE WATER PROPOSE TO IMPLEMENT THE ALTERNATIVES IDENTIFIED AND DISCUSSED IN THE PLAN?

A. That is not a question that can currently be answered. Initially, it must be pointed out that the Augmentation Plan attached to my testimony as Exhibit B was prepared in direct response to the Commission's directive in Decision No. 65435 that the Company include in its rate filing a plan for addressing the water supply problems that have plagued the Pine area. The Augmentation Plan submitted herewith is intended as an outline of the possible, or maybe I should say theoretical, alternatives Pine Water is aware of and believes are worthy of consideration and further discussion. Some alternatives, like new wells and water sharing agreements, the revised Curtailment Tariff and the initial steps towards a more progressive rate design are within Pine Water's discretion and power to implement or seek approval to implement, and the Company has already taken steps toward such implementation.

However, many of the alternatives, such as the Pine Reservoir Project, deep well exploration or exchange of the Company's CAP allocation require the collective efforts of the Company and its ratepayers, as well as the Commission, its Staff and various other federal, state and County governmental agencies. Put bluntly, it would not be prudent for Pine Water to simply plow forward with implementing the more complex alternatives identified in the Augmentation Plan until the collective efforts of those identified above demonstrates that such

alternatives are: (1) hydrologically sound; (2) operationally feasible; (3) legally possible; and (4) economically viable.

Q. DOES THE PLAN DISCUSS COSTS AND OTHER OPERATIONAL, LEGAL AND/OR PRACTICAL CONSIDERATIONS?

A. Yes, to the extent such information is known or subject to estimation, we have identified projected costs and identified a number of advantages, disadvantages and concerns relative to specific alternatives. As can be readily seen, as I pointed out above, what this information illustrates is that there are no easy quick, low cost solutions to the water supply problems in and around Pine, Arizona.

Q. HOW WILL IMPLEMENTATION OF THE PLAN ALTERNATIVES BE FUNDED?

A. Again, the Company can only provide partial answers to that question. As indicated in the Augmentation Plan, funding various alternatives would occur by debt and/or equity financing. Pine Water also is proposing that the Commission approve a Water Exploration Surcharge. As explained by Mr. Bourassa in his direct testimony, this surcharge would help offset the costs to be incurred by Pine Water and Brooks Utilities while helping to better allocate the risks associated with such capital projects.

But the source of capital funding is not really the problem. Where should all this capital be spent? What if millions of dollars are spent pursuing one or two of the alternatives I have identified and little or no additional water is secured? Is Brooke Utilities really assured of recovery? Or will some argue that such investments are not prudent because they did not yield a quantity of water to justify the expenditure?

Q. MR. HARDCASTLE, ARE YOU SUGGESTING THAT PINE WATER AND ITS SHAREHOLDER WITHHOLD CAPITAL INVESTMENT AND DO

NOTHING TO AUGMENT EXISTING SUPPLIES EXCEPT HAUL WATER IN EMERGENCIES?

A. Absolutely not. Brooke Utilities has already demonstrated its commitment to improving service to customers by exploring new sources and improving infrastructure. As I said, Brooke Utilities is willing to continue to do so within reason but it will not shoulder all of the risk associated with the search for the wet needle in the big dry haystack, as it has done since acquiring the Pine Water system in 1996. In large part, the exploration surcharge mechanism is designed to offset and better allocate such risks to those creating the demand for solutions.

And that really illustrates the problem. Again, not only are there no quick and inexpensive fixes, there may be no fixes at all for the water supply problems that plague Pine water and its ratepayers. As a consequence, until all interested parties can agree on which of the Augmentation Plan alternatives should be pursued, beyond their identification in some sort of "White Paper" like Exhibit B, pinpointing a funding plan is not possible. There is simply too much uncertainty in most of the Plan alternatives for Brooke Utilities to proceed on its own facing all of the risk yet armed only with a mere hope of cost recovery.

Q. WHAT ABOUT CONSERVATION? WHAT ADDITIONAL STEPS DOES PINE WATER PROPOSE TO FURTHER PROMOTE CONSERVATION?

A. In addition to the proposed, revised Curtailment Tariff and associated water hauling surcharge mechanism now pending Commission approval. Pine Water has also included its proposed Customer Education Program in this rate filing pursuant to Commission directives. *See* Exhibit C. The proposed Customer Education Program is another important tool in the Company's efforts to address the water supply problems through a combination of new rate design, additional capital investment and various conservation measures.

Q. HOW DOES THE CUSTOMER EDUCATION PROGRAM AID THE COMPANY IN THESE EFFORTS?

A. As described in the attached proposed Education program, the Company proposes to facilitate the dissemination of information to customers regarding water system and supply issues as needed during critical and pertinent time periods. Pine Water's Customer Education Program outlines a variety of measures that will be used to disseminate information including mass mailings, bill inserts, customer and community meetings, and a variety of methods of providing information regarding current water supply conditions. This Program should allow Pine Water and its ratepayers a far greater opportunity to conserve precious water supplies and manage the water systems to maximize delivery capability.

V. REQUEST FOR PERMANENT RATE RELIEF

Q. WHY IS PINE WATER SEEKING PERMANENT RATE RELIEF AT THIS TIME?

A. Well, initially I should point out that the exact timing of this rate filing is pursuant to Commission order in Decision No. 65435, wherein the Company was ordered to file an application for permanent rate relief no later May 1, 2003. Beyond the Commission dictating the timing of this filing, however, Pine Water has a substantial need for rate relief.

Q. WHY DOES PINE WATER NEED RATE RELIEF?

A. As explained in Mr. Bourassa's direct testimony, Pine Water has suffered operating losses for each of the past three years. This is true, primarily, due to increased operating expenses being incurred by the Company associated with Project Magnolia, the water delivery project I discussed above. Because Project Magnolia came online after the Company's current rates were approved, none of the costs, including the cost of purchasing water from Strawberry Water or the costs

associated with the transportation of that water through Project Magnolia, are being recovered by Pine Water.

In addition, Pine Water seeks a mechanism to make permanent the type of expense recovery being addressed in the pending Curtailment Tariff and interim rate docket. Again, as explained earlier in my testimony, and in Mr. Bourassa's direct testimony, the Company faced significant increases in operating expenses three of the past four years to augment water supplies during periods of critical shortage. Again, like the costs associated with Project Magnolia, none of these increased costs have been recovered by Pine Water. And, while the interim surcharge mechanism will allow Pine Water to recover some of the costs it will incur to haul water until such time as the Commission issues a decision in this rate proceeding, the Company remains concerned that the costs of augmenting water supplies during periods of critical shortages, which costs have historically run ten times normal operating costs, will never be fully recovered through permanent rates. Therefore, the Company seeks approval of permanent rate recovery methodology to address the costs associated with water hauling and other means of water augmentation.

Q. ARE THERE ANY OTHER REASONS FOR THE COMPANY'S APPLICATION FOR PERMANENT RATE RELIEF?

A. Yes, further pursuant to Commission directive in Decision No. 65435, Pine Water has included in this filing its Water Supply Augmentation Plan, Exhibit B, and its Proposed Customer Education Program, Exhibit C. Not only does Pine Water view these proceedings as an opportunity for the Company and the Commission to begin the process of implementing such plans, this rate proceeding is also necessary to ensure that the initial steps towards capital investment and recovery of such investment are addressed. As explained above, there is a substantial amount of

planning and decision making that needs to be conducted by all interested parties, not just Pine Water, in order to determine the best alternatives to pursue to augment Pine Water's existing available water sources. In addition, it is necessary to begin the process of developing ways to fund the capital investment needed to both explore for new resources and to develop such resources and to make them productive. This proceeding provides the first opportunity for the Commission, its Staff, the Company and its ratepayers to substantively address these very important issues.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

1414529.1

HARDCASTLE DIR. EXH. A

CLEAR CREEK ASSOCIATES

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March 27, 2002

Mr. Thomas R. Wilmoth, Esquire
Fennemore Craig, P.C.
3003 North Central Avenue, Suite 2600
Phoenix, Arizona 85012-2913

Letter Report
Water Resources Study
Strawberry/Pine, Arizona

Dear Mr. Wilmoth:

This letter presents the analysis and findings of Clear Creek Associates' water resources study of the Pine Water Company service area and Strawberry Water Company service area. As part of this investigation, Clear Creek Associates reviewed existing documents and basic data that were obtained from public sources and Brooke Water Company. We also interviewed a local well drilling firm, Aero Drilling Company of Payson, Arizona, to obtain additional verbal information relating to the local groundwater conditions. Clear Creek Associates prepared groundwater elevation contour maps and conducted a flow net analysis to estimate the groundwater resources of the Strawberry/Pine area. We also prepared hydrographs of wells in the Pine and Strawberry service areas, to assess the relationship between local groundwater levels and regional precipitation events.

GROUNDWATER ELEVATIONS AND FLOW DIRECTION

Clear Creek Associates prepared a groundwater elevation contour map of the Strawberry/Pine area, which is presented on Figure 1. The Strawberry/Pine groundwater elevation map is based on water level data from the Arizona Department of Water Resources (ADWR) Groundwater Site Inventory (GWSI) records. Most of the water level data for the area were measured in 1987, with some water level measurements from more recent years between 1996 and 1999 (Figure 1).

The groundwater table in the Strawberry/Pine area ranges in elevation from approximately 5,818 feet above mean sea level (MSL) in the northeastern portion of Strawberry service area, to approximately 5,262 feet MSL near the west-central portion of the Pine service area. Generally, groundwater moves through the region in a southward and westward direction. Figure 2 shows a regional groundwater elevation map that was prepared by ADWR and the United States Geological Survey (USGS) for the region north of the Strawberry and Pine service areas

(McGavock and others, 1986). The regional groundwater map indicates a groundwater gradient (water table slope) to the west (Figure 2). This westward groundwater gradient is also reflected in the local groundwater elevation contours for the Strawberry area (Figure 1).

The natural groundwater gradient has been reversed in the Pine area, however, by the development of a groundwater depression (drawdown cone), which is indicative of groundwater withdrawal in amounts exceeding the rate of natural recharge. The drawdown cone in the Pine area extends to the eastern boundary of the Strawberry service area, causing some groundwater from that area to migrate in an eastward direction. The flow direction of groundwater always occurs at right angles to groundwater elevation contours. The approximate pathway of groundwater flow (flux) beneath the Strawberry/Pine area is represented by the arrows on Figure 1. Groundwater enters the area from the north, and splits into a westward flow path (in response to the natural hydraulic gradient) and an eastward flow path (in response to the drawdown cone in the Pine area) (Figure 1). The groundwater flow paths on Figure 1 indicate that the Pine service area is receiving groundwater flux from essentially the same source area as the Strawberry service area. The Pine service area may also receive groundwater flux directly from the north (along Pine Creek) and/or the east (from the Mills Ranch Point area), but groundwater elevation data for those areas were insufficient to include them in the groundwater elevation map.

SENSITIVITY OF THE STRAWBERRY/PINE AREA TO DROUGHT CONDITIONS

The groundwater supply available to an area is directly related to the amount of recharge that occurs up-gradient of the area, and the amount of groundwater in storage that can be withdrawn. Recharge occurs when water from precipitation or runoff percolates down into the aquifer through pore spaces and fractures in the earth. The amount of recharge varies from year to year, in response to changes in precipitation rates. The sensitivity of an aquifer to drought conditions depends on the horizontal extent of the up-gradient recharge area, and the amount of groundwater in storage.

Groundwater in storage in the Strawberry/Pine area occurs in sedimentary rocks that are composed of sandstone, siltstone, or limestone formations of Paleozoic age (over 200 million years old). While these formations have some porosity between sediment grains, much of the original porosity was lost by compaction and cementation of the sediment during lithification. Secondary porosity is created by fractures and faults that occur within the Paleozoic strata. The secondary porosity in the Strawberry/Pine area is high enough to allow generally uninterrupted groundwater flow through the area, but the volume of groundwater stored in the fractures and pore spaces is relatively small.

The horizontal extent of the recharge area for the Strawberry/Pine area is also limited. The regional groundwater map prepared by ADWR and USGS shows a groundwater divide only several miles north of the Strawberry and Pine service areas (Figure 2). This groundwater divide is the northern limit of the area that contributes groundwater flux to the Strawberry/Pine aquifer

system. This relatively small recharge area is analogous to a small watershed that contributes surface water to a small stream only in response to precipitation events. In times of extended drought, the lack of recharge would likely result in severe impact to the groundwater resources of the Strawberry/Pine area.

EVALUATION OF HYDROGRAPHS IN THE STRAWBERRY AND PINE AREAS

A hydrograph is an x-y plot for a single well, which shows changes in the groundwater depth (shown on the left vertical axis) over time (shown on the bottom horizontal axis). Clear Creek Associates prepared hydrographs for two wells in the Strawberry Water Company service area, and for two wells in the Pine Water Company service area. The locations of those wells are shown on Figure 3, and they have been labeled as Wells No. 1 through No. 4, for reference. The hydrographs for Wells No. 1 through No. 4 are presented in Attachment A.

In addition to the groundwater data, the hydrograph plots include monthly precipitation data from the Payson weather station, for the period from 1986 to 2000 (Attachment A). The precipitation data show that the period from November 1986 to February 1993 was wetter (with an average monthly precipitation of about 1.7 inches per month), and the subsequent period from March 1993 to December 1999 was dryer (averaging only about 0.7 inches per month). This change in precipitation is directly reflected by both wells in the Strawberry area.

Well No. 1 had rising water levels from November 1990 to April 1993, followed by a declining water-level trend that resulted in an approximate 81-foot decline in groundwater depth from about 45 feet below land surface (bls) in April 1993, to about 126 feet bls in December 1999. The water level in this well dropped as low as 184 feet bls in August 1997 (Attachment A).

Well No. 2 has a shorter period of record, but also had rising water levels from January through May 1993. The following period had a declining water-level trend similar to Well No. 1, which also resulted in an approximate 81-foot decline in groundwater depth from about 196 feet bls in May 1993 to about 277 feet bls in November 1999. The water level in this well also dropped significantly in August 1997, to about 301 feet bls (Attachment A).

The two wells in the Pine area have somewhat different water-level trends, which may result from importation of water from the Strawberry area after 1997. Brooke Water Company did not own Pine Water Company or Strawberry Water Company prior to 1997, and thus, they do not have records of previous water transfers. However, during some previous years, water was reportedly hauled into the Pine and Strawberry areas from the Starlight Pines area to the north (Mr. Dean Shaffer, personal communication). The water transfers from Strawberry to Pine since 1997 are shown below, in Table 1.

TABLE 1 – Water Transfers from Strawberry Water Company to Pine Water Company	
Year	**Water Transfer (gallons)**
1997	1,169,000
1998	3,763,400
1999	539,700
2000	5,535,000
2001*	16,008,000

*Through November 2001

Well No. 3 had variable but generally stable water levels from prior to 1993, followed by an abrupt water-level decline of approximately 65 feet from March to August 1993. The water level then recovered and remained somewhat stable until March 1995, when water-level declines again resulted in a drop of about 77 feet by November 1996 (Attachment A). Significant water-level declines have not been measured in this well after 1997, possibly due to the water transfers from the from the Strawberry area (Table 1).

The water levels in Well No. 4 are quite variable but generally stable prior to 1993. An abrupt water-level decline of approximately 99 feet occurred from April to August 1993. The water level then recovered and remained somewhat stable until August 1995, when an abrupt water-level rise and decline occurred from August 1995 to November 1996 (Attachment A). The water level has increased in this well since 1997, possibly due to the water transfers from the from the Strawberry area (Table 1).

FLOW NET ANALYSIS OF THE STRAWBERRY AND PINE AREAS

Aquifer test data can be used to estimate the transmissivity (T) of an aquifer, which generally represents the aquifer's ability to transmit groundwater to a pumping well. The T value is represented in units of gallons per day per foot (gpd/ft), and is related to the hydraulic conductivity (K) and aquifer thickness (b) by the relationship:

$$T = Kb$$

Information from four aquifer tests in the Strawberry and Pine service areas were provided by Brooke Water Company. The aquifer test data were evaluated using the Cooper-Jacob (1946) method to estimate the transmissivity at each well site. The aquifer test data and Cooper-Jacob Plots for each well are presented in Attachment B, and the results of the aquifer test analyses are presented in Table 2, below. The locations of wells that were tested are shown on Figure 4.

TABLE 2 – Aquifer Test Results, Strawberry/Pine Area		
Well Name	**Transmissivity (gpd/ft)**	
Strawberry View III Well	17	Average = 117
Johnson Well #1	215	
Johnson Well #2	119	
Bloom Well	537	537

The local aquifer test data enabled Clear Creek Associates to perform a flow net analysis of the Strawberry/Pine area, to estimate the rate of groundwater flux beneath the two service areas. The rate of groundwater flow can be estimated with the relationship:

$$Q = KIA$$

Where,

Q is the groundwater discharge (flow) in gallons per day (gpd),

K is the hydraulic conductivity in gallons per day per square foot (gpd/ft^2),

I is the groundwater gradient (slope) in horizontal feet per foot of drop (ft/ft, or unitless), and

A is the cross-sectional area of the aquifer in square feet (ft^2).

Based on water levels and well depths in the area, Clear Creek Associates conservatively considers the aquifer thickness (b) to be approximately 327 feet. The width of the Strawberry service area is approximately 1 mile (5,280 feet) at right angles to the down-gradient direction, so the cross-sectional area (A) of the aquifer is considered to be 1,726,560 ft^2.

From the local groundwater elevation contours (Figure 1), the groundwater gradient (I) was measured to be approximately 140 feet per mile (0.026 ft/ft).

The average T value for the Strawberry area is 117 gpd/ft (Table 2, Attachment B), and the aquifer thickness is conservatively considered to be 327 feet, as indicated above, so a representative K value for the Strawberry area is considered to be 0.358 gpd/ft^2.

Using these values for the Strawberry area, the groundwater flux is calculated to be:

$Q = KIA$
$Q = (0.358) \times (0.026) \times (1{,}726{,}560)$
$Q = 16{,}071$ gpd

Converting units,

Q = 5,865,849 gallons per year (gal/yr) for the Strawberry area
Q = 18 acre-feet per year (AF/yr) for the Strawberry area

Since the natural groundwater gradient in the Pine area has been disturbed by the local drawdown cone, we assume that the hydraulic gradient (I) and aquifer thickness for that area are similar to the Strawberry area. Therefore, the aquifer thickness (b) is considered to be approximately 327 feet. The width of the Pine service area is approximately 1.5 miles (8,011 feet) in the northwest-southeast direction, at right angles to what was likely the original groundwater flow direction. Thus, the cross-sectional area (A) of the aquifer is considered to be 2,619,597 ft^2.

From the local groundwater elevation contours (Figure 1), the groundwater gradient (I) was measured to be approximately 140 feet per mile (0.026 ft/ft).

The T value for the Bloom Well in the Pine area can be estimated to be several different values, as the well was pumped intermittently for a 3-day period (Attachment B). The lowest T value of 537 gpd/ft (Table 2, Attachment B) was calculated from data from the initial pumping period. This T value is considered most representative of the true aquifer conditions, due to the possibility of incomplete water level recovery prior to the last two pumping periods. The aquifer thickness is conservatively considered to be 327 feet in the Pine area, as indicated above, so a representative K value for the Pine area is considered to be 1.64 gpd/ft^2.

Using these values for the Pine area, the groundwater flux is calculated to be:

$Q = KIA$
$Q = (1.64) \times (0.026) \times (2{,}619{,}597)$
$Q = 111{,}700$ gpd

Converting units,

Q = 40,770,360 gallons per year (gal/yr) for the Pine area
Q = 125 Acre-feet per year (AF/yr) for the Pine area

Therefore, our analysis indicates that the estimated groundwater resource for the Strawberry/Pine area is at least 143 AF/yr (46,636,209 gal/yr).

The above groundwater supply estimate for the Strawberry/Pine area is quite conservative, due to the limited data and the hydrogeologic complexities in the area. Although reliable data and appropriate analyses were used to develop the water supply estimate of 143 AF/yr (46,636,209 gal/yr), that value is likely an underestimate of the actual groundwater resource, since the hydrogeologic data for the area were so sparse.

In consideration of the data limitations and conservative assumptions in this analysis, the actual groundwater flux beneath the Strawberry/Pine area is probably in the range of 300 AF/yr (97,755,300 gal/yr) to 500 AF/yr (162,925,500 gal/yr). This range is consistent with the groundwater flux that was estimated for the area by the ADWR Water Resources Planning Section (1996). ADWR estimated a groundwater flux of about 226 AF/yr (73,642,326 gal/yr) coming laterally from the sandstone formation into the Pine area, and about 11 AF/yr (3,584,361) coming from the northeast, parallel to Pine Creek.

CONCLUSIONS

This report is based solely on existing information, which was limited for the study area. The groundwater elevation contour maps and hydrographs suggest that the area is sensitive to drought conditions, which appear to have a rapid and significant effect on the local groundwater system (Figure 2, Attachment A).

Based on our evaluation, there appears to be between 300 AF/yr (97,755,300 gal/yr) and 500 AF/yr (162,925,500 gal/yr) available to the Strawberry/Pine area.

Clear Creek Associates appreciates this opportunity to provide hydrogeological consulting services to Fennemore Craig. References cited in this report are listed in Attachment C. If you require additional information, or would like to discuss our analyses or findings, please call us at (602) 294-9600.

Sincerely,

CLEAR CREEK ASSOCIATES, PLC.

Marvin F. Glotfelty, R.G.
Principal Hydrogeologist

REGISTERED GEOLOGIST
CERTIFICATE NO. 22744
MARVIN GLOTFELTY
Date Signed 3-27-02
ARIZONA, U.S.A.

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FIGURES

THE QUALITY
OF THE FOLLOWING IMAGES IS
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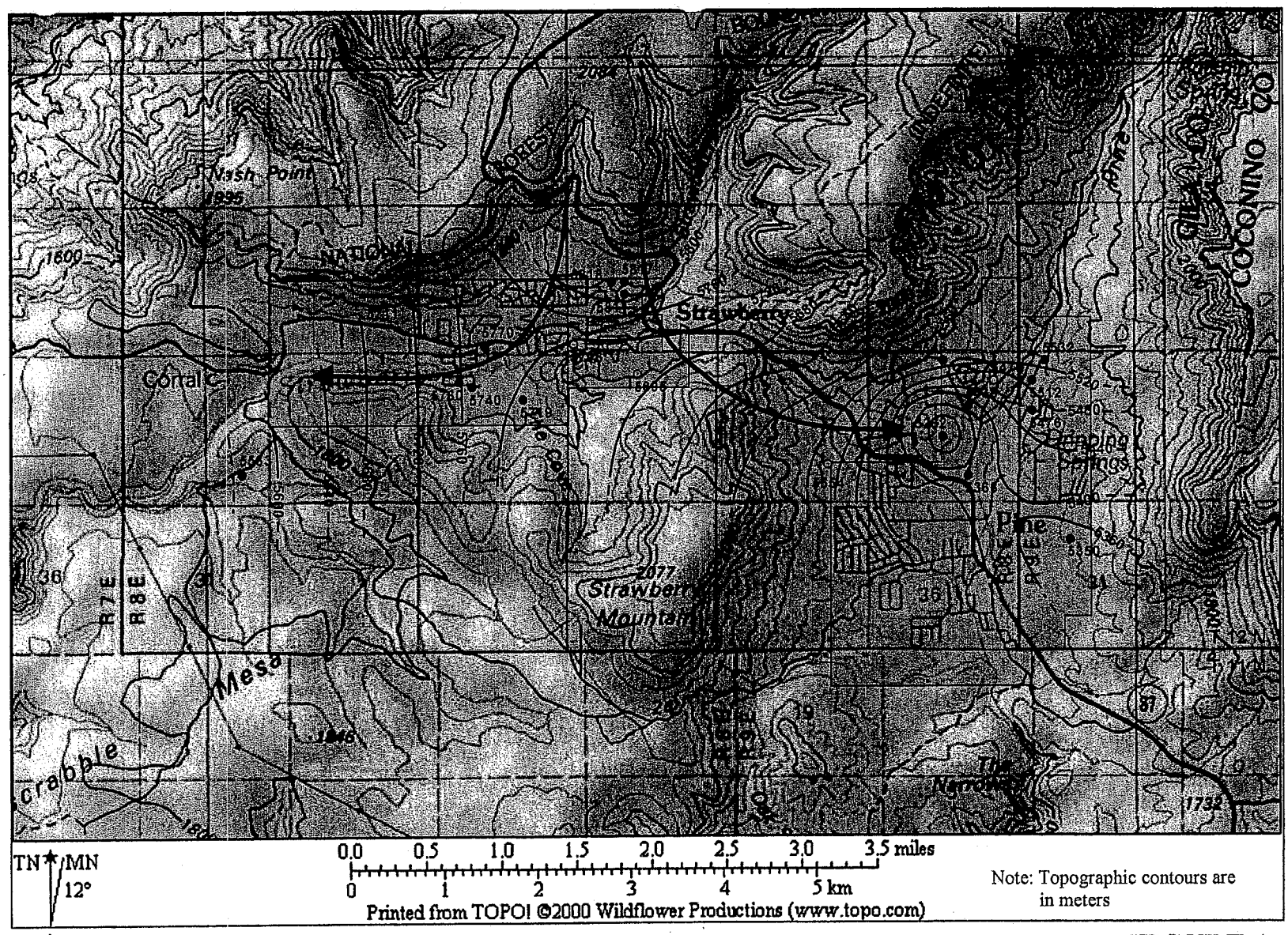
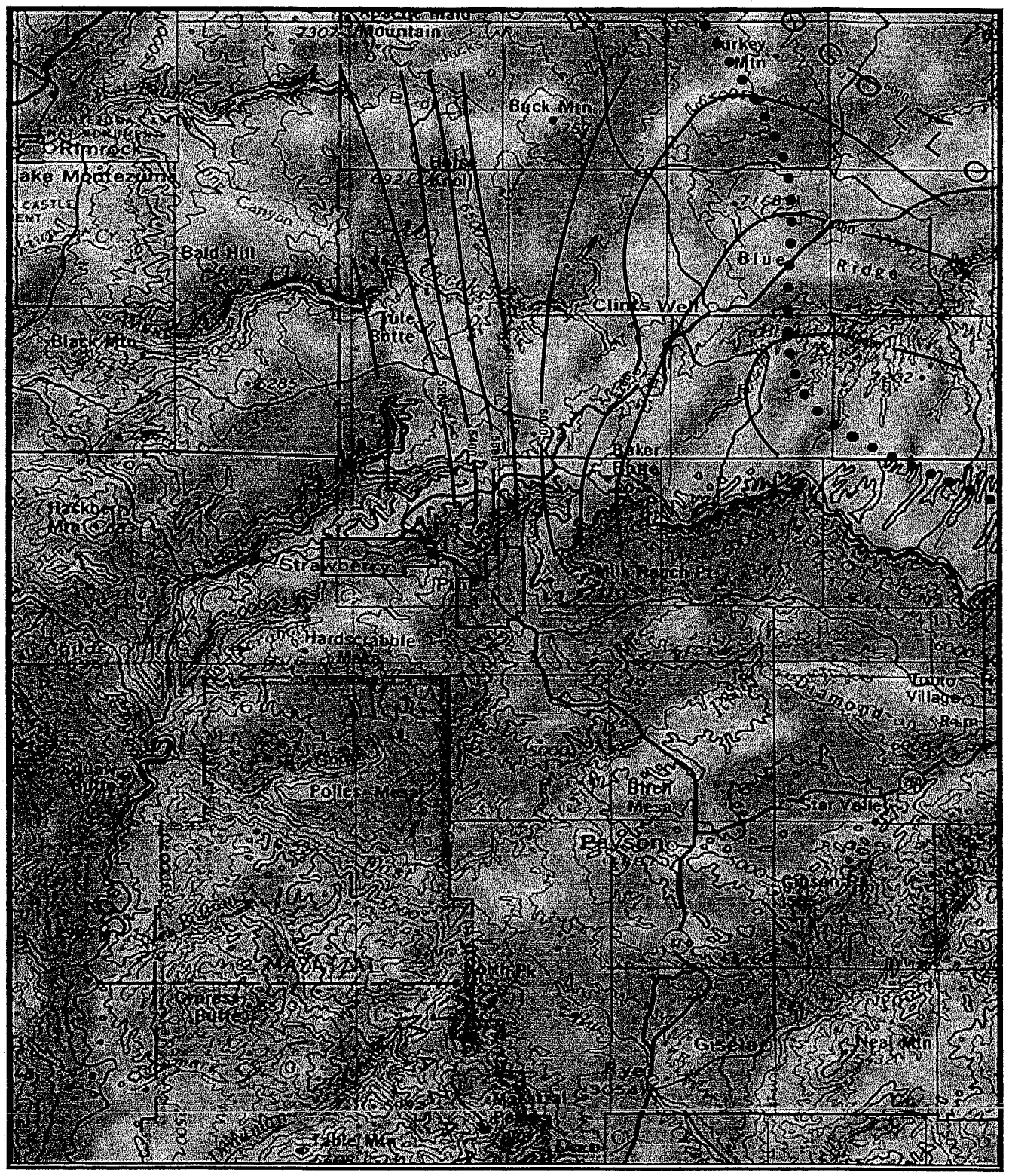


Explanation

- Approximate Strawberry Water Co. service area boundary
- Approximate Pine Water Co. service area boundary
- 5760 Well with groundwater elevation (measured 1987)
- 5695 Well with groundwater elevation (measured 1996 – 1999)
- 5700 Groundwater Elevation Contour (contour interval 40 feet)
- Approximate Groundwater Flow Direction

FIGURE 1
GROUNDWATER ELEVATION CONTOUR MAP
Pine-Strawberry, Arizona

Data Source: Arizona Department of Water Resources Groundwater Site Inventory (GWSI) records.



Base map from TOPO! ©2000 Wildflower Productions (www.topo.com).

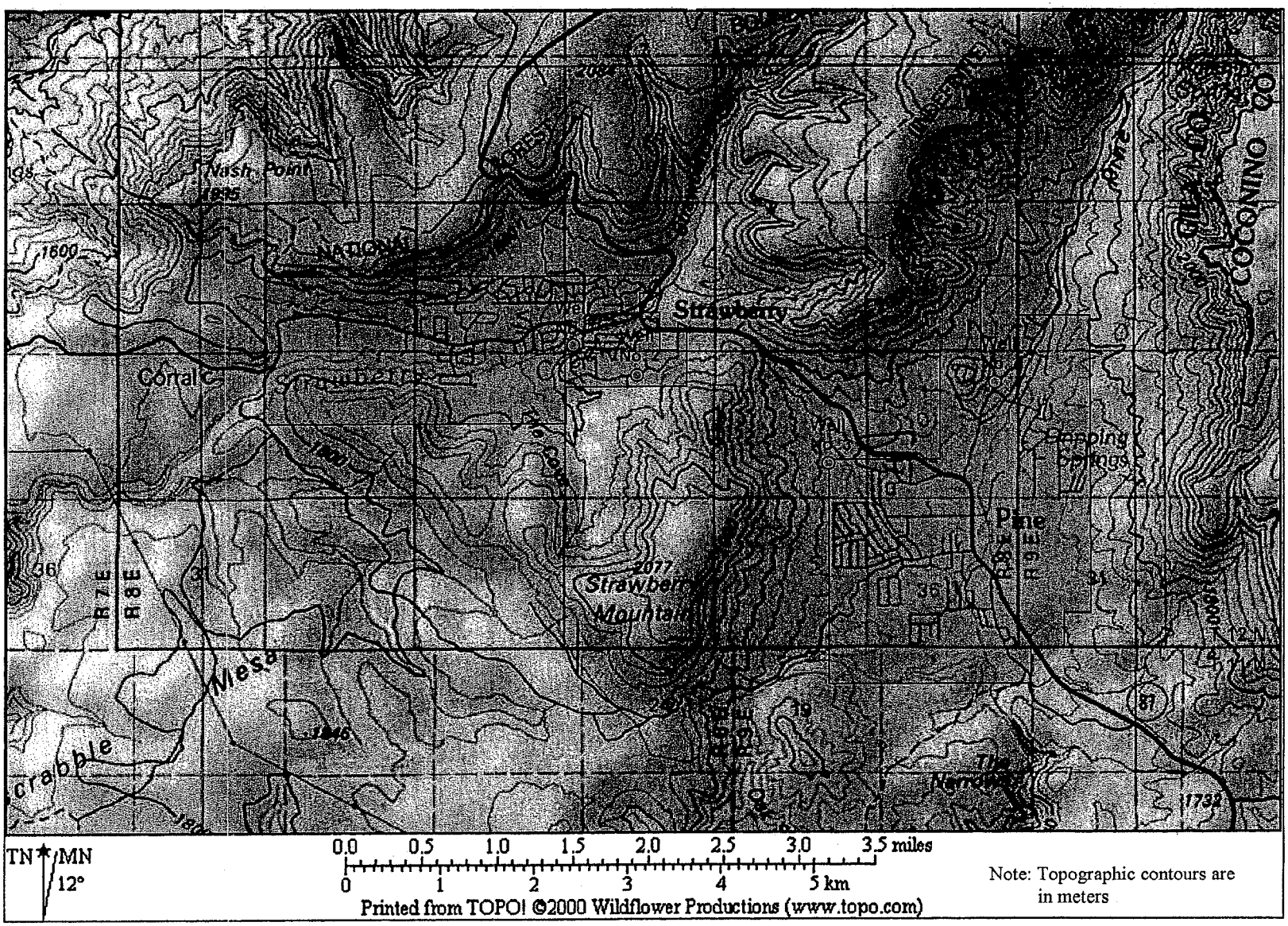
0 5 10
MAP SCALE, IN MILES

6400 Groundwater Elevation Contour
(Contour Interval = 200 feet)

● ● ● ● ● Groundwater Divide

Modified from: McGavock, E.H., Anderson, T.W., Moosburner, O., and Mann, L.J., 1986. Water resources of southern Coconino County, Arizona, ADWR Bulletin 4.

FIGURE 2
REGIONAL GROUNDWATER ELEVATION CONTOUR MAP
Pine-Strawberry, Arizona



Note: Topographic contours are in meters

Explanation

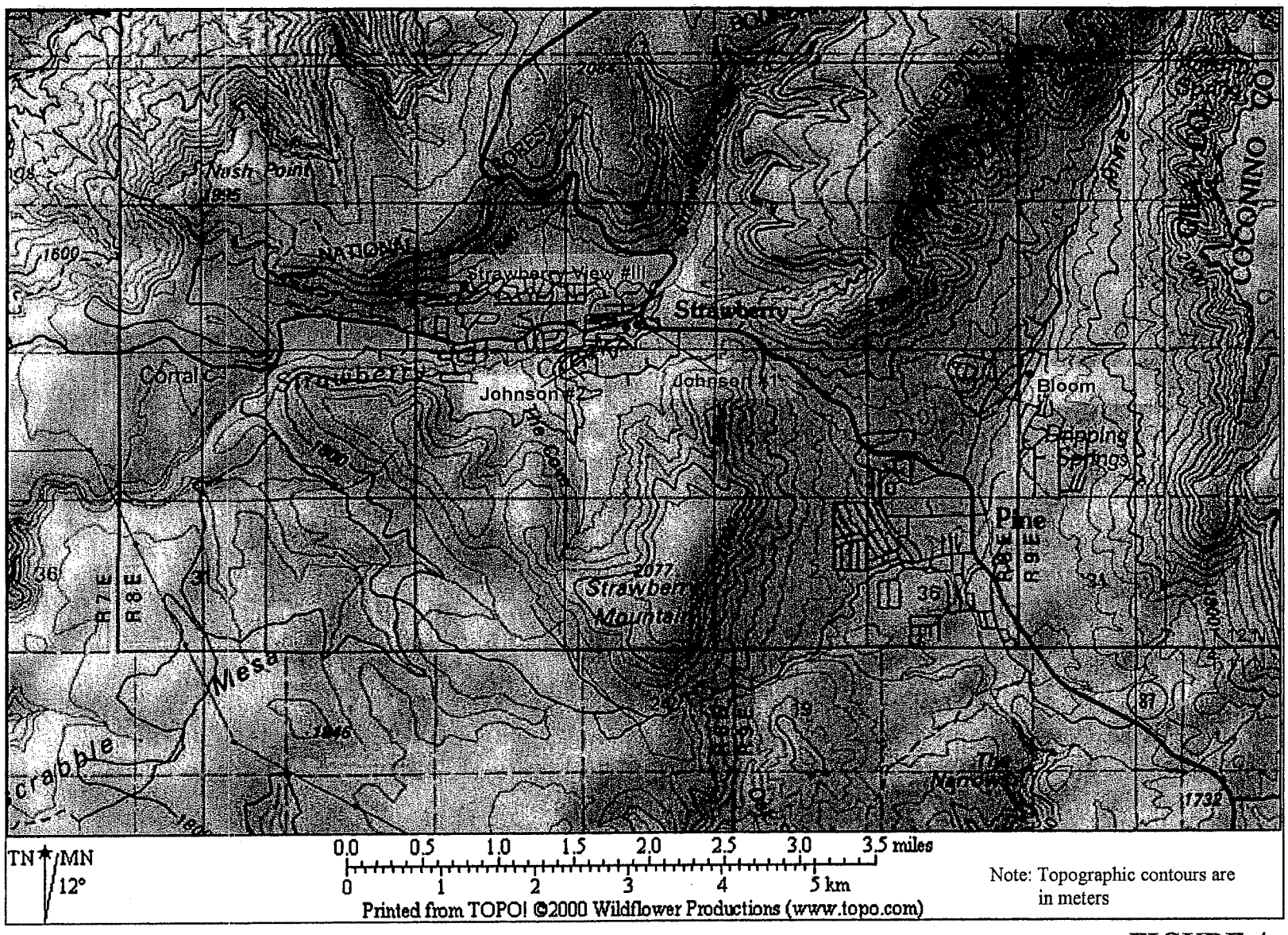
Approximate Strawberry Water Co. service area boundary

Approximate Pine Water Co. service area boundary

Well No. 1 — Well with multi-year groundwater level data

FIGURE 3
WELL LOCATION MAP
Pine-Strawberry, Arizona

Data Source: Arizona Department of Water Resources Groundwater Site Inventory (GWSI) records.



Note: Topographic contours are in meters

FIGURE 4

Wells with Available Aquifer Test Data

Pine-Strawberry, Arizona

Explanation

• Bloom Well with available aquifer test data

Data Source: Brooke Utilities, Inc. (see Attachment B)

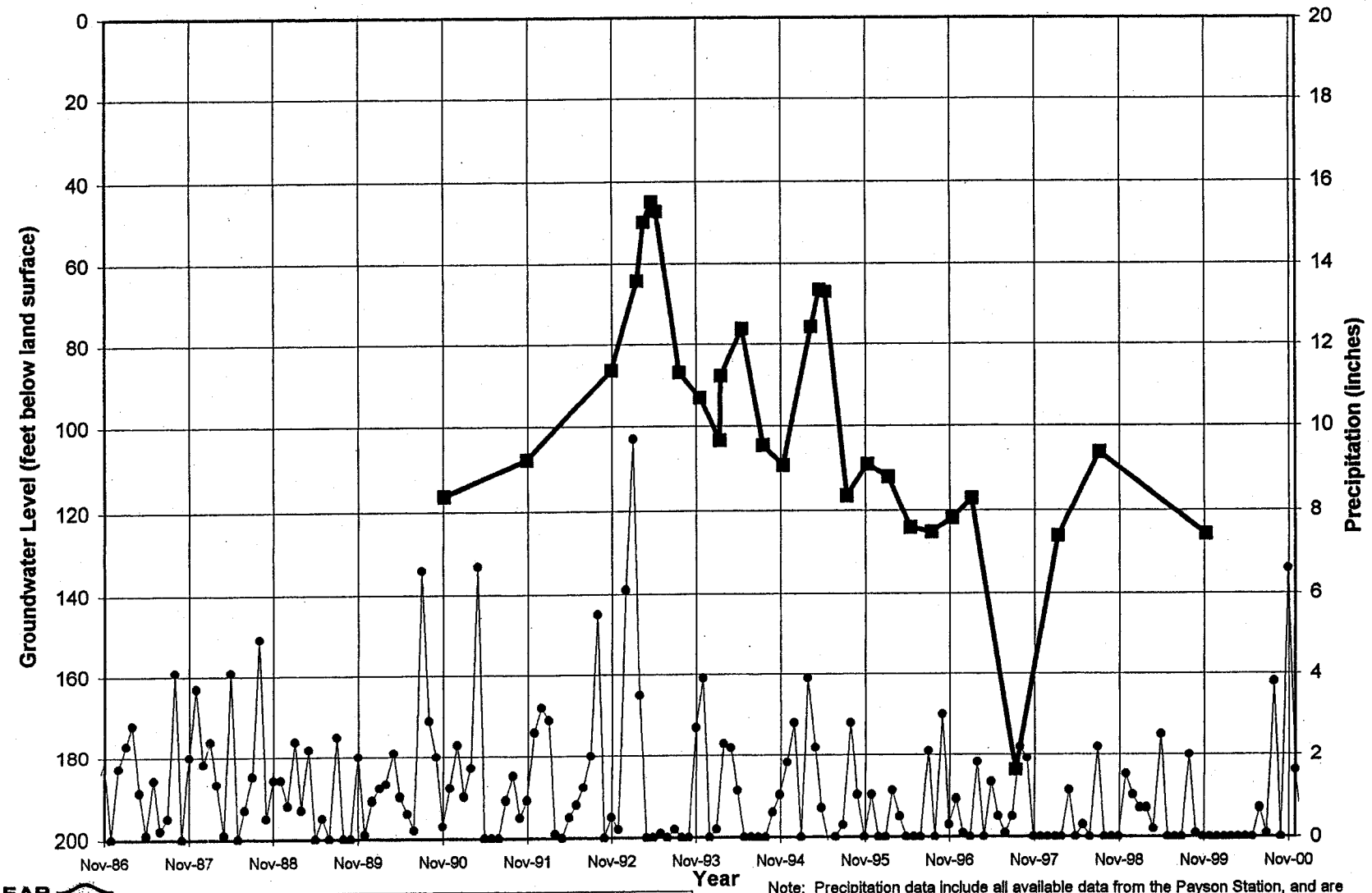
CLEAR CREEK ASSOCIATES

March 27, 2002
Thomas R. Wilmoth, Esquire
Fennemore Craig, P.C.

ATTACHMENT A
HYDROGRAPHS OF WELLS IN THE STRAWBERRY/PINE AREA

Well No. 1 Hydrograph

(B(12-8)22ccc)



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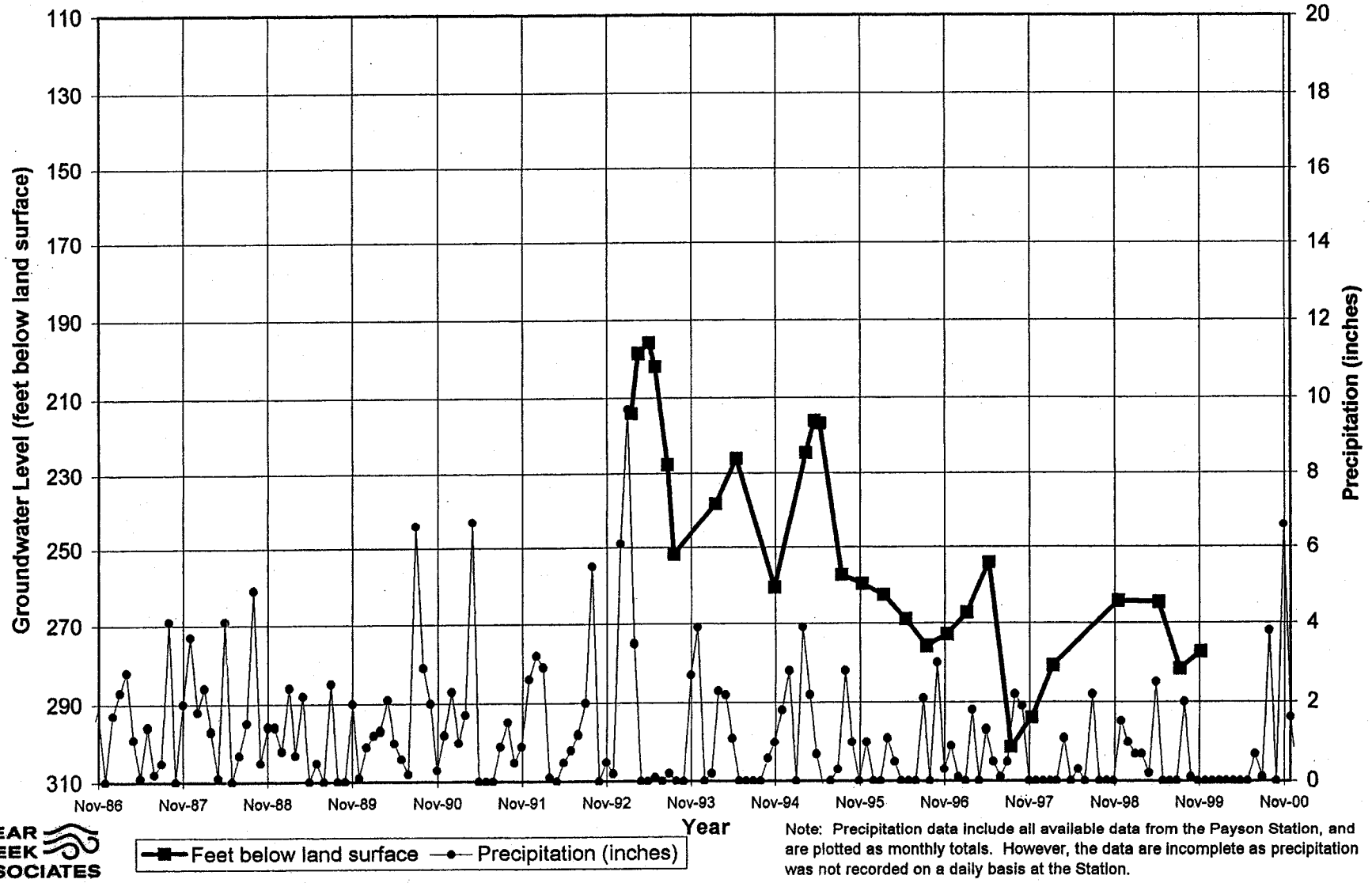
Note: Precipitation data include all available data from the Payson Station, and are plotted as monthly totals. However, the data are incomplete as precipitation was not recorded on a daily basis at the Station.

Well No. 2 Hydrograph

(B(12-8)27bad)



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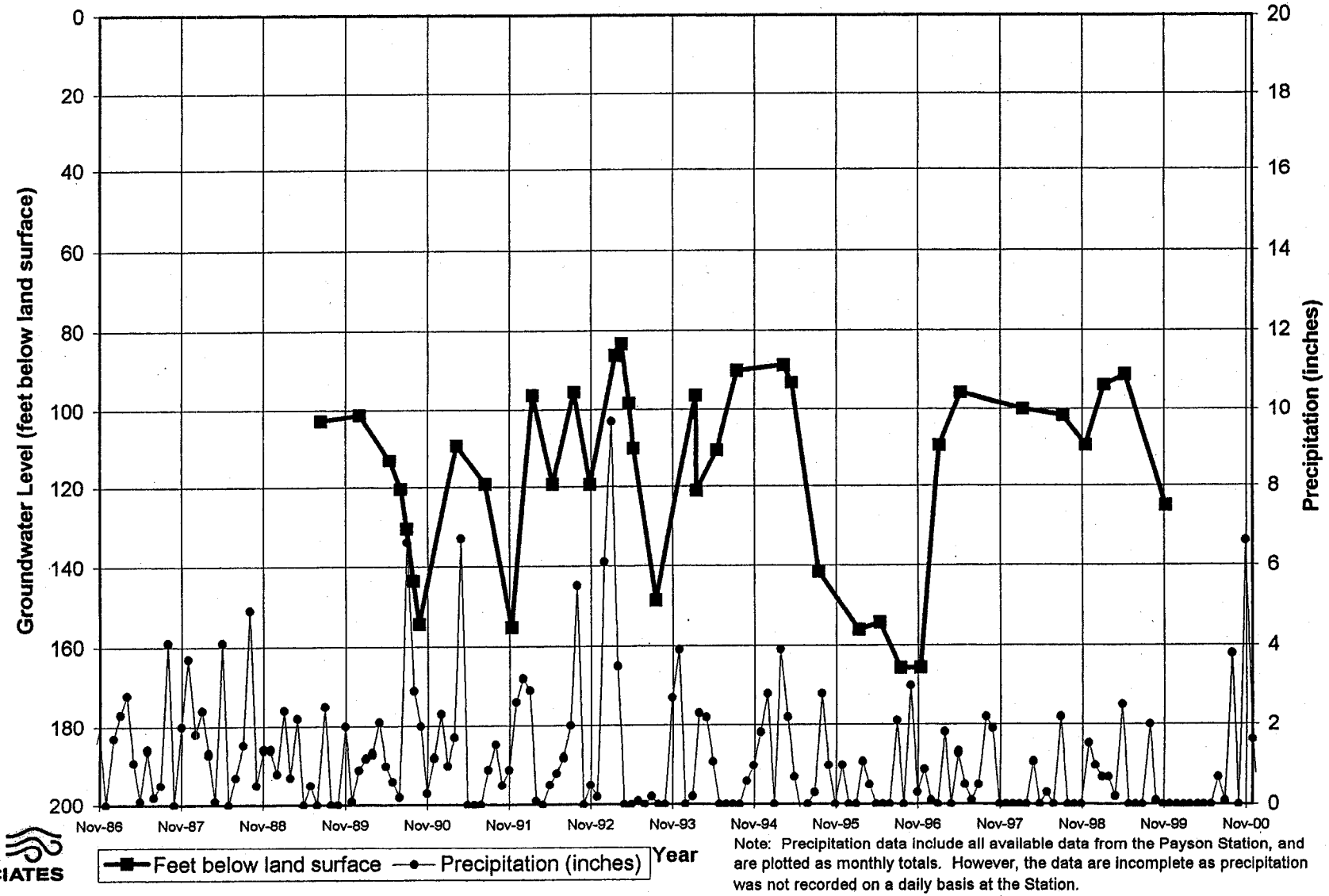
Note: Precipitation data include all available data from the Payson Station, and are plotted as monthly totals. However, the data are incomplete as precipitation was not recorded on a daily basis at the Station.

Well No. 3 Hydrograph

(B(12-8)26dac)



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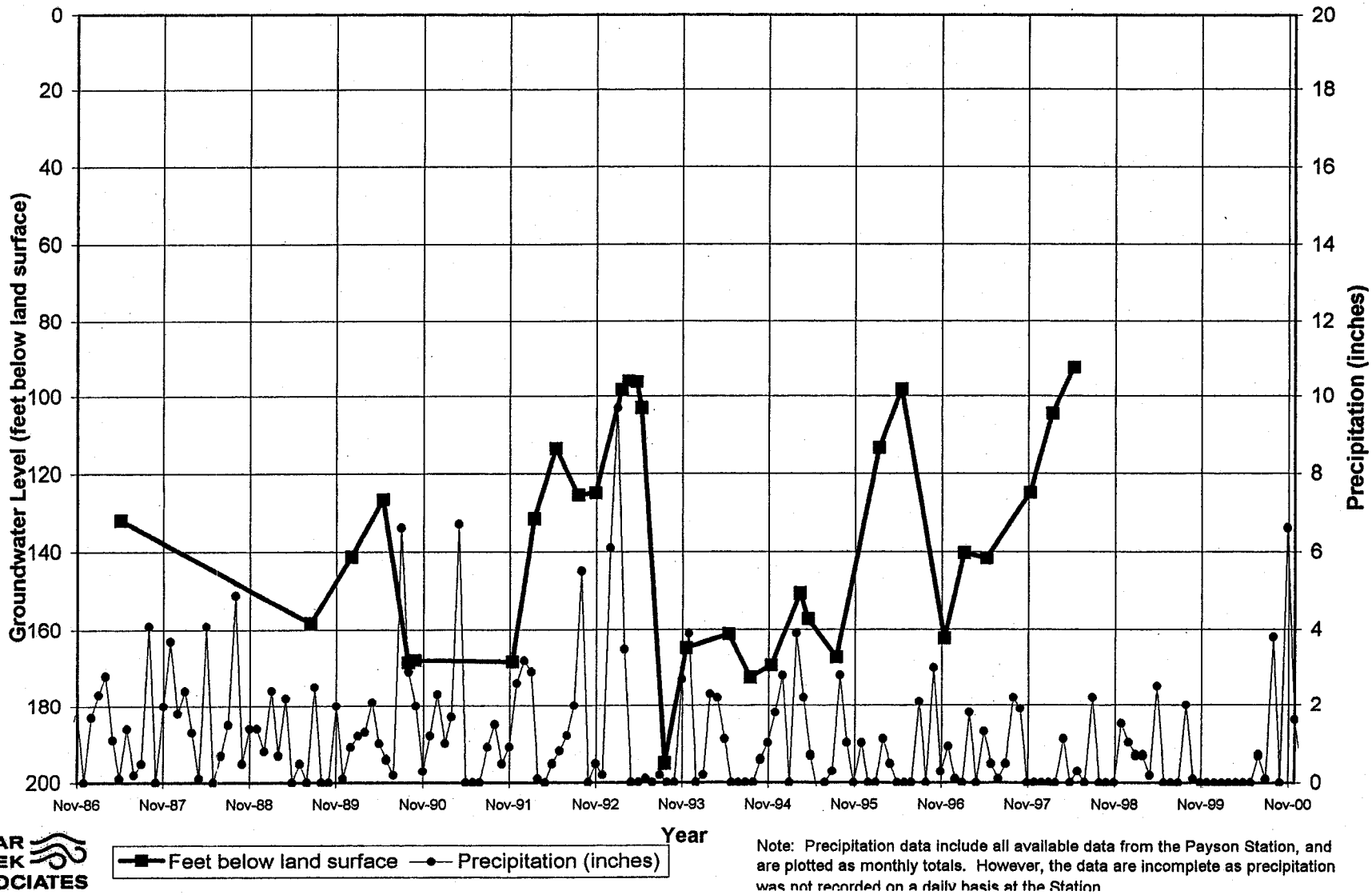
Note: Precipitation data include all available data from the Payson Station, and are plotted as monthly totals. However, the data are incomplete as precipitation was not recorded on a daily basis at the Station.

Well No. 4 Hydrograph

(B(12-8)25aac)



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Note: Precipitation data include all available data from the Payson Station, and are plotted as monthly totals. However, the data are incomplete as precipitation was not recorded on a daily basis at the Station

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ATTACHMENT B
AQUIFER TEST RESULTS FOR THE STRAWBERRY/PINE AREA

Strawberry View III Well (Lot 226)

Brooke Utilities - Strawberry/Pine Groundwater Study

Static Water Level = 214

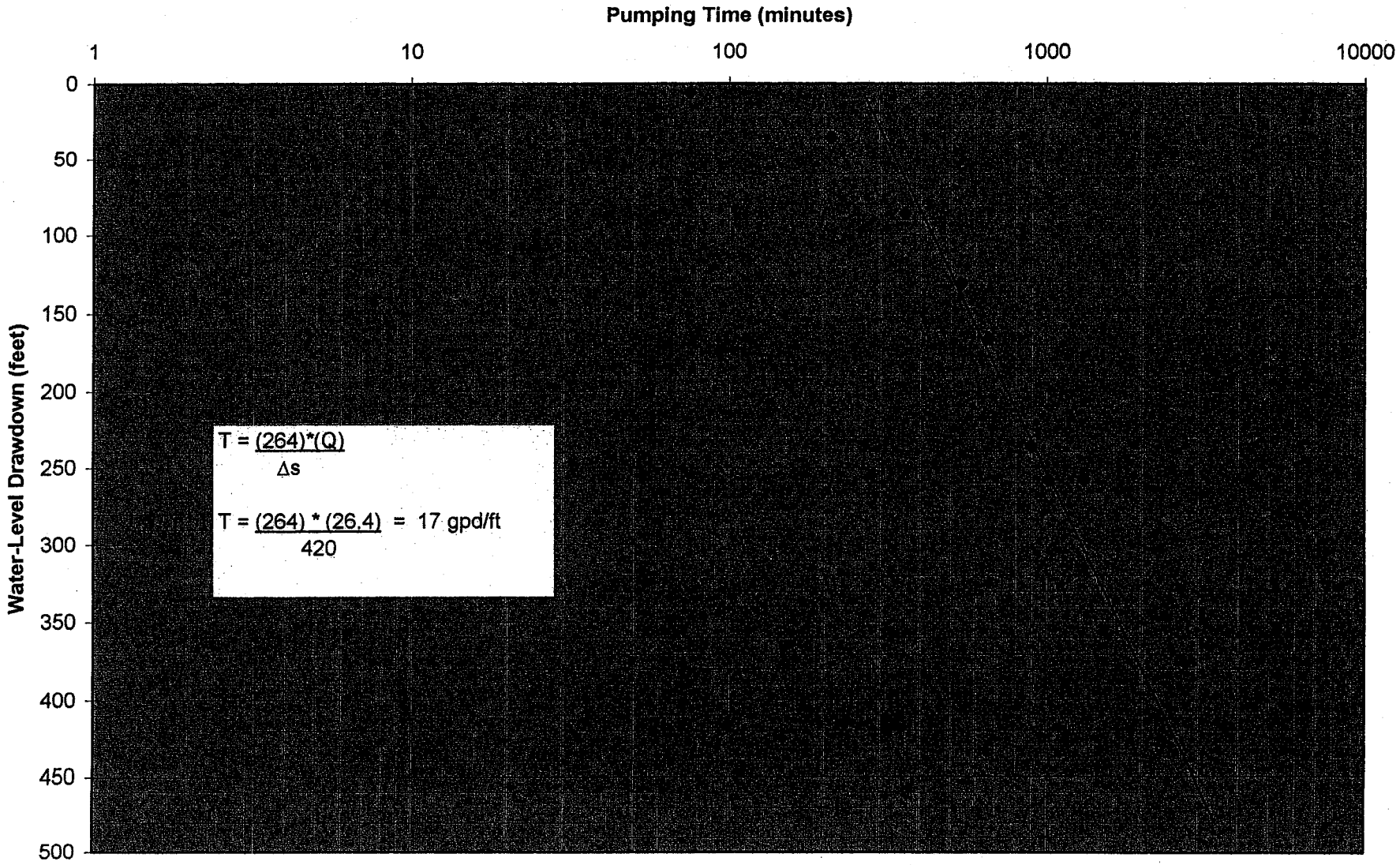
Date	Time	Pumping Time (minutes)	Water Level (feet)	Drawdown (feet)	Discharge (gpm)	Specifc Capacity (gpm/ft)	Comments
7/29/96	8:00	0	214	0	0		Pump on
	9:15	75	220	6	29	4.83	
	11:30	210	250	36	28	0.78	
	14:00	360	300	86	27	0.31	
	17:00	540	345	131	27	0.21	
	19:00	660	380	166	26	0.16	
	23:00	900	450	236	26	0.11	
7/30/96	1:00	1020	472	258	25	0.10	
	6:00	1320	472	258	25	0.10	Pump off

Data Source: Brooke Utilities, Inc.

Average Pumping Rate = 26.4 gpm
Total Pumping Period = 22.0 hours
Transmissivity (in gpd/ft) = 17 gallons per day/foot

Cooper-Jacob Plot

Brooke Utilities Strawberry View III Well



$$T = \frac{(264)*(Q)}{\Delta s}$$

$$T = \frac{(264) * (26.4)}{420} = 17 \text{ gpd/ft}$$

Johnson Well #1 (Meter No. 58283215)

Brooke Utilities - Strawberry/Pine Groundwater Study

Static Water Level = 110

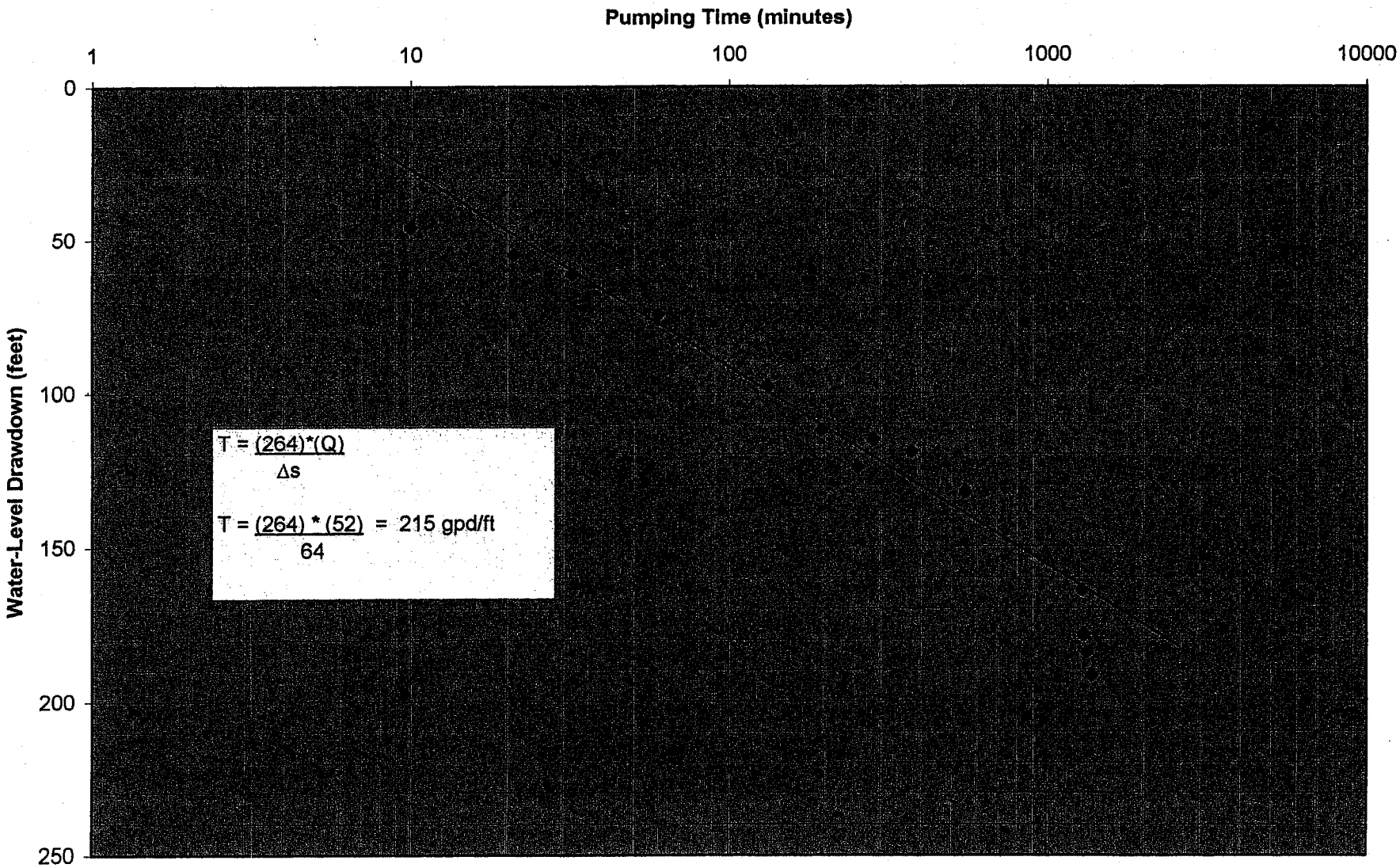
Date	Time	Pumping Time (minutes)	Water Level (feet)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)	Comments
05/29/2001	10:45	0	110	0	0		No discharge reported
	10:55	10	155.8	45.8	74	1.62	
	11:06	21	164.7	54.7	73	1.33	
	11:17	32	171.2	61.2	72	1.18	
	11:45	60	184.4	74.4	71	0.95	
	12:58	133	207.9	97.9	68	0.69	
	14:01	196	222.1	112.1	67	0.60	
	15:00	255	234.2	124.2	66	0.53	
	15:30	285	225.2	115.2	50	0.43	gated back to 50 gpm
	17:00	375	229	119	52.5	0.44	
	21:00	555	242.3	132.3	50	0.38	
05/30/2001	9:14	1289	274.1	164.1	46	0.28	opened valve to 62 gpm
	9:30	1305	288.6	178.6	62	0.35	
	10:00	1335	294.2	184.2	61	0.33	
	10:45	1380	301.7	191.7	61	0.32	Pump off
	12:55	1510	227	117			
	14:47	1622	209.1	99.1			
05/31/2001	9:40	2755	154	44			
	12:00	2895	148.4	38.4			

Data Source: Brooke Utilities, Inc.

Average Pumping Rate = 52.1 gpm
Total Pumping Period = 23.0 hours
Transmissivity (in gpd/ft) = 215 gallons per day/foot

Cooper-Jacob Plot

Brooke Utilities Johnson Well #1



$$T = \frac{(264)*(Q)}{\Delta s}$$

$$T = \frac{(264) * (52)}{64} = 215 \text{ gpd/ft}$$

Johnson Well #2 (Meter No. 58283216)

Brooke Utilities - Strawberry/Pine Groundwater Study

Static Water Level = 125.4

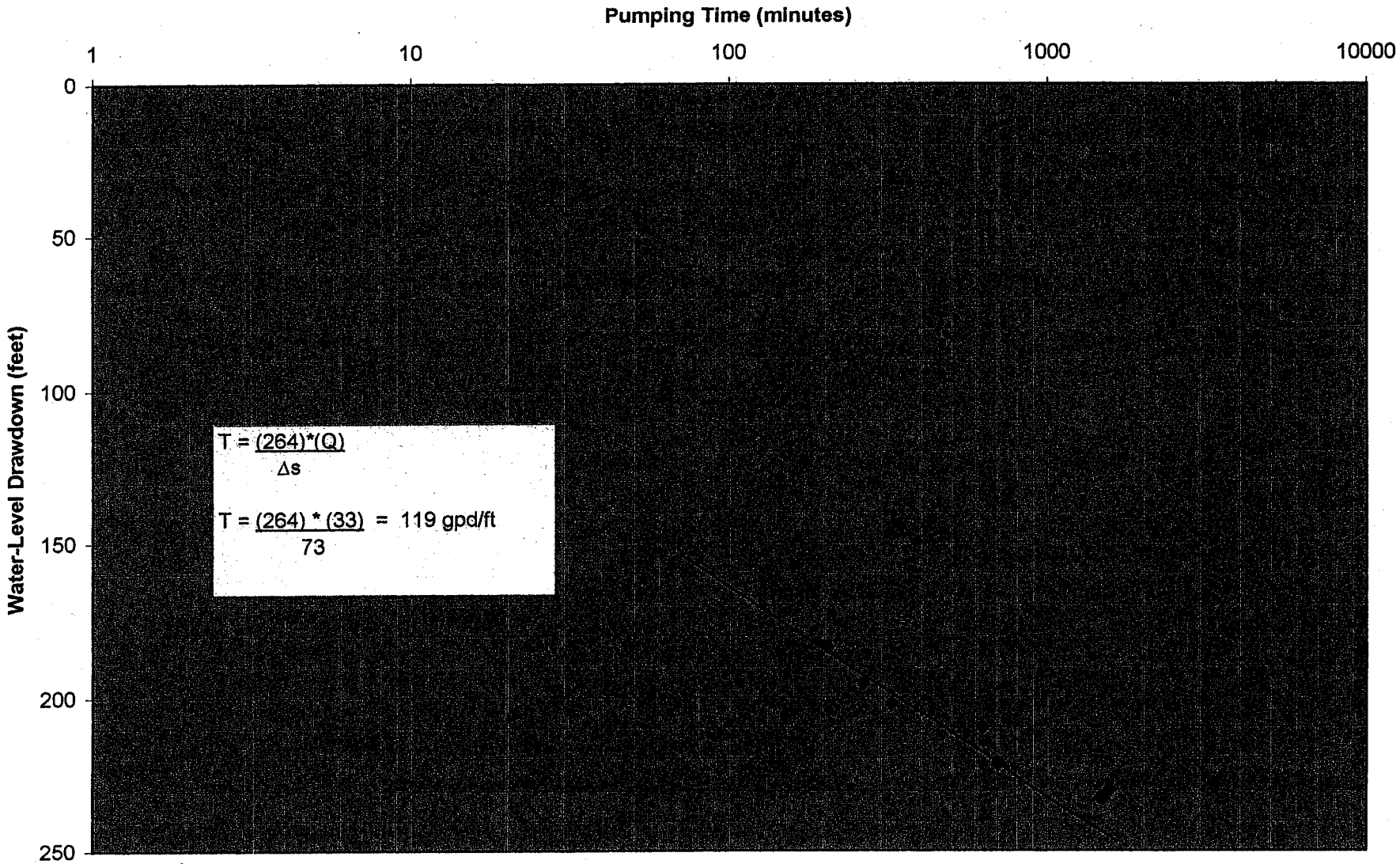
Date	Time	Pumping Time (minutes)	Water Level (feet)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)	Comments
05/30/2001	9:17	0	127	1.6	?		No discharge reported
	11:32	135	128.9	3.5	43	12.29	
	11:42	145	254	128.6	38	0.30	
	12:42	205	309.1	183.7	34	0.19	
	13:42	265	320.9	195.5	34	0.17	
	14:42	325	327.7	202.3	33	0.16	
	19:45	628	335.4	210	33	0.16	
	21:00	703	347.2	221.8	32	0.14	
05/31/2001	9:45	1468	357.6	232.2	31	0.13	
	10:30	1513	357.6	232.2	31	0.13	
	11:30	1573	354.9	229.5	31	0.14	
	12:00	1603	174.6	49.2			Pump off
	12:33	1636	170.6	45.2			
	13:34	1697	166.5	41.1			

Data Source: Brooke Utilities, Inc.

Average Pumping Rate = 32.8 gpm
Total Pumping Period = 26.2 hours
Transmissivity (in gpd/ft) = 119 gallons per day/foot

Cooper-Jacob Plot

Brooke Utilities Johnson Well #2



$$T = \frac{(264)*(Q)}{\Delta s}$$

$$T = \frac{(264) * (33)}{73} = 119 \text{ gpd/ft}$$

Bloom Well (Lot 52908317)

Brooke Utilities - Strawberry/Pine Groundwater Study

Static Water Level = 53

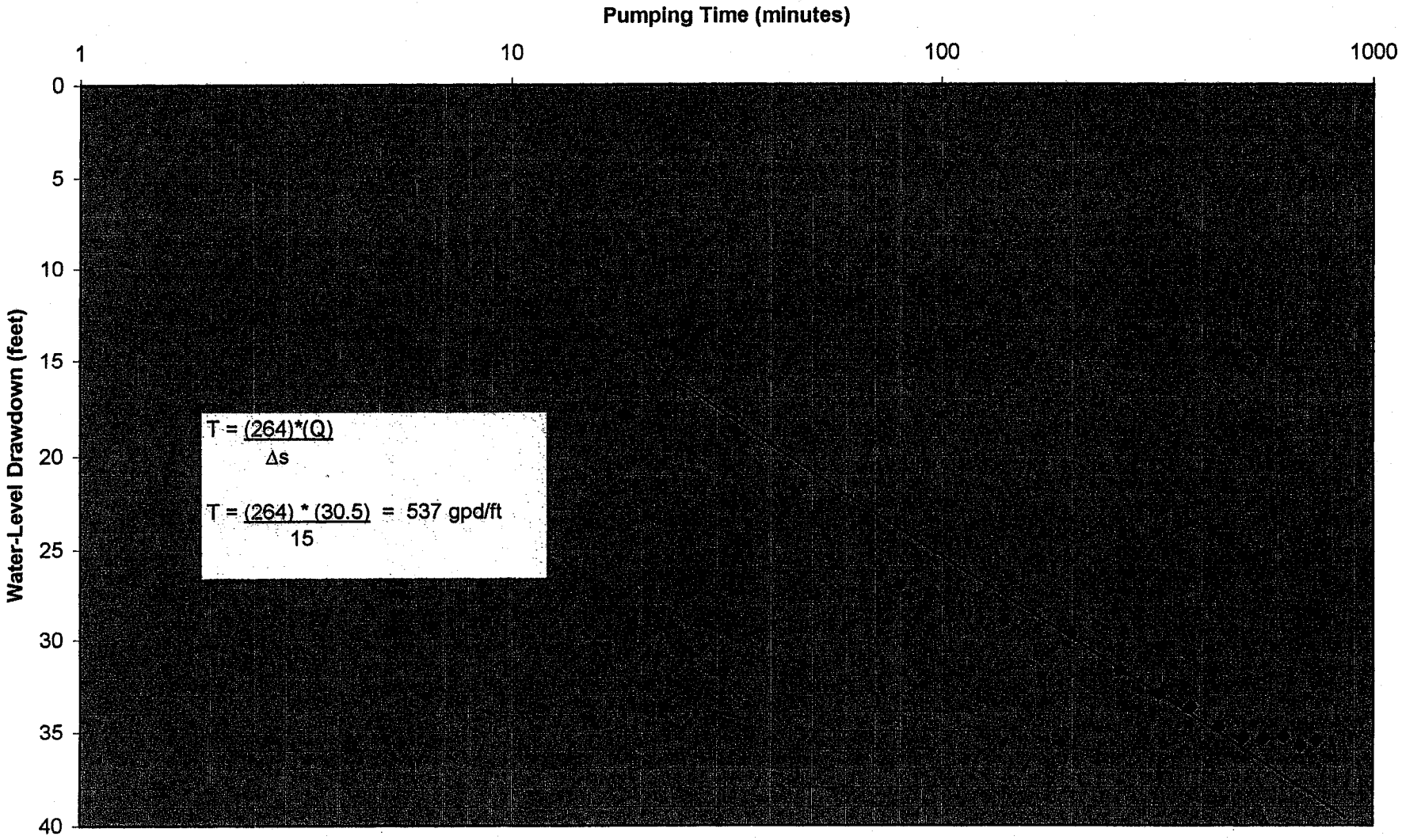
Date	Time	Pumping Time (minutes)	Water Level (feet)	Drawdown (feet)	Discharge (gpm)	Specific Capacity (gpm/ft)		Comments
04/09/1999	11:20		53	0	0			Static Water Level
04/12/1999	7:10	0						"clean up water" (?)
	7:30	20	62	9	31	3.44	620	Pump on
	8:30	80	80	27	32	1.19	1920	
	9:30	140	82	29	30	1.03	1800	
	10:30	200	82.7	29.7	31	1.04	1860	
	11:30	260	84.7	31.7	31	0.98	1860	
	12:30	320	86	33	30	0.91	1800	
	13:30	380	86.7	33.7	31	0.92	1860	
	14:30	440	87.8	34.8	30	0.86	1800	Gated to 30 gpm
	15:30	500	88.4	35.4	30	0.85	1800	
	16:30	560	88.4	35.4	30	0.85	1800	
	17:30	620	88.3	35.3	30	0.85	1800	
	18:30	680	88.8	35.8	30.5	0.85	1830	
	19:30	740	88.5	35.5	30	0.85	1800	Pump off
04/13/1999	7:00	0	54	1	0	0.00		"Static" Water Level
	8:00	60	82.6	29.6	30	1.01	1800	Pump on
	9:00	120	86	33	31	0.94	1860	
	10:00	180	87.7	34.7	31	0.89	1860	
	11:00	240	88.6	35.6	30	0.84	1800	
	12:00	300	88.8	35.8	31	0.87	1860	
	13:00	360	89.2	36.2	31	0.86	1860	
	14:00	420	89	36	30	0.83	1800	
	15:00	480	90.1	37.1	31	0.84	1860	Gated to 30 gpm
	16:00	540	89.8	36.8	30	0.82	1800	
	17:00	600	89.8	36.8	30	0.82	1800	
	18:00	660	90.5	37.5	30	0.80	1800	
	19:00	720	90.9	37.9	30	0.79	1800	Pump off
04/14/1999	7:00	0	55	2	0	0.00		"Static" Water Level
	8:00	60	83	30	31	1.03	1860	
	9:00	120	87.3	34.3	30.5	0.89	1830	
	10:10	190	89	36	31	0.86	2170	
	12:21	321	90.1	37.1	30	0.81	3930	
	14:00	420	91.2	38.2	31	0.81	3069	Gated to 30 gpm
	15:45	525	91.2	38.2	30	0.79	3150	Pump off
04/15/1999	7:00	0	55.1	2.1	0	0		"Static" Water Level

Data Source: Brooke Utilities, Inc.

	04/12/1999	04/13/1999	04/14/1999
Average Pumping Rate =	30.5	30.4	30.5
Total Pumping Period =	12.3	12.0	8.8
Transmissivity (in gpd/ft) =	537	1,672	1,610

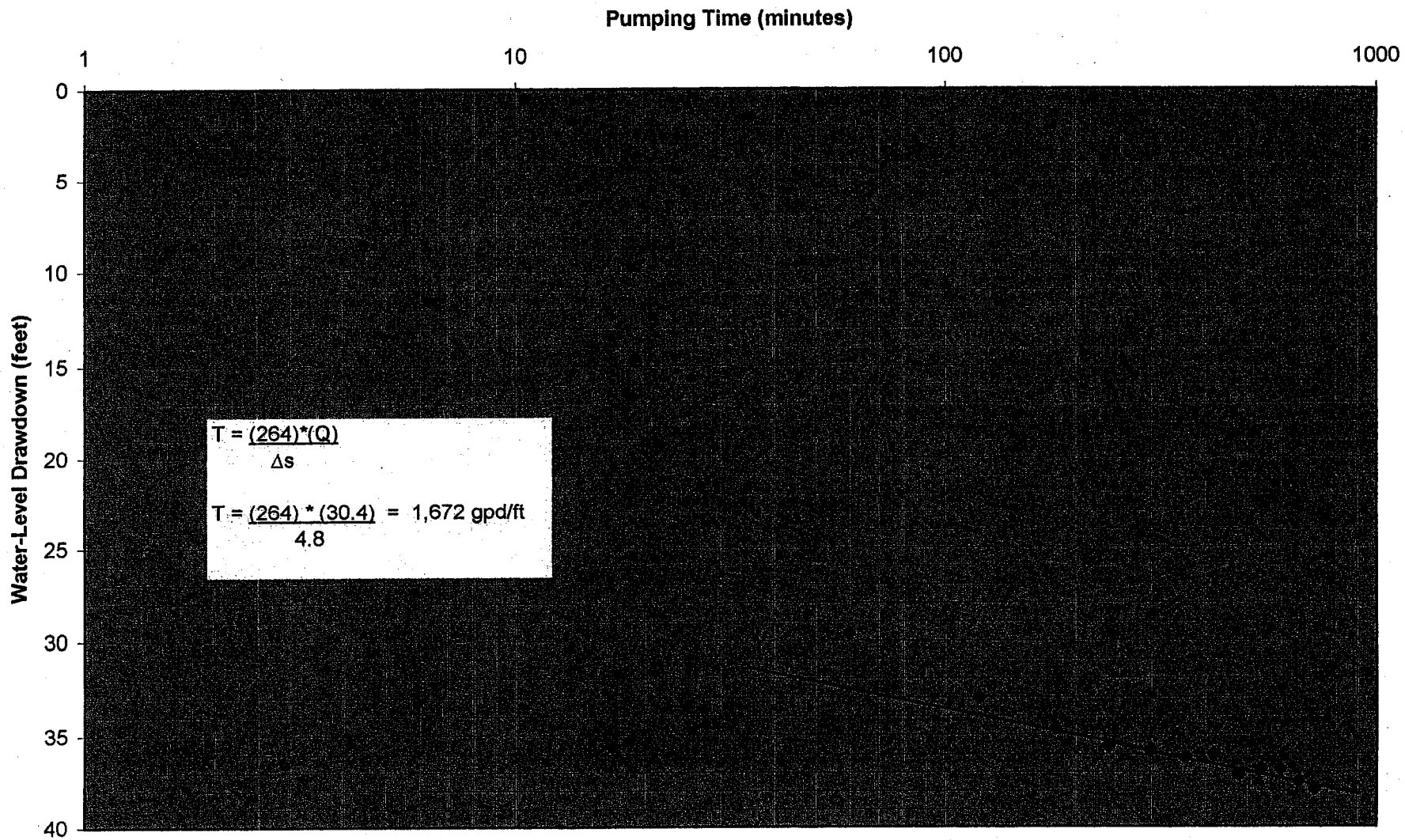
Cooper-Jacob Plot

Brooke Utilities Bloom Well
April 12, 1999



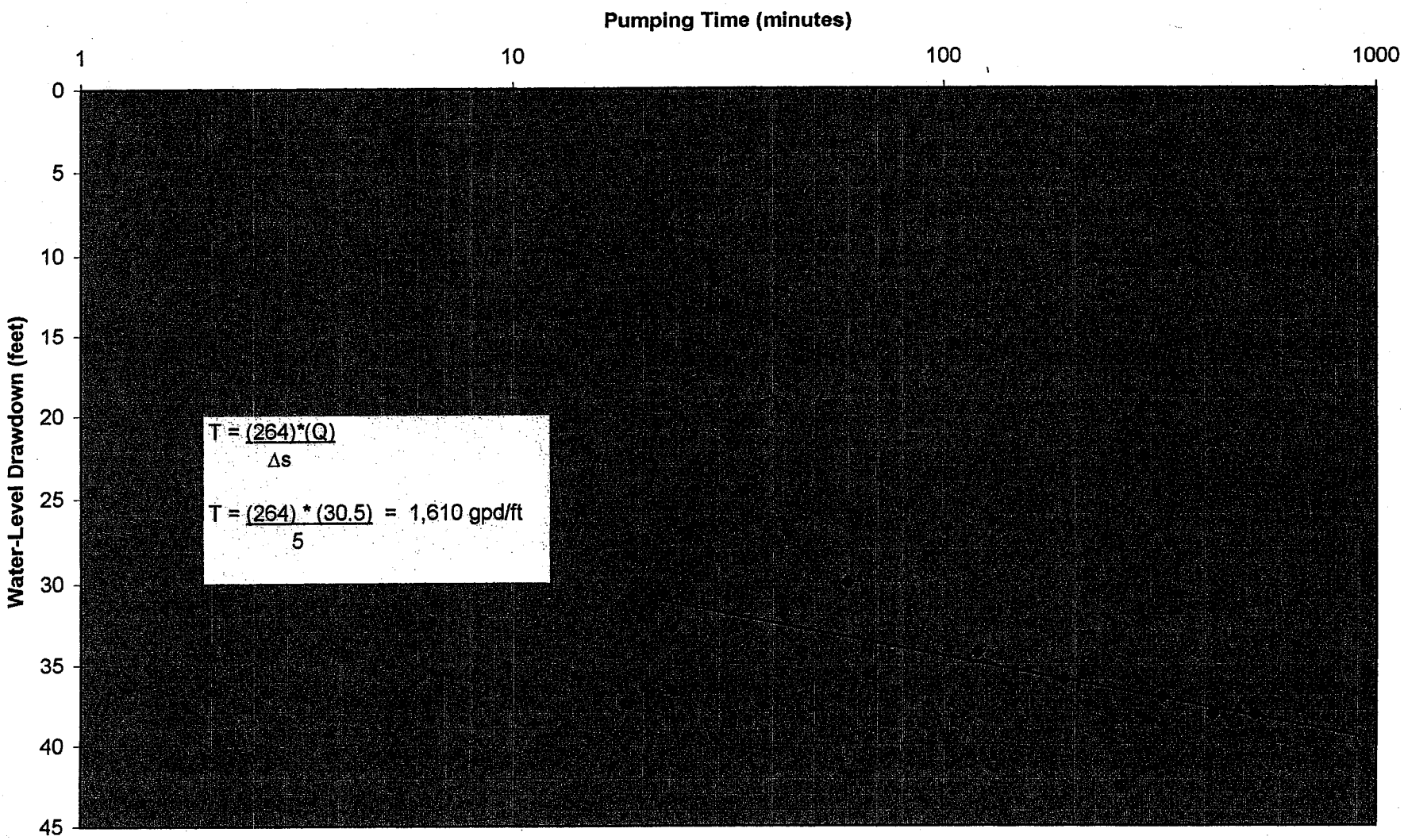
Cooper-Jacob Plot

Brooke Utilities Bloom Well
April 13, 1999



Cooper-Jacob Plot

Brooke Utilities Bloom Well
April 14, 1999



CLEAR CREEK ASSOCIATES

ATTACHMENT C
REFERENCES CITED

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HARDCASTLE DIR. EXH. B

Water Supply Augmentation Plan

for

Pine Water Co., Inc.

Pine, Arizona

May 1, 2003

Water Supply Augmentation Plan for Pine Water Co., Inc.

Statement of Purpose

Pine Water Co., Inc. (hereinafter "Pine Water") serves domestic potable water to nearly 2000 customers in the community of Pine, Arizona. Pine is located north of Payson in Northern Gila Co. Pine, like much of Northern Gila County, is heavily populated in the "summer" months by part-time residents. Pine Water, a wholly owned subsidiary of Brooke Utilities, Inc. ("Brooke"), has owned and operated the water systems in Pine since August 1996.

For *decades* the community of Pine has suffered from chronic ground water supply deficiencies caused by consumption in excess of the available water supply. Excessive development of the area, lack of mandated water conservation measures, poor water system management prior to Pine Water's ownership, and insufficient development of alternative sources have contributed to the history of deficient water supplies relative to demand.

During the last several years the entire State of Arizona, and particularly Northern Gila County, has been severely affected by the worst drought conditions in over 100 years. The confluence of these conditions has intensified Pine's already serious water supply conditions. For several days during the summer of 2002 customers of Pine Water were without any water supplies.

The Arizona Corporation Commission (the "Commission") has recognized Pine Water's success to date in enhancing water availability and improving service. Still, the Commission desires that Pine Water continue in its efforts to address water supply problems, and in Decision No. 65435 (the "Decision") directed Pine Water to "develop a detailed plan showing how it will address the water shortage problem". As a result, Pine Water has developed this *Water Supply Augmentation Plan for Pine Water Co., Inc.* (the "Plan") in an effort to (a) comply with the directives of the Commission, and (b) discuss effective alternatives to Pine's chronic water shortage problems.

It cannot be overstated, however, that Pine Water alone cannot address the water supply problems that prevail in Pine, Arizona. It will take the collective effort of Pine Water, its shareholder Brooke Utilities, Inc., its ratepayers, the Commission and its Staff and various other local, state and federal governmental agencies to develop strategies to explore and utilize additional water resources. Then, it will take a great deal of capital investment and allocation of risk to pursue implementation of such strategies. And, despite all that effort, very little additional water may be available to Pine Water's ratepayers. At its core, the water supply dilemma plaguing Pine, Arizona is an act of nature and no amount of planning, study and capital investment can change hydrological reality.

Short Range Water Supply Augmentation

Increased Water Storage: Pine Water currently has 950,000 gallons of available water storage. This storage is currently supplied and re-supplied exclusively from ground water sources in Pine and nearby Strawberry.[1] Pine Water is currently in compliance with required storage requirements under Arizona law, including A.A.C. R-18-4-503.

This Plan alternative contemplates building additional storage at the rate of 160,000 gallons for every 100th customer connection added to the water system. Pine Water estimates that 9 acre feet, or approximately 2.9 million gallons, of water supply would be required to meet peak customer demand for ten days. Under this alternative, new storage would be filled with off-season excess water supplies and stored for peak demand consumption. It is likely that water treatment facilities would be required to store potable water for long periods of time.[2]

There are several disadvantages to this alternative. For one thing, it is not likely that this water augmentation alternative could be utilized during peak demand months once water is initially distributed from the storage because peak demands prevents regular re-supply of water storage reservoirs. Therefore, water stored in this manner only provides a brief respite (about 10 days) to periods of water shortages. Additionally, water storage, water treatment, and property acquisition are costly. For this reason, this Plan alternative may not be as attractive, or could be rendered unnecessary, if Pine Water were able to successfully develop a larger, more permanent water storage in the area as discussed below.

Projected Cost:	
160,000 gallons water storage (each)	$100,000
Water treatment facilities[3]	$125,000
Property acquisition	$ 25,000[4]
Total Projected Cost	$250,000[5]
Development Period (per)	120 to 150 days
Funding Source:	Equity/Debt

Condemnation of Local Water Supplies: Pine Water believes it has the legal authority to exercise the power of eminent domain and that such power could theoretically be used to condemn privately owned water wells throughout its Certificate of Convenience and Necessity ("CC&N"). The condemnation process would be time consuming and expensive, however, and it is virtually impossible to estimate the economic impact on Pine Water and its ratepayers. Condemnation of water sources also represents significant risk as sustained flow characteristics for high demand public water systems are generally unknown with respect to wells previously used for private purposes. As a consequence, any such effort must be preceded by significant operational,

[1] Water is transferred to Pine from Strawberry through Project Magnolia at a rate of up to 700,000 gallons per day.
[2] It is likely that long-term water storage would be required for at least six months during the period of January through mid-July of each year.
[3] Water treatment facilities could be constructed to support more than one 160,000 gallon increment of additional above ground water storage.
[4] Assumes a negotiated purchase, as opposed, for instance, to a condemnation.
[5] Excludes additional operating expenses associated with additional storage capacity.

hydrological and legal study of possible condemnation targets, increasing the necessary investment of time and capital.

Projected Cost: (estimated per private well)	
Hydrological study	$ 10,000
Operational costs	$ 10,000
Condemnation award	Unknown
Legal costs	$ 50,000
Total Projected Cost	$ 70,000 (plus award)
Acquisition Period:	Up to one year
Funding Source:	Equity/Debt

Revised Curtailment Tariff/Water Hauling Surcharge: Pine Water has implemented voluntary and mandatory water conservation measures since acquiring the water system serving Pine, Arizona. Unfortunately, such measures have been inadequate, in large part because mandatory conservation restrictions are not implemented until the situation becomes critical and Stage 5 of the current Curtailment Tariff is reached. Moreover, in the past, there has been no penalty for violation of these mandatory conservation restrictions.

Pursuant to Commission order, Pine Water filed a revised Curtailment Tariff on February 18, 2003. The revised Curtailment Tariff, expected to be approved in May 2003, is the product of the cooperative effort of Pine Water and the Commission's Utilities Division Staff to revise the curtailment plan to incorporate stricter conservation requirements and penalties for violations. Specifically, under the revised Curtailment Tariff, mandatory conservation measures begin in Stage 3. In addition, under the revised Curtailment Tariff, Pine Water is required to augment water supplies by hauling or other similar means during Stages 4 and 5.

In order that Pine Water meets the obligation to augment supplies during Stages 4 and 5, Pine Water and Staff have recommended Commission approval of an interim rate surcharge. Historically, water hauling costs have run ten times normal operating expenses and Pine Water does not currently recover any portion of such increased costs through rates. The surcharge is designed to allow Pine Water to timely recover the cost of water supply augmentation along with the costs of implementing the revised Curtailment Tariff.[6] As a result, if approved, the revised Curtailment Tariff and rate surcharge will constitute components of Pine Water's plan to address water supply problems.

Well Exploration/Water Sharing Program: Since acquiring the water systems in Pine and Strawberry, Arizona in 1996, Brooke has undertaken an aggressive water well exploration program. To date, Pine Water has drilled 5 new wells and Strawberry Water Co., Inc., another Brooke Utilities subsidiary ("Strawberry Water") has drilled 6 new wells. Pine Water has also drilled three wells that were not economically productive. Generally, these wells have been drilled on utility-owned property or private property under water sharing agreements with private property owners. These agreements provide for well development and long-term water production from those wells. Water produced from wells under water sharing agreements is then distributed to Pine Water customers and the private property owners are paid a monthly royalty.

[6] The costs of the revised Curtailment Tariff and surcharge are discussed in detail in Commission Docket Nos. W-03512A-03-104 and –106.

Pine Water expects to continue this well exploration program over the foreseeable future. In 2003, Pine Water began drilling three new wells for this purpose. These wells are permitted through the Arizona Department of Water Resources ("ADWR") and water quality monitoring is conducted pursuant to the regulations of the Arizona Department of Environmental Quality ("ADEQ"). Newly drilled water wells that do not prove to be economically justifiable will not be fully developed but may be retained for the private property owner's personal use if desired.

Projected Cost:	
Well drilling and development	$ 75,000
Annual operating expenses	$ 6,000
Total Projected Cost	$ 81,000
Development Period	90 days
Funding Source	Equity/debt/current cash flow

Mid-Range Water Supply Augmentation

Cooperative Water Exchange: Pine Water possesses a Municipal and Industrial water exchange contract with the Central Arizona Water Conservation District ("CAWCD") for 160 acre feet of Central Arizona project ("CAP") water (about 52 million gallons). Despite having this valuable right, Pine Water cannot use CAP water given its location far from the CAP canal and the rights under the CAP subcontract cannot be sold. However, Pine Water has previously explored the possibility of an "exchange" with Salt River Project ("SRP") whereby SRP would take receipt of Pine Water's allocation from the CAP canal near Phoenix, where SRP already takes delivery of significant amounts of water. In "exchange" Pine Water would be given access to SRP's surface water rights in Pine Creek and the East Verde River or other area tributaries.[7]

Although such an "exchange" may appear simple, it is not. There are numerous operational, legal, regulatory and practical impediments to an "exchange" of Pine Waters CAP allocation. For example, when Pine Water most requires supplemental water sources, the peak demand summer months, there is typically little or no flow in Pine Creek. The CAP exchange concept requires a surface water source for storage, treatment, and distribution to be operationally viable, except during limited periods of above normal flow.

In addition to the supply problems, the requirements of dealing with down stream water rights holders who may be impacted by Pine Water's upstream access to SRP's surface water are substantial, as are the compliance obligations under federal law. Approval of the use of SRP's surface water sources in Pine Creek and of the "exchange" of the CAP subcontract would require NEPA compliance, i.e., an environmental assessment or even an environmental impact study, and it is possible there will be Endangered Species Act and Clean Water Act compliance issues as well. Overcoming such regulatory and legal hurdles could result in hundreds of thousands of dollars of costs, with no guarantee of a successful outcome.

Projected Costs:	
Legal costs	$ 50,000
Environmental study costs	$ 100,000
Water reservoir costs (minimum)	$ 650,000[8]
Water treatment costs	$ 100,000
Property acquisition	$ 165,000[9]
Annual operating costs	$ 50,000
Total Projected Costs	$1,115,000
Development Period:	3 years
Funding Sources:	Equity/Debt/surcharge[10]

[7] It might also be possible to "exchange" the CAP allocation for finds to be used to develop new water resources.
[8] In conjunction with other discussion provided herein it is possible that the flow of water from Pine Creek could be captured during winter months and stored in a mass water storage facility for future use in peak demand summer months.
[9] Assumes a negotiated purchase, as opposed, for instance, to a condemnation.
[10] In its request for permanent rate relief, Pine Water seeks approval of a Water Exploration Surcharge. This surcharge is explained in detail in the Direct Testimony of Thomas J. Bourassa.

Progressive Rate Design: In Pine Water's application for permanent adjustment of its rates, the Company has proposed a new seasonal, tiered rate design. An overarching goal of this rate design is to place a "premium" on water consumption during peak demand periods, the same time that water conservation is most required, and that Pine Water is likely to be required to augment supplies under the revised Curtailment Tariff.

Development of a rate design that equitably allocates costs, promotes conservation and protects Pine Water's financial viability is an ongoing process. The rate design proposed in this rate proceeding is a significant step, however, more remains to be done. For example, the ideal rate design for Pine Water will not only recognize seasonal fluctuations in supply and demand, but also increased demand during weekend and holiday periods when the part-time population in the Pine area dramatically increases. This would, in turn, require implementation of advanced technology water meter systems that permit the collection of "time of use" consumption data in addition to other operational changes. In addition, implementation of the rate design proposed herein will lead to more information and the likelihood of refinement and modification, a sort of trial and error process Pine Water and its customers will need to pass through before achieving maximum benefit from a progressive rate design. For now, it is imperative that the Commission approve a seasonal, tiered rate design like the one proposed by Pine Water in its application for rate relief so that the economic value of scarce water supplies in Pine, Arizona become a reality.

Engineering and Hydrological Studies: Pine Water recognizes that any consideration of alternative water sources must have a sound hydrologic and engineering foundation. It would not be prudent, Pine Water believes, to search for water in areas that do not support such exploration. Pine Water recently commissioned a regional geohydrological study of ground water sources in the Pine, Arizona area. *See* Direct Testimony of Robert T. Hardcastle, Exhibit A. Generally, this report indicates that sub-surface water flows in to Strawberry from the north and continues southerly into Pine while, at the same time, flows westerly through Strawberry valley. The report concludes that Pine has a very limited sub-surface water structure and that Strawberry is a far better water production candidate than Pine. The report further concludes that it is likely a minimum of 300-500 acre feet of subsurface water flows through these areas at various depths during the course of a year.

Geohydrological Report Cost: $13,000[11]

Water Well Exploration of Public Lands: More than 90% of all land in Gila Co. is publicly owner by the U.S. Forest Service ("USFS") or other governmental landowners. There are areas surrounding Pine and Strawberry that could be attractive sub-surface water sources. Pine Water has thoroughly discussed the potential of such projects with representatives from USFS on previous occasions. Brooke Utilities also has significant experience in dealing with USFS through its development of Project Magnolia in 2000.[12] The permitting process of exploring for water on USFS land is time consuming and expensive. An additional and separate permitting process may be required to move produced water supplies off USFS or other public land and into Pine Water or Strawberry Water's existing water system infrastructure. All of these processes require NEPA compliance, including the possibility of environmental studies of unknown duration and cost to determine whether or not other water rights holders are impacted by water well development, as well as the potential need for compliance with other federal laws.

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[11] This amount has already been paid by Pine Water

[12] As explained in detail by Mr. Hardcastle in his direct testimony, Project Magnolia is a 10,800 foot eight inch water line that connects the water systems of Pine and Strawberry.

Project Cost (per well):	
Water well exploration	$ 40,000
Well development	$ 35,000
USFS permitting process	$ 10,000
Environmental study[13]	$ 100,000
Legal Costs	$ 50,000
Water distribution costs[14]	$ 100,000
Total Projected Costs	$ 335,000
Development period	2-3 years
Funding Sources	Equity/Debt/Surcharge

Legislative Relief: This Plan alternative bears discussion, but is largely outside of Pine Water's ability to implement due to the potential for substantial cost and the fact that Pine Water lacks any sort of political clout. The Commission, for instance, or perhaps DWR, could pursue changes in legislation that would enhance long-term water management in the Pine, Arizona area. Pine Water believes at least three forms of legislative reform are needed. First, legislation to limit County authority to form water improvement districts without a showing that adequate water resources exist and that utilization of such resources will not be at the expense of existing water service customers. Otherwise, these districts exacerbate current water supply deficiencies and interfere with effective management of existing water systems, as Pine Water has learned from its ongoing battle with Gila County over the proliferation of water improvement districts to facilitate development. Second, legislation should be proposed that limits growth in water plagued areas. Growth without proper water resources is problematic for any water purveyor and, ultimately, its customers and the community in general. Third, Pine Water's ability to withdraw and transport groundwater from other groundwater basins is currently restricted under Arizona's Groundwater Code. See, e.g., A.R.S. § 45-544(A)(2). These restrictions were temporarily relaxed by the Legislature in 2000 to address severe drought conditions. 2000 Ariz. Laws, 2d Reg. Sess., Ch. 205 (repealed on April 30, 2001). Given the severity of the water supply situation in Pine, Arizona, similar longer-term relief appears warranted.

Long Range Water Supply Augmentation (5 to 10 years)

Pine Reservoir Project: Pine Water has been diligently working on the design of a surface water storage facility in South Pine. This facility would be able to store approximately 75 acre feet of water (approximately 24.4 million gallons) collected from off peak demand season water supplies in Pine and Strawberry and stored for distribution and consumption during peak demand periods. Pine Water has entered into an option agreement with a large property owner in South Pine that provides for a 7.63 acre site on which the facility would be constructed. The site is well situated for distribution of stored water to both Pine and Strawberry.[15] The option agreement expires at the end of 200____. The Lease Agreement associated with this facility provides for a 15-year term and three consecutive 5-year renewable option periods for a total operating period of 30 years.

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[13] Cost estimate is based on the known cost of such a study for Project Magnolia.

[14] The process of obtaining a USFS permit to move water off public lands, if discovered, and connect to water system infrastructure may be able to be conducted at the same time as the well exploration process.

[15] Project Magnolia is designed to also flow water in a northerly direction from Pine if necessary.

This Plan alternative would be extremely expensive and even an estimate of the total costs would be overly speculative. Development costs for such a project could vary substantially depending on design, reservoir materials, coverage, and operational design. Given the significance of the capital investment that would have to be made, and the substantial uncertainty from factors outside Brooke's ability to control, this is an example of the type of project that would require collective planning by multiple interested parties and Commission approval of funding sources and cost recovery before the conceptual alternative can become a reality.

Projected Cost:	
Reservoir development (minimum)	$ 650,000
Water treatment facility	$ 100,000
Distribution and connection infrastructure	$ 90,000
Annual operational costs	$ 85,000
Total Projected Cost	$ 925,000[16]
Development Period:	Up to 5 years
Funding Sources:	Equity//debt/surcharge

Deep Well Exploration: There has long been a "layman's" belief that a large amount of water lies underneath Pine at depths up to and exceeding 2000 feet. However, Pine Water is not aware of any data, study, or expert hydrological or hyrdogeological information that supports such a belief. Moreover, Pine Water has always maintained that it is most reasonable and prudent to first exhaust all less expensive, realistic alternatives for increasing available water supplies and improving water service.

Nevertheless, Pine Water understands that representatives of the Pine-Strawberry Water Improvement District ("PSWID") are conducting a study to discover the prudency of drilling so-called deep wells. While Pine Water remains skeptical that such sources actually exist, even if they are discovered, there are certain economic realities that undermine the viability of this fabled resource. For instance, Pine Water estimates that a deep exploration endeavor such as PSWID envisions would cost between $5 and $10 million with no greater certainty of outcome of hydrological result than any other shallow well exploration project.[17]

Project Cost:	
Well exploration cost	$5,000,000
Well development cost	Unknown
Annual operating expenses	Unknown
Development Period	3 years
Funding Sources	Unknown[18]

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[16] Again, it cannot be overstated that these are very speculative estimates. The actual costs could be substantially higher.

[17] A representative of PSWID, speaking as a private citizen, testified in Docket No. W-03512A-03-0104 and –106, not only as to his firm believe in the availability of such resources but also that he believed that the exploration costs could easily exceed $4,000,000, exclusive of well development costs and annual operating expenses. Pine Water believes the costs would be substantially higher and the likelihood of success far less than projected by this witness.

[18] As seen in Mr. Hardcastle's direct testimony, the impact on rates of even a $4,000,000 capital investment in deep well exploration by Pine Water is tremendous. Direct Testimony of Robert T. Hardcastle at 5.

HARDCASTLE DIR. EXH. C

PINE WATER COMPANY
CUSTOMER EDUCATION PROGRAM

PURPOSE: The purpose of Pine Water Company's Customer Education Program is to facilitate the dissemination of information to customers regarding water utility service by Pine Water. Such information will generally focus on the ongoing water supply problems in the Pine, Arizona area and actions being taken to maximize utilization of the region's scarce water resources by promoting mandatory and voluntary conservation measures. Such information will address the status of the Company's water supplies; Pine Water Company's short and long-term efforts to address water supply problems; implementation and enforcement of the Company's Curtailment Tariff; imposition of water supply augmentation surcharges; and additional information regarding recommended conservation measures not mandated under the Curtailment Tariff. Pine Water Company may also use the Company's Customer Education Program to disseminate information regarding regulatory decisions impacting water utility service, including decisions that impact requirements for the establishment of service and the rates and charges for such service.

TIMING: In order to ensure the timely dissemination of important information, the Company has divided the year into four quarters. As designated below, certain information will be distributed during specific quarters in order to aid Pine Water Company in maximizing utilization of the region's scarce water resources by promoting mandatory and voluntary conservation. The four quarters to be utilized are as follows:

- **Summer Quarter:** ***May – July***
- **Fall Quarter:** ***August – October***
- **Winter Quarter:** ***November – January***
- **Spring Quarter:** ***February-April***

METHODS: Pine Water will use a variety of different measures to fulfill the purposes of its Customer Education Program. Such methods include:

Bill Inserts:

- Bill insert containing conservation tips (Summer Quarter)
- Bill insert about winterizing homes (Fall Quarter)
- Bill insert about Curtailment Tariff and means of obtaining current information regarding stage changes (Spring Quarter)

Electronic Mail Advisories:

- Email Advisory for service interruptions as needed
- Email Advisory for staging changes as needed

Mailings:

- Notices as required under Pine Water Company's Curtailment Tariff

Local Sign Postings:

- Posting Curtailment Tariff stage definitions in Pine Post Office
- Posting signs regarding current stage status under Curtailment Tariff.
- Posting water storage levels in the Pine Post Office as needed.

Toll-Free Number:

- Maintaining a toll-free customer service number for billing and outage information
- Maintaining a toll-free number with information regarding current stage status under Curtailment Tariff

Community Outreach:

- Maintaining key contact (businesses and community leaders list) for distribution of information as needed.
- Working with local and statewide media to disseminate information regarding current water issues in the Pine, Arizona as needed
- "Coffee Table Meetings" with designated Company representatives and local residents and community leaders (Winter and Spring Quarters)

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-

REBUTTAL TESTIMONY OF

ROBERT T. HARDCASTLE

EXHIBIT
A-2
admitted

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I. INTRODUCTION AND QUALIFICATIONS.

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

A. Robert T. Hardcastle, 3101 State Rd., Bakersfield, California 93308.

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

A. I am the President of Brooke Utilities, Inc. Brooke Utilities is the sole shareholder of the Applicant, Pine Water Company, Inc. ("Pine Water" or the "Company").

Q. ARE YOU THE SAME ROBERT T. HARDCASTLE WHO FILED DIRECT TESTIMONY IN THIS MATTER?

A. Yes.

II. PURPOSE AND SUMMARY OF REBUTTAL TESTIMONY.

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

A. I have reviewed Staff's direct filing, which includes the testimony of Staff's three witnesses, John S. Thornton, Claudio M. Fernandez, and Marlin Scott, Jr., along with Staff's supporting schedules. I have also reviewed the direct filing by Intervenor Pine/Strawberry Water Improvement District ("District"), which includes the testimony of John F. Nelson, Gila County's Manager, and Harry Jones, the District's "general business" consultant. I have also reviewed the direct testimony submitted by Intervenor John Breninger. The purpose of my rebuttal testimony is to respond to certain issues raised in such testimony. In general, my rebuttal will address issues related to the Company's operations, including discussing water supply and the environment in which we must operate, the Company's request for a Water Exploration Surcharge, Project Magnolia and I will also respond to a number of the baseless and inflammatory comments by District witness, Harry Jones.

Q. WOULD YOU PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY?

A. Certainly. My rebuttal testimony addresses four major themes: (1) water availability in Pine, Arizona, and the economic realities of pursuing new water sources; (2) Pine Water's efforts to enhance water supply availability for its ratepayers at reasonable and prudent costs; (3) Brooke Utilities' sole ownership interest in Project Magnolia, and the prudency of the Wheeling Agreement between Brooke Utilities and Pine Water needed for water augmentation; and (4) the District's testimony, as well as the District's efforts to expand the scope of this rate proceeding to further its effort to acquire Brooke Utilities' assets in the Pine-Strawberry area.

Pine Water is not responsible for the water shortage problems in Pine, Arizona. In fact, the District's own investigative report concludes that the area has been plagued by recurrent water supply shortages since the 1980s. However, despite the report's conclusion that the regional aquifer systems are inadequate to support "existing or future water demands," Gila County continues to work with other "pro-growth" entities to develop the area without addressing the recurring water supply problems in a meaningful way. Further, Pine Water is uncertain whether the costs of exploring for new water supplies that may never materialize are prudent or reasonable.

Despite the District's claims, Pine Water has attempted to participate in County efforts to find new sources of water. However, the inherent mistrust of Pine Water and Brooke Utilities continues to undermine any meaningful attempt at addressing the area's water supply problems. Indeed, Pine Water continues to hold that the Commission plays an integral role in formulating a policy that allows for recovery of capital needed to fund new sources of water supply and/or continue Pine Water's water augmentation program.

Project Magnolia, which is clearly owned by Brooke Utilities, represents recent efforts to augment Pine Water's water supply in an the most prudent manner available. Due to a lack of real alternatives for water supply, the $15.00 per 1000 gallons charged for "wheeling" water purchased from Strawberry Water to Pine Water represents the most efficient and low-cost alternative for ratepayers.

Finally, I discussed the District's filing in this proceeding. On the whole, the District's direct testimony reflects, at best, a significant misunderstanding of the scope of this proceeding and the manner in which rates are established for public service corporations in Arizona. Moreover, the District's filing, and the District's responses to Pine Water's data requests, reflect the District's clear intention to expand the scope of this proceeding to further its efforts to condemn or otherwise acquire the assets of Brooke Utilities in the Pine-Strawberry area, including the assets of Pine Water, at the lowest possible cost. In the end, I believe the District's direct filing as well as its conduct to date in this proceeding reflects that the District, now run by Gila County, is concerned more with furthering its own pro-growth agenda in an area of scarce water resources than with the public health, safety and welfare of the residents of Pine, Arizona which Pine Water serves.

III. WATER SUPPLY AND THE ENVIRONMENT IN WHICH PINE WATER OPERATES.

Q. WHY START WITH WATER SUPPLY ISSUES, MR HARDCASTLE?

A. Because everything in Pine, Arizona, every major issue facing this water company, every complaint and criticism of Pine Water essentially begins and ends with the water supply available to serve the residents of Pine, Arizona. In short, we operate in an extremely unfavorable environment due to the inherent limitations on water supply we face every day, and the general misunderstanding of the public

regarding the area's chronic water shortages.

Q. CAN YOU BRIEFLY EXPLAIN THE PROBLEM WITH THE WATER SUPPLY IN PINE, ARIZONA?

A. Yes. The water supply in and around Pine, Arizona is inadequate to meet the needs of the community. As a result, the area has been plagued by recurrent water supply shortages since the 1980s. *See Investigation of Groundwater Availability for the Pine/Strawberry Water Improvement District* ("*Investigation of Groundwater Availability*"), copy attached to Direct Testimony of John O. Breninger ("Breninger Dt.") as Attachment B, at 1. The same is true, although to a somewhat lesser extent, of the area in and around Strawberry, Arizona. *Id.* at 5.

Q. THE *INVESTIGATION OF GROUNDWATER AVAILABILITY* YOU REFFERED TO WAS PREPARED FOR THE DISTRICT?

A. Yes, by geologists with Morrison Maierle, Inc. Intervenor John Breninger participated extensively in this investigative effort and even drafted the Preface to the report. *Id.* at vi-ix. As a result, we now have a recent, extensive and scientific report addressing the availability of groundwater in the area served by Pine Water.

Q. DOES THE DISTRICT'S *INVESTIGATION OF GROUNDWATER AVAILABILITY* REACH ANY CONCLUSIONS REGARDING THE REASONS FOR WATER SHORTAGES IN THE PINE-STRAWBERRY REGION?

A. Yes, the report concludes that the aquifer systems in the area of the District, which area includes Pine Water's CC&N, are inadequate to support "**existing or future** water demands." *Investigation of Groundwater Availability* at 9. The report further concludes that the water supply inadequacies result from "the physical properties of the aquifers." *Id.* In other words, the problem is hydrological. Wells

in the aquifers underlying both Pine and Strawberry "exhibit decreasing yield in response to increased pumping during periods of increased seasonal demand for water." *Id.* at 6. From the perspective of Pine Water, the hydrological conclusions described by the District's report are reasonably consistent with actual operational conditions encountered by Pine Water since we acquired this water system in August 1996.

Q. WHAT DOES THE *INVESTIGATION OF GROUNDWATER AVAILABILITY* SAY ABOUT DROUGHT OR BELOW AVERAGE PRECIPITATION CONDITIONS?

A. That these factors are not the cause of the water supply shortage in Pine, Arizona, but they do make the problem worse. *Id.* at 6, 8.

Q. DOES THE DISTRICT'S INVESTIGATION ADDRESS SURFACE WATER SUPPLIES?

A. Not in detail, although the authors conclude that "surface water sources are not physically and legally available for immediate development." *Investigation of Groundwater Availability* at 6.

Q. DOES THE REPORT PREPARED FOR THE DISTRICT CONCLUDE THAT BROOKE UTILITIES AND/OR ITS SUBSIDIARY UTILITIES ARE A CONTRIBUTING FACTOR TO THE WATER SHORTAGES?

A. No, the report actually supports the opposite conclusion. In finding that the water shortages in the Pine-Strawberry area result from the inherent physical hydrology of the region, the authors specifically discussed and rejected the notion that "improper management, operation and maintenance" was the reason for the water shortages. *Id.* On the other hand, I would note that the report is critical of a number of studies conducted since 1989 by consultants overestimating the availability of water resources available to serve the Pine and Strawberry

communities. *Id.* at 7.

Q. WHY WOULD CONSULTANTS OVERESTIMATE THE AVAILABILITY OF WATER SUPPLIES?

A. To foster growth. Gila County has been encouraging development of the Pine-Strawberry area for a number of years. Real estate developers in the area have been required to "push the envelope" to justify further homebuilding. It is generally accepted knowledge that only about one-half of the total developable residential parcels in Pine, Arizona have been or are actually being developed. It is also no secret that Gila County has long viewed the development of the rest of these parcels as a means of increasing property tax revenues, but such development is very much dependent upon adequate water supplies. We have been voicing our concern over this pro-growth philosophy, unsupported by adequate water supplies, for a number of years but have received little or no cooperation from Gila County and the real estate development community in and around the Pine-Strawberry area. Instead, development pressures continue and we are constantly criticized as being the reason for the area's water shortage problems. *See* Investigation *of Groundwater Availability* at 9. In fact, Gila County and the real estate developers in the area actually argued *against* the development of Project Magnolia claiming it was "premature" without further hydrological investigation. One can only imagine what the recent water supply conditions would have been if Project Magnolia had not been developed and not been available to supplement the needs of Pine Water's customers in recent years.

Q. WHAT CONCLUSIONS DO THE AUTHORS OF THE *INVESTIGATION OF GROUNDWATER AVAILABILITY* REACH REGARDING INCREASING THE WATER SUPPLIES AVAILABLE FOR CUSTOMERS IN PINE, ARIZONA?

A. The report essentially concludes that further development of water sources in Pine, Arizona is unlikely. *See* Investigation *of Groundwater Availability* at 9-10. However, the authors further indicate that an alternative aquifer may be available in deeper strata underlying the northwestern corner of the Strawberry Valley. Specifically, the report concludes, "[t]he alternative identified by the investigation is a deep aquifer contained in primarily limestone strata in the Redwall Limestone and Martin Formation." *Id.* at 9. According to the report, the static water level in these deep aquifers is approximately 1500 feet and such aquifers may continue to a depth of more than 2100 feet. *Id.* at 10.

Q. INTERVENOR JOHN BRENINGER CLAIMS THAT *THE INVESTIGATION OF GROUNDWATER AVAILABILITY* DEMONSTRATES THAT THESE DEEP AQUIFERS REPRESENT A LONG TERM RELIABLE WATER SUPPLY FOR PINE, ARIZONA. DO YOU AGREE?

A. Not entirely, I think Mr. Breninger presents an overly simplistic view of the circumstances. Breninger Dt. at 2-3. The authors of the *Investigation of Groundwater Availability* were careful to qualify their conclusions as reflecting a "reasonable expectation" that the limestone formations are fully saturated. *Investigation of Groundwater Availability* at 10-11. Even more importantly, the report reaches the ultimate conclusion that:

> The new information and concepts provided by this investigation indicate that there is a need for **considerable additional investigation** to refine the quantification of groundwater resources in the area as well as to quantify existing and future demand for water. It is anticipated that this report will provide a new framework for effective accomplishment of future investigations of the groundwater resources in the PSWID area. *Id.* at 11(emphasis supplied).

Thus, while making for great media sound bites, I simply cannot agree with Mr. Breninger that this report reaches a definitive conclusion that "**We Have the**

Water!" Breninger Dt. at 5 (emphasis original). Instead, we have a report, an investigation based on what appears to be sound scientific analysis, telling us where there is a reasonable expectation that additional water supplies **might** be found, but "considerable" work remains to be done before we know for certain where and how much water is available in the area of the District and Pine Water's CC&N. *See Investigation of Groundwater Availability* at 10-11 Further, knowing where water lies beneath Strawberry does not mean that it is physically, legally or economically deliverable to the Pine Water system and it remains to be seen whether the potential new water resources identified in the District's investigation represent financially viable water sources for Pine Water's ratepayers.

Q. WHAT LEGAL AND/OR PHYSICAL LIMITATIONS MIGHT IMPACT PINE WATER'S ABILITY TO OBTAIN WATER SUPPLIES FROM DEEP WELLS IN THE STRAWBERRY VALLEY?

A. There are a number of concerns. Depending on the ownership of the land where such wells are located, rights-of-way, easements and/or permits may be required. A delivery pipeline would require similar approvals and/or access rights and, after our experience with Project Magnolia, I am frankly not sure another such pipeline could be built from Strawberry to Pine. Also, I do not know much about the validity of such claims, but I suspect Salt River Project might contest any attempts to withdraw groundwater in the Strawberry Valley for delivery to Pine, Arizona. In sum, there remains considerable uncertainty over the physical and legal aspects of such a plan.

Q. DOES THE *INVESTIGATION OF GROUNDWATER AVAILABILITY* ADDRESS THE COSTS THAT WOULD BE INCURRED TO OBTAIN WATER FROM THE LIMESTONE ACQUIFERS UNDER THE STRAWBERRY VALLEY FOR DELIVERY INTO THE PINE WATER

SYSTEM?

A. To some extent. Appendix C to the *Investigation Of Groundwater Availability* provides some preliminary cost estimates for test/production wells. The authors of the report estimate the total cost of each deep well to be between $606,830 and $870,580. *Id.* at C-2. No information regarding the costs that will be incurred to conduct the necessary additional investigation, to obtain required approvals and rights-of-way, to build additional transmission lines, or to pump water from these deep wells and then deliver it from the Strawberry Valley to the Pine Water system is provided. While I suspect these latter costs were beyond the scope of the District's study, they are well within the scope of Pine Water's decision-making as well as that of this Commission.

Q. DO YOU AGREE WITH THE ESTIMATED COSTS FOR DEEP WELL DRILLING PROVIDED IN THE INVESTIGATIVE REPORT?

A. It has been our experience that sub-surface geology always provides hidden challenges that cannot be accurately predicted from the surface. Under perfect conditions and assuming a drilling effort without significant surprises, the upper end of the cost estimate proffered by the District's report may be used as "base" estimate of the drilling costs.

Of course, solving the Pine Water problem, assuming it can be solved at all this way, would require that several such wells be drilled. This may be the basis for Mr. Breninger's estimated $4.2 million price tag. *See* Breninger Response to Pine Water Data Request No. 1.4, copy attached hereto as Hardcastle Rebuttal Exhibit 1. Mr. Breninger notes, however, that his estimate excludes the costs of "property easements or acquisition, a trunk pipeline beyond the well sites delivery point, project overhead costs, or cost of money." *Id.* In Pine Water's opinion, the "all-in" costs of such a project could easily escalate to more the double Mr.

Brenniger's estimated cost.

Q. IS MR. BRENINGER REQUESTING THAT THE COMMISSION ORDER PINE WATER TO ATTEMPT TO OBTAIN WATER SUPPLIES FROM THE DEEP AQUIFERS UNDERLYING THE STRAWBERRY VALLEY?

A. I think one can reach that conclusion from his testimony:

> Would the Commission please take a new look at the rate structure for water that it has ruled for this Community, and reconsider the need for a significant increase in capital investment on the part of the water utilities that can be justified by the rate base.
>
> * * *
>
> The Commission should rule to facilitate the residents of this Community to use all the water they want to pay for! I say again: **Put enough capital to work where it does the most good.** Breninger Dt. at 5 (emphasis original).

Q. DOES MR. BRENINGER PROVIDE ANY EVIDENCE REGARDING THE RATEMAKING IMPACTS OF ATTEMPTING TO LOCATE AND DELIVER WATER FROM THE DEEP AQUIFERS IDENTIFIED IN THE *INVESTIGATION OF GROUNDWATER AVAILABILITY*?

A. No, and Mr. Breninger has admitted in data request responses that he is not able to testify regarding the ratemaking impacts of this undertaking. *See* Breninger Response to Pine Water Data Request Nos. 1.8 and 1.11, copies attached hereto as Hardcastle Rebuttal Exhibit 1. This is unfortunate as Pine Water has, for years, differed with the views of the District in this regard, as such views do not consider that developing a water supply solution to Pine, Arizona's dilemma without a corresponding economic solution that is affordable to Pine Water's ratepayers represents no solution at all. Mr. Breninger's testimony merely furthers this historic shortcoming on the part of the District.

Q. WHAT ABOUT THE DISTRICT? HAS IT PROVIDED ANY EVIDENCE CONCERNING THE COSTS TO PINE WATER'S RATEPAYERS OF

IMPLEMENTING THE DEEP AQUIFER PROJECT IDENTIFIED IN ITS REPORT?

A. No. Despite its sweeping criticism of Pine Water's past efforts to address water supply problems in its certificated service area, the District's witnesses do not testify regarding any specific alternatives available to the Company to enhance water supplies, nor do they provide any evidence of the ratemaking impacts that will be realized from efforts such as the drilling of deep wells discussed in the District's *Investigation Of Groundwater Availability.*

However, in data request responses, the District claims that deep wells in the Strawberry Valley will cost approximately $150,000 to drill and that Pine Water should expect to spend $200,000-$300,000 annually on water exploration, well drilling and support for other exploration efforts. *See* District Response to Pine Water Data Request No. 1.41, copy attached hereto as Hardcastle Rebuttal Exhibit 2. The District's estimates are contradicted by its own study and by the estimates of its own agent, John Breninger, as explained above. *Compare id. with* Appendix C to the *Investigation Of Groundwater Availability* and Breninger Response to Pine Water Data Request No. 1.4, copy attached hereto as Hardcastle Rebuttal Exhibit 1.

Put bluntly, the District's witnesses are following a long tradition in Pine, Arizona of criticizing Brooke Utilities for failing to provide an adequate water supply to Pine Water's customers without offering any specific and viable solutions and without acknowledging the severe ratemaking implications of providing additional water into the Pine Water system.

IV. WATER SUPPLY ENHANCEMENT AND PINE WATER'S REQUESTED EXPLORATION SURCHARGE.

Q. DID YOUR DIRECT TESTIMONY ADDRESS PINE WATER'S PAST EFFORTS TO AUGMENT AVAILABLE WATER SUPPLIES?

A. Yes, this testimony can be found in my direct testimony (at 7-8) where I describe the Company's substantial investment since 1996 in well drilling, leak repair and additional storage, as well as Brooke Utilities' development of Project Magnolia. Explicitly recognizing the efforts at increasing water available for delivery to Pine Water's customers by the Company and Brooke Utilities, the Commission recently modified the moratorium on new service connections. Decision 64400 (January 31, 2002) at 3-4, 6.

Q. DOES THE DISTRICT PROVIDE TESTIMONY REGARDING THE COMPANY'S EFFORTS TO DEVELOP NEW WATER RESOURCES?

A. Yes, Mr. Jones is severely critical of our efforts to develop additional water resources as well as additional storage facilities. Direct Testimony of Harry D. Jones ("Jones Dt.") at 16. Again, as with Mr. Breninger, Mr. Jones presents an erroneous and incomplete picture of the situation. To begin with, his claim that there is no public record demonstrating our investment is contradicted by, among other things, Commission Decision No. 64400. Moreover, simply looking at the amount of capital investment in new wells or new storage facilities does little to reflect reality. Our customers cannot drink or bathe in capital investment and punching holes in the ground in an area well known to lack adequate aquifers is hardly the type of reasonable and prudent investment we believe we are obligated to undertake. *See Investigation of Groundwater Availability* at 3, 7 (discussing findings of Arizona Department of Water Resources indicating that since 1973 almost all new subdivisions have received statements of inadequate water supply).

Q. WHAT ABOUT MR. JONES' CLAIM THAT PINE WATER AND BROOKE UTILITIES HAVE FAILED TO PARTICIPATE OR SUPPORT THE SIGNIFICANT EFFORTS BY OTHER GROUPS TO LOCATE ALTERNATIVE SOURCES OF NEW WATER?

A. I guess my answer is essentially the same. While we have certainly been aware of these efforts, and in the past have supported and participated in community-wide efforts to locate new water resources, it has been our experience that investing capital as well as time in such efforts does little to produce additional water supplies for our customers. Instead, what such efforts lead to is name calling and finger pointing directed at Brooke Utilities and Pine Water by Gila County, the District and others, and the inevitable conclusion that such efforts no longer provide a benefit to our customers.

Q. MR. JONES REFERS TO EFFORTS BY THE NORTHERN GILA COUNTY WATER PROJECT ALLIANCE AND THE MOGOLLION RIM WATER RESOURCES MANAGEMENT STUDY FUNDED BY THE BUREAU OF RECLAMATION, THE TOWN OF PAYSON AND GILA COUNTY. HAVE THESE EFFORTS PRODUCED ADDITIONAL WATER SUPPLY AVAILABLE TO PINE WATER?

A. Again, none of these efforts have produced a single gallon of water for consumption by Pine Water's ratepayers. In my opinion, these efforts are politically driven, politically motivated and unfairly offer hope to customers that if we continue to study the problem long enough we will, eventually and after untold expenditures, find some solution. Apparently, local politicians believe that as long as someone is studying the problem the voting constituency will believe progress towards a solution to the water shortage problem is being made. Now, knowing full well they cannot further develop Pine, Arizona without more water, Gila County officials appear willing to delude residents into believing that "all the water we need is located right over there". Ultimately, I believe the community will see the fallacy of this thinking. Again, the District's own report clearly indicates that <u>the water necessary to solve the water demand problem is located</u>

somewhere else, a substantial sum of money away from Pine, Arizona.

Q. HAS THE DISTRICT BEEN SUCCESSFUL IN DEVELOPING ADDITIONAL WATER SUPPLIES FOR THE BENEFIT OF CUSTOMERS IN PINE, ARIZONA?

A. According to the Gila County Manager, John Nelson, who is now running the District, the District was established to locate an "adequate long-run stable source of water for the property owners within the District." Direct testimony of John Nelson ("Nelson Dt.") at 2. To my knowledge, however, the District has not increased the water supply available to the Pine-Strawberry region by a single gallon. From our vantage point, this is a pretty significant indictment of the District, especially when one considers the extremely harsh comments of the District's witnesses regarding our efforts. Nevetheless, as discussed above, we believe that the District's recent report contains valuable information for the Company's consideration. However, the report is a long way from a physically, legally and economically viable source of wet water for our ratepayers.

Q. WHAT EFFORTS DOES PINE WATER PLAN TO TAKE IN THE FUTURE TO AUGMENT AVAILABLE WATER SUPPLIES?

A. Attached to my direct testimony as Exhibit B is a Water Supply Augmentation Plan for Pine Water. This plan identifies short, mid and long-range options for enhancing the water supply available to Pine Water's customers. This Commission has already ordered some of these measures, like a more restrictive curtailment tariff and a water hauling surcharge. *See* Decision No. 65914 (May 16, 2003). In addition, since the filing of this case, we have taken steps to secure a supplemental water supply source of up to 150,000 gallons per day from Starlight Pines Water Company ("Starlight Pines") located in Coconino County. This water source was extensively used during the high demand summer months of 2003 to augment the

declining water supplies in Pine, Arizona. That supplemental water source contributed to Pine Water successfully providing uninterrupted water service to its customers through the high demand summer months of 2003.

However, after carefully reviewing the *Investigation Of Groundwater Availability* it would appear a number of potential alternatives are not worth pursuing given the physical and legal restrictions on using surface water supplies and the inherent hydrological and physical limitations on the available supplies of groundwater. *See Investigation Of Groundwater Availability* at 6, 9-10. As a result, we are going to have to reevaluate the possible courses of action and hopefully, in cooperation with the Commission and Staff, prioritize and attempt to determine the most prudent courses of action.

Q. HOW DID PINE WATER PROPOSE TO FUND ITS WATER AUGMENTATION PLAN?

A. At the time the Company's rate application was filed pursuant to Commission order, we had not yet determined which projects should be funded. Therefore, the manner of funding specific projects was not yet addressed.

Q. BROOKE UTILITIES, AS PINE WATER'S SHAREHOLDER, IS OBLIGATED TO INVEST CAPITAL TO ENSURE AN ADEQAUTE SUPPLY OF WATER FOR THE COMPANY'S RATEPAYERS, CORRECT?

A. The short answer is "yes, but..." The "but" is how are we going to define adequate? Does "adequate" mean spending whatever it takes to find water in deep wells a third of a mile below the earth's surface and then deliver it to the Pine Water system? We only have 2000 customers. Is the Commission ready to approve rates sufficient to 1) provide a return of and on a more than $4 million capital investment (using Mr. Breninger's estimates, or perhaps $8 million using

our potential cost assessment) in drilling wells in the deep aquifers below the Strawberry Valley with no guarantee of success; 2) the costs of pipelines to deliver such water; and 3) significant increases in operating costs, especially purchased power, which costs are going to skyrocket if we have to start pumping a large portion of our water supply from 1500 feet and below? Our customers would be facing rate increases that have never been seen before and, I suspect, are not fully appreciated by the same people that exclaim this is the only viable alternative.

Of course, this assumes substantial capital investment actually yields additional water supplies for the Pine Water system. What if it doesn't? Does Pine Water's CC&N obligate Brooke Utilities to spend hundreds of thousands or even millions of dollars looking for water all over Northern Arizona that might not be found, or if found, might not be available for delivery into the Pine Water system? Is the Commission prepared to deem investment that yields no additional water reasonable and prudent? I know one customer, John Breninger, isn't. *See* Breninger Response to Pine Water Data Request No. 1.9, copy attached hereto as Hardcastle Rebuttal Exhibit 1.

In the end it comes down to what is a reasonable and prudent price tag for 2000 customers? What solution are **all** of Pine Water's rate payers, not just the minority of customers that have vested financial interests, truly prepared to accept in the form of increased rates? Is it $100 per month or maybe $200 per month or what if it's $500 per month? Are the 2000 Pine Water ratepayers really prepared to accept the economic impact of what the District wants to do to solve the problem? If they are, then why hasn't such a solution been implemented long before now? Absent support from our ratepayers and the guidance of this Commission, Pine Water and Brooke Utilities is simply not convinced, for example, that investing million of dollars in locating water deep under the Strawberry Valley is reasonable

and prudent.

Q. DOES THAT MEAN PINE WATER AND BROOKE UTILITIES DO NOT INTEND TO PURSUE ADDITIONAL WATER SUPPLIES?

A. Absolutely not. However, given the conclusions reached in the District's *Investigation Of Groundwater Availability*, and the positions of the other parties to this proceeding, it is clear that we need to reevaluate the situation in order to ensure we pursue the most prudent and financially viable course of action.

Q. WHAT ABOUT THE WATER EXPLORATION SURCHARGE PINE WATER REQUESTED IN ITS APPLICATION?

A. Pine Water is withdrawing its request for approval of a Water Exploration Surcharge in this docket.

Q. WHY IS THE COMPANY WITHDRAWING ITS REQUEST FOR APPROVAL OF A WATER EXPLORATION SURCHARGE AT THIS TIME?

A. Well, for one thing, the District has more or less accused me personally of proposing this surcharge as a means of stealing money from our ratepayers:

> Obviously, he intends for $20,000 per month of the rate-payers money to go to Brooke Utilities, which is unregulated and can do what it wants with the money without the scrutiny of the Commission or the rate-payers. Mr. Hardcastle's proposal for such a process for augmenting water supplies is an indication of his personal willingness to continue to operate regardless of the conflicts of interest he has with the various group that depend on him and his companies for fair treatment in a monopolistic environment. Putting this rate-payer money into the hands of an unregulated company that deals with its subsidiaries on other than an arms-length would be a poor decision. Jones Dt. at 14.

Since the District claims to be representing the interest of all of our customers (Nelson Dt. at 2-3), we can only assume our ratepayers oppose the Water Exploration Surcharge for the reasons voiced by Mr. Jones. Given such

opposition, why we would we want to collect such a charge?

Q. DOES THIS MEAN THE DISTRICT'S WITNESS WAS CORRECT?

A. Of course not. Mr. Jones's testimony is not only unprofessional, given his baseless personal attacks on me, it is utterly ridiculous. Indeed, I suggest this testimony unmistakably illustrates Mr. Jones' complete ignorance of the ratemaking process. Either that, or he simply failed to read Mr. Bourassa's direct testimony concerning this surcharge. As Mr. Bourassa explained, the Water Exploration Surcharge was intended to provide the Company with a low cost means of financing the upfront costs of exploring additional water supply alternatives. Direct Testimony of Thomas J. Bourassa ("Bourassa Dt.") at 48-49. Ironically, the District's own water supply study makes it clear that additional upfront costs are going to be necessary. *Investigation Of Groundwater Availability* at 11 & Appendix C.

Q. WHAT DID YOU MEAN BY "LOW COST MEANS OF FINANCING"?

A. As Mr. Bourassa explained, amounts collected under the proposed Water Exploration Surcharge were to be booked as contributions-in-aid of construction. Bourassa Dt. at 49-50. Accordingly, there would have been no return of or on the expenditure of these sums by Pine Water, in contrast to any amounts booked as paid in capital from Brooke Utilities. Again, I can only assume Mr. Jones either did not read or did not understand this portion of Mr. Bourassa's testimony.

Q. IS THE SAME THING TRUE WITH RESPECT TO MR. JONES' ALLEGATIONS THAT THE EXPENDITURE OF FUNDS COLLECTED UNDER THE WATER EXPLORATION SURCHARGE WOULD BE WITHOUT COMMISSION SCRUTINY?

A. It would appear so. For one thing, I have no idea where Mr. Jones came up with the idea the ratepayers' money being collected under the surcharge would go to Brooke Utilities. Jones Dt. at 14. I think it is safe to assume that had Pine Water

been authorized to collect a Water Exploration Surcharge, the Commission would have required Pine Water, not Brooke Utilities, to spend such funds exploring additional water supplies for Pine Water's ratepayers. In fact, it was for this reason that Pine Water proposed to segregate funds collected under the surcharge in a separate interest bearing account and assumed collection and expenditure would be subject to certain Commission-imposed reporting requirements. Bourassa Dt. at 48. In other words, we fully expected and supported Commission scrutiny, as we have in all other regulatory matters involving Pine Water.

Q. WHAT IS STAFF'S POSITION WITH RESPECT TO THE PROPOSED WATER EXPLORATION SURCHARGE?

A. Staff recommends that the surcharge not be implemented at this time. Direct Testimony of Claudio M. Fernandez ("Fernandez Dt.") at 16. Instead, Staff recommends bifurcating the request for approval of the Water Exploration Surcharge into a second phase of this proceeding and, in fact, the Company and Staff were discussing this idea informally before the District and Mr. Breninger intervened and filed their direct testimonies. *Id.* Staff's proposal might have some merit, if it were not for the uncertainty over the most prudent course of action and the vehement opposition to such a surcharge from ratepayers. However, Pine Water has no interest in going through another costly proceeding, at further ratepayer expense, to fight for approval of a charge that no one seems to support. Therefore, we believe it best to withdraw our request for the Water Exploration Surcharge at this time.

Q. IN THE MEANTIME, WILL PINE WATER CONTINUE TAKING STEPS TO AUGMENT WATER SUPPLIES?

A. Absolutely. The arrangement we have entered into with Starlight Pines is a viable supplemental solution to water shortages in the short-term, exactly what an

"augmentation" program is supposed to provide. We have made water transportation arrangements, at the urging of the Commissioners, to deliver this water to customers of Pine Water in a volume and manner that avoids long term water service interruptions. This supplemental water supply solution may not be the best long term solution to the problem but as an augmentation approach to managing available water supplies in the short run, the Commissioners correctly concluded that it is a viable alternative, in part, because rate payers can control their costs of such supplemental water supplies based on their personal consumption. *See* Decision No. 65914 (May 16, 2003). As discussed above, we will also be reevaluating our options in light of the District report and hopefully, specific guidance from the Commission in this proceeding.

V. <u>PROJECT MAGNOLIA</u>.

Q. WHAT IS PROJECT MAGNOLIA?

A. As explained in my direct testimony, Project Magnolia is a 10,800-foot pipeline constructed, owned and operated by Brooke Utilities and connecting the water systems of Pine Water and Strawberry Water Company, also owed by Brooke Utilities ("Strawberry Water"). Direct Testimony of Robert T. Hardcastle ("Hardcastle Dt.") at 8. Project Magnolia can deliver approximately 700,000 gallons per day between the two systems.

Q. WHAT IS THE ISSUE WITH RESPECT TO PROJECT MAGNOLIA IN THIS PROCEEDING?

A. Pine Water's test year operating expenses include the costs of transporting water purchased by Pine Water from Strawberry Water through Project Magnolia. The Company purchased 11,643,000 gallons of water from Strawberry Water during the test year, all of which was delivered into Pine Water's system through Project Magnolia. Nevertheless, Staff has failed to include any of these costs in its

recommended expense levels. Fernandez Dt. at 12-13.

Q. WHY DID STAFF REMOVE THE TRANSPORTATION COSTS ASSOCIATED WITH PROJECT MAGNOLIA FROM OPERATING EXPENSES?

A. According to Mr. Fenandez, Staff removed the transportation costs paid by Pine Water because it believes the costs of Project Magnolia should be recorded on Pine Water's books and records. Fernandez Dt. at 7. In other words, Staff has essentially concluded that Pine Water owns Project Magnolia and therefore, these transportation costs are "not applicable." *Id.*

Q. WHO OWNS PROJECT MAGNOLIA?

A. As I testified in my direct testimony, Project Magnolia is owned by Brooke Utilities. *See* Hardcastle Dt. at 8. All of the permits, rights-of-way and other approvals necessary for the siting and construction of Project Magnolia were paid for by and issued to Brooke Utilities. *See* Hardcastle Rebuttal Exhibit 3. All of the costs for constructing Project Magnolia were paid for by Brooke Utilities. *See* Hardcastle Rebuttal Exhibit 4. Since Project Magnolia became operational in February 2001, Brooke Utilities has paid all of the costs associated with operating and maintaining the pipeline.

Q. DO PINE WATER'S BOOKS AND RECORDS REFLECT ITS OWNERSHIP OF PROJECT MAGNOLIA?

A. Nothing in Pine Water's books and records supports Staff's conclusion that the Company owns Project Magnolia.

Q. ON WHAT BASIS THEN DOES STAFF CLAIM THAT PROJECT MAGNOLIA IS OWNED BY PINE WATER?

A. Well, first I should point out that the Staff witnesses do not seem to be in agreement on this point. Staff Engineer, Marlin Scott, Jr., has submitted an

Engineering Report for Pine Water and this report indicates that Project Magnolia is owned by Brooke Utilities. Direct Testimony of Marlin Scott, Jr. ("Scott Dt.") at Exhibit MSJ, page 3 of 15. In contrast, in his testimony, Mr. Fernandez claims that Pine Water owns Project Magnolia because the pipeline was included in CWIP and listed as a future capital project to be funded with stock in the last rate case. Fernandez Dt. at 7-8.

Q. DO YOU AGREE WITH MR. FERNANDEZ?

A. No. For a number of reasons, Staff's reliance on the generic exhibits in the last rate case is overly simplistic. According to responses to data requests, "the basis for Staff's conclusion that Project Magnolia was included in CWIP" is the Company's application, which included schedules referring to projected capital expenditures, including Project Magnolia. *See* Staff Response to Pine Water Data Request No. 1.13, copy attached hereto as Hardcastle Rebuttal Exhibit 5.

The first of these schedules mentioning Project Magnolia is a listing of capital budget items from 1999-2003. *Id.* This schedule simply shows Project Magnolia as one of several projects under consideration at the time. *Id.* However, at that time, final decisions regarding which projects would be undertaken had not been made, let alone how those projects would be financed, owned and operated.

The second schedule Staff provides mentioning Project Magnolia is a plant detail listing from the last rate case. *Id.* This appears to be the document from which Mr. Fernandez concluded the project was included in the Company's CWIP because next to the listing for Project Magnolia is a cost amount equal to $17,040. However, there is obviously a serious error with respect to that listing.

Q. WHY DO YOU BELIEVE THE LISTING OF PROJECT MAGNOLIA ON THAT PLANT LISTING SCHEDULE WAS IN ERROR?

A. Because Project Magnolia is shown as being placed in service June 30, 1998. We

did not even obtain the permit to build Project Magnolia until February 2000 and the project was completed and placed in service in February 2001, as I have already testified. *See* Hardcastle Rebuttal Exhibit 3. In addition, this schedule shows the cost being $17,040, yet Project Magnolia has an original cost price tag of approximately $450,000. In other words, our plant detail schedule in the last rate case was mistaken, at least with respect to Project Magnolia.

Q. YOU TESTIFIED THAT THIS IS THE COMPANY'S MISTAKE. WOULDN'T YOU AGREE, THEN, THAT IT IS NOT REALLY MR. FERNANDEZ' FAULT THAT HE RELIED ON THIS SCHEDULE?

A. Not entirely. Certainly the inclusion of a project that was still years away from being undertaken on a plant listing in that last rate case is our fault. However, Mr. Fernandez was certainly aware of evidence in this case that Project Magnolia was placed in service much later and the cost of Project Magnolia. *See* Fernandez Dt. at 7-8, 13-14. From there, he could have, in fact should have, questioned the accuracy of the schedule from the last case if he was relying on it for his recommendations in this case.

Q. WAS PROJECT MAGNOLIA PART OF CWIP INCLUDED IN RATE BASE IN THE LAST RATE CASE?

A. No, based on Staff's recommendation, the Commission declined to include any CWIP in rate base in the last proceeding. *See, generally,* Decision No. 62400 (March 31, 2000). Frankly, in this light, I find Staff's position somewhat incredible. After recommending in the last rate case that the Commission exclude all CWIP from rate base, Staff now argues that the pipeline was included in the Company's CWIP, meaning it must be owned by Pine Water.

Q. WAS PROJECT MAGNOLIA LISTED AS A PROJECT TO BE FUNDED BY THE SALE OF STOCK IN THE LAST RATE CASE?

A. Only in a generic manner. The request in the last rate case for authority to issue equity to the parent, Brooke Utilities, was not tied to any specific project or projects. *See* Staff Response to Pine Water Data Request No. 1.13, copy attached hereto as Hardcastle Rebuttal Exhibit 5. At the time the application was filed in that case, we were still in the process of making decisions concerning which investments were most prudent. Although we felt it possible we would have to issue additional stock, and therefore sought the necessary authority, we had also not yet decided on the appropriate financing.

Q. DID THE COMMISSION APPROVE THE REQUEST FOR AUTHORITY TO ISSUE ADDITIONAL STOCK?

A. Yes, although again, the authority was not tied to any specific facilities or project. *See, generally,* Decision No. 62400. Furthermore, no stock was ever issued under this authority.

Q. DID SOMETHING CHANGE FOLLOWING DECISION NO. 62400?

A. I do not think the situation changed so much as we continued our planning process at both the utility and shareholder level. As I testified earlier, most of the projects listed in the schedules attached to the last application for rate increases were in the future planning stage. Project Magnolia was one of the projects still on the drawing board so to speak and we had not yet decided to build the project when that list was completed. Ultimately, it was decided that Brooke Utilities would finance, construct, own and operate Project Magnolia.

Q. WHY WAS IT DECIDED THAT BROOKE UTILITIES WOULD BUILD, OWN AND OPERATE PROJECT MAGNOLIA?

A. Basically, it came down to risk. The construction of Project Magnolia required a number of regulatory approvals and there was no guarantee that Brooke Utilities would succeed in obtaining all of the necessary permits, rights-of-way, easements

and environmental clearances. Further, at the time the pipeline project was conceived, Brooke Utilities faced the risk that it would never be used. It faces additional risks every day it owns the project because Pine Water pays only for water actually delivered, there are no standby or other charges. In other words, as a result of the decision that Brooke Utilities would pay for, build, own and operate the pipeline, Brooke Utilities, not Pine Water and/or its ratepayers, has borne and continues to bear the risks associated with Project Magnolia.

Q. BUT ISN'T PINE WATER EXPECTED TO TAKE THESE RISKS? AREN'T THE RISKS YOU IDENTIFIED TYPICAL OF MOST INVESTMENT DECISIONS BY PUBLIC SERVICE CORPORATIONS?

A. Not entirely. I am not saying other water, sewer or electric providers regulated by the Commission do not face serious operational problems, many of which are unique. But how many entities operate in an environment where they are expected to spend millions of dollars hunting for water supplies that have never before been found? What if we take every reasonable step and find no additional water that can actually be provided to the Pine Water system? Or what if we are successful in finding the water but cannot provide it to the Company's ratepayers at a rate that makes financial sense? Does that mean Pine Water would recover nothing for its investment?

My point is the Commission, and for that matter our ratepayers, cannot hold Pine Water to some sort of impractical rigid standard. Investment in increasing the water supply to Pine, Arizona is substantially risky because there is never a guarantee that water will be found. Unlike Pine Water, Brooke Water would not have its decision-making second guessed, and if successful, it would have a better opportunity to recover its investment and earn a return that rewarded it for the significant risks it took. As long as the charges to the ratepayers of Pine Water are

reasonable, all parties benefit. After all, it should not be forgotten that Brooke Utilities has owned the Company only since August 1996. For decades before, the collective interests in Northern Gila County, including the County, have been unsuccessful in resolving the water shortage problem, or, for that matter, procuring a single gallon of additional water.

Q. THANK YOU. WOULD YOU PLEASE CONTINUE WITH YOUR DISCUSSION OF THE REASONS IT WAS DECIDED THAT BROOKE WOULD BUILD, OWN AND OPERATE PROJECT MAGNOLIA?

A. As I said, we decided that the risks of Project Magnolia were sufficient enough that they should be borne entirely outside the regulatory arena. In addition, Project Magnolia is a two-way pipeline able to deliver water to Pine Water's system as well as from the Pine Water system to the Strawberry Water system. Since the pipeline is not for the exclusive benefit of Pine Water's customers, ownership by Brooke Utilities avoids complicated allocation problems in the ratemaking process. Finally, but of significant importance to Brooke Utilities, there were also considerations related to Gila County and the District that factored into our final decision.

Q. WHAT DID THE COUNTY AND DISTRICT HAVE TO DO WITH THE DECISION CONCERNING WHO WOULD BUILD, OWN AND OPERATE PROJECT MAGNOLIA?

A. As I discussed elsewhere in this rebuttal testimony, the County wants Brooke Utilities out of the water business in the Pine-Strawberry region. Certain elements of the District feel the same way, as do a number of real estate developers in the region. *See* District Responses to Pine Water Data Requests 1.1 and 1.15, copies attached hereto as Hardcastle Rebuttal Exhibit 2. We further believe that these parties will do whatever they can to make it easier to condemn the Pine Water

system, including using this proceeding to lower the Company's value by depriving it of necessary rate relief, also discussed later in this testimony. Candidly, Brooke Utilities was not willing to make the risky investment associated with Project Magnolia only to have the pipeline subject to the County and/or District's powers of eminent domain as well as the uncertainty of adequate cost recovery and rate of return.

Q. HAS THE DISTRICT TAKEN A POSITION REGARDING THE OWNERSHIP OF PROJECT MAGNOLIA?

A. The District recognizes that Project Magnolia is owned by Brooke Utilities. *See* Jones Dt. at 6; *Investigation of Groundwater Availability* at 3.

Q. IS THE OWNERSHIP OF PROJECT MAGNOLIA EVEN BEFORE THE COMMISSION IN THIS PROCEEDING?

A. I do not think so. I am not legally qualified to express an opinion, but I do not see how the Commission can order Brooke Utilities, an unregulated entity, to divest itself of ownership of Project Magnolia. As a result, I believe Staff's testimony must be rejected.

Q. WHAT DO YOU BELIEVE IS THE COMMISION'S ROLE REGARDING PROJECT MAGNOLIA?

A. To determine the appropriate expense level associated with Pine Water's costs of having water transported into the Pine Water system through the pipeline..

Q. WHAT IS THE APPROPRIATE EXPENSE LEVEL FOR THESE TRANSPORTATION COSTS?

A. As discussed in Mr. Bourassa's direct and rebuttal testimonies, and as shown in both direct and rebuttal schedule C-1, Pine Water incurred $176,144 in transportation or wheeling costs during the test year. In addition, Pine Water paid Strawberry Water for water purchased according to Strawberry Water's

Commission approved tariffs, although this cost is recorded elsewhere.

Q. WHAT IS THE RATE PAID BY PINE WATER TO BROOKE UTILITIES FOR TRANSPORTING WATER THROUGH PROJECT MAGNOLIA?

A. Brooke Utilities charges Pine Water $15.00 per 1000 gallons actually transported. There are no access, stand by, or resource reservation charges related to Project Magnolia.

Q. WHAT POSITION HAS STAFF TAKEN WITH RESPECT TO THE REASONABLENESS OF THIS WHEELING CHARGE?

A. None. Because Staff erroneously concluded that Pine Water owns Project Magnolia, Staff provided no testimony regarding the reasonableness of the wheeling charge by Brooke Utilities. Fernandez Dt. at 12-13 ("wheeling charges are inapplicable.") If the Commission rejects Staff's position, which it must since Pine Water does not own Project Magnolia, it would appear that Staff does not oppose the reasonableness of the wheeling charge or the test year level of transportation costs.

Q. WHAT POSITION DOES THE DISTRICT TAKE REGARDING THE TRANSPORTATION COSTS CHARGED TO PINE WATER BY BROOKE UTILITIES?

A. The District declares the wheeling charge "completely unregulated and excessive." Jones Dt. at 3. In essence, the District does not trust Pine Water or Brooke Utilities, calling the wheeling charge "highly suspect" and alleging that transactions between the Company and its shareholder are "conflicts of interest." *Id.* at 7-8, 12.

Q. IS THE WHEELING CHARGE BASED ON ARMS-LENGTH NEGOTIATIONS BETWEEN BROOKE UTILITIES AND PINE WATER?

A. No, I agree with Mr. Jones that this is not an arms-length transaction. Because a

transaction is not conducted at arms-length, however, does not necessarily mean it is unfair. In this case it is not unfair. In fact, we further agree with Mr. Jones that ratepayers should not view the wheeling charge as a conflict of interest if the terms are fully disclosed and priced at fair market. Jones Dt. at 7-8. We also agree that the reasonableness of the wheeling charge by Brooke Utilities is fairly within the scope of this proceeding.

Q. WOULD YOU PLEASE EXPLAIN WHY PINE WATER BELIEVES THAT $15.00 PER THOUSAND GALLONS IS A REASONABLE WHEELING CHARGE?

A. Certainly. Initially, the wheeling charge was determined by a comparison to the costs that would be incurred by Pine Water to haul water. The cost of trucking water into the Pine Water system is approximately $38 to $45 per 1000 gallons hauled.

Q. WHY WAS THE COST OF TRUCKING WATER AN APPROPRIATE STARTING POINT FOR DETERMINING AN APPROPRIATE WHEELING CHARGE?

A. Because there are no other additional viable water supplies readily available to Pine Water, every gallon of water delivered through Project Magnolia is a gallon that does not have to be hauled. *See Investigation of Groundwater Availability* at 3. This means that Pine Water saves at least $23 on every 1000 gallons delivered through Project Magnolia, a savings of approximately 150%.

Q. HOW DOES THE $15.00 WHEELING CHARGE COMPARE TO THE COSTS TO RATEPAYERS UNDER STAFF'S APPROACH?

A. Well, to begin with, as discussed in Mr. Bourassa's rebuttal testimony, Staff has failed to properly treat Project Magnolia as if Pine Water owned it. *See* Rebuttal Testimony of Thomas J. Bourassa ("Bourassa Rb.") at 10-11. Instead, Staff has

substantially understated the rate impacts of recording Project Magnolia on Pine Water's books. *Id.*

For purposes of illustration though, under a more traditional, cost based analysis, based on the original cost of the pipeline, a 10% rate of return, annual operating expenses for the pipeline of approximately $33,000, and accounting for depreciation recovery and income taxes, the cost of the water using test year deliveries would be $12.37 per 1000 gallons.

Q. WHY ISN'T $12.37 AN APPROPRIATE WHEELING CHARGE?

A. Because I think the rate that would result from a traditional, cost based analysis, as opposed to the calculation offered by Staff, must be further adjusted for two factors. One, I do not believe original cost is applicable here. Assuming Brooke Utilities was to transfer title to Project Magnolia to Pine Water today, as Staff is essentially suggesting, that transfer would have to take place at fair market value. Simply put, Project Magnolia represents a key component to any future water supply resolution in Pine, Arizona and its value should be recognized as such. Thus, with the benefit of hindsight, the fair market value would approximate the amount that a condemning authority would have to pay to acquire the pipeline. We believe that the amount a condemning authority would have to pay for Project Magnolia far exceeds original cost.

Furthermore, given the risks that were involved in building the pipeline, 10% is far too low a return. Using original cost and a rate of return of 15%, still well below an adequate return given the risk commensurate with the investment, the cost based wheeling charge comes to $15.43 per 1000. Again, the analysis reflects that the $15.00 per 1000 wheeling charge paid by Pine Water to Brooke Utilities is fair and reasonable.

Q. HOW DOES THE COSTS OF WATER DELIVERED THROUGH

PROJECT MAGNOLIA COMPARE TO THE COSTS OF WATER SUPPLY ALTERNATIVES?

A. Well, again, I must emphasize that Pine Water is not convinced that there are viable alternatives. However, we could use Mr. Breninger's estimates of pursuing the recommendations in the District's study, at a cost of $4 million, to illustrate the point, with the caveat that Pine Water questions both the hydrology (availability and reliability of source) and cost estimates in this study. In any case, assuming a $4 million investment in "deep wells", Pine Water's annual revenue requirement would have to increase by approximately $833,333 for the Company to recover depreciation expense, pay taxes and earn just a 10% return on its investment. This equates to an additional cost of $71.57 per 1000 gallons, exclusive of operating expenses (including property taxes, transportation expenses, additional treatment, etc.) and ignoring the likelihood that these so called "deep well" investments will ever yield a viable water source. With Project Magnolia, the owner of the pipeline covers all costs and risk.

Q. ARE THERE ANY OTHER FACTORS THAT SUPPORT THE REASONABLENESS OF THE WHEELING CHARGE?

A. Yes, in addition to delivering water at a substantially reduced rate, Project Magnolia delivers water faster and more reliably than hauled water. One water hauling truck can deliver 6,500 gallons per load, a process that takes several hours. In contrast, Project Magnolia delivers some 720,000 gallons per day at a rate of 500 gallons per minute. In other words, Project Magnolia is able to respond to Pine Water's demand requirements more quickly and at approximately one-third of the cost of the only sure alternative.

Q. DOES PINE WATER STAND BY ITS REQUEST FOR INCLUSION OF TEST YEAR TRANSPORTATION COSTS IN THE APPROVED LEVEL

OF OPERATING EXPENSES?

A. Yes. Brooke Utilities owns the pipeline. The terms of the wheeling arrangements between Pine Water and Brooke Utilities have been fully disclosed, the evidence shows them to be fair market priced and no other party has presented evidence that the wheeling charge is unreasonable. Pine Water must have the supply delivered through Project Magnolia and Pine Water must be given the ability to pay for that service.

VI. RESPONSE TO DISTRICT TESTIMONY.

Q. DO YOU HAVE AN OPINION REGARDNG THE REASONS FOR THE DISTRICT'S INTERVENTION IN THIS RATE CASE?

A. I do. It is my belief that Gila County is using the District's intervention in this ratemaking proceeding to further its desire to run Pine Water and Brooke Utilities out of the water business in Northern Gila County.

Q. THAT IS A VERY SERIOUS ACCUSATION MR. HARDCASTLE. WHY DO YOU BELIEVE IT TO BE TRUE?

A. I believe there are several factors that support my belief. First, it was the County that made the decision to intervene in this rate case. Nelson Dt. at 1. This follows from the fact that the District does not have a Board of Directors, it is being governed by the Gila County Board of Supervisors and administered by the County Manager. *Id.* This case was filed in May, when an elected Board of Directors made up of members and taxpayers was still running the District. Yet, it was only in mid-October, after the County had assumed control of the District, that the motion to intervene was filed. Curiously, however, the authority for the District to intervene was not provided until approximately two weeks later in the form of a County resolution executed by Gila County Supervisor Christenson on November 4, 2003. *See* District Response to Pine Water Data Request No. 1.13, copy

attached hereto as Hardcastle Rebuttal Exhibit 2. Given the County's previous reluctance to participate in Commission proceedings regarding Pine Water, and to respond to concerns over its actions being voiced by the Commissioners, I find the County's decision to move the District to intervene highly suspect. Though, I guess am not surprised. Supervisor Christensen has made no secret of his desire to control the water delivery and development process in Northern Gila County. Now, he seems to have found an appropriate "Trojan Horse" behind which he can step up his efforts.

Q. HOW WOULD YOU CHARACTERIZE THE RELATIONSHIP BETWEEN PINE WATER AND THE DISTRICT?

A. The District and Pine Water have been at odds for many years over the manner in which the Company should address the region's chronic water supply shortages. The District does not provide water utility service, however, and therefore does not seem to appreciate the financial and regulatory constraints we face as an Arizona public service corporation with a very small customer base. In fact, despite the message of its own comprehensive study, i.e., that the availability of additional supplies for Pine, Arizona is possible but not yet certain, that further work needs to be done and that millions of dollars may have to be invested, the District and its agent, Intervenor John Breninger, declare the problem solved. As discussed above, we believe the claim that **"We have the water"** is, at best premature. I am sure, however, we will continue to hear from the District, as well as others, that we should just go out and start drilling deep wells in the Strawberry Valley.

Q. PLEASE CONTINUE WITH YOUR DISCUSSION OF THE REASONS YOU BELIEVE THE COUNTY HAS INTERVENED TO FURTHER ITS DESIRE TO GET PINE WATER AND BROOKE UTILITIES OUT OF THE WATER BUSINESS IN THE PINE-STRAWBERRY AREA?

A. Gila County has made no secret of its desire to grow the Pine-Strawberry area and thereby increase the tax base. Towards that end, they have approved the creation of multiple water improvement districts as a means of skirting limitations on growth the Company faces under Commission resolution, a practice Pine Water now knows it has to live with since the County's authority to create new service providers without any consideration of the water supply shortage has been upheld in court. Minute Entry Order (dated October 9 2002); *Pine Water Company v. Gila County; Strawberry Hollow Domestic Water Improvement District*, Cause No. CV 2001-153. The County's efforts have been supported by local real estate developers and like-minded community interests that seek expansion of the residential, and likely commercial, development of the area. The County and its pro-growth constituency have made outlandish accusations criticizing Pine Water for everything from excessive water loss to excessive expenditures on travel and lodging expenses. More recently, these interests have started to publicly voice a desire to condemn or otherwise acquire Brooke Utilities' assets in the Pine-Strawberry region.

Q. ARE THERE INDICATIONS IN THIS PROCEEDING THAT THE COUNTY AND/OR THE DISTRICT ARE USING THIS RATE CASE TO FURTHER THEIR DESIRE TO CONDEMN OR OTHERWISE ACQUIRE BROOKE UTILITIES' WATER UTILITY SYSTEMS IN THE PINE-STRAWBERRY REGION?

A. Yes, several. In fact, the District's witnesses do not even attempt to hide their view that the water utility system serving this area should be taken out of the hands of Brooke Utilities. Mr. Nelson testifies that one of the purposes of his testimony in this rate case is "returning the Pine-Strawberry Water Improvement System back into the hands of its citizens where it justly belongs." Nelson Dt. at 3. Similarly,

Mr. Jones testifies "rate-payers will ultimately demand to take full control of the water development, any water treatment, and the distribution of water in the CC&N service areas of both Pine Water Co. and Strawberry Water Co." Jones Dt. at 19.

The District's responses to Pine Water's first set of data requests further illustrate the County and/or District's desire to acquire the assets of Brooke Utilities in the Pine-Strawberry region. For example, we were provided an e-mail stream discussing the District's and/or County's retention of financial advisor and bond attorney in connection with its consideration of "buying out" the utilities is discussed. *See* District Response to Pine Water Data Request No. 1.1, copy attached hereto as Hardcastle Rebuttal Exhibit 2. In another document provided by the District, Mr. Nelson received a "preliminary report on the feasibility of the potential acquisition value of two Brooke Utilities, Inc. subsidiaries -- Pine Water Company and Strawberry Water Company." *See* District Response to Pine Water Data Request No. 1.15, copy attached hereto as Hardcastle Rebuttal Exhibit 2. Frankly, I do not believe it is a coincidence that shortly after this document dated September 25, 2003 was received by Mr. Nelson the County caused the District to intervene in this rate proceeding. *Id.*

Q. HOW CAN THE COUNTY AND DISTRICT UTILIZE THIS RATE PROCEEDING TO FURTHER ITS EFFORTS TO CONDEMN OR ACQUIRE BROOKE UTILITIES' WATER UTILITY ASSETS IN THE PINE-STRAWBERRY REGION?

A. There are several ways. First, as reflected in the feasibility report mentioned above, some valuation methodologies rely on determinations of asset values and cash flow for regulated utilities. Of course, it is unlikely the District would admit to this, but it seems, again, to be no coincidence that shortly after receiving a report pegging the value of Pine Water Company and Strawberry Water Company at $3 -

4 million, the County caused the District to move to intervene, file testimony challenging numerous aspects of Pine Water's request for rate relief and asserting that rate increases should be denied or at least delayed and subsequently limited. *See, generally*, Jones Dt. Thus, it would appear that if the County has determined that the District's intervention successfully reduces the value of Pine Water's assets and/or its cash flow, it may be able to argue for a lower valuation making it easier to acquire the Company through condemnation.

Q. DO YOU AGREE THAT GILA COUNTY AND/OR THE DISTRICT RETAIN THE RIGHT TO CONDEMN THE UTILITY ASSETS OF BROOKE UTILITIES?

A. Well, as I have stated earlier in this testimony, I am not in a position to express legal opinions. However, I am generally familiar with the power of eminent domain and we accept that, subject to paying fair market value for our assets, the County and/or the District may choose to condemn our property. The key is what is fair market value? Brooke Utilities believes the fair market value of all of its assets in the Pine-Strawberry region is well in excess of the $3-4 million reflected in the recent feasibility study prepared for the County. Let's assume, for the purpose of this testimony, the value of these assets is $10 million. I do not believe that the County is ready to go to the taxpayers in the Pine-Strawberry region to collect $10 million to acquire assets that are already providing uninterrupted water service utilizing available water resources. In other words, what do the ratepayers in the Pine-Strawberry region get for their money? Not one additional drop of water would be purchased by the costs of condemning Brooke Utilities' assets. It follows that it is in the interest of County and/or the District to drive down the value of Brooke Utilities assets, including Pine Water, by any means available.

Q. THANK YOU MR. HARDCASTLE, WOULD YOU PLEASE CONTINUE

WITH THE DISCUSSION OF THE USE OF THIS PROCEEDING TO FURTHER EFFORTS TO ACQUIRE THE ASSETS OF BROOKE UTILITIES.

A. Yes. The District's conduct in discovery further compels our conclusion that this proceeding is being used to further other agendas. Shortly after the District's intervention was granted, the District promulgated over 75 separate discovery requests on Pine Water. A number of these requests plainly support our conclusion that the District is seeking information related, not to the determination of fair value and just and reasonable charges, but to the value of the assets that would be condemned by the County and/or the District. For example, in Request to Produce No. 15, the District sought

> "[A]ll estimates compiled by Pine Water Company of the value of the certificate of convenience and necessity of Pine Water Company during the past five years, up to and including the day of your answers." *See* District Request to Produce, excerpts attached hereto as Hardcastle Rebuttal Exhibit 6.

Similarly, in interrogatories the District asks:

> Has the internal management, or any of its creditors in discussions with management of the Company, had discussion of the option of bankruptcy of Pine Water Company?

See id., Interrogatory No. 45. In addition, a substantial number of the District's discovery requests seek financial and other unrelated information concerning Strawberry Water, Brooke Utilities, as well as additional unregulated entities owning interests in Brooke Utilities. *See, e.g., id.* at Interrogatory Nos. 4, 10, 41. Yet, no connection between the information sought for these unregulated entities and this rate proceeding has been established by the District to justify this fishing expedition. One thing is clear though, Pine Water's customers are now being burdened by the County and District's efforts to expand this rate case because, at a

minimum, the District's expansion of the scope of this proceeding is likely to result in an increase in the Company's rate case expense.

Q. DO YOU HAVE ANY OTHER COMMENTS IN RESPONSE TO THE TESTIMONY OF THE DISTRICT'S WITNESSES?

A. Yes, unfortunately, the District' direct testimony, particularly the testimony of Mr. Jones, is of such an inflammatory nature that we are compelled to respond to set the record straight. Let me give you an example.

Throughout his testimony, Mr. Jones claims that Pine Water's application is based on inadequate and inaccurate information. *E.g.*, Jones Dt. at 2. Mr. Jones goes on to testify that substantial critical information has been left out, misstated or presented in a confusing manner. *Id.* Based on this testimony, Mr. Jones recommends the Commission "suspend the current rate application, delay the application process, or dramatically minimize any increases until (1) accurate data is supplied and prior reports and with a new rate application." Jones Dt. at 4. Obviously, the Company's application is subject to the Commission's rules and regulations governing rate filings. As reflected in the record in this case, on June 2, 2003, Staff issued its finding that the Company's rate application "met the sufficiency requirements as outlined in Arizona Administrative Code R14-2-103." *See* Staff Sufficiency Letter dated June 2, 2003. Thus, Staff, the party charged with the responsibility to determine whether Pine Water has provided all of the necessary information, has made that determination. Further, with the exception of the Water Expiration Surcharge discussed above, Staff's direct presentation does not indicate that the Company's application suffers from any material missing or inaccurate information. As a result, I can only conclude that Mr. Jones' allegations reflect either his lack of understanding of the requirements imposed upon Pine Water in this proceeding, or the District's single-minded focus on depriving the

Company of necessary rate relief, or both.

Q. HOW DO YOU RESPOND TO MR. JONES' TESTIMONY REGARDING THE RELATIONSHIP BETWEEN PINE WATER AND BROOKE UTILITIES AND PINE WATER AND STRAWBERRY WATER?

A. Like much of Mr. Jones' testimony, his comments in this regard are unsupported and unsupportable. For example, with respect to the three entities, Mr. Jones testifies that by the Commission "choosing not to regulate Brooke Utilities, the two firms and their parent company are able to allocate costs and revenues in an unjustified, manipulative manner." Jones Dt. at 3. Of course, Mr. Jones is wrong that the Commission has chosen not to regulate Brooke Utilities because that entity is not a public service corporation and therefore, falls outside the Commission's jurisdiction under the Arizona Constitution. *See* Arizona Constitution, Article 15, Section 2. Nor has Mr. Jones presented any evidence demonstrating improper allocation of costs and revenues between affiliated entities. In fact, we can only conclude that they have no such evidence. When the District was asked to provide supporting information for Mr. Jones' claims concerning misapplication of expenses and revenues, the District responded by directing Pine Water to the very pages in Mr. Jones' direct testimony containing his baseless accusations. *See* District Response to Pine Water Data Request 1.27, copy attached hereto as Hardcastle Rebuttal Exhibit 2. When asked to supplement its response, the District refused to do so in a timely manner, providing a supplemental response mere hours before this rebuttal filing was due. Although we were unable to conduct a proper analysis of the District's supplemental response to 1.27, a cursory review demonstrates it is little more than speculation on the part of the District's witness, as opposed to evidence to support his earlier unsupported testimony. I guess it is one thing to make a claim but another to prove it.

Q. IS MR. JONES SUGGESTING THAT BROOKE UTILITIES SHOULD OPERATE STRAWBERRY WATER AND PINE WATER SEPARATELY?

A. Frankly, I do not know what he is suggesting but Strawberry Water and Pine Water are essentially separate regulated entities with distinct books and records. That is not to say, however, that common ownership by Brooke Utilities does not allow Pine Water and Strawberry Water to benefit from certain overlapping administration, management and operations, which ultimately results in economies of scale and reduced operating expenses. I am merely pointing out that despite such common ownership, Strawberry Water, Pine Water and their shareholder, Brooke Utilities, are distinct and separate entities.

Q. TO THE BEST OF YOUR KNOWLEDGE, MR. HARDCASTLE, IS THERE ANYTHING IMPROPER ABOUT BROOKE UTILITIES' COMMON OWNERSHIP OF STRAWBERRY WATER AND PINE WATER?

A. I am not aware of any rule, regulation or other authority that precludes or otherwise impacts common ownership of Pine Water and Strawberry Water by Brooke Utilities. Apparently, the District is not aware of any authority either. *See* District Response to Pine Water Data Request 1.25, copy attached hereto as Hardcastle Rebuttal Exhibit 2.

Q. WOULD YOU AGREE THAT TRANSACTIONS BETWEEN STRAWBERRY WATER AND PINE WATER OR BETWEEN BROOKE UTILITIES AND PINE WATER ARE SUBJECT TO COMMISSION SCRUTINY?

A. Absolutely, I would even agree that such transactions require a higher level of scrutiny than transactions between Pine Water and unaffiliated entities, as I have discussed above with respect to Project Magnolia. This does not mean that these types of transactions are prohibited or inappropriate. It means that the Commission

should ensure that such transactions take place in a manner that reflects the fair value of the goods or services being provided without unduly impacting the ratepayers. Despite Mr. Jones' sweeping allegations, the District has presented no evidence that any transaction between Pine Water and Strawberry Water or between Pine Water and Brooke Utilities cannot withstand Commission scrutiny.

Q. MR. JONES ALSO CLAIMS THAT THE COMPANY'S IMPLEMENTATION OF ITS CURTAILMENT TARIFF IS AN ADMISSION THAT PINE WATER CANNOT PROVIDE ADEQUATE WATER SERVICE. HOW DO YOU RESPOND?

A. This testimony by Mr. Jones is the height of absurdity. In Decision No. 65435, the Commission ordered Pine Water, on Staff's recommendation, to file a revised curtailment tariff by February 15, 2003 and a full-blown rate case by May 1, 2003. Decision No. 65435 (December 9, 2002) at 8. Which we did. In Decision No. 65914, the Commission ordered Pine Water to implement the new current curtailment tariff. Decision No. 65914 (May 16, 2003). Which we did. Now, the District claims that this curtailment tariff is "an admission that [Pine Water] cannot provide adequate water service in the area." Jones Dt at 14. Likewise, Intervenor John Breninger claims that to rely on the curtailment on a "continuing basis without developing an adequate supply is an interaction of the regulatory process that violates the public trust." *See* Breninger Response to Pine Water Data Request No. 1.1, copy attached hereto as Hardcastle Rebuttal Exhibit 1.

In other words, Staff recommends a more stringent curtailment tariff, the Commission orders it, Pine Water implements it and our customers and Gila County proclaim that we are a bad service provider. This is the environment we operate in, one in which parties with differing points of view throw around baseless

accusations that seemingly lead to the suggestion we should simply disregard Commission direction.

Q. MR. JONES ALSO TESTIFIES REGARDING THE COMPANY'S EFFORTS TO REDUCE WATER LOSS. HOW DOES PINE WATER RESPOND TO SUCH TESTIMONY?

A. Mr. Jones testifies that:

> [I]f a leak reduction program was far more successful and more aggressively pursued, less water would need to be purchase [sic] pumping costs would be reduced, hauling costs might be completely eliminated, purchases from private wells might be greatly reduced, exorbitant wheeling charges from Brooke Utilities Magnolia Project could be reduced, and ultimately less new water would need to be discovered." Jones Dt. at 18.

The starting point for discussing water loss in this proceeding is the Engineering Report for Pine Water Company prepared by the Staff Engineer, Marlin Scott, Jr. In his report, Mr. Scott concludes that the Company has a water loss of 7.3%, which level is "acceptable to Staff." Scott Dt. at Exhibit MSJ, page 5 of 15. Frankly, between Mr. Scott, a Staff Engineer who has analyzed more than 350 utility companies for the Commission's Utilities Division and testified in 39 rate proceedings, and Mr. Jones, the general manager of a cabinet company with no water utility experience whatsoever, I think it is clear whose testimony the Commission should follow with respect to the issue of Pine Water's water loss. In fact, it appears Mr. Jones is testifying based on someone else's analysis, and I do not see how that third person is much more qualified than Mr. Jones is to address the issue of water loss.

Q. EXCUSE ME MR. HARDCASTLE, WHAT DO YOU MEAN?

A In response to data requests, the District identified Dan Jackson from Economists.com in Plano, Texas as providing "research into the actual water losses

incurred" by Pine Water. *See* District Response to Pine Water Data Request 1.15, copy attached hereto as Hardcastle Rebuttal Exhibit 2. Mr. Jackson is the same person that prepared the September 2003 feasibility study regarding the acquisition of Brooke Utilities I mentioned above. In addition, the Company requested copies of the District's work papers and in those papers we found Mr. Jackson's water loss calculations. *See* District Response to Pine Water Data Request 1.1, copy attached hereto as Hardcastle Rebuttal Exhibit 2. Although Mr. Jackson's work papers are essentially incomprehensible, it seems clear that it was Mr. Jackson, not Mr. Jones, that came up with the District's water loss calculations for Pine Water. Based on the name of his company and his valuation of Brooke Utilities, I would assume Mr. Jackson is some sort of economist or valuation expert, so I am not sure is qualified to address the issue of water loss. Of course since he is not testifying, we have no chance to challenge his qualifications or the performance of his analysis. However, it is clear to me now that Mr. Jones is not only unqualified to address this issue based on his lack of any utility expertise, he is not competent to testify on the subject because the analysis is not his.

Q. ISN'T MR. JONES CLAIMING, HOWEVER, THAT STAFF'S DETERMINATION OF WATER LOSS IS BASED ON ERRONEOUS OR INCOMPLETE INFORMATION PROVIDED TO STAFF BY PINE WATER?

A. This certainly seems to be the gist of Mr. Jones' testimony. *See* Jones Dt. at 17-18. Apparently, in addition to testifying to Mr. Jackson's analysis, Mr. Jones is testifying regarding information he claims to have obtained from a third party selling water to Pine Water. Jones Dt. at 17. However, Mr. Jones has not provided anything beyond his testimony to support his position. In short, until the District demonstrates that our water loss is a problem, based on competent evidence by

someone qualified to testify on the subject, we stand by the information we have provided Staff and by Mr. Scott's determination of 7.3% water loss.

Q. MR. JONES ALSO TESTIFIES REGARDING THE COMPANY'S FINANCIAL CONDITION. HOW DO YOU RESPOND TO THIS TESTIMONY BY MR. JONES?

A. Once again, I have to confess to being puzzled by Mr. Jones' testimony. First, Mr. Jones testifies that "if Pine Water Co. cannot survive economically, the public health, safety, and welfare is in jeopardy." Jones Dt. at 4. In the very next paragraph, Mr. Jones recommends "the Commission should suspend the current Rate Application, delay the application process, or dramatically minimize any increases." *Id.* Then, later in his direct testimony, Mr. Jones testifies:

> I believe the Applicant is being presented to show a poor financial condition in hopes of a large rate increase. I do believe the Company is probably in deep trouble and could possible cease operations. If it does not survive financially, the public health, safety and welfare is in jeopardy. Jones Dt. at 15.

To begin with, Mr. Jones' claim that Pine Water is being presented to show a poor financial condition seems to imply a conscious effort by Pine Water to misstate the Company's financial condition. As with the overwhelming majority of the District's contentions, no supporting evidence is provided. Perhaps more importantly, for the reasons explained in our direct filing, the Company doesn't need to do anything to enhance the picture of its poor financial condition; Pine Water's poor financial condition speaks for itself.

In the end, though, what is most troubling is the inconsistency reflected in Mr. Jones' testimony. Mr. Jones seemingly admits that Pine Water is in financial trouble. Yet, Mr. Jones recommends that the Commission deprive Pine Water of rate relief that would indisputably improve its financial condition. Again, it is hard

to escape the conclusion that the District cares less about the health, safety and welfare of our ratepayers by ensuring that Pine Water can continue to operate than it does about driving down the value of the Pine Water system to further its desire to condemn or otherwise acquire Brooke Utilities' assets in the Pine-Strawberry region.

Q. DOES THAT CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, except I wish to reiterate that our failure to specifically address a specific portion of the testimony of any other party's witnesses does not necessarily reflect our agreement with such testimony.

1487499.2/75206.006

HARDCASTLE

REBUTTAL EXHIBIT 1

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.,
TO INTERVENER JOHN BRENINGER
(Docket No. W-03412A-03-0279)

REQUEST:

1.1 Admit that restrictions on water use in Pine Water's CC&N are imposed pursuant to Commission order and/or a Commission approved Curtailment Tariff.

RESPONSE:

I deny this admission because the premise of the Commission's allowing the Pine Water Co. to continue rely upon restrictions to curb water demand on a continuing basis without developing an adequate supply is an interaction of the regulatory process that violates the public trust. When Pine Water posts the restriction Stages 2 through 5, that is prima facie evidence of failure to supply an adequate quantity when the residential aggregate per meter usage is below the 375 gallons per day level. [This Intervener requests Pine Water to provide the data identifying the actual amounts of water delivered and billed against individual meters for the months April through September for each of the preceding years, 1999-2003, and to provide a meaningful analysis showing the constraint on water consumption while under water the restriction stages at the time.]

REQUEST:

1.4 State in detail how you suggest Pine Water "service the Community's normal demand for domestic water year round" as you reference in your direct testimony. In support of your response, please state the estimated cost to undertake such efforts and the impact of such cost expenditures on Pine Water's ratepayers.

RESPONSE:

Intervener Testimony by J. Breninger, page 2, and Attachment "B" discloses the proposed source of groundwater that could be developed to meet the supplemental water demand of the entire Pine & Strawberry community, presently served by three regulated water companies, including Pine Water Co., and four domestic water improvement districts. An estimated cost to implement this supplemental water supply may be found in the document, "Concept/Proposal for PSWID as Supplier of Supplemental Water ~~May 8, 2003~~ Revised in consideration of Project PS 2002-01 Final Report Findings and Cost Estimates 10-1-03, by PSWID Agent for Project" at an initial implementation cost of $4.2 million. This estimate does not provide for property easements or acquisition, a trunk pipeline beyond the well sites delivery point, project overhead costs, or cost of money. This Concept/Proposal document, in the original May 8 version, was adopted by

the PSWID Board in the July 2003 meeting, is a public document, and a copy is provided herewith. The spreadsheet analysis referenced below demonstrates the viability of the tentative wholesale price of water. The initial wholesale cost of water produced by this system at the delivery point could be $6.00 per thousand gallons (ptg) and driving to below $3.00 ptg after 7-10 years. This cost estimate requires the repayment of the initial investment and interest along with adequate reserves for depletions and replacements, and provides for the system operations into perpetuity, all to be funded from water delivery revenues. [See spreadsheet entitled, "PSWID Supplemental Water System, compiled by John Breninger, – estimated costs are preliminary and not supported by detailed analysis and quotations against firm requirements. The revenue forecasts are based upon the PSWID Supply and Demand Study… as found in the Intervener Direct Testimony, Attachment "A". Also see the revised chart of "Supplemental Water Requirements"]

REQUEST:

1.8 Regarding your claim that "a better solution to solving the water shortage problem seems to lie in tapping the R-Aquifer," please explain how this would occur, what facilities would be necessary to provide water from this aquifer to Pine Water's customers, the cost of such an undertaking, and the impact of the recovery of such cost on Pine Water's ratepayers.

RESPONSE:

The answer to Data Request 1.4 above addresses the "how" and the implementation cost is estimated for the undertaking as conceived for the PSWID as a supplier of supplemental water to serve all the purveyors in the local area. Pine Water Co., in conjunction with its sister company Strawberry Water Co., and parent, Brooke Utilities Inc., may be able to implement this project more efficiently and with less capital investment to serve their needs than the PSWID. The assumptions necessary to structure this project and the resulting cost impact upon the ratepayers are dependent upon how the Companies above would proceed and how the Commission would administer the Rate Structure and Rate Base. These are beyond the purview of this Intervener at this time. Therefore, I cannot respond to the issue of impact upon the ratepayers in a meaningful way.

REQUEST:

1.9 Would you agree to allowing Pine Water to earn a return on capital investment in exploring water supplies in the R-Aquifer, even if the Company is unable to locate supplies that ultimately can be delivered to customers in Pine Water's CC&N?

RESPONSE:

The "Risk" in this case, of exploring the R-Aquifer from the locations defined in the Attachment "B" Report, has a greater impact from deficient well drilling and development techniques than of the issue of finding water. As I understand the Utility Rate Base system of regulation, the ratepayers would not be subject to costs from an investment that did not produce consumable water. Neither an improperly managed drilling project nor failing to find the water qualify for a subsidy from the ratepayers. But, yes, a successful project should earn a return on the capital investment when adequate water is supplied to the ratepayers.

REQUEST:

1.11 What would be the cost per gallon to pump and deliver water to Pine Water's CC&N if supplies were found in the R-Aquifer? In responding, please provide a detailed breakdown of such costs.

RESPONSE:

See the answer to Data Request 1.4 above. These costs are again subject to the same wide range of assumptions and constraints of 1.8 above.

HARDCASTLE

REBUTTAL EXHIBIT 2

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.,
TO PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT
(Docket No. W-03412A-03-0279)

REQUEST:

1.1 Please provide a complete set of work papers in support of the testimony and exhibits filed by the District on October 31, 2003, in this Docket. In responding to this request, to the extent available, please provide electronic versions of all schedules and work papers provided in response to this data request.

ANSWER: # 1.1 See Exhibit 1.1 for all work papers.

REQUEST:

1.13 Please identify the Gila County Supervisor elected to represent the citizens of the Pine/Strawberry, Arizona region, on the Gila County Board of Supervisors, and please identify any and all discussion or meeting held between Mr. Nelson and said supervisor regarding Pine Water, Brooke Utilities, and/or this rate proceeding. In responding to this data request, please provide copies of any and all documents evidencing such discussions and/or meetings.

ANSWER attached.

REQUEST:

1.15 In his Direct Testimony, Mr. Nelson identifies Don Jackson as one of the individuals that has assisted him in his efforts with respect to the District. Please identify any and all efforts undertaken by Mr. Jackson on behalf of the District, including identifying any efforts Mr. Jackson has made in connection Pine Water's pending application for rate increases, and provide copies of any documents prepared by Mr. Jackson related to either his efforts on behalf of the District and/or in connection with this rate proceeding.

ANSWER; #1.15 Dan V. Jackson as the Managing Director of Economists.com provided the PSWID with report entitled "Preliminary Report to Pine-Strawberry Improvement District, Financial Feasibility of Acquiring Utility Assets". As a result of Mr. Jackson familiarity with Pine Water he has been contracted by the District to support Dr. Jones in his analysis of the financial position of Pine Water Co. See Exhibit 1.15 Mr. Jackson has provided research into the actual water losses incurred within the Pine Water Co. area of service and into contents of the Annual Reports provided by Pine Water Co. and Strawberry Water Co. to the Commission.

REQUEST:

1.25 Referring to the Direct Testimony of Harry Jones at pages 5-6, please state whether Harry Jones or the District are aware of any Arizona law, Commission decision, rule, or regulation that prohibits or otherwise impacts common ownership of Pine Water and Strawberry Water by Brooke Utilities.

ANSWER: Without performing legal services for Pine Water Company, the District asserts that the dissertation of the law could be substantial, but, without this list being exhaustive or limiting, among the statute statutes one may find information from the following statutes and all rules and regulations reasonably promulgated hereunder may have an impact upon common ownership issues and interaffiliate transfers. Arizona Revised Statutes Section 10-202; 10-842, 40-201 et seq.40-221 et seq., 40-241 et seq. 40-321 et seq., 40 361 et seq. This does not include any reference to applicable federal law or applicable common law

REQUEST:

1.27 Regarding the Direct Testimony of Harry Jones at pages 5-6, please provide any evidence of any "confusion or miss-application [sic] or expenses or revenues" related to Pine Water or Strawberry Water. In support of response to this data request, please provide any documents or other evidence supporting the District's response.

ANSWER: #1.27 See p. 8 of Harry Jones' testimony related to property taxes that are mis-allocated. See p. 8-9 of testimony related to repair and maintenance expenses. See p. 9 of testimony related to confusion concerning costs of hauling water. See p.10 of testimony related to confusion in determining cost of purchased water by Pine Water Co. See p. 11 of testimony related to confusion concerning level of outside services costs. See p. 11-12 of testimony related to questionable legal fees included in the test year calculations. See p. 12 of testimony related to the wheeling costs that are not clearly applied. See p. 12 of testimony about miscellaneous expenses that excessively lumped together. See p. 13 of testimony related to large unexplained sources of revenue. See p. 13 of testimony related to differences in financial statement amounts for transportation when comparing statements that are presented in the rate application vs. in the annual report presented to the Commission. See all supporting documents referred to and supplied with the direct testimony of Harry Jones.

REQUEST:

1.41 Referring to the Direct Testimony of Harry Jones at page 13, wherein he expresses the District's position that the "budgeted amount should be many times the $75,000 proposed," please state the amount the District believes Pine Water should spend on increasing water supply shortages. In responding to this date request, please identify the manner in which such amounts should be spend, as well as the impact of such expenditures on Pine Water ratepayers.

ANSWER: #1.41 Taking the severity of the water shortage problems faced by the ratepayers, I believe, until the problem is solved, the Applicant should expect to spend $200,000-$300,000 per year on water exploration, well drilling (including all related turn-key costs to make wells operational), and support of other reasonable alternative programs like the Alliance, Bureau of Reclamation, and the District are currently pursuing. It is likely that the new water would be found in the formations that are below the aquifers now being mined, and the cost of reaching those strata (1500 feet plus) is over $100 per foot. The impact of such costs on the ratepayers should not be calculated until the financial records, support documents, and reports to the Commission are revised, corrected, made consistent, made not misleading, and are brought up to the standards required by the Commission, and all test year transactions can be verified as being made on an arms-length basis. Costs of finding the new water should be born by both the current users and the landowners who would become future water users.

PINE STRAWBERRY WATER IMPROVEMENT DISTRICT'S RESPONSE TO PINE WATER COMPANY REQUEST FOR SUPPLEMENTATION OF RESPONSES TO FIRST DATA REQUEST

3. Response to 1.27. This answer is non-responsive. This data requests asks the District to identify evidence supporting Jones' explicit testimony that Pine Water and/or Broke Utilities has misapplied revenues or expenses. Instead of providing such evidence the District merely references other portions of Jones' direct testimony. Such testimony is not evidence, it has not been admitted in this proceeding yet in any capacity and if the District does not have evidence to support Jones' testimony, except for that testimony itself, it should so state. This concern also relates to the District's responses to data requests 1.33

RESPONSE:

1.27.1 The evidence supporting Mr. Jones' testimony related to misapplied revenues or expenses is clearly stated in the referenced paragraphs of his direct testimony, . . . (all in direct conflict to the accuracy, clarity, and necessity requirements of the National Association of Regulatory Utility Commissioners requirements for Water, Class C-1996, as required under the Arizona Administrative Code and to the Cost of Service definition provisions covering application of logical and generally accepted cost analysis and allocation techniques as stated in Section A. 3c of R14-2-103) . however it can be restated here:

- The Pine system serves about twice as many customers and has about twice as many assets as the Strawberry system, therefore I would expected to see the property tax expense at Pine Water Co. only about twice as high (67% verses 33%) as Strawberry Water Co. However, from 2000-2002 property taxes are about 25 times higher at Pine Water when compared to Strawberry Water. For the 2002 Test Year on which the Applicant's 41% Rate Application increase is based, $51,177 was reported to be charged to Pine Water Co. and only $1,627 was reported to be charged to Strawberry Water Co. The actual tax bill amounts are $34,559.80 and $18,224.22,respectively, which shows a severe misrepresentation in the Application. Thus, 96.9 % of the total property taxes for the two companies were charged to Pine Water Co., when in actuality, only 65.4% should have been allocated to the Pine System (see actual tax bills attached as an Exhibit to the initial written testimony of Harry Jones). This inaccurate allocation of costs added an extra $16,617 to the Pine Water Co. expenses in the Test Year, with such amount increasing property tax expense by 48% and total operating costs in that all-important base year by over 1.8%. Are extra costs being deliberately charged to Pine Water Co., or is this just another slip? The fact the bills are clearly marked with the correct "Pine" and "Strawberry" names, the total of the bills together is accurate to the correct dollar amount, and the fact it happened to nearly the same degree in the prior two years (even $1,212 negative taxes for Strawberry Water in the year 2000), may be an indication that this is not a simple clerical

error made year after year. Why management would certify this in their Annual Report as being accurate is beyond me.

- The repair and maintenance expenses vary dramatically (see Exhibits to the initial written testimony of Harry Jones), with $-0- expense in 1999, $11,261 in 2000, $-0- in 2001, and $59,423 in 2002. To have two years of $-0- expense in a system with almost 2000 customers is near impossible. More likely the expense is in some other category or some other company, or is just wrong or misleading. Since this expense in 2002 is up from –0- percent of sales in 2001 to 8.8 % in 2002 (the year being used as the test case), I don't believe we have accurate information for the ratepayers to properly analyze this case. Besides, the repairs and maintenance costs for Strawberry Water, with almost 1000 users were $77 in 2000, $157 in 2001, and only $2,414 in 2002.
- During the test year, costs of hauling water were apparently combined with costs of purchased water because the Applicant's current Rate Increase Request adjusted out $39,270 to arrive at an "adjusted test year cost (see Schedule C-2, page 1 of the Rate Application). Whether this was all or just a part of the cost of hauling water is unknown. If it was all the cost, and only related to the 753,000 gallons purchased from Starlight Water Co. (see 2002 Annual Report to Commission, attached to the initial written testimony of Harry Jones), the transport cost was an amazing $.052 per gallon.
- The Pine Water Co. 2002 Annual Report to the Commission (Exhibit attached to the initial written testimony of Harry Jones) indicates on page 9 that 11,643,000 gallons were purchased through the "Strawberry-Pine Pipeline" and 753,000 gallons were purchased from Starlight Water Co., for a total volume of purchased water of 12,396,000 gallons. Purchased water costs in the same report on p. 7 are $125,033, indicating an average cost of $10.08 per 1000 gallons ($.010 per gallon). From the data, how much of this cost is paid to whom (Strawberry Water, Brooke Utilities, Starlight Pines Water) cannot be determined, however the average is over 10 times what was paid to Fumosa, the largest supplier of which I am aware, and over 20 times what is paid to McKnight whose well is a major supplement to the Strawberry well field so the Strawberry system has production capacity to help support the Pine System. Justification for such massive mark-ups by the inter-related companies is unknown.
- Legal fees seem exorbitant in every sense when compared to total revenues (see Exhibits attached to the initial written testimony of Harry Jones). They were 25.5% of revenues in the year 2000, 18.8% in 2001, and 24.1% in 2002, the test year. With few details provided and some comment available in the Direct Testimony of Hardcastle and Bourassa, inadequate data is available for the Commission or the rate-payers to be able to fully analyze the meaning of these expenses. However, from the information available, it is apparent legal fees and rate-hearing costs are way out of line with what a firm this size should spend. For tens of thousands of dollars (probably over $100,000), Pine Water recovered only $6,914 from Strawberry Hollows Domestic Water Improvement District during their legal dispute related to excluding that development from the CC & N service area of Pine Water Co. It is possible that some of this cost may be for services

Brooke Utilities provides to Pine Water Co, which services are not apparently done at arm's length.

- In Schedule E-2 of the Application, the Company indicated legal expenses of $7,448 in 2000 and $104,161 in 2002. Yet the Company wants to set the test year at $60,000 based on the fact fees were incurred, whether the money was spent on a reasonable basis or not. Only much smaller fees that are based on reasonable business decisions should be allowed into the test year base expenses.
- Other than the fact Mr. Bourassa explained on p.11of his testimony that the $533,599 inter-company payable on 12-31-02 was for "wheeling charges owed to Brooke Utilities for deliveries of water through Project Magnolia, the water transmission project owned and operated by Brooke Utilities", the true basis for this massive charge cannot be determined. As stated previously, if the total revenues for 2001 and 2002 were added together (a total of $1,355,680), the wheeling charge of $533,599 would amount to at least 40.8% of sales, a staggering percentage that cannot be confirmed since the pipeline was not in full operation during all of 2001. The fact this expense is charged to the Applicant by an unregulated firm (Brooke Utilities, Inc.) that fully controls Pine Water Co. makes that large payable highly suspect.
- Those expenses (generally a catch-all category for relatively small expenses not categorize elsewhere) should not total large amounts. However, from 1999-2000 (see Exhibits attached to the initial written testimony of Harry Jones) these expenses are as high as 23% of revenue, with total expenses of $55,761 to $124,658. Revenues during these years were $534,627 to $685,233. Again, no one can tell what is occurring financially with large unexplained items like this in the financial statements.
- There is a non-utility income item of $494,709 (with no offsetting expenses) shown in the year 2000 (see Exhibit attached to the initial written testimony of Harry Jones). This greatly boosted the reported net worth of Pine Water Co. I have no idea of the source of this income that greatly changed the reported status of their financial condition over the last three years.
- There are differences in the financial statements presented yearly to the Commission then compared to the supposed same financial statements presented in the Rate Application. The Schedule E-2, page in the Rate Application has line items such as "transportation" that vary by $132,000 (year 2000) and items like "Purchased Water" that vary by 20%-25% in the 2001 and 2002 years. Since these are categories with significant cost totals ($87,000 to $132,000), I'm not sure what is wrong or why the data is different than previously reported in the Exhibits attached to the initial written testimony of Harry Jones.

PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT RESPONSE TO PINE WATER COMPANY, INC. DATA REQUESTS
(Docket No. W-03412A-03-0279)

Attachment to Response No. 1.1

From: Dan V. Jackson
To: Harry Jones
Date: 10/28/03 12:51:46 PM
Subject: Pine Water Loss

Per our conversation.

Dan V. Jackson
Managing Director
Economists.com LLC
5500 Democracy Drive Ste. 130
Plano TX 75024
(972) 378-6588
(972) 378-6988 fax
djackson@economists.com
www.economists.com

Date: 10/28/03

WATER LOSS ANALYSIS
FY 2002

	Pine 2002	Strawberry 2002	Total 2002
Sources:			
Water Pumped	43,711,000	50,151,790	93,862,790
Delivered through Magnolia	11,643,000	(11,643,000)	-
Starlight Water Co.	753,000		753,000
	56,107,000	38,508,790	94,615,790
Total Consumed	52,006,014	32,451,257	84,457,271
Percent Loss	**7.3%**	**15.7%**	**10.7%**

8,402,440 FROM MARK
+ 56,107,000
64,509,440 TOTAL

753,000 Starlight Pine
8,402,440 from Mark 7.
9,155,440 Total Purchased

9,155,440 ÷ 64,509,440 = 14.1% of water purchased
signing Bill Zac Knight!

10-31-03 Gallons Purchased from Pumps

2002 8,402,440

2003 6,546,060

Customer Copy

2000 12,859,240

2001 6,666,929

2002 8,402,440

2003 TODATE (SEPT) 6,546,060

Who paid to drill? Well.
Ownership of well? Mediterranean Investments Inc.
Who pays for operation? Nick.
You are paid by P.W.C., Bronke,

10/8/00 Jason

10-27-03 Page 2 of 20

To: Pa Dept: We are concerned about rehabilitation of this #3 related to [illegible] and hitting [illegible].

10-29-03

Recovery

$.43M purchased
12 MI (Sale upon including formations and pumps)
1 million Purchased - Stockpiled & Drinked.

56 million gallons TOTAL
52 consumed. - I think this # was 43M.

= 7.3% loss

From: Initial report to annual meeting

Standing - 15% losses.

= 10.7% unaccounted system loss before both engines.

1 - wells in total they own.
- 23 O.P.M. is best one.

Date: 10/28/2003

WATER LOSS ANALYSIS
FY 2002

	Pine 2002	Strawberry 2002	Total 2002
Sources:			
Water Pumped	43,711,000	50,151,790	93,862,790
Delivered through Magnolia	11,643,000	(11,643,000)	-
Starlight Water Co.	753,000	-	753,000
	56,107,000	38,508,790	94,615,790
Total Consumed	52,006,014	32,451,257	84,457,271
Percent Loss	**7.3%**	**15.7%**	**10.7%**

Source of data
See attached
Intra Circulated
- See off for water
sources on p. 9.
Another 11,643 & 753

Purchased water for P.W.C. in 2002 was $125,033

They negotiated purchased water from two sources.

- Strawberry Pipeline = ~~12,000,000~~ 11,643,000
- Starlight Prison 753,000

TOTAL PURCHASED = 12,396,000 GAL.

$$\frac{\$125,033 \text{ COST}}{12,396,000 \text{ GAL}} = \$.0100865$$ AVERAGE COST per gallon, based on purchased water they have reported.

Amount paid to Fumuro is $10.00 per 1000 gallon pumped and put into P.W.C. lines.

$$\frac{\$10.00}{1000} = \$.001 \text{ per gallon.}$$

Amount paid to McKnight is 50¢ per 1000 gallon

$$= \frac{.50}{1000} = \$.0005$$

In Strawberry Water they show other water revenue of $50,283 and # of gallons sent down the pipeline are 11,643,000. Therefore revenue per gallon is

$$\frac{\$50,283}{11,643,000} = .0043$$ per gallon on water put through. They pay McKnight .0005 per

Pine - Strawberry gallonage

	Year	Gallons Pumped	Gallons Sold		
Strawberry Water Co., Inc. (owned by Brooke Utilities)	2000	25,621,000	23,102,903		
Strawberry Water Co., Inc. (owned by Brooke Utilities)	2001	47,341,000	28,156,454		
Strawberry Water Co.,(not owned by Brooke)	2000	?	?		
Not known, flat rate, unmetered - but they did purchase 30,000 gal. From Brooke Utilities					
Pine Water Co. (owned by Brooke Utilities)	2000	54,590,000	42,344,302		
Pine Water Co., (owned by Brooke Utilities)	2001	40,117,000	82,256,454		
Note: Project Magnolia (Strawberry -Pine pipeline purchased or obtained 17,000 (or 17,000,000 if this is correct) gallons for Pine Water Co.)					
Brooke Water, LLC	2000	135,373,000	105,729,869		
Brooke Water, LLC	2001	131,782,000	108,492,287		

STATISTICAL INFORMATION

gallons per day

SYSID	SYSNAME	Population Served	Service Connections	Avg Production	Max Production	Design Capacity	Emergency Capacity	gal. Storage Capacity
04006	E & R WATER CO-STRAWBERRY	2949	983	181440	0	0	0	130000
04016	PINE WATER ASSOCIATION	200	44	9000	43200	43200	0	20000
04020	STRAWBERRY WATER COMPANY	92	43	0	0	0	0	15000
04034	PINE WATER CO-PINE	4512	1504	58000	0	0	0	815000
04043	PINE WATER CO-PINE	1080	360	72000	144000	144000	0	250000
04044	PINE CREEK CANYON DWID	16	65			43000		
04233	SOLITUDE TRAILS DWID	40	60			43000		

active community systems Pine / Strawberry

Info provided by ADEQ

From: Nelson, John
To: harryjoneshdj@earthlink.net
Date: 11/11/03 6:36:08 AM
Subject: FW: Pine Strawberry Water Improvement District

Mark has agreed to be our financial advisor. He's been workng with Dan Jackson, so this appears to be a good fit. He suggested we start with a meeting in Phoenix, I told him you would be contacting him (his contact information is below). I'm in Phoenix monday thru wend. next week so any time during those three days would work fine for me.

Concerning the Bond Attorney, my experiance has been only the financial consultant work on contingency fee, the Bond Attorney wants to be paid regardless if the financing is ever issued. Let's discuss with Mark, if we need a Bond Attorney now, I'd rather get one that Mark has a good working relationship with.

Today is a holiday so I'll be home today. I have a new cell # 928-200-1266.

John

From: Mark Reader [mailto:mreader@syllc.com]
Sent: Mon 11/10/2003 3:18 PM
To: Nelson, John
Cc: Grant Hamill
Subject: RE: Pine Strawberry Water Improvement District

John,
Per our discussion, the following represents our new contact information. As always, nice visiting with you and I look forward to seeing you soon.

Mark Reader

Mark Reader
Director
Stone & Youngberg LLC

2555 East Camelback Road
Suite 280
Phoenix, Arizona 85016
602-794-4011 tel
602-432-4889 tel
602-794-4046 fax
mreader@syllc.com
www.syllc.com

-----Original Message-----
From: Nelson, John [mailto:jnelson@co.gila.az.us]
Sent: Monday, November 10, 2003 2:04 PM
To: Mark Reader
Subject: Pine Strawberry Water Improvement District

Mark,

The Pine Strawberry Water Improvement District is seriously considering 1 of 2 options (if not both).

1. Buy out of Brooke Utilities (3-4 million per cost study)
2. Drilling a deep production well and selling the water to Brooke Utilities (cost unknown at this time)

They (I) are looking for a financial advisor, and was wondering if you would be interested.

I tried to call today but apparently I have the wrong number in my contact list.

My numbers are Globe 928-425-3231 ext 8754, Cell 928-200-1266, and Home 928-476-5980.

Thanks
John Nelson

****
ATTENTION: All e-mail sent to or from this address will be received or otherwise recorded by the Stone & Youngberg LLC e-mail system and is subject to archival, monitoring or review by, and/or disclosure to, someone other than the recipient.
****

PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT RESPONSE TO PINE WATER COMPANY, INC. DATA REQUESTS
(Docket No. W-03412A-03-0279)

Attachment to Response No. 1.13

RESOLUTION NO. 03-11-01

A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF GILA, ARIZONA, ACTING AS THE BOARD OF DIRECTORS FOR THE PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT (PSWID) AUTHORIZING JOHN F. NELSON, PSWID ADMINISTRATOR, TO INTERVENE ON BEHALF OF THE PSWID AT THE HEARING BEFORE THE ARIZONA CORPORATION COMMISSION IN THE MATTER OF ~~BROOKS UTILITIES, INC.'S~~ Pine WATER Company's PROPOSAL FOR A RATE INCREASE.

WHEREAS, on August 18, 2003, the Gila County Board of Supervisors unanimously voted to revoke the authority of the Board of Directors of the PSWID pursuant to A.R.S. §48-1016 in order to protect the residents of the PSWID on account of the Board lacking a quorum for more than 30 days; and

WHEREAS, on September 9, 2003, the Gila County Board of Supervisors acting as the Board of Directors for the PSWID appointed John F. Nelson, County Manager/Clerk, as the Administrator of the PSWID to oversee all administrative and financial functions of the PSWID until such time as a new Board of Directors is elected; and

WHEREAS, the PSWID was established to locate an adequate, long-running, and stable source of water for the property owners within the PSWID; and

WHEREAS, the PSWID and the property owners and members that make up the PSWID have a vital interest in the rate case of Brooke Utilities, Inc. since approximately two-thirds of the members of the PSWID are customers of Pine Water Company and approximately two-thirds of the water supplied to Pine Water Company comes from wells in the Strawberry portion of the PSWID, and the fact that significant water is wheeled by pipeline from the Strawberry area to Pine Water Company from several major wells in Strawberry owned by private citizens and from some wells owned directly by Strawberry Water Company; and,

WHEREAS, the Administrator of the PSWID is faced with finding solutions to the long-run water availability and service issues faced by the current rate-payers connected to the water system; the property owners who are not yet connected to the water system; the Gila County government who is constantly pressured by property owners to help with highly emotional and technical water issues in the Pine and Strawberry areas; and, the Arizona Corporation Commission that has been faced with numerous issues related to this matter.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Gila County acting as the Board of Directors for the PSWID as follows:

1. John F. Nelson is hereby authorized and requested to intervene on behalf of the PSWID at the hearing before the Arizona Corporation Commission against the proposed rate increase by ~~Brooke Utilities, Inc~~. for its customers residing within the boundaries of the PSWID. Pine Water Company

2. John F. Nelson is hereby authorized to call upon other individuals during the hearing before the Arizona Corporation Commission to testify on the inappropriateness of the

proposed rates based on the inadequacy and inaccuracy of basic rate justification information that is currently being, and has in the past, been supplied to the Arizona Corporation Commission.

PASSED AND ADOPTED this 4th day of November 2003.

GILA COUNTY BOARD OF SUPERVISORS

Ronald Christensen, Chairman

Attest:

John F. Nelson, Clerk

PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT RESPONSE TO PINE WATER COMPANY, INC. DATA REQUESTS
(Docket No. W-03412A-03-0279)

Attachment to Response No. 1.15

ECON.COM

economists com

Economic & Financial Consulting

Date: September 25, 2003

To: John Nelson – Pine-Strawberry Water Improvement District

From: Dan V. Jackson – Managing Director, Economists.com

Re: PRELIMINARY FEASIBILITY STUDY

Enclosed is a preliminary report on the feasibility of the potential acquisition value of two Brooke Utilities, Inc. subsidiaries - - Pine Water Company and Strawberry Water Company.

Please note that the Economists.com valuation approaches are employed under a "going concern" premise. Three valuation approaches are described in the report:

ASSET VALUATION METHOD

CASH FLOW VALUATION METHOD

SUBSCRIBER VALUATION METHOD

Together these analytical approaches give an expected range of value for a potential purchase transaction.

Please review the enclosed report. I am available to review these findings with the Board at your convenience. Please advise me on your availability.

PINE WATER COMPANY
STRAWBERRY WATER COMPANY
Subsidiaries of Brooke Utilities, Inc.

PRELIMINARY REPORT TO
PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT

Financial Feasibility of Acquiring Utility Assets

Prepared by:

Dan V. Jackson, Managing Director
Economists.com, LLC
5500 Democracy Drive, Suite 130
Plano, TX 75024
Tel: 972-378-6588
Fax: 972-378-6988

Email: djackson@economists.com

Web Site: www.economists.com

HARDCASTLE

REBUTTAL EXHIBIT 3

ASL Consulting Engineers

431 South Beeline Highway
Payson, Arizona 85541
520/474-4636
Fax 520/474-4867
www.aslce.com

50 Years of Success

PROFESSIONAL SERVICES AGREEMENT

Date February 14, 2000

Project No. _____

Previous Project No. _____

Brooke Utilities, Inc.
(Client)
1011 South Stover Road
(Mailing Address)
Payson, AZ 85541

Dean Shaffer
(Client Representative)
Phone No. (800) 792-7665

FAX No. (520) 474-1695

Scope of Services Additional Engineering Services for watermain between Pine and Strawberry in accordance with Exhibit "C".

Project Location: _____ ¼, Section 22, 23, & 26, Township 12 N, Range 8 E

Subdivision, Lot No. _____

Tax Parcel No. _____ H.E.S. _____

Title Insurance Company _____ Escrow No. _____

Estimated Starting Date: ~~February 14, 2000~~ May 30, 2000 BH.

Estimated Completion Date: ~~May 12, 2000~~ June 9, 2000 BH.

Estimated Professional Fee: $ ~~24,650.00 Not To Exceed~~ $7350.00 Not To Exceed for Task 5 only

Retainer Fee: $ -0-

Hourly Rates to be 90% of Standard Hourly Rates (Exhibit "A")

Retainer applied to final invoice.

This is a confirmation of the scope of services to be performed in accordance with the Standard Conditions of Service attached as Exhibit "B". Additional services, if desired, shall be provided per the fee schedule attached as Exhibit "A" or per a mutually agreed upon fee. If any of the information shown is not in accordance with your understanding, please advise us immediately. Verbal instructions are not acceptable. ASL Consulting Engineers will not be responsible for any errors or misunderstandings which may arise from a lack of proper notification.

ASL CONSULTING ENGINEERS

By Ralph Bossert
Ralph O.
Title Ralph O. Bossert, PE
Date 2-14-00

CLIENT: Brook Utilities, Inc

By _____
Title PRESIDENT
Date 5/24/00

C:\Prop 00\P-020rob.wpd

ASL Consulting Engineers

5/24/00 Requires June 9 ADEQ submittal date. BA

ATTACHMENT "C"
SCOPE OF SERVICES

PINE/STRAWBERRY WATERMAIN

Task 5 - ADEQ and ADOT Permits

We will resubmit the plans and application to ADOT to secure a new Right-of-Way Permit. We will also revise the existing Prefinal Plans to address ADEQ Comment received in February 1998, to secure the ADEQ "Approval to Construct" Permit.

Estimated Fee . . . . . $ 7,350.00

Task 6 - Final Plans and Specifications

We will perform field surveys to identify and detail existing improvements in conflict with the watermain. Additional work required to resolve conflicts with existing improvements will be detailed on the plans to allow prospective contractors to bid the work.

Estimated Fee $15,000.00

Task 7 - Bid Documents and Bidding Assistance

If requested, we will prepare bid documents in a format approved by Brooke Utilities, and submit the plans and bid documents to the selected list of contractors during the Bidding Phase. We will assist Brooke Utilities in conducting a pre-bid conference, and answer any questions which may arise during the Bidding Phase of the project. Upon receipt of the bids, we will tabulate them and submit them to Brooke Utilities with recommendations.

Estimated Fee . . . . . $ 2,300.00

TOTAL ESTIMATED FEE NOT TO EXCEED $24,650.00

Bob Hardcastle

From: Bob Hardcastle
Sent: Wednesday, May 24, 2000 2:14 PM
To: 'Bossert, Ralph'
Cc: Dean Shaffer; Mistie Jared
Subject: RE: Project Magnolia

By means of this message you are approved to complete all aspects of Task 5 of Attachment "C" as described by your February 14, 2000 Professional Services Agreement. As a condition thereof, ASL Consulting Engineers agrees to prepare amended plans necessary for the subject water line in a completely responsive form to meet all requirements of the Arizona Department of Environmental Quality and the Right-of-Way permit requirements of the Arizona Department of Transportation by not later than June 9, 2000.

A further condition of this acceptance is that the nature, subject matter, and scope of ASL's work on this project shall remain confidential and shall not be discussed with any members of the media, individuals, government officials, other any other parties which are not directly involved in the subject project without the expressed written prior permission of Brooke Utilities, Inc.

Please confirm your receipt and understanding of this message. I will execute the ASL Agreement with the appropriate attachments including hereof and return to you in the next day or so. Upon receipt of same please initial changes made to the Agreement and return to me.

Thank you.

RTH
Brooke Utilities, Inc.

—Original Message—
From: Bossert, Ralph [SMTP:RBossert@aslce.com]
Sent: Wednesday, May 24, 2000 11:50 AM
To: Bob Hardcastle
Subject: Project Magnolia

I reviewed the 2/25/98 letter that noted T&M NTE $6,000 would get us through ADEQ approval. The difference between that figure and the $7350 now is for 2 reasons:

1. Our fees have risen since 2/98 which adds $650.
2. We had overspent the budget by $700 before we stopped work. We are now looking to be able to get paid for that also.

In looking at the ADEQ comments from the previous review the only one that didn't involve a spec or detail change was a request to "describe how the pumps in Strawberry will be controlled as well as the tank fill controls in Pine. Also include the capacity that is required for the current proposed design." The tank system is presently designed with a float controlled hytrol valve in combination with a surge protection valve. The valve would close when the tank is full activating a pressure switch to stop the pumps. I'll need some help from Dean to work out the operation sequence.

Easement will need to be obtained for the waterline through the private parcels. The recorded document for the existing roadway does not include a utility easement. We are also planning to cross the north parcel in the old road alignment for which there is no easement.

Ralph

United States Department of Agriculture | Forest Service | Payson Ranger District | 1009 E. Hwy. 260 Payson, AZ 85541

File Code: 1950/2720
Date: February 23, 2000

Dear Interested Citizen:

Brooke Utilities, Inc. submitted a proposal to the Tonto National Forest to install an 8 inch diameter waterline between the communities of Pine and Strawberry, Arizona. After completion of an environmental analysis of that proposal was completed Charles Bazan, Tonto Forest Supervisor, made a decision to proceed with issuance of a special use permit for that pipeline. A copy of that decision notice is enclosed. This decision is subject to appeal. The procedures for appeal are outlined in the Decision Notice. Any appeals must be filed no later than March 31, 2000.

Sincerely,

David P. Cummings

DAVID P. CUMMINGS
District Ranger

RECEIVED
FEB 2 8 2000
BY:_____

FEB 22 2000

RECEIVED
FEB 28 2000
BY:_____

DECISION NOTICE
and
FINDING OF NO SIGNIFICANT IMPACT
for the
Issuance of a Special Use Permit
for the Construction and Maintenance of
the Strawberry - Pine Water Line

USDA Forest Service
Tonto National Forest
Payson Ranger District
Gila County, Arizona

Brooke Utilities has made application for a special use permit for construction and maintenance of a water transmission line between the communities of Strawberry and Pine Arizona. The proposed line would cross approximately one and a half miles of National Forest land located in Township 12 North, Range 8 East, Sections 22, 23 and 26, G&SRBM. An Environmental Assessment (EA) that discusses the proposed water transmission line has been completed. The authority to issue this type permit is founded in Public Law 94-579, 90 Stat. 2743.

Based on the analysis documented in the EA, it is my decision to implement Alternative 1. This alternative provides for a route to construct a pipeline parallel to State Highway 87. This waterline will allow the transmission of water pumped from wells on the privately owned lands within the communities of Strawberry and Pine to be moved between those two communities as needed to be used as domestic water. It is recognized that most of the water would be moved from Strawberry to Pine. The majority of this pipeline route lies within an existing abandoned roadbed that provides easy access for construction and minimal disturbance of vegetation. Best management practices for construction and maintenance of the line will be incorporated into the special use permit, assuring minimal soil erosion and vegetation removal. The permit administrator will be responsible for seeing that the project is implemented on the ground according to the design specifications to be included in the permit.

Scoping began on October 1, 1998 with a letter being sent to 98 individuals, State and local agencies, special interest groups, local water users and American Indian tribes. A public meeting was sponsored jointly between the Forest Service and Arizona Corporation Commission on October 15, 1998 and a news release was published in the Payson Roundup on October 20, 1998 to solicit any issues associated with this proposal. Comments were synopsized in a scoping report which is a part of the project record.

There was minimal public interest or concern expressed regarding impacts to physical resources. The issues that were identified through both public and internal Forest Service reviews were: 1) possible effects of well pumping on springs and surface water flow, 2) visual quality impacts, 3) Socioeconomic effects(increase in development and water demand in Pine and private well impacts in Strawberry effecting property values) 4) Potential effects on biological resources, and 5) potential effects on archeological resources. These issues are discussed in detail in Chapter 2 of the EA. An addendum was prepared following the release of the EA for public review to clarify points raised in six comment letters that were received. Two issues raised by the public were eliminated from evaluation in the EA. The real controversy over this pipeline proposal are in regards to the potential impacts of removing water from the Strawberry community and sending it to the Pine community. In brief, most Pine residents favor a pipeline that will help alleviate the perennial water shortage and most Strawberry residents oppose any measure that would facilitate removing ground water that could conceivably affect their private well water levels. However, well drilling and pumping are outside th jurisdiction of the Forest Service and outside the scope of this EA. State agencie that do have that jurisdictional responsibility will make the decisions regarding appropriate use of the water regardless of the delivery system that may be used. The second issue that was dropped from the evaluation was the potential effects of pipeline on future widening of Highway 87. The Arizona Department of Transportatic (ADOT) will issue their own concurring permit after review of construction plans f any segments of this pipeline that lie within the existing ADOT highway easement. It is not within the Forest Service purview to make that determination for ADOT.

Any permit issued by the Forest Service will require a permit from ADOT be attached to it before it is valid. All the comments received throughout the analysis were given consideration in this decision.

Five alternatives were considered; Three of the alternatives were eliminated due to high costs with a very minimal chance of addressing the need for an effective water delivery system. One of those alternatives that was eliminated was the continuation of hauling water by truck due to extraordinary costs that would be passed on to the consumers. A second alternative was drilling more wells in Pine. Four of five new wells drilled in Pine for the community system were unproductive, therefore, this alternative was also eliminated. A third alternative was to conserve water which is a management principle already implemented and offers limited opportunity to improve water supplies. The only practical action alternative was to provide a route parallel to the State Highway for a pipeline.

The no action alternative and one possible pipeline route were considered in detail.

No Action Alternative - Deny a special use permit for a pipeline across National Forest land. The No Action Alternative was evaluated and would effectively mean that one or a combination of the three alternatives that had been eliminated would have to be implemented regardless of cost or effectiveness. There were no significant impacts to Forest lands that would be created by a pipeline and the Forest Service does not have the authority to regulate water use on private lands; therefore this alternative was rejected.

Alternative 1 would not impact wilderness values, vegetative cover, soil, water or air significantly. Threatened or endangered plant or animal habitat is not an issue as the Biological Assessment and Evaluation rendered a "no effect" determination for the analysis area. The only archeological feature that would be affected is an historical roadbed that will not suffer any significant loss of integrity with a pipeline placed under it. This alternative would allow the pipeline to be built without significant impact on any Forest resource.

A Biological Assessment and Evaluation (BA&E) is included in the project record for this decision. A "no effect" determination was made in this BA&E.

The cultural resource survey has been completed. Clearance, with concurrence from the State Historic Preservation Officer, has been completed.

This project is located within Management Area 4F as described in the Tonto National Forest Land and Resource Management Plan and is consistent with the management standards and guidelines of that Plan.

I have determined that this project is not a major federal action, individually or cumulatively, and will not significantly affect the quality of the human environment. Therefore an environmental impact statement is not needed. This determination is based on the following factors:

This project is similar in context and intensity to other water pipelines on the Forest which have been found to not have a significant effect on the environment.

The physical and biological effects are insignificant and are limited to the project area and the immediately surrounding areas;

Public health and safety are minimally affected by the proposed action.

There are no known cultural resources adversely affected and the project is not in the proximity of any unique resources that would be affected.

Based on public participation, the effects on the quality of the human environment are not likely to be highly controversial;

There are no known effects on the human environment that are highly uncertain or involve unique or unknown risks;

This project does not set a precedent for other projects that may be implemented to meet the goals and objectives of the Forest Land and Resource Management Plan;

There are no known significant cumulative effects between this project and other projects implemented or planned on areas separated from the affected area of this project;

All proposed or currently listed endangered, threatened or sensitive species will not be affected; The actions do not threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment;

This project will not be implemented sooner than five business days following the close of the appeal filing period established in the legal notice of decision published in the Mesa Tribune newspaper. If an appeal is filed, implementation will not begin sooner than 15 calendar days following a final decision on the appeal. This decision is subject to appeal in accordance with 36 CFR 215.7. Appeals must be filed with Regional Forester, Southwest Region, 517 Gold SW, Albuquerque, NM 87102-0084 within 45 days of the date of the legal notice in the Mesa Tribune.

The appeal must:

* state that the document is an appeal filed pursuant to 36 CFR 215;
* list the name and address of the appellant, and if possible, a telephone number;
* identify the decision document by title and subject, date of decision, and name of the Responsible Official;
* identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects;
* state how the Responsible Official's decision fails to consider comments provided and, if applicable, how the appellant believes the decision violates law regulation, or policy.

For additional information concerning this decision or the Forest Service appeal process, contact Carl Taylor, Tonto National Forest, 2324 E. McDowell Rd., Phoenix, AZ 85006 (602) 225-5200 or District Ranger, Rodney E. Byers, Payson Ranger District, 1009 E. Hwy 260, Payson, AZ 85541, (520) 474-7900.

CHARLES R. BAZAN, Forest Supervisor

Date 2/9/00

ARIZONA DEPARTMENT OF TRANSPORTATION

District Permits Office
1210 E. Sheldon Street
Prescott, AZ 86301-3230

RECEIVED
FEB 2 5 2000
BY:

APPLICATION FOR PERMIT TO USE STATE HIGHWAY RIGHT OF WAY
(PRINT OR TYPE)

Application is hereby made to enter in upon and use a portion of the State Highway.

Name of Encroachment Owner Brooke Utilities Phone (520) 474-1337

Address of Owner 1011 South Stover Road

City Payson State AZ Zip 85541

Signature of Owner [signature] Dean Shaffer
TYPE OR PRINT NAME

Name of Applicant ASL Consulting Engineers Legal Relationship to Owner Engineer

Mailing Address 431 S. Beeline Highway Suite A

City Payson State AZ Zip 85541

Phone (520) 474-4636

Signature of Applicant [signature] Ralph Bossert/ASL Cons.
TYPE OR PRINT NAME

(Applicant and Owner are responsible for conditions on permit)

City (in or near) Pine AZ PROJECT NO. FH9-F/F.H. 10-02

Highway Route No. SR 87 Aproximately 1320/1980 Feet NW/SE of Milepost No. 269.25/270.62

Side of Highway (N S) E W (circle one) Highway Station 947+50 to 1020+00

Purpose Construct 8" watermain from Strawberry to Pine to connect Brooke Utility Systems

FOR DEPARTMENT USE ONLY

THIS APPLICATION is approved with the following directions, requirements and specifications indicated on the back of this form. WITH THE ACCEPTANCE OF THIS PERMIT, THE PERMITTEE AGREES TO ALL THE CONDITIONS AS DESCRIBED HEREIN. NO WORK WILL BE ALLOWED TO TAKE PLACE INSIDE THE RIGHT OF WAY WITHOUT A VALID PERMIT ON SITE.

Date received 2-22-00

PERMIT AND LICENSE

Permit No. 85165-U (8853)

A permit and license is hereby issued to the foregoing licensee for the purpose contained in the application and upon the expressed condition that every agreement and covenant therein contained is faithfully performed, and said work to be performed in accordance with final approved plans and specifications. Construction is authorized only for period indicated below.

Date Issued 2-23-2000

Construction to be completed by:
8-23-2000
Date

ARIZONA DEPARTMENT OF TRANSPORTATION

By [signature] 2-23-00
District Maintenance Engineer Date

22-5101 R8/97 (web)

HARDCASTLE

REBUTTAL EXHIBIT 4

Brooke Utilities, In * Bakersfield, CA
H106 GLENN HALE Nov 21 00

412 Nov 16 00 2,590.00 0.00 2,590.00

NOT NEGOTIABLE

2,590.00 0.00 2,590.00

Brooke Utilities, Inc.
P.O. Box 82218
Bakersfield, CA 93380-2218

BANK OF AMERICA
1440 TRUXTUN AVENUE
BAKERFIELD, CA 93301

11962

16-66
1220

CHECK NO.

********** Two Thousand Five Hundred Ninety and 00/100 **********

DATE
Nov 21 00

AMOUNT
$2,590.00

PAY TO THE ORDER OF

GLENN HALE
805 N COLCORD ROAD

PAYSON, AZ 85541

NOT NEGOTIABLE

⑈011962⑈ ⑆122000066⑆ 4787⑈0162 5⑈

INVOICE

©1997 REDFORM® 7L724

INVOICE NO. 0412

SOLD TO: Brooke Utilities	SHIP TO: Glenn Hale
ADDRESS: 1010 S. Goodfellow	ADDRESS: 802 N. Colcord Rd
CITY, STATE, ZIP Payson AZ 85541	CITY, STATE, ZIP Payson AZ 85541

CUSTOMER'S ORDER:	SOLD BY:	TERMS:	F.O.B.	DATE:
				11-16-00

QUANTITY		DESCRIPTION	PRICE	AMOUNT
	1			
	2			
	3	99-2000		2590 00
	4			
	5			
	6			
	7	DIV # 99		
	8	ACCT # 105.00 $ 2590 -		
	9	ACCT # _____ $ _____		
	10	ACCT # _____ $ _____		
	11	ACCT # _____ $ _____		
	12	ACCT # _____ $ _____ APPROVED BY DS		
	13	DATE. 11/17/00		2590 00
	14			
	15	Project Wagnitzi		
	16	project manager		
	17			
	18			
	19			

12127

Brooke Utilities, Inc. P. Bakersfield, CA
PO# HUGHES SUPPLY INC Dec 27 00

193425	Dec 5 00	1,253.17	0.00	1,253.17
193426	Dec 5 00	216.07	0.00	216.07
193427	Dec 5 00	56.60	0.00	56.60
200308	Dec 6 00	108.94	0.00	108.94
200997	Dec 7 00	35,469.92	0.00	35,469.92
205,34	Dec 15 00	15.48	0.00	15.48

NOT NEGOTIABLE

37,120.18 0.00 37,120.18

12127

Brooke Utilities, Inc.
P.O. Box 82218
Bakersfield, CA 93380-2218

BANK OF AMERICA
1440 TRUXTUN AVENUE
BAKERFIELD, CA 93301

16-66
1220

CHECK NO.

******** Thirty-Seven Thousand One Hundred Twenty and 18/100 ********

Project Wagner

DATE	AMOUNT
Dec 27 00	$37,120.18

PAY TO THE ORDER OF

HUGHES SUPPLY INC
4493 N. TECH BLVD.
GILBERT, AZ
85233

~~NOT NEGOTIABLE~~

⑈012127⑈ ⑆122000186⑆ 1754⑈01525⑈

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/05/00	198425	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

1 3 11779 MC **7096
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
125669	OUR TRUCK	12/05/00	12/04/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
UFR1500-C	8" RESTRAINT F/C900 (MEGALUG)	8	0	8	32.791	EA	262.33
UFR1400-D	8" RESTRAINT F/DIP (MEGALUG)	4	0	4	26.751	EA	107.00
6BLINFLAN	6" BLIND FLANGE 129967	1	0	1	35.919	EA	35.92
6GASK116	6" FULL FACE CL INS GASK 1/16"	6	0	6	2.370	EA	14.22
MP60CADM	6" CAD PLTD BOLT W/NUT	6	0	6	9.360	EA	56.16
	1ST LEFT IN PINE. OLD COUNTY RD. TAKE 1ST RIGHT. FOLLOW TO MATERIAL YARD JUST PAST CREEK ON LEFT SIDE OF ROAD. PAYSON CONCRETE YARD.						
	GLEN HALE 520-978-3777						
A-2360-6-	6" FLANGED GATE VALVE (MUEL)	3	0	3	267.706	EA	803.12
8TJGASK	8" TYTON JOINT GASKET	5	5	0	3.159	EA	0.00

105.00
Project Magnolia

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	1278.75
FREIGHT	
TAX	0.00
INVOICE AMOUNT	1278.75

Amount Due 01/10/01

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/05/00	198426	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

2 3 11780 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
125831	OUR TRUCK	12/05/00	12/04/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
8MJ90	8" MJ 90 L/ACC 072249	5	0	4	55.120	EA	220.48

105.00
Project Wigmaker

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

Amount Due 01/10/01

NET AMOUNT	220.48
FREIGHT	0.00
TAX	0.00
INVOICE AMOUNT	220.48

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/05/00	198427	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

3 3 11781 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
125847	OUR TRUCK	12/05/00	12/04/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
6X2TAPPBL	6X2 TAPP BLIN FLANGE	1	0	1	57.759	EA	57.76

Project Mgr
10-5-00

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	57.76
FREIGHT	.00
TAX	0.00
INVOICE AMOUNT	57.76

Amount Due 01/10/01

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/04/00	200308	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

1 2 11272 MC **6798
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

HSI PO# 460145

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN	TERMS AND CONDITIONS OF SALE ON REVERSE SIDE
10809!7761	PO# 2921	0001	MDR	135	
REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE		
114018	DIRECT SHIPMENT	12/04/00	11/21/00		

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
6X6FLSPOO	6" X 6" FLXFL DIP SPOOL FLANGE	1	0	1	99.157	EA	99.16
WF	WATERWORKS FREIGHT CHARGE	1	0	1	12.000	EA	12.00
	SHIP TO:						
	BROOKE UTILITIES 1011 SOUTH STOVER RD. PAYSON, AZ 85541						

105.00 Project Magnolia

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	111.16
FREIGHT	0.00
TAX	0.00
INVOICE AMOUNT	111.16

Amount Due 01/10/01

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/07/00	200982	1

LAKESIDE - 7781
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

2 2 11273 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
PROJECT MAGNOLIA
HWY 87
PINE, AZ

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
1080917761	JOB# 11-00-37873	0002	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
128980	DIRECT SHIPMENT	12/07/00	12/06/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
8PVCC900C	8" PVC R/T C-900 200PSI DR14	6740	0	6740	5.370	FT	36193.80
	DELIVER TO PINE, AZ						
	TAKE 1ST LEFT IN TOWN (OLD COUNTY RD.) TAKE 1ST RIGHT.						
	FOLLOW DIRT RD. TO MATERIAL YARD JUST PAST CREEK. MATERIAL YARD IS ON LEFT.						
	GLEN HALE 520-978-3777 TODD RALLS 520-970-0194						

charge Project Magnolia 105.00

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

Amount Due 01/10/01

NET AMOUNT	36193.80
FREIGHT	.00
TAX	0.00
INVOICE AMOUNT	36193.80

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
12/15/00	209134	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

PO Box 87218

SOLD TO:

1 1 10721 MC **6488
BROOKE UTILITIES-MASTER
~~P O BOX 1807~~
BAKERSFIELD CA ~~93303-1807~~
93380

SHIPPED TO:

BROOKE UTILITIES
GILBERT

Project Magnolia

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN	TERMS AND CONDITIONS OF SALE ON REVERSE SIDE
10809!7761	PO# 2921	0001	MDR	135	
REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE		
125669-2	OUR TRUCK	12/15/00	12/04/00		

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
8TJGASK	8" TYTON JOINT GASKET	5	0	5	3.159	EA	15.80

Brooke Utilities
105.0

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	15.80
FREIGHT	0.00
TAX	0.00
INVOICE AMOUNT	15.80

Amount Due 01/10/01

Terms and Conditions / MSDS Information On Reverse

Brooke Utilities, Inc * Bakersfield, CA
M109 H HES SUPPLY INC Nov 28 00

174778	Nov 9 00	36,193.80-	0.00	36,193.80-
157781	Nov 1 00	55,505.12	0.00	55,505.12
171443	Nov 7 00	792.52	0.00	792.52
174777	Nov 8 00	33.75	0.00	33.75
175677	Nov 10 00	31.10	0.00	31.10
175678	Nov 10 00	61.53	0.00	61.53
175679	Nov 10 00	672.57	0.00	672.57
175680	Nov 10 00	31.10	0.00	31.10
175681	Nov 10 00	122.47	0.00	122.47
		21,056.36	0.00	21,056.36

NOT NEGOTIABLE

Brooke Utilities, Inc.
P.O. Box 82218
Bakersfield, CA 93380-2218

BANK OF AMERICA
1440 TRUXTUN AVENUE
BAKERFIELD, CA 93301

11994

16-66
1220

CHECK NO.

********** Twenty-One Thousand Fifty-Six and 36/100 **********

DATE
Nov 28 00

AMOUNT
$21,056.36

PAY TO THE ORDER OF

HUGHES SUPPLY INC
1493 N. TECH BLVD.
GILBERT, AZ
85233

NOT NEGOTIABLE

⑈011994⑈ ⑆122000661⑆ 1476⑈0625⑈

STATEMENT

Hughes SUPPLY, INC.

HUGHES SUPPLY INC.
1493 N. TECH BLVD.
GILBERT, AZ 85233
520-537-5788

STATEMENT DATE	DUE DATE
11/25/00	12/10/00

CUSTOMER	JOB #	PAGE
10809!7761	0002	1
JOB NAME		
PROJECT MAGNOLIA		

MAIL REMITTANCE TO:
HUGHES SUPPLY, INC.
1493 NORTH TECH BLVD
GILBERT, AZ 85233

PLEASE EXPLAIN ANY DIFFERENCES BETWEEN TOTAL AMOUNT DUE AND AMOUNT REMITTED ON THE BACK OF THIS STUB.

CUSTOMER	JOB #	PAGE
10809!7761	0002	1
TELEPHONE NO.	DATE	
805-393-7000	11/25/00	

3 3 2501 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

DATE MO DY YR	INVOICE NUMBER	PYMT CODE	BR. NO.		AMOUNT DUE
10/25/00	157781		1		55,505.12
11/02/00	167454		1		209.55
11/07/00	171443		1		792.52
11/08/00	174777		1		33.75
11/09/00	174778		1		-36,193.80
11/10/00	175677		1		31.10
11/10/00	175680		1		31.10
11/25/00	188485		1		1,110.10

INVOICE NUMBER	DISPUTE ITEMS	AMOUNT DUE
157781		55,505.12
167454		209.55
171443		792.52
174777		33.75
174778		-36,193.80
175677		31.10
175680		31.10
188485		1,110.10

90 DAYS	60 DAYS	30 DAYS	CURRENT/FUTURE	ACCOUNT BALANCE
		55,505.12	-33,985.68	21,519.44

TERMS AND CONDITIONS ON THE REVERSE SIDE

* = FUTURE

AMOUNT DUE	21,519.44
AMOUNT REMITTED	

TO INSURE PROPER CREDIT, PLEASE RETURN THIS STUB WITH YOUR PAYMENT

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/09/00	174778	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

2 2 10992 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
PROJECT MAGNOLIA
HWY 87
PINE, AZ

105.0

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	JOB# 11-00-37873	0002	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
101535	DIRECT SHIPMENT	11/09/00	11/09/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
8PVCC900C	8" PVC R/T C-900 200PSI DR14	-6740		-6740	5.370	FT	-36193.80

credit - tube delivered later

Ok MK

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	-36193.80
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	-36193.80

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/07/00	171443	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

1 1 11582 MC **6920
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
[redacted]
HWY 87
PINE, AZ

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN	TERMS AND CONDITIONS OF SALE ON REVERSE SIDE
10809!7761	JOB# 11-00-37873	0002	MDR	135	
REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE		
097663	OUR TRUCK	11/07/00	11/06/00		

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
UFR1400-D	6" RESTRAINT F/DIP (MEGALUG)	1	0	1	17.338	EA	17.34
6MJACCE	6" MJ ACCESSORY SET L/B 085805	1	0	1	12.283	EA	12.28
6GASK116	6" FULL FACE CL INS GASK 1/16"	5	0	5	2.365	EA	11.83
MP60CADM	6" CAD PLTD BOLT W/NUT	5	0	5	9.224	EA	46.12
T580-70-3	3 FIP BALL VALVE R/PORT T58070	2	0	2	152.942	EA	305.88
	DELIVER TO OFFICE IN PAYSON						
6FLTEE	6" FLANGE TEE 124238	1	0	1	106.218	EA	106.22
6MJXFLADA	6" MJXFL ADAPTER L/ACC 083818	1	0	1	44.960	EA	44.96
A-2360-6-	6" FLANGED GATE VALVE (MUEL)	1	0	1	247.893	EA	247.89

105.00

ACCT # 311.00 DIV. # 15 $ 792.52
ACCT # $
ACCT # $
ACCT # $
ACCT # $
APPROVED BY DS
DATE 11/22/00
WO# 99-15-2002

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

Amount Due 12/10/00

NET AMOUNT	792.52
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	792.52

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/08/00	174777	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

1 2 10991 MC **6721
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

105.0

BROOKE UTILITIES
PROJECT MAGNOLIA
HWY 87
PINE, AZ

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN	TERMS AND CONDITIONS OF SALE ON REVERSE SIDE
10809!7761	JOB# 11-00-37873	0002	MDR	135	
REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE		
097762	DIRECT SHIPMENT	11/08/00	11/06/00		

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
9767088#	200 PSI OIL FILLED GUAGE	2	0	2	14.000	EA	28.00
WF	WATERWORKS FREIGHT CHARGE	1	0	1	5.750	EA	5.75
	SHIP TO:						
	BROOKE UTILITIES						
	1011 SOUTH STOVER						
	PAYSON, AZ 85541						

Sh Pmt

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

Amount Due 12/10/00

NET AMOUNT	33.75
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	33.75

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/10/00	175677	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

4 5 3623 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
PROJECT MAGNOLIA
HWY 87
PINE, AZ

105.0

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
1080917761	JOB# 11-00-37873	0002	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
100321	VIA SALESMAN	11/10/00	11/08/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
3COMPFLAN	3X7 1/2" CI COMPANION FLANGE	2	0	2	14.160	EA	28.32
3GASK116	3" FULL FACE CL INS GASK 1/16"	2	0	2	1.390	EA	2.78
	SHIP VIA MATT ON THURSDAY 11.9.00						

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	31.10
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	31.10

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/10/00	175678	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

1 5 3620 MC **569
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
100674	VIA SALESMAN	11/10/00	11/08/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
4GALV45	4" GALVANIZED 45	1	0	1	61.534	EA	61.53

Project Magnolia
Sh. Mt

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	61.53
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	61.53

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/10/00	175679	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

2 5 3621 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
100684	OUR TRUCK	11/10/00	11/08/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
UFR1400-D	8" RESTRAINT F/DIP (MEGALUG)	2	0	2	26.687	EA	53.37
8FL90	8" FLANGE 90 121756	1	0	1	111.838	EA	111.84
8MJACCE	8" MJ ACCESSORY SET L/B 085812	2	0	2	15.115	EA	30.23
8GASK116	8" FULL FACE CL INS GASK 1/16"	2	0	2	3.105	EA	6.21
6GASK116	6" FULL FACE CL INS GASK 1/16"	3	0	3	2.365	EA	7.10
MP80CADM	8"FLG PLT BOLT/NUT KIT 8ea/BAG	2	0	2	9.637	EA	19.27
MP60CADM	6" CAD PLTD BOLT W/NUT	3	0	3	9.22	EA	27.67
8MJ90	8" MJ 90 L/ACC 072249	1	0	1	68.00	EA	68.00
6FLTEE	6" FLANGE TEE 124238	1	0	1	106.218	EA	106.22
8X10FLXPE	8X10' FLXPE SPOOL	1	0	1	[illegible]55	EA	242.66
	DELIVER TO PINE JOB SITE						
	CALL GLEN AT 520-978-3777 FOR DELIVERY INSTRUCTIONS						
	8X10 SPOOL IS BEHIND CULVERT. IF YOU CANNOT FIND, SEE MATT						

Paid

Paid

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	672.57
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	672.57

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/10/00	175680	1

LAKESIDE - 7761
1493 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

5 5 3624 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
PROJECT MAGNOLIA
HWY 87
PINE, AZ

105.0

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN	TERMS AND CONDITIONS OF SALE ON REVERSE SIDE
10809!7761	P.O.# 2921	0002	GEB	135	
REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE		
102318	OUR TRUCK	11/10/00	11/09/00		

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
3COMPFLAN	3X7 1/2" CI COMPANION FLANGE	2	0	2	14.160	EA	28.32
3GASK116	3" FULL FACE CL INS GASK 1/16"	2	0	2	1.390	EA	2.78
	SEE GEB W/ANY PROBLEMS						

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	31.10
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	31.10

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

INVOICE

Hughes SUPPLY, INC.

INVOICE DATE	INVOICE NUMBER	PAGE
11/10/00	175681	1

LAKESIDE - 7781
1483 NORTH TECH BLVD
GILBERT, AZ 85233
Telephone 520-537-5788

SOLD TO:

3 5 3622 MC
BROOKE UTILITIES-MASTER
P O BOX 1807
BAKERSFIELD CA 93303-1807

SHIPPED TO:

BROOKE UTILITIES
GENERAL

CUSTOMER NO.	CUSTOMER ORDER NO.	JOB	WRITER	SALESMAN
10809!7761	PO# 2921	0001	MDR	135

REFERENCE	SHIP VIA	DATE SHIPPED	ORDER DATE
102914	VIA SALESMAN	11/10/00	11/10/00

TERMS AND CONDITIONS OF SALE ON REVERSE SIDE

OUR CODE NO.	DESCRIPTION	ORDERED	BACK ORDERED	SHIPPED	UNIT PRICE	UNIT	NET AMOUNT
8X6FLRED#	8X6 FL RED	1	0	1	122.470	EA	122.47

Proper Upgrade

Paid

"HUGHES SUPPLY STOCKS OVER 85,000 DIFFERENT PRODUCTS FOR TIMELY DELIVERY."

NO CREDIT WILL BE ALLOWED FOR GOODS RETURNED WITHOUT OUR PERMISSION. ALL RETURNS SUBJECT TO RESTOCKING, HANDLING AND FREIGHT CHARGES.

NET AMOUNT	122.47
FREIGHT	0.00
TAX	
	0.00
INVOICE AMOUNT	122.47

Amount Due 12/10/00

Terms and Conditions / MSDS Information On Reverse

HARDCASTLE

REBUTTAL EXHIBIT 5

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.
TO ARIZONA CORPORATION COMMISSION STAFF
(Docket No. W-03412A-03-0279)

REQUEST:

1.13 Regarding the Direct Testimony of Claudio M. Fernandez at page 7, l. 28 through page 8, l. 4, please state the basis for Staff's conclusion that PWCo's Construction Work in Progress represented the cost of Project Magnolia in Docket No. W-01576A-99-0277. In support of Staff's response, please provide any documentation or other evidence supporting Staff's conclusion that the costs of Project Magnolia were included in Company's CWIP in that docket.

RESPONSE:

The basis for Staff's conclusion that Project Magnolia was included in CWIP in Docket No. W-01576A-99-0277 is the Company's application. Please refer to Schedule A-4, Column 2, Projected year as of and for the year ended 6/30/99 (Exhibit 5) in the amount of $334,242; Schedule B-1; Schedule B-4 – Projected capital expenditures of $334,242; Schedule E-5, page 2, Project Magnolia – Date in Service 6/30/98, Useful life 20 yrs. – Method Straight line – Cost as of 6/30/98 of $17,040. See attached copies of above mentioned schedules.

E R Water Company
Detail of Utility Plant
Schedule E-5
Test Year Ended June 30, 1998

STAFF 1.13 ONLY
ATTACHMENT

	Date in Service	Useful Life	Method	6/30/97	6/30/98
Total Additons:					
Project Magnolia	6/30/98	20-yrs	Straight line	$ -	$ 17,040
Canyon Tanks Rebuild Well #11	6/30/98	20-yrs	Straight line		8,043
Brooke View Terrace - Ferrari Well	6/30/98	20-yrs	Straight line	3,345	16,227
Pine Creek Canyon - Cedar	6/30/98	20-yrs	Straight line		12,308
Pinecrest - Well Recasing	6/30/98	20-yrs	Straight line		10,887
Portals 2 Well Rebuild	6/30/98	20-yrs	Straight line	6,982	
Water System Planning	6/30/98	20-yrs	Straight line	12,977	5,363
Strawberry View 1 Well	6/30/98	20-yrs	Straight line	5,817	23,967
Strawberry Pines Well	6/30/98	20-yrs	Straight line	16,566	55,018
Rimwoods Well	6/30/98	20-yrs	Straight line	14,535	33,334
Strawberry Ranch 5 Well	6/30/98	20-yrs	Straight line	18,162	21,036
Stawberry View 3 Well	6/30/98	20-yrs	Straight line	8,932	4,678
McKnight Well	6/30/98	20-yrs	Straight line	17,845	2,335
O'Hara Well	6/30/98	20-yrs	Straight line	20,503	150
Strawberry Ranch 3 Well	6/30/98	20-yrs	Straight line	9,262	26,267
Strawberry Ranch 2 Well	6/30/98	20-yrs	Straight line	15,227	3,052
Mohawk Paving Project	6/30/98	20-yrs	Straight line		553
Apache Tank Bi-Pass Project	6/30/98	20-yrs	Straight line		2,682
Cool Pines Paving Meter Relocation	6/30/98	20-yrs	Straight line		5,144
Homestead Well	10/31/97	20-yrs	Straight line		1,390
Walnut Glen Well	11/30/97	20-yrs	Straight line	1,277	1,259
Interconnections	8/31/97	20-yrs	Straight line		330
O'Brien Main-line Extension	7/31/97	20-yrs	Straight line	351	
Pine Booster Site	11/30/97	20-yrs	Straight line	1,160	1,304
Air Compressors	9/30/96	20-yrs	Straight line	5,873	
Cimmaron Pines Improvements	9/30/96	20-yrs	Straight line	1,960	2,201
Strawberry Hollow Well	6/30/97	20-yrs	Straight line		970
Correction between years				31,105	(31,105)
				191,879	224,433
Meters:					
Meter 5/8"	1996	20-yrs	Straight line	5,153	-
Meter 5/8"	1997	20-yrs	Straight line	10,549	17,555
Meter 5/8"	1998	20-yrs	Straight line	-	40,879
				15,702	58,434
				$ 207,581	$ 282,867

EXHIBIT 10

E&R Water Co., Inc.
Capital Expenditure Budget 1999 through 2003

Ref #	Water System	Expenditure Description	Total	1999 Q1	1999 Q2	1999 Q3	1999 Q4	2000 Q1	2000 Q2	2000 Q3	2000 Q4	2001 Q1	2001 Q2	2001 Q3	2001 Q4	2002 Q1	2002 Q2	2002 Q3	2002 Q4	2003 Q1	2003 Q2	2003 Q3	2003 Q4
1	Brookview Terrace 2	Bloom well development	$ 22,586	$ 2,486	$ 20,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	Brookview Terrace 2	Brookview 2 (Lot 20C) site improvements, concrete slab, fencing	$ 1,500	$ -	$ -	$ 1,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	Brookview Terrace 2	Brookview 2 (Lot 6) site abandonment	$ 2,700	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,700	$ -	$ -	$ -	$ -	$ -	$ -
4	Brookview Terrace 2	Brookview 2 building site remodel and raise floor above grade	$ 7,680	$ -	$ -	$ 7,680	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5	Brookview Terrace 2	Brookview 2 water site development (5 wells, booster station, 3P, Brooke building)	$ 32,660	$ -	$ 32,660	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
6	Cimmaron Pines	Noble booster site development (1/2 zone)	$ 8,400	$ -	$ 8,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	Cool Pines	Apache Tanks relocation	$ 9,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500	$ 4,500	$ -	$ -	$ -	$ -	$ -
8	Cool Pines	Relocate easement, 100,000 gallons tank relocation, Brooke building, PRV's	$ 2,910	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,910	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
9	Homestead	Rebuild booster site	$ 7,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	Pine	Cauffiun well (further) exploration	$ 8,000	$ -	$ -	$ -	$ 8,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
11	Pine	Compliance fencing	$ 14,000	$ -	$ 5,000	$ -	$ -	$ -	$ 4,000	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	Pine	Highway 87 heavier electrical service connection	$ 3,100	$ -	$ -	$ 3,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	Pine	New well exploration	$ 21,000	$ -	$ -	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
14	Pine	New well exploration	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
15	Pine	Project Magnolia (construction and development)	$ 300,000	$ -	$ 200,000	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
16	Pine	Project Magnolia (planning and preparation)	$ 2,300	$ 2,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
17	Pine	Rudall reservoir filtration plant	$ 75,000	$ -	$ -	$ -	$ -	$ -	$ 75,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Pine	Rudall Storage Reservoir	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ 50,000	$ 250,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19	Pine	Rudall well (further) exploration	$ 8,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20	Pine	Replacement of existing, non-functional meters	$ 7,000	$ -	$ 3,500	$ 3,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
21	Pine Mtn Acres Lot 16	Rebuild well site	$ 14,870	$ -	$ -	$ -	$ -	$ -	$ 14,870	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	Pine Mtn Acres Lot 10	Abandon well site	$ 800	$ -	$ -	$ -	$ -	$ 800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	Pine Mtn Acres Lot 7	Rebuild well site	$ 12,010	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,010	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
24	Pine Ranch II Lot 25	Rebuild well site	$ 8,835	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,835	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
25	Pine Ranch Lot 1	Tank relocation (3); rebuild well site	$ 31,060	$ -	$ -	$ -	$ -	$ -	$ -	$ 31,060	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
26	Pinecrest Canyon	Filter plant abandonment and relocation of tanks	$ 11,200	$ -	$ -	$ -	$ -	$ -	$ 11,200	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
27	Pinecrest Canyon	Master electrical service; well controls; Portal 3 solenoid; well UG1	$ 26,560	$ -	$ -	$ -	$ 26,560	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
28	Pinecreek Canyon	Rebuild well site #7	$ 17,100	$ -	$ -	$ -	$ -	$ 17,100	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
29	Pinecrest	Brooke building, complete site development	$ 8,800	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	Strawberry	Compliance fencing	$ 9,000	$ -	$ 2,000	$ -	$ -	$ -	$ 3,000	$ 4,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31	Strawberry	Evans well exploration	$ 21,000	$ -	$ -	$ -	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
32	Strawberry	Hale well exploration	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 21,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
33	Strawberry Hollow	460,000 gallons water storage, site clean up well site #10	$ 139,640	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 139,640	$ -	$ -	$ -	$ -	$ -	$ -
34	Strawberry Hollow	Abandon well site #12	$ 800	$ -	$ -	$ -	$ -	$ -	$ -	$ 800	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	Strawberry Hollow	Rebuild well site #11	$ 11,885	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,885	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	Strawberry Hollow	Rebuild well site #9	$ 11,830	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,830	$ -	$ -	$ -	$ -	$ -
37	Strawberry Mtn 1	Abandon well site at Rick's Ln.	$ 900	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 900	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
38	Strawberry Mtn 2	Site clean, repair masonry walls, install dual boosters	$ 13,960	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,960	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
39		Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
40		Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
41		Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42		Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Total	$ 1,221,916	$ 4,986	$ 291,660	$ 134,780	$ 55,560	$ 17,900	$ 179,070	$ 343,300	$ 21,000	$ -	$ 900	$ 7,600	$ -	$ -	$ 144,840	$ 16,330	$ -	$ -	$ -	$ -	$ -
		Annual Total					$ 488,986				$ 561,270				$ 8,500				$ 165,170				$ -

EXHIBIT 5

HARDCASTLE

REBUTTAL EXHIBIT 6

LAW OFFICE OF JOHN G. GLIEGE
P.O. Box 1388
Flagstaff, AZ 86002-1388
(928 380 0159)

John G. Gliege (#003644)
Attorney for Pine Strawberry Water Improvement District

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY, A RATE INCREASE AND FOR APPROVAL TO INCUR LONG-TERM DEBT.	**DOCKET NO. W-03512A-03-0279** **REQUEST TO PRODUCE**

TO: PINE WATER COMPANY and its Attorneys.

Pursuant to Rule 34, Ariz.R.Civ.P., you are hereby requested to produce for inspection, copying and photographing at 9:00 AM on November 18, 2003 at the LAW OFFICE OF JOHN G. GLIEGE, 13 MOUNTAIN VIEW, KENDRICK PARK, ARIZONA, or the same can be mailed to the LAW OFFICE OF JOHN G. GLIEGE, P.O. BOX 1388, FLAGSTAFF, AZ 86002-1388, by or before November 17, 2003, the following described documents and tangible things:

INSTRUCTIONS FOR USE

1. In producing the documents designated below, you are requested to furnish all documents known or available to you regardless of whether a document is currently in your possession, custody, or control, or that of your attorneys, employees, agents, investigators, or other representatives, or is otherwise available to you.

2. If, for any reason, you are unable to produce in full any document requested:

a. Produce each such document to the fullest extent possible;

b. Specify the reasons for your inability to produce the remainder; and

c. State in detail whatever information, knowledge, or belief you have concerning the whereabouts and substance of each document not produced in full.

PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT'S REQUEST TO PRODUCE DOCUMENTS TO PINE WATER COMPANY

Request No. 15:

All estimates compiled by Pine Water Company of the value of the Certificate of Convenience and Necessity of Pine Water Company during the past five years, up to and including the day of your answers.

LAW OFFICE OF JOHN G. GLIEGE
P.O. Box 1388
Flagstaff, AZ 86002-1388
(928 380 0159)

John G. Gliege (#003644)
Attorney for Pine Strawberry Water Improvement District

BEFORE THE ARIZONA CORPORATION COMMISSION

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TO: PINE WATER COMPANY, and its attorney of record.

Pursuant to Rule 33, Arizona Rules of Civil Procedure and the Order of the Hearing Officer in the above captioned matter, you are hereby required to answer in writing and under oath, within ten (10) days, the following interrogatories, in accordance with the following instructions.

INTERROGATORIES

I. INSTRUCTIONS

(A) These interrogatories shall be deemed continuing so as to require supplement answers if you obtain further or additional information with respect to the subject matter of any of these interrogatories after your answers have been made.

(B) As used herein, "person" shall mean any natural person, firm, partnership, joint venture, corporation or other entity.

(C) Whenever an interrogatory requests that you identify a person, state his or its full name and complete present or last known residential and business address and phone numbers.

Where the "person" identified" is an individual, state in addition: (i) the name and address of the person who was his employer at the time relevant to the interrogatory; (ii) his present

PINE-STRAWBERRY WATER IMPROVEMENT DISTRICT
INTERROGATORIES TO PINE WATER COMPANY

Interrogatory No. 4:

What terms of sale, transaction relationships, and ownership relationships does Pine Water Co. have with entities related to Strawberry Water Co., Brooke Utilities, Robert Hardcastle, Crystall Investments L.L.C., Jayco or Jayco Oil Company, or similar entities that are not arms-length transactions that effect the cost of water (including purchase, transportation or wheeling), or reliability of water supply to Pine Water Co?

Interrogatory No. 10:

Who are the beneficial owners or principals of Crystal Investments L.L.C., and Jayco and what other firms or entities are related thereto?

Interrogatory No. 41:

State the names and addresses of each shareholder in Pine Water Company, Brooke Utilities, Inc., Crystal Investment L.L.C. and any other entity falling within the definition of Pine Water Company set forth herein and the number of shares owned by each in each such entity or organization, setting forth the same by the name of the entity or organization.

Interrogatory No. 45:

Has the internal management of the Company, or any of its creditors in discussions with management of the Company, had discussion of the option of bankruptcy of Pine Water Co.? If so, please state who was involved in such discussions, when they occurred, and what was the sum and substance of such discussion?

FENNEMORE CRAIG
Jay L. Shapiro (No. 014650)
Patrick Black (No. 017141)
3003 N. Central Ave.,
Suite 2600
Phoenix, Arizona 85012
Attorneys for Pine Water Company, Inc.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-0279

REJOINDER TESTIMONY OF

ROBERT T. HARDCASTLE

EXHIBIT
A-3
admitted

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V.	WATER SUPPLY ISSUES	20
VI.	REJOINDER TO THE DISTRICT	27
VII.	PUBLIC COMMENT SESSION	32

I. INTRODUCTION AND QUALIFICATIONS.

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

A. Robert T. Hardcastle, 3101 State Rd., Bakersfield, California 93308. The business telephone number is (661) 633-7546.

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

A. I am the President of Brooke Utilities, Inc. ("Brooke"). Brooke is the sole shareholder of the Applicant, Pine Water Company, Inc. ("Pine Water" or the "Company").

Q. ARE YOU THE SAME ROBERT T. HARDCASTLE THAT FILED DIRECT AND REBUTTAL TESTIMONY IN THIS MATTER?

A. Yes.

II. PURPOSE AND SUMMARY OF REJOINDER TESTIMONY.

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

A. I have reviewed Staff's surrebuttal filing, which includes the testimony of Staff's three witnesses, Claudio M. Fernandez, Joel M. Reiker and Marlin Scott, Jr. I have also reviewed the surrebuttal filings by Intervenors Pine/Strawberry Water Improvement District ("District") and John O. Breninger. The purpose of my rejoinder is to respond to certain issues raised in these testimonies, particularly with respect to Brooke Utilities' ownership of Project Magnolia, the Company's request for cost recovery associated with water deliveries through Project Magnolia, existing water supply issues and the possibility of new water sources for the Company. I use the term "possibility" because over the past fifty (50) years, no study has concluded that there is a viable new water source in or under Pine, Arizona. I also respond to certain selected portions of the District's testimony.

FENNEMORE CRAIG
Jay L. Shapiro (No. 014650)
Patrick Black (No. 017141)
3003 N. Central Ave.,
Suite 2600
Phoenix, Arizona 85012
Attorneys for Pine Water Company, Inc.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-0279

REJOINDER TESTIMONY OF

ROBERT T. HARDCASTLE

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Finally, I will respond to questions asked of the Company in a December 9, 2003 letter from Commissioner Hatch-Miller, which letter followed the Commission's public comment session held on December 8, 2003 in Pine, Arizona. In responding to Commissioner Hatch-Miller's questions, I will also address several other issues raised by customers during the Commission's three public comment sessions.

Q. WOULD YOU PLEASE SUMMARIZE YOUR REJOINDER TESTIMONY?

A. Certainly. My rejoinder testimony focuses on five major issues. These issues are as follows:

- Ownership of Project Magnolia. It is my position that this should not even be an issue in this rate case and the Company does not concede that the Commission even has the right to make a decision regarding who owns the pipeline. The overwhelming evidence supports the fact that Brooke owns Project Magnolia. Despite Staff's assertions to the contrary, ownership status is not determined based on generic and outdated information from prior rate cases.

- Cost Recovery for Water Deliveries Through Project Magnolia. By contrast, this is an issue the Commission can and should address in this docket. Buying excess water from Strawberry Water Company ("Strawberry Water") for delivery through Project Magnolia is currently the only viable water supply alternative to trucking when the wells in Pine Water's CC&N are inadequate to meet customer demand. To date, Pine Water has never paid for such water, requiring Brooke to subsidize water service. That subsidy is going to cease in the near future. Therefore, without adequate cost recovery, Pine Water will not be able to buy water from Strawberry Water for delivery through Project Magnolia.

- Water Supply Issues. Water in and around Pine, Arizona is in scarce supply. In response, Intervenor John Breninger continues to advocate massive deep well drilling in the Strawberry Valley north of Pine, but refuses to address the ratemaking impacts of his proposed plan. The District has hired yet another consultant, Michael Ploughe, who contradicts the conclusions reached by the District's prior consultants that there is no additional water in Pine, Arizona. Not surprisingly, these are the same conclusions Mr. Breninger relies on, and which the Company relied upon in our rebuttal filing. The District's latest consultant also disagrees with Mr. Breninger's conclusion that "we have the water" but recommends Pine Water build a massive storage tank for over $1 million. Meanwhile, Staff agrees that it is uncertain whether additional supplies are available and points out that a test well can be drilled in the Strawberry Valley for as much $870,000, but offers no recommendation whether Pine

Water should take such a step and no discussion of the ratemaking impacts. In sum, unless the Commission provides some guidance on these difficult issues, it is virtually impossible for Pine Water to determine what action would be prudent.

- The District's Surrebuttal Filing. For a variety of reasons, the District continues to advocate depriving Pine Water of rate relief at this time. Mr. Bourassa will address a number of the accounting mistakes and misrepresentations offered by District witness Jones. For my part, I will also address several of Mr. Jones' misstatements as well as explain the repercussions of a decision by the Commission to deny rate relief, including the fact that Pine Water would be unable to meet customer demand for water by June 2004.

- Commissioner Hatch-Miller's Letter and Public Comment. Pine Water appreciates the opportunity to respond to the Commissioner's questions and to address a number of issues raised by our customers. It is unfortunate that our customers still appear to lack accurate information regarding these matters and hope these answers to Commissioner Hatch-Miller and some of the additional questions posed during the public comment sessions will set ratepayer minds at ease. Pine Water is doing everything it reasonably can to ensure adequate water for its customers under the most difficult of circumstances.

III. PROJECT MAGNOLIA.

Q. WHAT ENTITY OWNS PROJECT MAGNOLIA?

A. Brooke Utilities.

Q. THE DISTRICT ARGUES THAT PINE WATER HAS PRODUCED NO EVIDENCE TO SUPPORT THAT CLAIM. DO YOU AGREE?

A. No, the District's claim, actually made in its recent Motion to Consolidate (Docket No. W-03512A-03-0106, January 20, 2004), ignores a mountain of evidence reflecting Brooke's ownership.

Q. WHEN DID PLANNING AND CONSTRUCTION OF PROJECT MAGNOLIA BEGIN?

A. Sometime in 1997, Brooke began exploring the idea of connecting separate Brooke systems by a pipeline as a means of enhancing the ability to augment supplies in times of critical shortage. In November 1997, SWCA Environmental Consultants,

Inc. completed a cultural resources study for Brooke concerning a 1.9-mile pipeline project. *See* Hardcastle Rejoinder Exhibit 1. A week later, Brooke retained ASL/Sierra Consulting Engineers to provide engineering services related to what by then was known as Project Magnolia. *Id.*

By August of the following year, Brooke had entered into a Memorandum of Understanding with the US Forest Service regarding a proposed pipeline from Pine to Strawberry, Arizona. *Id.* In November 1998, again on behalf of Brooke, I wrote to the District seeking clarification of its support or opposition to Project Magnolia. *Id.*

Q. HAS PINE WATER PREVIOUSLY PRODUCED THIS EVIDENCE?

A. Some, such as the Forest Service permit, which was attached to my rebuttal testimony along with an ADOT permit application and some examples of invoices for hard plant costs incurred by Brooke in 2000-2001. Frankly, because Pine Water does not believe ownership of the pipeline should be an issue in this case, the Company thought that Staff would be satisfied with the evidence provided in our rebuttal filing clearly evidencing Brooke's ownership of the pipeline. Staff is the party that has attempted to make ownership an issue, rather than focusing on cost recovery. Now, given that Staff has not changed its view in the face of clear and convincing evidence, and that the District has jumped on the bandwagon and submitted sweeping discovery requests, the Company is now forced to go further in an effort to convince the Commission of Brooke's ownership of Project Magnolia. Otherwise, I fear the Company is in for a long and costly struggle.

Q. PREVIOUSLY YOU TESTIFIED THAT A FINAL DECISION REGARDING WHO WOULD BUILD AND OWN PROJECT MAGNOLIA HAD NOT BEEN MADE WHEN THE 1999 RATE CASE WAS FILED. ARE YOU NOW TESTIFYING A DECISION HAD BEEN MADE?

A. Not at all. This was a complex decision, a lot of factors needed to be considered and evaluated and Brooke could not even be certain it could build the pipeline at all when the Company filed its rate application in February 1999, based on a June 30, 1998 test year. Remember, the Forest Service did not issue the Special Use Permit until February 2000, after all the required assessments and notices were complete. *See* Hardcastle Rebuttal Exh. 3. A month later the rate case was decided and shortly thereafter a decision was made that Brooke would build, own and operate the pipeline.

Q. WHAT EVIDENCE DOES THE DISTRICT PRESENT SHOWING THAT PINE WATER OWNS THE PIPELINE?

A. None. Lacking an independent analysis of its own, the District relies on Staff's analysis. Mr. Jones declares that "the best evidence of ownership are the facts that the project was listed as a $17,040 asset on a plant listing in 1998, and it was included in CWIP and also listed as a capital project to be funded with stock during the Company's last rate case. The Staff appears to have properly recognized the situation." *See* Surrebuttal Testimony of Harry Jones, ("Jones' Sb.") at 12 *citing* Surrebuttal Testimony of Claudio M. Fernandez ("Fernandez Sb.") at 8 (emphasis supplied). Thus, the District simply echoes the same arguments and conclusions advanced by Staff.

Q. IF NO DECISION REGARDING OWNERSHIP HAD BEEN MADE AT THE TIME THE 1999 RATE CASE WAS FILED, WHY WERE COSTS OF PROJECT MAGNOLIA REFLECTED IN THAT FILING?

A. I do not know for certain as I was not the "accounting" witness in that rate case, but it appears that some of the invoices for Brooke's 1997-98 activities were paid by subsidiary entities, including E&R Water, Pine Water's predecessor.

Q. IF BROOKE WAS THE ENTITY ENGAGING THESE CONSULTANTS

AND ENTERING INTO AGREEMENTS, WHY WOULD E&R WATER BE PAYING BROOKE'S INVOICES?

A. It has been several years now and I simply am not sure how we decided which entity would pay which invoice. In some cases, I assume invoices for those earlier activities were sent to Brooke, but many were received by the local office in Arizona, where they were coded for payment and then paid by the subsidiary. As such, there would have been ledger entries for E&R that would have been picked up when the 1999 rate case was filed. Some 1999 invoices in Brooke's name were paid by the subsidiaries as well. Again, I am not really sure why these invoices were routed, in some cases by me, for payment by the subsidiary, except that no final decision had been made regarding who would own Project Magnolia.

I would also note I need to clarify my rebuttal testimony, to the extent I testified that Pine Water's book and records do not reflect payment of any costs associated with Project Magnolia. *E.g.,* Hardcastle Rb. at 21. Although at times I was careful to clarify that no costs of constructing or operating the pipeline were paid by Pine Water, at others times I could have been more careful in my testimony. Again, to be clear, some Project Magnolia costs invoiced to Brooke before the 1999 rate filing was decided in March 2000 were paid by E&R or Pine Water, as explained above and to the extent I stated otherwise that testimony needs to be modified.

Q. MR. HARDCASTLE, AREN'T THESE EXACTLY THE TYPES OF BOOKKEEPING ERRORS THE DISTRICT HAS BEEN HARPING ON THROUGHOUT THIS CASE?

A. Yes, and they have a point about our previous bookkeeping errors. I would note that by 1997-1998, we had owned these systems for only a couple years and the entire utility business was new to us. We also did not have someone of Mr.

Bourassa's experience and skills at the time, or until this case was being prepared really, and mistakes were being made. In any event, this case has taught the Company a lot and by the next rate case the lessons will have been learned and the books will certainly be in much better condition.

Q. BUT DOESN'T THIS PROVE THE DISTRICT'S POINT THAT ALL OF BROOKE'S RECORDS AND ALL OF THE SUBSIDIARIES NEED TO BE OPENED UP SO THAT THE COMMISSION CAN ENSURE THAT NO HARM HAS COME TO RATEPAYERS?

A. No. Despite all of the District's claims regarding inadequate record keeping, the District has not pointed to a single instance where our shortcomings have impacted the rates paid by our customers, either currently or in the future. And while I expect the District, and perhaps even Staff, to declare E&R/Pine Water's pre-Decision No. 62400 payment of planning or engineering costs related to Project Magnolia the "smoking-gun", this is not the case. All of the hard costs of the pipeline were paid for by Brooke beginning in 2000, after Decision 62400 rejected any possible ratemaking treatment of those costs, and after the Forest Service and ADOT permits were issued. *See* Rejoinder Testimony of Thomas J. Bourassa ("Bourassa Rj.) at 8-9 & Bourassa Rejoinder Exhibit 1. Brooke also holds all the permits and approvals and has paid all of the operating and maintenance costs since the pipeline went operational three years ago.

Q. BUT AREN'T PINE WATER RATEPAYERS, FORMERLY E&R WATER RATEPAYERS, PAYING FOR THOSE COSTS INCURRED BY E&R WATER IN 1997-99 RELATED TO PROJECT MAGNOLIA?

A. Absolutely not. Not a single dollar spent by E&R to pay Brooke's invoices has ever been included in rate base or operating expenses for ratemaking purposes. It must be recalled that, on Staff's recommendation, the $17,040 listed as Project

Magnolia costs on Schedule E-5 (Hardcastle Rebuttal Exh. 5) in the last rate case was removed as not being used and useful. Fernandez Sb. at 5. Moreover, none of those pre-Decision No. 62400 costs are included in the original cost of $449,598 for the pipeline. Instead, with one minor exception for approximately $1000, the $449,598 represents the actual costs of constructing the pipeline, paid by Brooke, shown on Brooke's general ledger and incurred in or after September 2000 Bourassa Rj. at 8-9.[1] Of course, I would also note that our customers have yet to pay a dollar for water bought and delivered through Project Magnolia.

Q. DID STAFF PRESENT ANY NEW EVIDENCE IN ITS SURREBUTTAL TESTIMONY THAT WOULD SUPPORT THE CLAIM THAT PINE WATER OWNS PROJECT MAGNOLIA?

A. Not really. For the most part, Staff merely repeats the position taken in its direct testimony. For example, Mr. Fernandez testifies that the "Company's last rate application reflected CWIP of $334,242 which represented the cost of Project Magnolia up to the time of the filing." *See* Fernandez Sb. at 5.[2]

Q. IS MR. FERNANDEZ SUGGESTING THAT PINE WATER (OR E&R WATER) SPENT $334,242 ON PROJECT MAGNOLIA PRIOR TO THE FILING OF THE LAST RATE CASE?

A. That is exactly what Mr. Fernandez is claiming and obviously he is wrong. That rate application was filed in February 1999. As discussed above, although some costs were incurred prior to and shortly after the filing of the application, and some of those were paid for by E&R/Pine Water, the Forest Service did not issue the

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[1] The exception involves an amount paid in 2000 by Pine Water and Strawberry Water as an expense, which payments were later reclassified to Brooke's general ledger. *See* Bourassa Rj. at Bourassa Rejoinder Exhibit 1.

[2] This is the same testimony referred to by Chairman Spitzer during the January 29, 2004 Open Meeting on the Company's Surcharge Tariff.

Special Use Permit for the pipeline until February 2000 and it was later in when the hard costs began. *See* Bourassa Rj. at 8, Bourassa Rejoinder Exhibit 1. *See also* Hardcastle Rb. at Exhibits 3 and 4.

Q. WHERE DOES THE $334,242 FIGURE MR. FERNANDEZ RELIES ON COME FROM?

A. From a schedule entitled Capital Expenditure Budget 1999 through 2003 included in the February 1999 application. One of the listed projects is Project Magnolia at an estimated cost of $300,000. As I clearly explained in my rebuttal testimony, however, that was a listing of proposed capital budget items under consideration. *See* Hardcastle Rb. at 22-23 and Hardcastle Rebuttal Exh. 5.

In fact, the schedule itself contradicts Staff's claim that $334,242 was spent on the project prior to the last rate case being filed because the schedule in question projects that the costs for Project Magnolia will be incurred in the 2nd and 3rd quarters of 1999, an estimate that was obviously off by more than one year. *See* Hardcastle Rebuttal Ex. 5. In sum, as Mr. Bourassa explains in his rejoinder, Mr. Fernandez' $334,242 number does not represent real costs. Therefore, it cannot possibly be the "**best evidence of ownership**"—as Mr. Jones alleges, nor could it clearly establish ownership, as Mr. Fernandez testifies. *See* Fernandez Sb. at 5.

Q. DID THE COMMISSION AUTHORIZE CWIP TO BE INCLUDED IN RATE BASE IN THE LAST RATE CASE?

A. No, and this is what makes Staff's arguments so inadequate.

Q. WHAT DO YOU MEAN, MR. HARDCASTLE?

A. Staff argues that the Company failed to obtain Commission approval to transfer ownership of Project Magnolia to Brooke. *See* Fernandez Sb. at 4. Apparently, Staff wishes the Commission to find that Pine Water has violated ARS § 40-285. But how can ownership of an physical asset that does not even exist be transferred?

Again, it wasn't until after the rate case, after all ratemaking treatment of Project Magnolia was rejected, after Brooke received the necessary permits and approvals that Brooke made a final decision to build the pipeline. Again, I do not see how the 1999 rate filing could have established ownership of a non existent asset.

Q. YOU MENTIONED ARS § 40-285. WOULD THAT HAVE BEEN APPLICABLE?

A. I am not a lawyer, but it does not take a lawyer to see that on its face, the statue is not applicable. The statute provides that a public service corporation shall not transfer any part of its plant "**necessary or useful**" in the performance of its duties without Commission approval. ARS § 40-285.A (emphasis added). Based on Staff's own recommendation, the Commission had just found that any costs related to Project Magnolia, which costs were not the costs of the pipeline itself, were not used and useful in the performance of the utility's duties. *See* Fernandez Sb. at 5. Again, as of the conclusion of the last rate case in March 2000, there was no pipeline.

Q. BUT THE COMMISSION DID GRANT AUTHORITY TO ISSUE STOCK TO FINANCE CAPITAL IMPROVEMENTS?

A. That is correct, although that financing approval was not tied to any specific projects, timelines or costs nor had Brooke made final decisions regarding which projects would be undertaken at that time, let alone how those projects would be financed, owned and operated. Again, I am not a lawyer, but it seems to me that issuance of stock in exchange for financing a specific capital project might establish ownership, not the mere grant of unspecified financing authority by the Commission.

Q. WAS THE STOCK EVER ISSUED?

A. No, and no financing for Project Magnolia is found on Pine Water's books or

reflected in its capital structure. *See* Fernandez Sb. at 4.

Q. WHAT ABOUT STAFF'S ASSERTION THAT IT WAS LED TO BELIEVE THAT PROJECT MAGNOLIA WAS GOING TO BE OWNED BY THE COMPANY?

A. I am not sure what to make of this claim, which Mr. Fernandez supports by reference to the same two aspects of the last rate case, CWIP and financing authority, which I addressed above. *Id.* at 6. The fact remains that the Commission did not include CWIP in rate base and the Company did not issue common stock to fund Project Magnolia. Moreover, at no time after Decision No. 62400 (March 31, 2000) did Brooke or Pine Water represent to Staff that Project Magnolia was being built by Pine Water (or E&R Water), rather than Brooke. As is now clear, Brooke didn't even know who was building the Project until after the last rate case was decided. Therefore, I fail to see how this claim, even if it were true, relieves Staff of its present duty to properly analyze the evidence presented in this case.

Q. STAFF IS CRITICAL OF THE COMPANY FOR SECOND GUESSING THE PRUDENCY OF PROJECT MAGNOLIA BASED ON THE RESULTS OF THE COMPANY'S LAST RATE CASE. HOW DO YOU RESPOND?

A. Staff should try to run a water company in Pine, Arizona before criticizing our business judgment. In fact, after delivering more than 38,000,000 gallons of **free** water to Pine Water ratepayers through the project, Brooke is second-guessing whether it should have built the pipeline at all. In any event, Staff's argument is irrelevant. As much as one would like to rely upon the Commission and other jurisdictional governmental entities to adhere to consistent regulatory standards, business decisions will often hinge on the risks associated with regulatory change. As I have said, before the last rate case, no final decision had been made regarding who would build Project Magnolia, although management was clearly leaning

towards having it built by Brooke. Ultimately, it was decided that the risks commensurate with the project favored it being built, owned and operated by Brooke.

Q. WHAT OTHER FACTORS LED TO THE FINAL DECISION THAT BROOKE WOULD OWN AND OPERATE PROJECT MAGNOLIA?

A. Of significant importance to Brooke were considerations related to Gila County. *See* Hardcastle Rb. at 26. Gila County and real estate interests in Pine, Arizona kept applying political pressure to lift the Commission-imposed moratorium on new service hookups in Pine Water's service territory. Meanwhile, renegade elements within the District continued to voice a desire to supplant Commission authority over the distribution and control of water in the Pine-Strawberry area. Project Magnolia suddenly became a much riskier investment, and Brooke quickly realized that the most efficient way to help alleviate Pine Water's chronic water shortage problems was to build Project Magnolia itself.

Q. ARE YOU SUGGESTING THAT THE BROOKE COULD NOT EARN A JUST AND REASONABLE RETURN ON PROJECT MAGNOLIA UNDER REGULATION?

A. I am. Indeed, Staff readily admits that the Company is "partially" correct in asserting that the regulatory process could not provide an adequate rate of return to the Company for Project Magnolia. *See* Fernandez Sb. at 6. This is certainly being borne out as true in this case where Staff is recommending a 9% cost of equity. *See* Surrebuttal Testimony of Joel M. Reiker ("Reiker Sb.") at 36. Given the risks that were faced and are still being faced, and the fact that this pipeline likely could not be built today, the current value of Project Magnolia greatly exceeds original cost and 9% is far too low a rate of return.

Q. WHAT ABOUT MR. JONES' CHARACTERIZATION OF YOUR

ARGUMENT REGARDING THE RISK BORNE BY BROOKE AS WEAK?

A. "Weak" is a term that should be reserved for testimony that is circular in nature, and conclusory at best. Mr. Jones has no knowledge whatsoever of the situation Brooke faced in the mid to late 1990's after acquiring this system and therefore can only rely on unsupported speculation. Moreover, his contention that Brooke and Pine Water face the same risk everyday fails to recognize the simple caveat that regulated entities have rates of return established by regulators, while unregulated entities have their returns set by the market. *See* Jones Sb. at 13.

He also incorrectly assumes that Brooke can just unilaterally impose additional charges on Pine Water. *Id.* Besides a violation of the Wheeling Agreement, Pine Water would only be allowed to recover from ratepayers an amount established by the Commission.

Q. DO YOU HAVE ANY FINAL COMMENTS REGARDING STAFF'S POSITION THAT PINE WATER OWNS PROJECT MAGNOLIA?

A. Yes. It should be obvious that Staff has found an opportunity to take advantage of Brooke in order to provide a windfall to Pine Water's ratepayers. Brooke's investment in Project Magnolia was made at a time when risk was high. Now that the pipeline is built and the risks associated with construction reduced, Staff seeks to secure an asset built at high risk to the Company's shareholder for a bargain basement price. In short, Staff refuses to recognize the risks Brooke undertook in order to address the water shortage issues in Pine, Arizona.

IV. PROJECT MAGNOLIA COST RECOVERY.

Q. DO YOU STILL BELIEVE A $15 PER THOUSAND WHEELING CHARGE IS REASONABLE?

A. Yes, for the reasons Mr. Bourassa and I have testified to throughout this case. *See* Hardcastle Rb. at 27-32; Bourassa Rb. at 14-15. Put simply, this is a market-based

rate taking into account the alternatives and reflective of the risk Brooke took in building the pipeline.

Q. WHAT ABOUT MR. BRENINGER'S "CHALLENGE" TO JUSTIFY THE $15 PER 1000 GALLONS WHEELING CHARGE?

A. Mr. Breninger's challenge is after the fact. In my rebuttal testimony, I provide several different approaches to support the basis for a wheeling charge of $15 per 1000 gallons. Hardcastle Rb. at 27-32. He simply ignores this testimony in issuing his challenge. By contrast, I challenge Mr. Breninger to provide evidence that contradicts my testimony. In fact, I even provided a comparison of the cost of Project Magnolia relative to the costs of the massive deep well project Mr. Breninger recommends Pine Water pursue. *Id.*

Q. ARE YOU AWARE OF OTHER SITUATIONS WHERE AFFILIATES PROVIDE SERVICES TO REGULATED UTILITIES?

A. I believe many public service corporations (e.g., Arizona Public Service, Qwest Corporation) are major beneficiaries of services provided by parent companies or affiliates, and the Commission has administrative rules to regulate such inter-affiliate transactions. *See* A.A.C. R14-2-801 *et seq*. The transaction at issue in this case, the delivery of water through Project Magnolia by Brooke, has been subjected to a similar level of scrutiny.

Q. DOES THIS MAKE BROOKE A PUBLIC SERVICE CORPORATION?

A. I do not think so. Again, I cannot offer a legal opinion but I am aware that the Arizona courts have held that the El Paso natural gas line did not make that entity a public service corporation. *See Southwest Gas Corp. v. Arizona Corporation Commission*, 169 Ariz. 279 (App. 1991). Like Brooke, El Paso has entered into long-term contracts. Moreover, unlike El Paso, Brooke does not sell to any end-users. Both Pine Water and Strawberry Water, the only two potential customers of

the pipeline, are re-sellers. *Id.* at 286-89.

Q. BUT YOU AGREE THAT THE COMMISSION HAS THE POWER TO DETERMINE THE APPROPRIATE LEVEL OF EXPENSE PINE WATER CAN RECOVER FOR WATER DELIVERIES THROUGH PROJECT MAGNOLIA?

A. Of course. However, Brooke is not bound by a decision of the Commission to set the wheeling rate based on the more traditional, regulatory cost of service approach.

Q. DOES THIS MEAN BROOKE WILL STOP DELIVERING WATER THROUGH PROJECT MAGNOLIA IF THE COMMISSION DOES NOT APPROVE THE $15 PER THOUSAND WHEELING CHARGE?

A. Not necessarily. Brooke will have to evaluate the amount the Commission authorizes Pine Water to recover from ratepayers for this service. If Brooke determines that the level of recovery is insufficient to cover its expenses and provide a return on its investment, it will have to evaluate its options and make a business decision. Certainly, one of those options would be discontinuing a service Pine Water cannot afford.

Q. MR. HARDCASTLE, ISN'T BROOKE JUST USING ITS OWNERSHIP OF PROJECT MAGNOLIA TO COERCE FAVORABLE RATEMAKING TREATMENT OUT OF THE COMMISSION?

A. That was clearly the view expressed by some Commissioners during the January 29, 2004 Open Meeting to consider the Company's requested amendment to its Water Augmentation Surcharge Tariff ("Surcharge Tariff") to include the costs of purchasing water from Strawberry Water for delivery through Project Magnolia. In fact, the Commission expressed such displeasure with Pine Water for even making such a request, the Company was threatened with an Order to Show Cause and the simultaneous suspension of the Surcharge Tariff if Brooke didn't continue to

provide free water from Strawberry Water and free delivery of such water through Project Magnolia. *See* Transcript of Special Open Meeting, January 29, 2004 ("TR") at 125-167. Clearly, the Commission was determined to make sure Brooke and Pine Water did, as one Commissioner put it, "do what's right." Tr. at 136. In other words, I guess it is fair to say that the Commission agreed with the District's view that Brooke is guilty of extortion. Tr. at 168.

Q. HOW DO YOU RESPOND TO THESE ALLEGATIONS?

A. The Commission is mistaking business reality for blackmail. In doing so, they are lending credence to the District's misuse of this proceeding to drive us out of business in Pine and Strawberry, Arizona. Brooke spent at least $450,000 building Project Magnolia. It has yet to recover one dollar for that investment. To make matters worse, Brooke has also been forced to pay for the water Pine Water buys from Strawberry Water because Pine water cannot afford that either. From February 2001 through the end of last year, Brooke had subsidized Pine Water's ratepayers to the tune of more than $500,000. Against this backdrop, Brooke made a business decision to stop the bleeding by stopping deliveries through the pipeline. Of course, this decision was made with full knowledge that the same water could be purchased from Strawberry Water and hauled by truck with an assurance of cost recovery under the Surcharge Tariff. So, while water costs would have increased to customers, the same quantity of water would have been available.

Q. WHAT WAS STAFF'S REACTION WHEN INFORMED OF THIS DECISION?

A. Staff's initial reaction was quite unfavorable. Nonetheless, recognizing the economic value of Brooke's service to Pine Water through the continued use of Project Magnolia, Staff suggested that an equitable solution lay in amending the Surcharge Tariff to include reasonable recovery for transportation and water costs

associated with Project Magnolia.

Q. SO THE AMENDED SURCHARGE TARIFF WAS STAFF'S IDEA?

A. Yes, and it was a very good compromise to Brooke's concern over continuing to provide tens of thousands of dollars worth of water to Pine Water ratepayers for free. Therefore, at Staff's suggestion, the Company submitted a Notice of Amendment to its Water Augmentation Surcharge Tariff to the Commission on January 15, 2004. This did not change Staff's view, however, that Brooke was somehow trying to "extort" money from ratepayers – money that Brooke or any other vendor would be entitled to for services rendered.

Of course, as we now know, the Commission disagreed with the compromise. Now, in the face of the Commission's threats Brooke has made another business decision and will continue to transport water through Project Magnolia and subsidize Pine Water's customers.

Q. DOES THIS MEAN THAT THE COMMISSION WAS RIGHT?

A. Not at all. It means we will accept the Commission's charge to "do the right thing" and allow the rate case to be completed.

Q. WILL BROOKE CONTINUE TO SUBSIDIZE WATER SERVICE INDEFINITELY?

A. No. However, Brooke has taken the Commission at its word when it made itself clear that this rate case needs to be resolved as soon as possible. Therefore, Brooke has committed to continuing buying water from Strawberry Water and delivering it through Project Magnolia through May 2004. However, if rate relief is not granted before the summer water season commences, which is approximately June 1, 2004, Brooke will have to reevaluate its decision. The same thing is true if rate relief is granted by then but is deemed inadequate to allow Pine Water to pay for water purchased from Strawberry Water and to pay for delivery of such water through

Project Magnolia.

Q. SO, BROOKE UTILITIES IS ATTEMPTING TO COERCE A FAVORABLE DECISION OUT OF THE COMMISSION?

A. Absolutely not, although I suspect this is exactly what the District and Staff will continue to assert. Frankly, I am amazed that anyone can criticize a company like Brooke for choosing to discontinue the loss of as much as tens of thousands of dollars each month. I am curious what has happened to Staff's view that "goodness deserves to be rewarded."

The Commission has found over and over again that we provide adequate water service in Pine, Arizona. *See* Decision Nos. 62400, 64400, 65435, 65914. The Commission has also noted the vast improvement in water service in Pine since Brooke took over several decaying water systems from Rich Williamson, at Staff's suggestion. For years, Mr. Williamson failed to make any capital improvements or repairs leaving the water systems in awful condition – despite Commission regulation. Water shortages were frequent and outages all too common. For Brooke's trouble, it has lost hundreds of thousands of dollars since acquiring these systems less than 10 years ago. And now, thanks to the District, Pine Water is forced to spend tens of thousands of dollars defending every accounting entry, every operational decision and every regulatory filing the Company has ever made. All that goodness, and very little reward.

Brooke invested several years and substantial capital to develop and build a project, at its expense – not the expense of ratepayers – that no one else had attempted and without ever knowing whether the pipeline would get used; and after listening to the so-called "water experts" at Gila County proclaim that the development of Project Magnolia was "premature." Brooke has since delivered some 40 million gallons of totally free water to Pine Water customers, without

breaking its promises to the customers of Strawberry Water to not limit the water supply in favor of Pine Water customers. Now, we have Staff's recommendation that Brooke never get paid for any of it. *See* Bourassa Rj. Exhibit 9; Reiker Sb. at 3. It should come as no surprise that we are asking the Commission to reject Staff's efforts to confiscate Brooke's investment and provide Pine Water the financial means to continue to provide the best water service Pine residents have known in decades. Put bluntly, it is the Commission's turn to "do the right thing."

V. WATER SUPPLY ISSUES.

Q. HOW WOULD PINE WATER LIKE THE COMMISSION TO ADDRESS THE WATER SUPPLY PROBLEMS IN PINE, ARIZONA THROUGH THIS PROCEEDING?

A. When this application was filed, the Company sought three things from the Commission with respect to the water supply shortage in Pine Water's CC&N. First, recovery of the Company's operating expenses, including a mechanism to recover water augmentation costs actually incurred. This was and is imperative if Pine Water is to avoid water outages. Second, a Water Exploration Surcharge to provide an equitable funding mechanism for water exploration projects. Due to customer opposition, that request was withdrawn. Third, guidance from the Commission.

Q. WHAT SORT OF GUIDANCE CAN THE COMMISSION PROVIDE?

A. No one knows whether there are additional water supplies available for Pine, Arizona. If there are, no one knows for certain where and how deep those additional supplies will be found. If found and available for delivery, no one knows the cost, although it will be substantial. Certainly, against this backdrop, the Commission can provide some guidance on what reasonable and prudent steps Pine Water is expected to take.

Q. MR. HARDCASTLE, ARE YOU ASKING THE COMMISSION TO MAKE MANAGEMENT DECISIONS REGARDING SPECIFIC CAPITAL IMPROVEMENT PROJECTS?

A. No, although after witnessing its frustration over Brooke's most recent business decision, I would think the Commission would jump at the chance to play a more active role in Northern Gila County water politics and planning. What I really seek though is simple. Right now, under normal operating conditions, including the Commission-imposed Curtailment Tariff, Pine Water we can meet customer demand with water supplies available in Pine, Brooke's deliveries through Project Magnolia and water hauling. As long as the Commission ensures adequate cost recovery, this should continue for the foreseeable future at rates that, while arguably high, reflect the severe water supply limitations in the area.

However, some are demanding more. For instance, John Breninger continues to advocate that the Company invest in excess of $4 million dollars for deep well drilling in the Strawberry Valley. If water is found in these deep wells, it will have to be pumped and delivered into the Pine Water system at significant additional expense. The District wants the Commission to deny rate relief until Pine Water "establishes immediate goals and plans, and supplies meaningful financial resources, in an attempt to find more water to support the service demands and projected growth of the Certificated Service Area." *See* Jones Sb. at 3. I do not know what the District envisions, but it doesn't sound cheap. Finally, Mr. Ploughe suggests that Pine Water build a one million gallon storage tank, which will cost at least one million dollars.

None of these proposed solutions is certain to result in additional water for Pine Water's ratepayers. What if we build a million gallon storage tank and can't keep it filled due to limited water supplies? What if we drill an $870,000 test well

in the Strawberry Valley and no water is found? Is Brooke expected to again forego recovery of and on its investments? And what if, by chance, these efforts are successful beyond our wildest dreams? We have 2000 ratepayers. Is this Commission prepared to saddle them with the costs of drilling, pumping and delivering water from deep wells in the Strawberry Valley? The capital costs on a $4 million investment, compared to the cost of water delivered through Project Magnolia is more than $71.00 per 1000 gallons. Mr. Ploughe's one million gallon storage tank would cost ratepayers an additional $ 200,000 per year in revenue requirement which translates to an approximate 30 percent rate increase over the test year revenues. Is that really a viable option? I do not think it is too much to ask that the Commission shed some light on these difficult questions. If the Commission does not think ratepayers can afford these projects, it should say so before Pine Water makes a commitment from which there is no cheap return.

Q. HAS STAFF ADEQUATELY ADDRESSED THE WATER SUPPLY ISSUE FACING THE COMPANY?

A. No. Staff has consistently failed to adequately address this issue in its testimony. Remarkably, Pine Water was ordered to prepare a Water Augmentation Plan as part of this filing, at Staff's recommendation, and they have provided virtually no comment on that plan.

Q. DOES STAFF STATE WHETHER IT BELIEVES ADDITIONAL WATER SUPPLIES ARE AVAILABLE FOR CUSTOMERS IN PINE, ARIZONA?

A. After reviewing the District's *Investigation of Groundwater Availability* submitted by Mr. Breninger, Staff engineer Marlin Scott, Jr. concludes that the actual amount of water available in Pine will remain questionable until a test/production well is drilled and tested for sustained flow rate verification. *See* Surrebuttal Testimony of Marlin Scott, Jr. ("Scott Sb.") at 5. According to Mr. Scott, this well could cost as

much as $870,580, with no guarantee of success. *Id. at* 4.

Q. DID STAFF MAKE A RECOMMENDATION REGARDING WHETHER THIS TEST/PRODUCTION WELL SHOULD BE DRILLED?

A. No. Staff does not discuss whether it would be prudent for Pine Water to spend an amount of money that is considerably larger than its existing rate base to drill a test well that may never lead to a viable new water source for the Company's ratepayers.

Q. WOULDN'T THESE TYPES OF COSTS HAVE BEEN FUNDED BY APPROVAL OF THE WATER EXPLORATION SURCHARGE INITIALLY REQUESTED BY PINE WATER?

A. Yes, in part. However, it would have taken some time before enough funds were collected to constitute "meaningful financial resources" given the magnitude of these types of projects. Of course, every other party and many of our customers vehemently opposed the surcharge, so it was withdrawn from our application. Nevertheless, Staff has had ample opportunity to address the ratemaking impacts of the recommendations set forth by the District and Mr. Breninger. It has simply chosen not to do so. I am not sure we can ever solve the region's water supply problems, but I am absolutely sure we will not be able to do it alone.

Q. HAVE YOU HAD AN OPPORTUNITY TO REVIEW THE SURREBUTTAL TESTIMONY OF DISTRICT WITNESS MICHAEL PLOUGHE?

A. Yes. Mr. Ploughe suggests that "newly developed information" shows that drilling in Pine, Arizona *may* lead to a new water source and essentially concludes that the construction of a new one million gallon water storage tank will solve the Company's water supply needs. *See* Surrebuttal Testimony of Michael Ploughe ("Ploughe Sb.") at 4, 6. In advancing these arguments, Mr. Ploughe repeatedly contradicts the recent hydrology study commissioned by the District.

Q. **DID MR. PLOUGHE PROVIDE ANY EMPIRICAL DATA TO SUPPORT HIS CONCLUSIONS?**

A. None whatsoever. He even fails to identify the "few exceptions" to his general rule that nearly all water systems in the region experience summer peak demands in excess of water production rates. *Id.* at 3. Nor could he produce any in response to data requests. Instead, Mr. Ploughe relies on the same District study he criticizes to justify his claim that there is more water in Pine, Arizona, although he concedes the authors of the report conclude otherwise. *See* District response to data request 3.11, copy attached hereto as Hardcastle Rejoinder Exhibit 2. Mr. Ploughe's testimony on the availability of water is simply the latest in a long line of contradictory hydrological assessments concerning the Pine-Strawberry, Arizona region.

Q. **DOESN'T MR. PLOUGHE HAVE A NUMBER OF YEARS OF EXPERIENCE ADDRESSING HYDROLOGY ISSUES ON THE MOGOLLON RIM?**

A. Mr. Ploughe has worked as the Water Resources Hydrologist for the Town of Payson for sometime. Mr. Ploughe has an incentive to present his views in a manner that preserves optimism over additional water resources on the Rim. Evidence is another thing. Even Mr. Ploughe's discussion of water production for the Town of Payson is not supported by one ounce of empirical data. *See* Ploughe Sb. at 4. More importantly, Mr. Ploughe makes no attempt to explain how water in and under Payson translates into water in and under Pine.

Q. **WHAT ABOUT MR. PLOUGHE'S SUGGESTION THAT THE CURRENT MOGOLLON RIM WATER RESOURCES MANAGEMENT STUDY SPONSORED BY THE BUREAU OF RECLAMATION REPRESENTS A VIABLE SOLUTION TO PINE WATER'S SUPPLY PROBLEM?**

A. Mr. Ploughe fails to provide one example where the efforts of any such group in the

past has produced one single gallon of water for the people of Pine or Strawberry. In light of such a poor track record, I fail to grasp how Brooke or the Company's participation in this most recent effort can be financially justified. Without the prospect of meaningful results, I will continue to hold that such efforts provide customers a false sense of hope that if someone else spends enough money, a solution to the water shortages will be reached.

Q. DO YOU AGREE WITH MR. PLOUGHE THAT WATER SHORTAGES ARE A FUNCTION OF STORAGE CAPACITY?

A. Mr. Ploughe's analysis misses the mark. *See* Ploughe Sb. at 2. Use of storage capacity is directly limited by water production. It does not matter how much storage capacity Pine Water has if it does not have the water production to fill it.

Q. WOULDN'T THE ADDITION OF A ONE MILLION GALLON STORAGE TANK MINIMIZE OR ALLEVIATE THE NEED TO HAUL WATER TO THE PINE WATER SYSTEM?

A. Even assuming the Company could produce the water to fill such a tank, the answer would still be no. More than doubling Pine Water's existing storage capacity would not even get the Company through a long Fourth of July weekend. A one million gallon water storage tank would likely cost more than $1 million to construct. This is equivalent to 6,410 loads of water that is bought only when needed, or about 8-10 years of water hauling, using 2003 numbers. Therefore, it is questionable that such an asset would be considered used and useful for regulatory purposes.

Q. IS PINE WATER CURRENTLY IN COMPLIANCE WITH APPLICABLE WATER STORAGE REQUIREMENTS?

A. Yes. Mr. Ploughe's recommendation for water storage is in excess, by a considerable margin, of storage requirements applicable to the Company and to

which Pine Water has complied. Therefore, it would be difficult for the Company to justify the addition of a new water storage improvement without specific direction from the Commission so that proper financing and cost recovery can occur.

Q. DOES MR. PLOUGHE PROVIDE ANY TESTIMONY ON THE RATEMAKING IMPACTS OF CONSTRUCTING A ONE MILLION GALLON WATER STORAGE TANK?

A. No, and again in data requests the District failed to provide support, including financial and ratemaking analysis, for its massive storage tank project. *See* District response to Company Data Request 3.14 and 3.15, copy attached hereto at Hardcastle Rejoinder Exhibit 3.

Q. HAS MR. BRENINGER PROVIDED HIS OWN SURREBUTTAL TESTIMONY ON THE ISSUE OF WATER SUPPLY AVAILABILITY FOR PINE WATER COMPANY?

A. Yes. Mr. Breninger's general conclusion is the same as it has always been – that water exists north of Pine, Arizona and all the Company has to do is go get it. *See* Surrebuttal Testimony of John Breninger ("Breninger Sb.") at 1-2. However, like Staff and the District, Mr. Breninger also fails to adequately address the financial impact to Pine Water's ratepayers of his recommendations for deep well drilling in Strawberry.

Q. DO YOU AGREE WITH MR BRENINGER'S CONCLUSION THAT PINE WATER HAS NOT BEEN EXCLUDED FROM UNDERTAKING VIABLE SOLUTIONS TO ITS WATER SUPPLY NEEDS?

A. Mr. Breninger assertions to the contrary, Pine Water has been excluded from undertaking "viable" solutions to overcome chronic water supply problems, primarily because viability includes considerations of financial impact, operational

reality, risk and reward, and most importantly, regulatory authority. Without these functions in place, it is impossible for Pine Water to pursue the solution that lies just beneath the surface, as Mr. Breninger suggests. Mr. Breninger simply fails to grasp the magnitude of the financial impact of his recommendations. *See* Hardcastle Rb. at 7-8. Moreover, given Staff's recommendation that the Commission confiscate Brooke's assets and then provide an anemic rate of return, we cannot ignore these realities.

Q. WHAT ABOUT MR. BRENINGER'S "CHALLENGE" TO YOUR ASSERTION THAT GROUNDWATER MAY NOT BE LEGALLY AVAILABLE EVEN IF FOUND?

A. Mr. Breninger is not qualified to make legal conclusions regarding Arizona water law. *See* Breninger Sb. at 2. At a minimum, numerous legal requirements exist for drilling, building pipelines and general permitting. Neither Brooke nor Pine Water have any idea what other entities with interests in such water supplies, if they exist, would do to protect their rights. Mr. Breninger does not know either.

VI. REJOINDER TO THE DISTRICT.

Q. DOES THE DISTRICT MAINTAIN ITS POSITION THAT RATE RELIEF SHOULD BE COMPLETELY DENIED AT THIS TIME?

A. Yes. *See* Jones Sb. at 3. Apparently, it is the District's position that Pine Water is not entitled to rate relief until the Company satisfies every one of its claims and demands. Or, until the District condemns or otherwise acquires Brooke's assets in Gila County, whichever comes first. Of course, without rate relief soon, it will more likely be the latter. As I testified earlier, Brooke is not going to continue subsidizing water service indefinitely.

Q. WHY DO YOU BELIEVE THE DISTRICT INTERVENED IN THIS PROCEEDING?

A. I believe Gila County has hijacked the District, hired several consultants and a lawyer and intervened in this rate case in order to pursue its long-standing agenda against Brooke's operations in Northern Gila County. I believe the only interests the District cares about protecting are those of real estate developers and the potential for a larger tax base.

Q. ISN'T THE DISTRICT SIMPLY ATTEMPTING TO PROTECT THE INTERESTS OF RATEPAYERS?

A. That is certainly what the District would like the Commission to believe. *E.g.*, Jones Sb. at 9. However, the District is being administered by Gila County and Gila County made the decision to intervene in this rate case, after the last elected board declined to do so. *See* Hardcastle Rb. at 32-35. At the same time, Gila County is making efforts to condemn Pine Water, as well as the rest of Brooke's interests in the region.

Q. HASN'T THE DISTRICT ALSO SOUGHT DELETION OF PINE WATER'S CC&N WHILE THE RATE CASE IS STILL PENDING?

A. Yes, and I am confident this is no coincidence. Apparently, the District's strategy is to convince the Commission to deny rate relief and then when Pine Water can no longer afford to provide water utility services to its customers argue that Pine Water has fallen short of the obligations imposed under its CC&N. Pine Water's assets would most certainly be easier to condemn if the Company lost its CC&N. Clearly, however, we have no intention of giving up our assets and without a CC&N, the Company has no obligation to serve. In the end, therefore, I fear the District's actions will have a negative impact on Pine Water's ratepayers for years to come.

Q. DO OTHERS SHARE YOUR VIEWS REGARDING THE DISTRICT'S ULTERIOR MOTIVES?

A. Yes, for one, Mr. Breninger does. He filed a motion in this case seeking to

disqualify the District from participating in this proceeding due to lack of adequate authorization and inconsistency with the needs of the District's members. In addition, several customers have recently and publicly voiced grave suspicions about the District's motives. *See* Hardcastle Rejoinder Exhibit 4.

Q. MR. HARDCASTLE, DO YOU HAVE ANY ADDITIONAL RESPONSE TO THE DISTRICT'S SURREBUTTAL FILING?

A. Frankly, I am not sure how to respond. As a practical matter, District witness Jones has challenged every accounting entry, every operational decision and every regulatory filing we have ever made. On top of that, he has repeatedly questioned my personal credibility and integrity. I cannot possibly respond to every allegation, nor should I have to given that the majority of his assertions are either wrong or immaterial.

Q. ARE YOU SUGGESTING THAT PINE WATER'S OPERATIONS AND RECORD KEEPING ARE NOT SUBJECT TO SCRUTINY?

A. Absolutely not. Everything we do as a public service corporation is subject to scrutiny. We are a heavily regulated business. What troubles me is the District's exaggeration, distortion and misrepresentation of facts. *See, generally,* Bourassa Rejoinder at 19-24.

Q. WHAT DO YOU MEAN?

A. For instance, Mr. Jones complains about our operating history. However, we are in compliance with every applicable ADEQ and Commission regulation and requirement. *See, e.g.,* Direct Testimony of Marlin Scott, Jr. at Exhibit MSJ. Mr. Jones' also alleges a seemingly infinite number of so-called accounting errors. Yet Staff, which analyzes hundreds of rate filings and has presumably reviewed all of the testimony in this case, including Mr. Jones' claims, has expressed concern over one book keeping error. Instead, our disagreements with Staff involve larger policy

issues, like cost of capital, or treatment of Project Magnolia and deferred taxes. Moreover, despite all of his accusations, Mr. Jones has not identified a single instance where a so-called record keeping error has impacted the amounts paid by customers or the amount to be paid if new rates are improved.

Q. ARE YOU SAYING THAT NONE OF THESE SO-CALLED BOOKKEEPING ERRORS OCCURRED?

A. Again, no. Just that they are either exaggerated and distorted or immaterial, or both. Additionally, even where we try to explain, the District persists in its position. Mr. Jones' repeated discussion of the recording of property tax payments is a perfect example.

Mr. Bourassa addressed this matter, explaining that the level of property tax expense approved in this proceeding will be based on historic and projected revenue, not historic costs recorded on the Company's books, in or out of the test year. Bourassa Rb. at 17. Staff's agrees with Mr. Bourassa (Fernandez Sb. at 10) and Mr. Bourassa has testified that the erroneous recording of property tax payments is of no consequence to the setting of rates in this proceeding. Nonetheless, Mr. Jones raises the issue again in his surrebuttal, again without identifying any negative impact on ratepayers. *See* Jones Sb. at 5.

Q. CAN YOU PROVIDE ANOTHER EXAMPLE?

A. Yes. Throughout this proceeding, the District has alleged that Pine Water has a major violation of ADEQ regulations because it had not filed its consumer confidence reports. *See* District's Motion to Compel (December 10, 2003) at 10. After this was first raised, the Company provided the District with copies of those filings showing that they were timely filed with ADEQ. *See* Pine Water Opposition to Motion to Compel (December 19, 2003) at Exhibit 5. Rather than confirming ADEQ's error, if it still had doubt, the District continues to allege that these filings

were not timely made. And worse, as seen in the following data request response, the District cites this example as a basis to question our accounting and assert that the Commission should question my credibility:

> #4.1-15 Incorrect Statements Related to Failure of Water Quality/Operating Issues/Reporting Issues: PWCo and SWCo both failed to submit required Consumer Confidence reports (classed as a "major" violations) to ADEQ and they did not report that fact for PWCo at Interrogatory 18. Again, this type response goes to witness credibility and brings into question cost of necessary operational controls or procedures. (District Response to Company Data Request 4.1-15, copy attached hereto as Hardcastle Rejoinder Exhibit 5).

The District knows full well that Pine Water timely made the subject filings with ADEQ. Yet, they perpetuate the misrepresentation that Pine Water's failure resulted in a major violation.

Q ARE THEY ANY OTHER SPECIFIC PORTIONS OF MR. JONES' TESTIMONY YOU WISH TO RESPOND TO AT THIS TIME?

A. Yes, there are a couple other points I wish to address. One involves Mr. Jones' claim that my calculation of the cost of long term solutions to inadequate water supplies at $100-$500 per month is merely a scare tactic aimed at discrediting the District. *See* Jones Sb. at 11. In response, Mr. Jones also claims that for less than $10 per month per parcel water will magically appear where it did not exist before. *Id.* No evidence is offered to support this claim. In any case, my calculation not a scare tactic – it is the reality facing the Company's ratepayers if Pine Water were to pursue Mr. Breninger's recommendations to drill for water in the Strawberry Valley.

Q. WHAT ABOUT MR. JONES' ACCUSATION THAT PINE WATER HAS BLOCKED THE DISTRICT FROM GAINING ACCESS TO BROOKE UTILITIES' BOOKS AND RECORDS.

A. According to Mr. Jones the Commission must order Brooke Utilities' books and

records opened up in order to ensure that Brooke can keep Pine Water afloat. *Id.* at 11. I understood the purpose of rate relief is to ensure that shareholders do not have to subsidize service by providing rates that allow for the recovery of reasonable operating expenses and a fair return on the value of the utility property devoted to public service.

In any event, Pine Water has consistently objected to the District's discovery requests that seek access to Brooke's books and records based on relevancy and jurisdiction. On January 15, 2004, Judge Nodes sustained Pine Water's objections. Unfortunately, Mr. Jones ignores Judge Nodes' decision and continues to argue that access to Brooke's books and records is warranted in light of his worn-out accusations about significant errors, misleading statements and inconsistencies. *Id.* at 12. His testimony is evidence that the District will continue to waste the Commission and Pine Water's valuable time and resources to continue its fishing expedition.

VII. PUBLIC COMMENT SESSION.

Q. DID YOU ATTEND THE COMMISSION'S PUBLIC COMMENT SESSION IN PINE, ARIZONA ON DECEMBER 8, 2003?

A. Yes, and a number of questions/issues were raised that I would like to address.

Q. WHY ARE YOU ADDRESSING THESE QUESTIONS/ISSUES IN YOUR REJOINDER TESTIMONY?

A. For two reasons. First, we are concerned that our customers do not have accurate information regarding the Company's application, its operations and the water supply situation we deal with every day. Second, we received a letter on December 9, 2003 from Commissioner Hatch-Miller asking the Company to respond to 8 separate questions raised during the public comment session. For convenience, I have attached a copy of Commissioner Hatch-Miller's letter to my rejoinder

testimony as Hardcastle Rejoinder Exhibit 6.

Q. REFERRING TO THE FIRST OF COMMISSIONER HATCH-MILLER'S QUESTIONS, "WHY ISN'T THERE A MORATORIUM ON NEW HOOKUPS UNTIL RELIABLE WATER SOURCES ARE SECURED?"

A. The issue of a moratorium on new water connections in Pine Water is has long and controversial history that dates back to the late 1980's. The number of allowed water connections has varied over years from zero per month to the present level of twenty-five water meters per month, which was unanimously approved by the Commission. *See* Decision No. 64400 (Jan. 31, 2002). At that time, the Commission realized, and rightly so, that much of the criticism of Pine Water coming from the community, and especially Gila County, was related to their charge that Pine Water was "unable to serve" new connections pursuant to the Commission-imposed moratorium against further connections. *See* Decision No. 65435 (Dec. 9, 2002). In the end, it became clear that as long as Pine Water was precluded from making new connections, Gila County would carve up Pine Water's CC&N by forming water improvement districts.

Q. BUT IF PINE WATER CANNOT SERVE WHAT IS WRONG WITH ANOTHER PROVIDER BEING FORMED?

A. The reason for the moratorium was a lack of available water supplies due to the prevailing hydrology. The creation of separate entities under the authority of Gila County does not bring more water to the equation. It merely allows more straws in the same deficient aquifer. Thus, the Commission determined that if Pine Water was not allowed some limited authority to install new water connections that the proliferation of water improvement districts by Gila County would place the water supply to existing customers very much in jeopardy.

Q. REFERRING TO THE SECOND OF COMMISSIONER HATCH-

MILLER'S QUESTIONS, "WHY SHOULD CUSTOMERS BE REQUIRED TO PAY A BASE MONTHLY SERVICE CHARGE DURING TIMES WHEN NO WATER IS AVAILABLE TO THEM?"

A. From a ratemaking standpoint, a utility's water system infrastructure is based on peak water demands, not minimum demand. The water system exists in the anticipation that customers will use water when needed and it must be able to deliver as much water as needed at any given time, although it is sometimes limited by available water. In addition to the water system infrastructure available on demand, operating costs such as salaries and wages, employee benefits, rents, insurance, telephone, etc., must be paid. The utility must pay these expenses regardless of the number gallons sold to customers. Base rates (monthly minimums) generally do not cover the fixed costs of a utility. In fact, in many cases, base rates (monthly minimums) cover less than two-thirds of the costs the utility must pay regardless of the gallons sold. Paying the monthly minimum is akin to making auto loan payments, auto insurance payments, and annual auto registration fees. These cost must be paid regardless of whether you drive your car or not.

Q. REFERRING TO THE THIRD OF COMMISSIONER HATCH-MILLER'S QUESTIONS, "WHY SHOULD CUSTOMERS RESIDING IN AREAS THAT HAVE ADEQUATE WATER PRESSURE, SUCH AS PORTAL III, BE REQUIRED TO PAY CHARGES FOR HAULING ADDITIONAL WATER SUPPLIES?"

A. There are a number of reasons. First, as the District's *Investigation of Groundwater Availability* shows, the water supply is very fragile throughout Pine Water's CC&N and no area is exempt from the need for augmented water supplies because customer demand on an area-by-area basis cannot be predicted with any certainty.

These augmented water supplies are available to ALL Pine Water customers because the delivery infrastructure is interconnected. There is no way to differentiate water deliveries to Pine Water customers by area or subdivision, at least not without separate tariff and pricing structures, which would lead to regulatory confusion, administrative melt down and intra-service area discrimination.

Q. ARE THERE OPERATIONAL ADVANTAGES ASSOCIATED WITH AN INTERCONNECTED SYSTEM?

A. Yes. A water system that is interconnected in a "loop" fashion is far more reliable, efficient, and cost effective than a "dead end" system where water cannot circulate throughout the system. For example, a "looped" system prevents problems like adequate water storage facilities from being required in a specific subdivision because sources of water and water storage can be utilized from other areas of the water system. Moreover, the fragility of Pine Water's supply is, at times, so critical that management must include the ability to "move" water from one area of the water system to another using the network of pipes and infrastructure. The ability to "move" water through the use of differentiated pressure zones in the water system is a key component to keeping customers supplied with water throughout periods of peak demand.

Q. REFERRING TO THE FOURTH QUESTION POSED BY COMMISSIONER HATCH-MILLER, "HOW CAN THE COMPANY BETTER COMMUNICATE THE STATUS OF ITS WATER SUPPLY TO ITS CUSTOMERS IN AN UNDERSTANDABLE, FACTUAL AND TIMELY MANNER?"

A. That is a good question. It is also a fair question, although difficult to answer. We have a substantial electronic mailing list, over 2000 names, and provide information

through that medium on a regular basis. There are also signs (five large signs posted for both directions along Hwy 87) and postings to advise of changes in the restrictions under the Commission-imposed Curtailment Tariff. We have a toll free number and a call center open 9am-3pm Monday through Friday, with emergency services available 24 hours a day, 7 days a week. Pine Water recently established a 2nd toll-free Pine information line in response to one of the requirements in the Pine meter modification order. The Company has also voluntarily, under no direction by the Commission or any other regulatory agency, mailed notices in late spring to each customer in Pine reminding them of the rules of our water conservation program, and requesting that they "use water wisely" in the upcoming summer months. In short, customers that want information can get it in a timely manner. But how much information is sufficient?

Through the years, Pine Water has produced community brochures, conducted meetings, participated in regional water study groups, and met with hundreds of customers individually to discuss the nature of the local water supply. In fact, in 2002 Pine Water commissioned a professional study of the area by a geohydrologist that defined water flows and confirmed the deficient natural water supply of the area. *See* Direct testimony of Robert T. Hardcastle ("Hardcastle Dt.") at Direct Exh. A. Water issues in Pine are largely technical and complex topics that require significant background and experience to meaningfully interpret and understand. There have been no less than six or seven other studies of the area water supply dating back to the 1960's that discuss the nature of the local water supply and the deficiencies that exist. The information is available to all customers of the area wanting to be more knowledgeable in the area of water supplies but it is not easy to understand.

For many years Pine Water has advocated that local real estate agents and

brokers fully explain the area water supply problems and deficiencies through referral to one of these water supply studies. In that way prospective property owners would be fully informed as to the actual local conditions instead those of the "puffery" common in sales of real property. Virtually all new subdivisions have received a finding of water inadequacy from ADWR for the last thirty years. *Investigation of Groundwater Availability* at 7. It is very hard to combat the misinformation that those with their own agenda, sales from real property and taxes for the County, have spread throughout the community.

Q. DOES PINE WATER HAVE A CUSTOMER EDUCATION PROGRAM?

A. We have proposed one in this proceeding. *See* Hardcastle Dt. at Direct Exh. C. Even though the Commission ordered us to file this proposal with this rate application, no other party, including Staff, has addressed the issue.

Q. HOW DO YOU RESPOND TO COMMISSIONER HATCH-MILLER'S FIFTH QUESTION?

A. In his fifth question to the company, commissioner hatch-miller asks, "is the company investigating new groundwater sources? Is the statement "there are no new groundwater sources available" factual? Is a groundwater resource study available to pine residents?"

As stated above, our 2002 study is available to the public and was attached to my direct testimony in this docket. The recent comprehensive study commissioned by the District was filed in this docket by Mr. Breninger and is also publicly available. Both of these documents support the conclusion that there are no new groundwater resources in Pine, Arizona and, as Staff Engineer Scott testified, the availability of water supplies in other areas such as the Strawberry Valley remains questionable. *See* Scott Sb. at 4-5.

Nevertheless, Pine Water has plans to explore for additional local water

supplies in its Strawberry Water system before the first of June of this year. Additionally, Pine Water has consistently expressed interest in new sources of "shared water" through water sharing agreements with Pine residents that have private water sources with excess supplies coupled with acceptable water quality testing results that might be utilized by the general community. Pine Water's exploration of new water sources is tempered by the realities of "economically viability." As Mr. Scott also recognizes, for example, a test/production well in the Strawberry Valley will cost as much as $870,000, and may not succeed in producing water for Pine Water customers. Is the Commission ready to saddle ratepayers with the burden of full cost recovery for such "exploration"?

Q. BUT ISN'T PINE WATER OBLIGATED TO EXPLORE FOR NEW WATER RESOURCES IF THAT IS WHAT IT TAKES TO PROVIDE ADEQUATE SERVICE?

A. Pine Water has not had a water outage in nearly 2 years. Can anyone say that about the prior operators of this system? Will the District be able to make the same claim if it takes over the water system? I do not know about the latter, but I do know Pine Water has provided adequate service to its customers given the prevailing hydrology, which the Company did not create and do not control. If the Commission agrees that more should be done to address the water shortage, despite the significant risk and substantial uncertainty, it must provide direction and ensure that adequate cost recovery mechanisms are in place.

Q. CAN YOU COMMENT ON THE UNCERTAINTY INVOLVED IN EXPLORING FOR NEW WATER SOURCES?

A. I have already discussed the uncertainty associated with Mr. Breninger's massive deep well project in the Strawberry Valley. Similar concerns exist more locally as well. Throughout the Pine area there are dozens of private water wells that have

minimal production of 10 gallons per minute or less. It is not uncommon to find some private water wells that produce three or four gallons or water per minute. Those sources of water exist and function well enough for private users with limited personal demand but may be every bit as expensive to explore and develop as a well with far greater production, including the additional cost associated with the stringent water quality testing requirements. Such a well might be "used and useful" to a private water user but for a commercial water company like Pine Water such a water well is not considered "economically viable." In other words, low production wells like these cannot produce enough water on a sustained basis to pay for the costs related to exploratory, drilling, development and water delivery.

For example, a well producing 5 gallons per minutes would provide daily revenues of $18 per day, less the costs of electricity, testing, monitoring, water treatment, and management. Such wells cannot require static water levels that are just as deep in the ground as wells that produce far more water. In many cases, the costs of lifting the water from such depths can exceed the revenue available through water sales. The net revenues available to Pine Water from such a well are so small that it is not considered to "economically viable" because the costs of development and operation exceed the available revenues.

Q. IS THIS THE REASON WATER EXPLORATION IS ALSO RISKY?

A. Exactly, and if Mr. Reiker really believes Brooke does not consider these risks before making capital investment in exploring new water resources for Pine Water because it has a diversified investment strategy he is truly mad. *See* Reiker Sb. at 28-37. We do consider these risks and we find Mr. Reiker's recommended 9% return on equity laughable and confiscatory given the extreme risks we face every day on the Rim.

Q. REFERRING TO THE SIXTH OF COMMISSIONER HATCH-MILLER'S

QUESTIONS, "HAS THE COMPANY DRILLED ANY NEW WELLS OR DEEPENED EXISTING WELLS IN THE PAST THREE YEARS? DOES THE COMPANY PLAN TO DRILL NEW WELLS OR DEEPEN EXISTING WELLS IN THE IMMINENT FUTURE?"

A. Yes. In late 2000 and early 2001, the Company Pine Water explored three prospective new sources of water in Pine, Arizona. In each case, water was either very limited or not found at all. Consequently, these newly explored water wells had to be abandoned.

In contrast, three new water wells in the Strawberry were developed in conjunction with the development of Project Magnolia in late 2000 and early 2001. All of these wells were determined to be "economically viable" and remain in production today. Water is available to Pine Water customers through the use of water augmentation sources or Project Magnolia. In fact, Pine Water's ratepayers have been getting free water from these wells for the past three years and counting. There are also plans to drill three new wells in Strawberry in 2004 with the hopes that discovered production can be made available through Project Magnolia or other water augmentation procedures.

Q. WILL THE COMPANY UNDERTAKE THIS SO-CALLED DEEP WELL DRILLING TO LOOK FOR WATER IN THE STRAWBERRY VALLEY?

A. Yes, if the Commission believes this is a prudent use of ratepayer money and ensures a fair return on the investment, even if no additional water is located that can be delivered to Pine, Arizona. Of course, in evaluating this issue of prudency, the Commission will have to consider that deep wells are not only more uncertain and costly to drill, they are far more expensive to operate due to the increased pumping costs. In addition, expensive delivery systems like Project Magnolia will have to be utilized to deliver water from the Strawberry Valley to Pine. We are

talking about millions of dollars and staggering rate increases to Pine Water's ratepayers.

Q. CAN EXISTING WELLS BE DEEPENED TO SEARCH FOR ADDITIONAL WATER?

A. There is, I believe, a misconception that significant water supplies are available at deeper and deeper depths in Pine, and maybe even in Strawberry. Although not impossible, Pine Water believes such sources are highly unlikely based on the geology of the area as confirmed by numerous private and public water studies. Therefore, for example, water discovery in Pine-Strawberry is not simply a matter of deepening an existing water well. In fact, wells in the area are not usually drilled "deep" because of the cavernous complexity of the areas geology. The risks of deepening wells include loss of existing water production, which would exacerbate an already deficient water supply.

Q. ANOTHER CUSTOMER AT THE PUBLIC COMMENT SESSION COMPLAINED THAT THE COMPANY HAD DRILLED THREE NEW WELLS MAKING THE WATER SUPPLY PROBLEM WORSE IN HIS AREA. IS THAT CORRECT?

A. I am unaware of where these wells are, who drilled them or what results were achieved so I cannot adequately address the customer's comments. However, it is important to note that the geology under Pine is primarily made up of fractured rock. If you are fortunate enough to drill a well in one of the fractures, you may discover water. You might have a completely different result if you were to relocate the drilling process fifteen or twenty feet in any direction. Thus, it is certainly possible, although unlikely, that other shared water sources in the immediate area would be affected. For this reason, it is our operating policy not to explore for water within 300-500 feet from another well, unless both wells are

owned or used by us.

Q. IS THERE ANY RESTRICTION ON WELL DRILLING IN THE PINE-STRAWBERRY AREA?

A. Presently, the only restrictions on drilling wells are (a) property ownership or access; (b) permits required from the Arizona Department of Water Resources; (c) sufficient capital: and (d) the availability of well drilling firms.

Q. COMMISSIONER HATCH-MILLER'S SEVENTH QUESTION ASKS "WOULD ADDED STORAGE CAPACITY ALLEVIATE WATER SUPPLY PROBLEMS, ESPECIALLY DURING TIMES OF LIKELY DISRUPTIONS (I.E., HOLIDAYS, WEEKENDS, SUMMERTIME)?"

A. As explained above in response to Mr. Ploughe's testimony (section V, *supra*, at 25), the answer is no, although that has not stopped the debate over this question, often raised by those without experience in the area's water shortage problems. First, Pine Water's required water storage considerably exceeds requirements. Are expensive additional storage tanks really a prudent investment? Second, the problem in Pine is one of ***production*** – not storage. It does not matter how much water storage exists if sufficient water production is not available to fill the tanks. Stored water must be cycled or "turned over" approximately every twenty-four hours, although in some cases treated water can be stored for a little longer. If Pine Water's source of supply produced 100 gallons per minute during the peak demand periods and it had an additional two million gallons of water storage, it would require almost two weeks to fill the water storage facilities and we simply do not have sufficient production for that. In other words, what is needed is more water production. Then the issue of water storage becomes moot.

Q. ANOTHER CUSTOMER MENTIONED THE PINE RESERVOIR PROJECT. IS THAT PROJECT STILL UNDER CONSIDERATION?

A. To a lessening degree, "yes". However, the Pine Reservoir Project cannot escape the pull of economic reality. This is another million dollar project, at least. At present, the rates charged to customers in the Pine Water could not cycle enough water through the reservoir to come close to paying for the facility. Either the "turn over" of the water stored on the facility would have to be dramatically increased or the rate charged customers for water stored in the facility would have to be greatly increased or a combination of both. Meanwhile, the Option Agreement for the Pine Reservoir remains in place and is available through 2006 subject to renewal.

Q. REFERRING TO THE EIGHTH OF COMMISSIONER HATCH-MILLER'S QUESTIONS, CAN METERS BE READ AT THE SAME TIME EACH MONTH SO A CUSTOMER'S BILL DOES NOT VARY FROM MONTH TO MONTH?"

A. It depends on the amount of investment that is available to be made. Technology exists today to read water meters simultaneously in fifteen-minute increments. Thus, to answer Commissioner Hatch-Miller's question, "yes". However, the cost to retrofit the water meters in Pine with remotely polled water meters is prohibitively expensive and would require two or three years to complete. I also wish to note that customer water meters can be read within 25-35 days from the last meter reading under Commission regulation. *See* A.A.C. R14-2-409.A.1.

Q. DO YOU HAVE ANY OTHER COMMENTS TO MAKE REGARDING QUESTIONS/ISSUES RAISED DURING THE PUBLIC COMMENT SESSION?

A. Yes. There seems to be a great deal of uncertainty regarding the Company's water hauling surcharge. For one thing, one customer claimed that the Company collected approximately $600,000 per month during the summer of 2003 from this surcharge. This is inaccurate. For the entire year, Pine Water collected

approximately $87,500 from the surcharge. I would also note that customers believing that the Company makes a "profit" for hauling water are wrong. Under the Commission approved surcharge mechanism, Pine Water recovers only its actual costs for water hauling.

Q. ANOTHER CUSTOMER COMPLAINED THAT THE COMPANY HAD RECEIVED NUMEROUS RATE INCREASES SINCE BROOKE UTILITIES ACQUIRED THIS SYSTEM. IS THAT CORRECT?

A. No, setting aside the Commission's approval of the water hauling surcharge in May 2003, there has only been one general rate increase for this system since Brooke acquired it in the mid-1990's. *See* Decision No. 62400.

Q. THE COMMISSION ALSO HELD A PUBLIC COMMENT SESSION IN PHOENIX ON DECEMBER 15, 2003, DURING WHICH ONE CUSTOMER ASKED WHY THE COMPANY DOESN'T OWN ITS OWN WATER-HAULING TRUCKS. HOW DO YOU RESPOND?

A. Pine Water has some limited capacity to haul water. Still, it is less expensive to Pine Water ratepayers for us to contract with people engaged in the business of water transport than to operate such facilities ourselves.

Q. THERE WERE ALSO QUESTIONS RAISED CONCERNING ADEQUATE PRESSURE FOR FIRE FLOW. DOES THE COMPANY PROVIDE FIRE FLOW SERVICE?

A. In accordance with the Arizona Administrative Code R14-2-407.E, the Company is required to provide a minimum delivery pressure of 20 psi at the customer's meter or delivery point, which we do. There is no further requirement imposed on the Company by Commission rule or regulation or by any other governmental entity with applicable jurisdiction. In order to provide greater pressures, setting aside the water supply issues, we would need to make several costly upgrades to the system.

Q. ANOTHER CUSTOMER ASKED WHETHER PINE WATER HAS LOCAL REPRESENTATIVES WORKING IN OR AROUND THE PINE, ARIZONA AREA. DOES PINE WATER MAINTAIN A LOCAL PRESENCE IN THE PINE, ARIZONA AREA?

A. Yes. Full-time water operations people are based in Pine. In addition, Brooke has retained the services of a public relations consultant who lives in the area and regularly works with customers in the area answering questions and providing important information.

Q. DOES THAT CONCLUDE YOUR REJOINDER TESTIMONY?

A. Yes, except that I wish to point out that our silence concerning specific portions of the surrebuttal testimony of any other witness should not be taken and acquiescence or agreement. Frankly, there was a great deal of immaterial testimony by other parties, specifically the District and it is simply not possible to address all of it here.

1513791.2/75206.006

EXHIBIT

1

A CULTURAL RESOURCES SURVEY OF A 1.9-MILE PROPOSED WATER PIPELINE BETWEEN PINE AND STRAWBERRY, ARIZONA

FILE COPY
Revised by

Prepared for

BROOKE UTILITIES, INC.

Prepared by

SWCA, INC.
Environmental Consultants

November 13, 1997

A Cultural Resources Survey of a 1.9 Mile Proposed Water Pipeline Between Pine and Strawberry, Arizona.

Prepared for

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SWCA Project No. 30-72296
SWCA Archaeological Report No. 97-194

Tonto National Forest Permit No. 4306-12
Arizona State Museum Annual Permit No. 1997-03BL

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INTRODUCTION

At the request of Brooke Utilities, Inc., SWCA, Inc., Environmental Consultants (SWCA) conducted a cultural resources survey along a 1.9-mile segment of Arizona Department of Transportation (ADOT) easement corridor along State Route (SR) 87 between Pine and Strawberry, Arizona. The survey was done on October 31, 1997 in compliance with the National Historic Preservation Act. The survey area consisted of a 100-foot right-of-way (ROW) for a proposed water pipeline extending from Strawberry Hollow northwest to Strawberry Knolls (Figure 1). The project pipeline will impact only 30 feet of the 100-foot wide survey area, thus providing a sufficient bufferzone. For about half of its length, the proposed pipeline follows the historic Pine-Strawberry Road (Forest Highway 9); for the other half it parallels the ROW fence for SR 87. The survey objective was to record and mark for avoidance any significant cultural resources that would be impacted by the proposed water line. The survey was conducted under the provisions of Tonto National Forest Permit No. 4306-12, and Arizona State Museum Annual Permit No. 1997-03BL. The fieldwork was conducted by James M. Potter.

The project area is located along SR 87 from approximately milepost 269 to 271 between Pine and Strawberry on Tonto National Forest (TNF). The legal description for the project area is T12N, R8E, Sections 22, 23, and 26 (Pine, Arizona, 7.5 minute series, 1973).

Following the TNF Region 3 Cultural Resources Handbook (1987), archaeological sites were defined by the presence of (1) one or more feature; (2) one formal tool if associated with other cultural materials of more than one formal tool; and (3) an occurrence of cultural material in a density of at least 10 items per 100 m^2, or a single type of artifact or material in a density of at least 25 items per 100 m^2. The observation of cultural remains not meeting these criteria were recorded as isolated occurrences (IO).

As a result of the survey, SWCA located and recorded a previously unrecorded segment of historic Forest Highway 9, AR-03-12-06-2028/AZ U:8:60(ASM), extending from milepost 269 to 270. The road segment consisted of a single-lane dirt road representing the latest construction phase of the highway (*ca.* 1945-60). The later construction phase appears to have obliterated any earlier roadbeds, such as the 1915-1919 roadbed and the Mormon wagon road built between 1875 and 1882. A 1969 highway marker located at the northern most point of the historic road segment in the project area suggests that improvements to this road continued well into the late 1960s. In addition, a historic artifact scatter that was associated with the southernmost section of the historic road segment was recorded. Field recording of this site exhausted all potential to yield significant archaeological and historic information. Consequently, it is not recommended that this site be considered eligible for the National Register of Historic Places (NHRP). No isolated occurrences were noted in the project area.

ENVIRONMENTAL SETTING

The project area is situated within the mountainous Transitional Zone located between the Basin and Range landscape to the south and the Colorado Plateau to the north. Possessing steep slopes that overlook Pine Creek and several smaller drainages Strawberry Mountain and the surrounding highlands are at the extreme northern edge of the Tonto Basin Physiographic area. The project area follows a relatively narrow drainage between Strawberry Mountain and the Mogollon Rim. The elevation of the project area ranges from 5600 to 6000 ft (1707-1829 m). Vegetation identified in the project area is representative of the Great Basin Conifer Woodland Vegetative Community within the Forest Formation

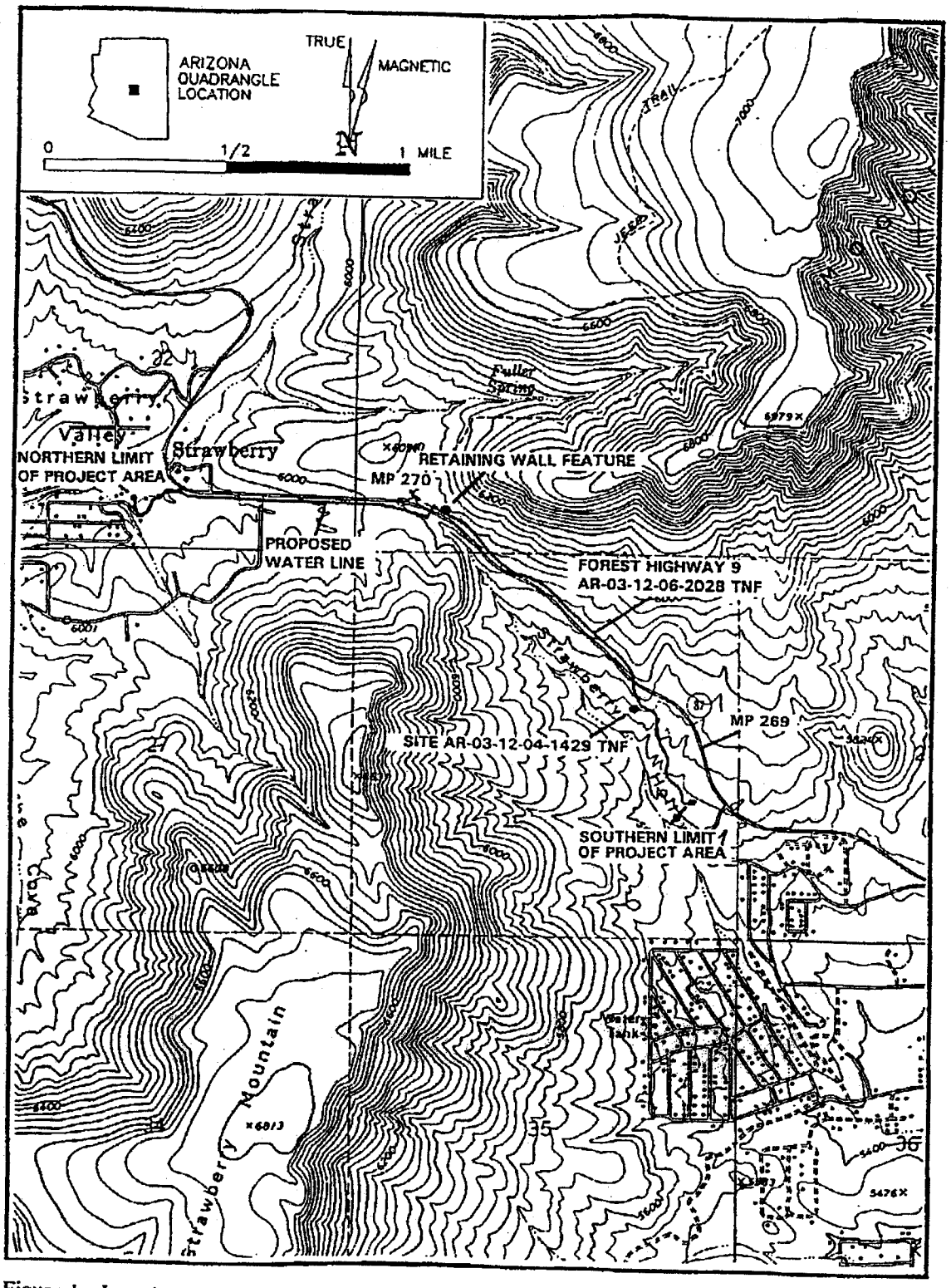


Figure 1. Location of project area. Base map is USGS 7.5 minute quadrangle Pine, AZ 1973.

(Brown 1994). Species present in the area include juniper (*Juniperus* sp.), pinyon (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), live shrub oak (*Quercus tubinella*), manzanita (*Arctostaphylos* sp.), catclaw mimosa (*Mimosa biuncifera*), and assorted unidentified grasses and annuals.

PREVIOUS RESEARCH

Previous research in and around the project area has been limited primarily to small archaeological surveys and historic inventories. Archaeological surveys done within or immediately adjacent to the project area include a survey performed by Arizona State University for a federal land exchange in 1986, a survey completed by Tonto National Forest in 1992 for the Wooffid Timber Sale, and a survey conducted by the Tonto National Forest for ADOT in 1995.

In 1986, at the request of the Federal Land Exchange, Inc, the Office of Cultural Resource Management at Arizona State University conducted an archaeological survey in and around the project area. No acreage value was given in the report. Within the survey block included in the current project area (Block D), ASU archaeologists visited and rerecorded one previously recorded site, AZ O:11:1(ASU) (Figure 2). No additional sites were found. Site AZ O:11:1(ASU) is located on a small knoll located approximately 700 m to the east of SR 87, and this site was estimated to contain between three and eight rooms enclosed by a low enclosing wall. The site dates between A.D. 900 and 1300 (Lindauer 1986).

In 1992 one historic and 10 prehistoric sites were recorded by the Tonto National Forest around the town of Strawberry as part of the Wooffid Timber Sale (Germick 1992). The three survey blocks that are closest to the current project area are plotted on Figure 2. One site, AR-03-12-04-1194, is located within these survey blocks (Figure 2). This historic site consists of a dispersed scatter of cans, glass, and other domestic trash which may be associated with early logging activities. All of the prehistoric sites were sherd and/or lithic scatters dating to sometime between A.D. 900 and 1100, and they were located at least 1 mile from the current project area.

Also in 1992, Plateau Mountain Desert Research conducted an archaeological survey for ADOT (ADOT Contract No. 90-40) of six land parcels along SR 87 between Payson and Strawberry (Weaver 1992). One parcel fell within the current project area, but no cultural resources were identified (Figure 2).

The 1995 ADOT survey conducted by the Tonto National Forest consisted of a total of 0.361 acres of easement across SR 87's ROW to private land (TNF #95-51) (Figure 2). This project recorded three historic sites, including a historic segment of SR 87 (Forest Highway 9) (AR-03-12-04-1286), a possible historic horseback/skid trail (AR-03-12-04-1287), and a segment of the Old Mormon wagon road (AR-03-12-04-1288). All of these sites were identified from 1946 air photos and from the 1919 and 1933 TNF maps (Morgan 1995).

In 1997, several miles south of the project area, Archaeological Research Services, Inc., conducted a cultural resources survey for ADOT along a 2.65-mile segment of SR 87 between mileposts 243 and 246, four miles south of Payson. One historic site was identified. The site consists of six segments of the historic Forest Highway 9, AR-03-12-06-2028/AZ U:8:60(ASM) (Barz 1997).

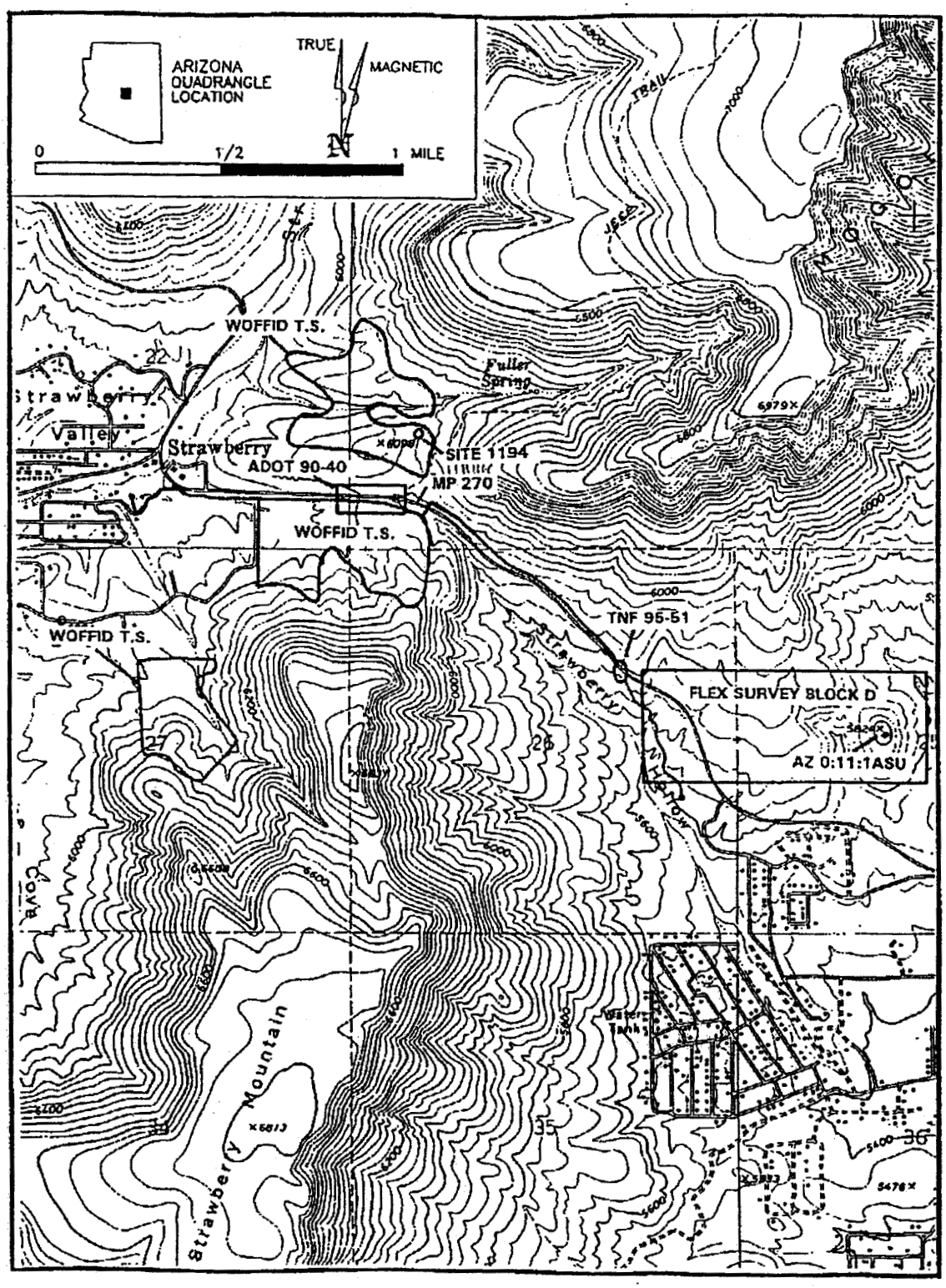


Figure 2. Location of previous surveys conducted within or adjacent to the project area. Base map is USGS 7.5 minute quadrangle Pine, AZ 1973.

In addition to these archaeological surveys, several historic inventories have been conducted in the area. In 1995, Plateau Mountain Desert Research performed an archaeological reconnaissance of eight potentially historic roads north of Payson, as well as an evaluation of NRHP-eligible properties in Strawberry and Pine (Spalding 1995a, 1995b). Included in this inventory was the Mormon Wagon Road (AR-03-12-04-1288). It is not clear from the report exactly where this site was identified on the landscape ("from the junction of SR 87 to the NE"). However, "the area inspected had been heavily disturbed by recent burning, logging, erosion, and camping activities, and this segment of road lacks integrity" (Spalding 1995a).

In 1996, a historic resources inventory of Pine, Arizona, was prepared by Johns & Strittmatter, Inc. This study involved the documentation of the history and historic architecture of Pine by means of a field inventory and archival research (Johns and Strittmatter, Inc. 1996).

FIELD METHODS

The survey consisted of a 100% Class 1 survey of a 100-foot ROW centered on the proposed water line. The ROW width was surveyed in two parallel transects spaced 15 m apart off each side of the centerline. Sites encountered were mapped, photographed, described, and plotted on the corresponding 7.5-minute quadrangle map.

SITE DESCRIPTIONS

A total of two sites were identified during the survey. The first site, AR-03-12-04-1429/AZ O:11:53(ASM), is a small (9 × 5 m) historic artifact scatter associated with historic Forest Highway 9 (Figure 3). The site is located in T12N, R8E Section 26, SE¼SW¼NE¼. Approximately 30 fragmented metal cans, several porcelain sherds, and numerous shards of brown, clear, and amber glass comprised the site. Both the porcelain and glass were highly fragmented. The procelain may have represented a single plate. The only identifiable glass piece was a clear jar base fragment. The cans were primarily weathered sanitary (milk and meat) cans with side and top/bottom seams, and church key openings. No solder was apparent on the seams or the tops and bottoms, and no measurements were possible on the milk cans due to their poor state of preservation. However, the presence of church key openings indicates that the cans post-date 1935, and a single carbon battery core on the site suggests a date after about 1920. These data, coupled with the lack of pull tabs on cans, suggests that the site probably dates between 1935 and 1962. The site appears to be limited to the modern ground surface, and may be in secondary deposition.

The second site is a previously unrecorded segment of the historic Forest Highway 9 (AR-03-12-06-2028/AZ U:8:60[ASM]). The portion of this site that falls within the boundaries of the project area is approximately 1.2 miles long, extending from the SE¼NE¼SE¼ of Section 26 to SE¼SW¼SW¼ of Section 23 of T12N, R8E, or from milepost 268.7 to 269.9 along SR 87 (Figure 1). The southern 1/3 of the segment is situated on the southwest side of SR 87, while the northern 2/3 of the segment lies on the northeast side of SR 87. The site is an unpaved, single lane dirt road. The road bed is 6 m wide on average, ranging from 5 to 7.5 m in places, and portions of the road, specifically those on the northeast side of SR 87, have been cut into the hillside to attain a level surface. In addition, at the northern end of the segment there is a large retaining wall that was built against the western edge of the road where the road apparently could not be cut into the hillside sufficiently (Figure 4). The retaining wall is a 16 m-long

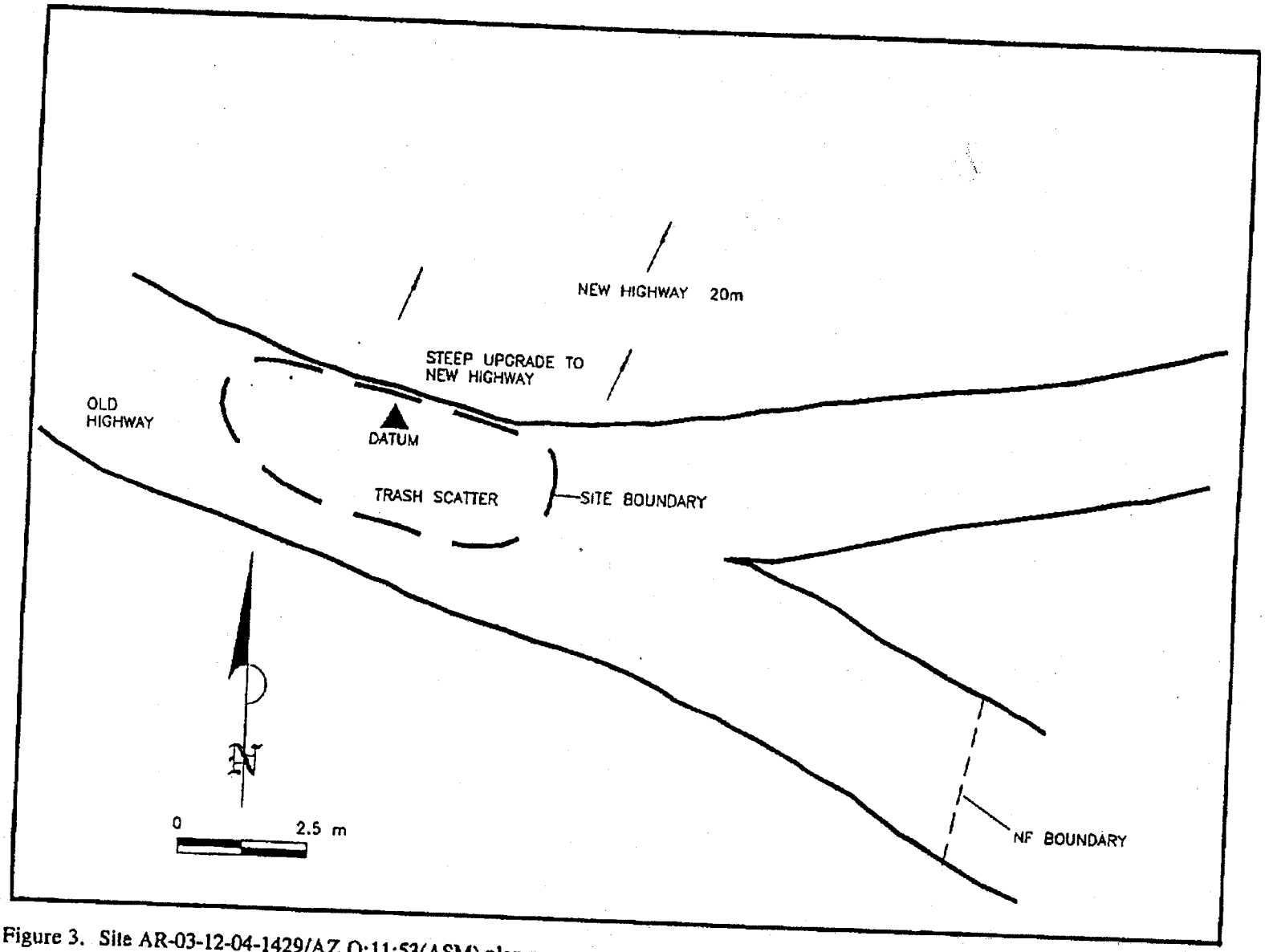
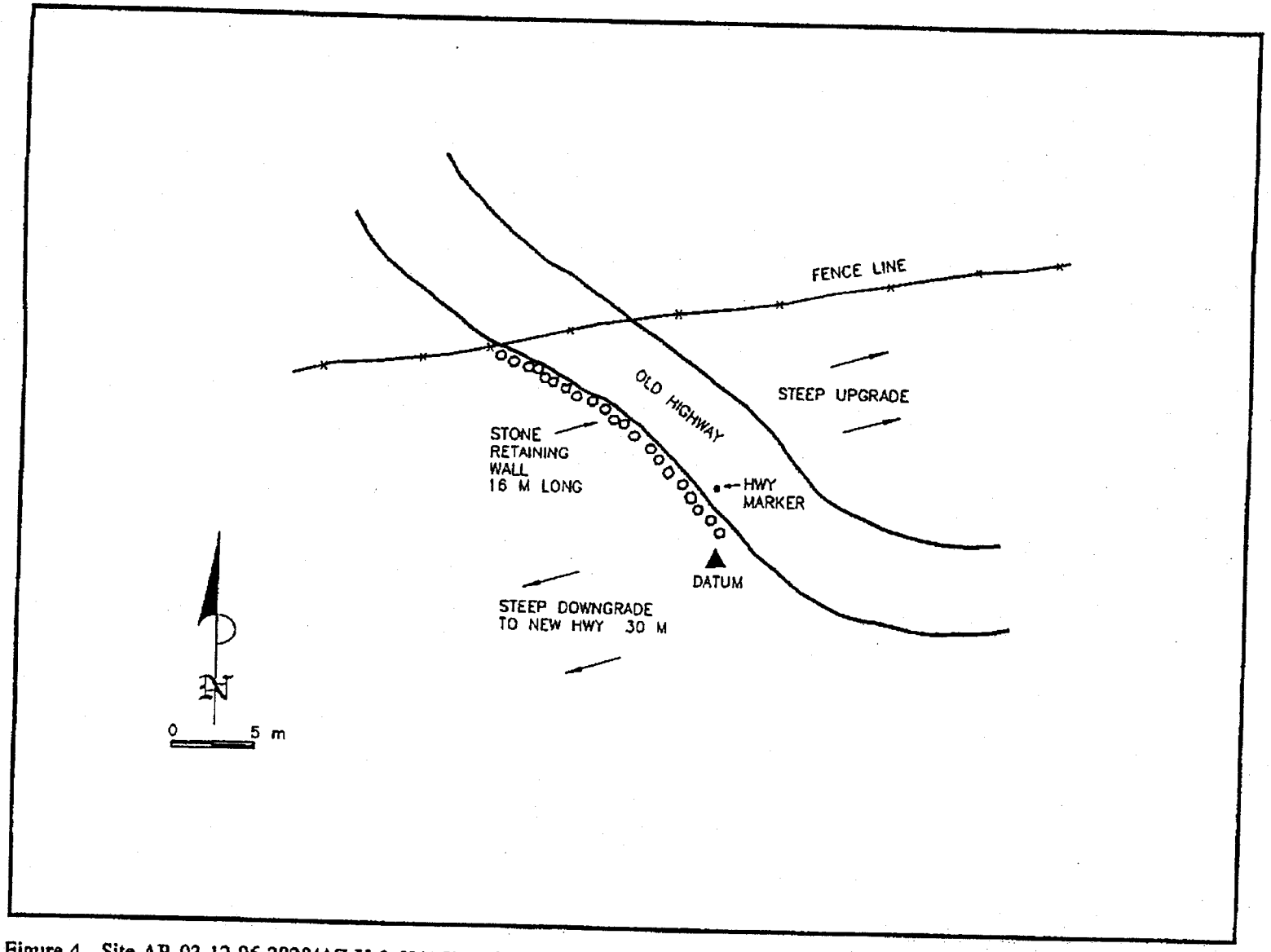


Figure 3. Site AR-03-12-04-1429/AZ O:11:53(ASM) plan map.



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stone wall comprised of unshaped sandstone boulders ranging in size from 25×30×10cm to 60×50×30 cms. These stones were heavily coated with lichen. No mortar was evident in the wall. The height of the wall ranged from .60 m to 1.3m (about 10 courses of stone). Next to the retaining wall in the road was a survey marker labeled "Arizona Highway Dept. R & M 779-15 1969." No other artifacts or features were associated with this retaining wall feature.

The southern end of this road segment was obscured by damage resulting from the construction of SR 87. In addition, modern off-road vehicle tracks were prevalent along the entire length of the segment. No artifacts were identified along the length of the road segment.

This road segment appears to be a portion of the realignment of the road that was constructed in the late 1940s-1950s. No other alignments or roads were visible, indicating that this realignment overlies and obscures earlier road alignments.

EVALUATION OF CULTURAL RESOURCES AND RECOMMENDATIONS

The recording, mapping, and photographing of Site AR-03-12-04-1429 is believed to have exhausted the potential of this site to yield further significant information; therefore, this site is not recommended as eligible to the NRHP.

Forest Highway 9 served as a major early transportation route for western Gila County. Because of this, Site AR-03-12-06-2028 has been previously recommended as eligible to the NRHP under Criterion A (event) and potentially eligible under Criterion D (information potential) of 36 CFR Part 60.4 (Barz 1997). However, the segment of the road within the current project area has been impacted by SR 87 construction and maintenance activities, as well as extensive modern off-road vehicular use. The road segment within the current project boundary lacks integrity and thus does not contribute to Forest Highway 9's National Register eligibility. Furthermore, the recording, mapping, and photographing of this road segment of the road has exhausted the potential to yield further significant archaeological information. Proposed construction activities may impact the road segment within the project area, but these activities will not alter the overall character of the historic road. Moreover, the proposed activities will not affect the site's eligibility to the NRHP.

Archaeological clearance is recommended for the proposed water pipeline.

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FILE COPY
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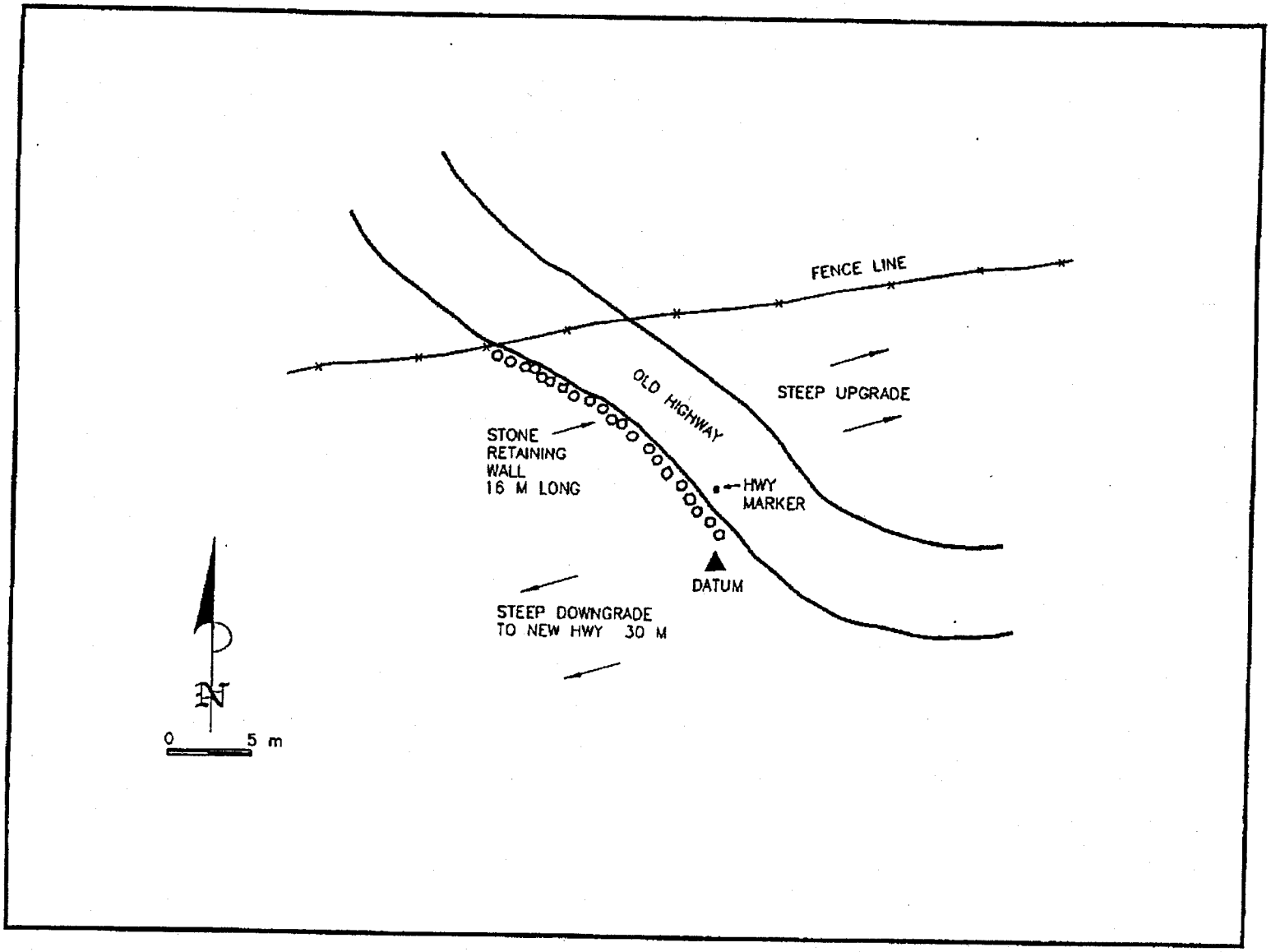

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This road segment appears to be a portion of the realignment of the road that was constructed in the late 1940s-1950s. No other alignments or roads were visible, indicating that this realignment overlies and obscures earlier road alignments.

EVALUATION OF CULTURAL RESOURCES AND RECOMMENDATIONS

The recording, mapping, and photographing of Site AR-03-12-04-1429 is believed to have exhausted the potential of this site to yield further significant information; therefore, this site is not recommended as eligible to the NRHP.

Forest Highway 9 served as a major early transportation route for western Gila County. Because of this, Site AR-03-12-06-2028 has been previously recommended as eligible to the NRHP under Criterion A (event) and potentially eligible under Criterion D (information potential) of 36 CFR Part 60.4 (Barz 1997). However, the segment of the road within the current project area has been impacted by SR 87 construction and maintenance activities, as well as extensive modern off-road vehicular use. The road segment within the current project boundary lacks integrity and thus does not contribute to Forest Highway 9's National Register eligibility. Furthermore, the recording, mapping, and photographing of this road segment of the road has exhausted the potential to yield further significant archaeological information. Proposed construction activities may impact the road segment within the project area, but these activities will not alter the overall character of the historic road. Moreover, the proposed activities will not affect the site's eligibility to the NRHP.

Archaeological clearance is recommended for the proposed water pipeline.

Brooke Utilities, Inc.

Colorado River Division • 9079-S Riverside Dr., Parker, Arizona 85344 (520) 667-3335 / (520) 667-2527 Facsimile
Circle City Division • P.O. Box 82218, Bakersfield, California 93380 (800) 792-7665 / (800) 748-6981 Facsimile
Payson Division • 1011 So. Stover Rd., Payson, Arizona 85541 (520) 474-1337 / (520) 474-1695 Facsimile
Corporate Offices • 3101 State Rd., Bakersfield, California 93308 (800) 792-7665 / (800) 748-6981 Facsimile

November 25, 1997

Ralph Bossert
ASL/Sierra Consulting Engineers, Inc.
431 So. Beeline Highway
Payson, AZ 85541

Re: ***Project Magnolia***

Dear Ralph,

Pursuant to our meeting at your offices of November 18 regarding the engineering status of the above referenced matter, please consider this correspondence as your authorization to proceed with professional services related to same, as further defined herein, not to exceed Ten Thousand Dollars and No Cents ($10,000.00) ("Submittal Engineering Cost") exclusive of those preliminary services previously approved in the approximate amount of Three Thousand Six Hundred Dollars ($3,600).

It is my understanding that the professional services related to the Submittal Engineering Cost will provide engineering drawings and related notations ("Submittal Engineering Drawings") that will allow submittal to various authorities having jurisdiction for review and subsequent approval including, but not limited to, the Arizona Department of Environmental Quality, Arizona Department of Transportation, Gila County, United States Forest Service (collectively "Agencies") and other authorities having jurisdiction. It is not my understanding the Submittal Engineering Drawings, described by this correspondence, will include final engineering drawings that may be approved by the Agencies but will provide for development of comments and recommendations which will subsequently lead to same. Further, it was my understanding at our meeting that approximately Seven Thousand Dollars ($7,000) of the Submittal Engineering Cost has already been incurred, prior to issuance of this authorization correspondence, and that not more than Three Thousand Dollars ($3,000) remains to be incurred in order to achieve the objective of the Submittal Engineering Drawings. It is not the purpose of this correspondence to approve engineering services in excess of the Submittal Engineering Cost at this time.

As you are aware the proposed construction schedule of this project is extremely demanding and deserves all of our collective expeditious attention. We appreciate you continuing attention to this aspect of this project.

Ralph Bossert
ASI/Sierra Consulting Engineers, Inc.
November 25, 1997

Sincerely,

Robert T. Hardcastle
President
RTH@jaco.com

Enclosures (as applicable)

cc: RTH correspondence file
Project Magnolia development file
DS, JGH, MJ
c:\brookutilities\aformletter

LAST TRANSACTION REPORT FOR HP FAX-700 SERIES VERSION: 01.03

FAX NAME: JACO OIL CO
FAX NUMBER: 8053938738

DATE: 25-NOV-97
TIME: 15:13

DATE	TIME		REMOTE FAX NAME AND NUMBER	DURATION	PG	RESULT	DIAGNOSTIC
25-NOV	15:12	S	520 474 4867	0:00:56	2	OK	66384010016C

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S=FAX SENT
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TO PRINT MANUALLY. PRESS THE REPORT/SPACE BUTTON. THEN PRESS ENTER.

United States Department of Agriculture
Forest Service
Tonto National Forest
2324 E. McDowell Road
Phoenix, AZ 85006
602 225-5200

File Code: 1580

Date: August 25, 1998

Brooke Utilities, Inc.
3101 State Road
Bakersfield, CA 93308

Attn: Robert T. Hardcastle, President

Re: MOU-03-12-98-D4-036
NEPA Analysis for Pine/Strawberry Pipeline

Dear Mr. Hardcastle:

Enclosed please find a fully executed original of the above-mentioned Memorandum of Understanding for your files.

We look forward to working with you on this project.

Sincerely,

Theresa K. Brown

THERESA K. BROWN
Budget Officer

Enclosure

Agreement No. MOU-03-12-D4-036
(Pine-Strawberry Pipeline)

MEMORANDUM OF UNDERSTANDING
between
FOREST SERVICE, TONTO NATIONAL FOREST
and
BROOKE UTILITIES, INC.

I. INTRODUCTION AND PURPOSE

The intent of this Memorandum of Understanding (MOU) is to establish an understanding and procedure between the US Department of Agriculture, Forest Service, Tonto National Forest (Forest Service) and the Brooke Utilities, Inc. for the purpose of accomplishing work related to the environmental analysis and documentation for the Pine -Strawberry Waterline proposal. This memorandum defines the responsibilities of all parties and sets forth the conditions under which the analysis and documentation will be completed.

The Pine-Strawberry Waterline Project is a proposal to construct ~~a 12~~ inch diameter water line adjacent to State Highway 87 from the unincorporated communities of Pine and Strawberry. The Payson Ranger District can not respond to the proposal in a reasonable time frame. Therefore, Brooke Utilities, Inc. will engage a consultant for the preparation of an Environmental Assessment and related reports, documents, and evaluations.

The Forest Service is the lead agency and retains ultimate responsibility for multiple-use management on National Forest System lands, for National Environmental Policy Act ("NEPA") compliance, and for directing the preparation of the Environmental Assessment and related documents.

II. GENERAL PROVISIONS

A. The Forest Service has approved AZtec Research and Consulting, as a qualified consultant (NEPA) contractor, to compile information, conduct data analysis, and all work related to NEPA documentation preparation. Costs for retaining AZtec Research and Consulting will be borne by the Brooke Utilities, Inc.

1. AZtec Research and Consulting may employ such other consultants and experts (Subcontractors) as are required for the adequate development and preparation of the NEPA document.

2. The qualifications of any subcontractors involved in the NEPA analysis or documentation will be evaluated and approved by the Forest Service prior to their work. Such approval will be provided to Brooke Utilities, Inc. in writing.

3. The NEPA Contractor will work directly for the Forest Service and will not take direction from Brooke Utilities, Inc.. The NEPA Contractor will make note of any communications with Brooke Utilities, Inc. in the Project Record.

B. AZtec Research and Consulting will gather environmental data, information, and reports required by the Forest Service for preparation of the NEPA document. This information includes any new material required following public comments. Brooke Utilities, Inc. may provide any of this information that they have accumulated.

C. The contract between Brooke Utilities, Inc. and AZtec Research and Consulting and any Subcontractors shall be consistent with the provisions of this MOU and

shall specifically incorporate those provisions herein which address the conduct of the Consultants.

1. Said contracts shall provide, and Brooke Utilities, Inc. hereby represents, except as provided in Section C.2. below, and that AZtec Research and Consulting, Subcontractors do not have any direct or indirect financial or other interest in the planning, design, construction, operation, or outcome of the Project, except with regard to the preparation of the NEPA document. Further, Brooke Utilities, Inc. shall ensure that the contract with AZtec Research and Consulting and Subcontractors shall specifically limit any remedies available to AZtec Research and Consulting and Subcontractors as to affirmatively relieve the United States Department of Agriculture, the Forest Service, and any officer, agent, or employee of same from any liability arising out of the performance or termination of such contracts or subcontracts on the Project or the MOU.

2. Brooke Utilities, Inc. Shall direct AZtec Research and Consulting and Subcontractors to provide the Forest Service within 30 days of execution of a contract between Brooke Utilities, Inc. and AZtec Research and Consulting and any Subcontractors, a disclosure statement (Statement of Financial Interest, (SOFI) outlining ownership of stocks, bonds, or other financial, legal, or other interest in Brooke Utilities, Inc. or the outcome of the Project by the AZtec Research and Consulting, or employees thereof, and Subcontractors or employees thereof. The SOFI shall also list any previous contracts, and total amounts of each between Brooke Utilities, Inc. and AZtec Research and Consulting and any Subcontractors.

D. Brooke Utilities, Inc. agrees to hold harmless and indemnify the Forest Service, their officers, agents, and employees, with respect to any and all judgements or settlements arising from claims, demands, or causes of action in connection with the employment of AZtec Research and Consulting and any Subcontractors which may arise from the termination of performance of the contracts or any other services or purchases of materials utilized for the development and preparation of the NEPA document or from termination of this MOU.

E. The Forest Service in the Southwestern Region uses the Integrated Resource Management process (IRM) as a method of implementing requirements of NEPA. All portions of the IRM process applicable to the Project will be followed in collecting and preparing environmental data, information, reports, preparation, analyses, and documents.

F. The Forest Service shall prescribe and/or review and approve the types of environmental data and collection methodologies, and shall independently evaluate and approve all information, environmental data and analyses, documents, reports, and evaluations submitted by AZtec Research and Consulting and Subcontractors.

G. The Forest Service will establish an Interdisciplinary Team (IDT) to conduct and oversee the NEPA/IRM process. The IDT will direct the work performed by AZtec Research and Consulting and Subcontractors and be responsible for the scope and contents of all NEPA documentation.

H. The release of any information, including but not limited to, environmental data, analyses, and NEPA-related documents, reports, and evaluations, generated by AZtec Research and Consulting during the preparation of the NEPA document shall be done through or with the approval of the Forest Service.

I. The requests for any information, including but not limited to, environmental data, NEPA related documents, reports, and evaluations, needed by AZtec Research and Consulting during the preparation of the NEPA document shall be done by the Forest Service. Privileged information submitted by Brooke Utilities, Inc. shall not be released to the public.

J. To facilitate the development of environmental data and the preparation of the NEPA document, joint meetings between the Forest Service and AZtec Research and Consulting will be held to inform Brooke Utilities, Inc. of the progress of the work. Should any situation indicate the need for a change of direction of the Scope of Work or a change in the conception of the NEPA documentation, then

prior to initiation of such changes, all parties will be informed of the need for change.

K. The Forest Service, AZtec Research and Consulting and Brooke Utilities, Inc. shall attend meetings as necessary with the public, federal, state, regional, and local agencies for the purpose of increasing communications and receiving comments; as the same may be necessary, desirable, or required by law, and insofar as such meetings are relevant to the development and preparation of the NEPA document. All parties will be notified of any pertinent meetings that are scheduled.

L. The parties will establish a detailed schedule that outlines the NEPA documentation preparation process and indicates key milestones for its completion. The parties will attempt to comply with the time frames specified in the schedule, subject to changes in the scope of the project or other conditions beyond the parties' control.

M. No Member of Congress, Delegate to Congress, or Resident Commissioner shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a general corporation for its general benefit.

N. All parties to this agreement do hereby expressly waive all claims against every other party hereto for compensation for any loss, damage, personal injury, or death occurring as a result of the performance of this agreement.

III. PROCEDURES

A. Forest Service Responsibilities.

1. The Forest Service shall designate a single point of contact on all matters concerning NEPA requirements and document preparation.

2. The Forest Service along with AZtec Research and Consulting will develop a public scoping plan in accordance with NEPA, which may include, but not be limited to, public meetings, public review of the project, and analysis of public comments. This plan will include development of a mailing list based on interested and affected publics and participants.

3. All cover letters used to mail information to other agencies and to the public shall be on Forest Service letterhead and shall be signed by the Forest Supervisor or his delegates.

4. AZtec Research and Consulting will be responsible for distribution of any draft and final documents.

5. The Forest Service shall be the recipient of all public comments. Comments will be provided to AZtec Research and Consulting for content analysis and incorporation into the NEPA document.

6. The Forest Service shall approve a project scoping report documenting the products from IRM Steps 5-6, before proceeding to subsequent IRM steps.

7. AZtec Research and Consulting shall provide the Forest Service with opportunities to review and comment on both the draft and final NEPA documents. AZtec Research and Consulting shall be responsible for incorporating all changes to the documents as required by the Forest Service.

8. The Forest Service shall make the final determination on the inclusion or deletion of materials in all instances where relevance the material is in question.

9. The Forest Service will monitor and review the work of AZtec Research and Consulting and Subcontractors to assure NEPA requirements are satisfied. AZtec Research and Consulting will periodically formally report to the Forest Service (and will copy Brooke Utilities, Inc.) on the progress of work, problems encountered, and suggested changes in methodology or schedules for completion.

10. Upon completion of the Environmental Assessment, the Forest Service will write the Decision Notice (or Decision Memo if warranted).

11. The Forest Service shall make available to AZtec Research and Consulting and Brooke Utilities, Inc. all resource inventories and land use information currently on file which cover the project study area for use in preparation of the NEPA document. Disclosure of site locations of sensitive resources (cultural resources and threatened, endangered, and Forest Service sensitive species) is prohibited. This prohibition applies to information provided by the Forest Service and to information gathered by all Contractors, Subcontractors, and Consultants.

B. Brooke Utilities, Inc. Responsibilities.

1. Brooke Utilities, Inc. shall designate a single point of contact on all matters concerning NEPA requirements and document preparation.

2. All costs incurred in connection with the retention of AZtec Research and Consulting and Subcontractors and with the preparation of the NEPA analysis and documentation will be the responsibility of Brooke Utilities, Inc..

3. Brooke Utilities, Inc. shall facilitate the coordination of effort and the exchange of information related to the planning, design, and construction of the Project as they relate to the preparation of the NEPA documentation.

C. AZtec Research and Consulting Responsibilities.

1. Under the direction of the Forest Service, AZtec Research and Consulting will follow the IRM process where applicable to the Project, and the Forest Service manual and handbook for preparation of the NEPA document.

2. AZtec Research and Consulting will participate in preparation of the public involvement plan (see III.A.2), and will conduct public scoping meetings with Forest Service assistance.

3. AZtec Research and Consulting will develop alternatives for Forest Service approval.

4. AZtec Research and Consulting will prepare the project scoping report, correspondence documents.

5. AZtec Research and Consulting will utilize environmental data collected by Brooke Utilities, Inc. its Consultants, or AZtec Research and Consulting's subcontractors to prepare reports and analyses necessary for preparation of both the draft and final NEPA document.

6. AZtec Research and Consulting will have the responsibility for writing, rewriting, printing, and mailing the draft and final NEPA document and all parent or appendix material, for researching and documenting social, physical, and biological information required by the Forest Service, and for preparing materials required in the public involvement plan. This will include performing content analysis on public comments.

7. AZtec Research and Consulting will create and provide to the Forest Service the Project Record and Index as defined under IRM, which shall include, but not be limited to, all data, reports, evaluations, analyses, public comments, responses, meeting notes, etc. This documentation shall be numerically numbered and organized chronologically with a Project Record Index supplied.

IV. TERMINATION

A. Either party to this MOU may terminate the same upon 30 days written notice to the other party. During the 30 day period, the parties will actively attempt to resolve any disagreement.

B. In the event of termination of this MOU, it is agreed as follows:

1. Brooke Utilities, Inc. shall assure that AZtec Research and Consulting provides the Forest Service with the Project Record complete to the date of termination of the MOU.

2. Brooke Utilities, Inc. shall assure that AZtec Research and Consulting submits to the Forest Service a written report on all environmental work and analysis performed prior to termination of the MOU.

C. Liability to AZtec Research and Consulting and Subcontractors for termination shall be in accordance with this MOU.

D. The MOU terminates on approval or denial of a special use permit.

V. MODIFICATIONS

A. This MOU may be modified by the parties hereto by mutually agreed upon written amendment.

B. This MOU will be effective as of the last date signed below.

BROOKE UTILITIES, INC.

By: _____ Date: 8-17-98
Name: ROBERT T. HARDCASTLE
Title: President

U.S. DEPARTMENT OF AGRICULTURE
Tonto National Forest

By: Thomas J. Klabunde Date: 8/19/98
CHARLES R. BAZAN
for Forest Supervisor

Brooke Utilities, Inc.

Customer Service Center • P. O. Box 82218 • Bakersfield, California 93380-2218 • (800) 792-7665 • (800) 748-6981 Facsimile

ROBERT T. HARDCASTLE
(805) 633 7526
RTH2@aol.com

November 19, 1998

Via Facsimile (520) 425-3720

Jerry DeRose
Gila County Attorney's Office
Gila County
1400 East Ash St.
Globe, AZ 85501

Re: ***Pine-Strawberry Water Improvement District ("PSWID")***

Dear Mr. DeRose,

On several previous public and private occasions, I have asked Chairman Matthews of the PSWID, to publicly state PSWID's support or opposition to Brooke Utilities, Inc.'s ("Brooke") proposed Project Magnolia (a water pipeline connecting the communities of Pine and Strawberry). This request has met with resistance for various implausible reasons that appear to be excuses rather than explanations. PSWID's latest reason for not taking a position on this matter is that the Bylaws of PSWID expressly prohibit them from doing so.

My recent review of the current PSWID Bylaws does not find the express prohibition referenced by Mr. Matthews. Further, no inference or indirect prohibition to a statement of position in matters which concern the basic reason for PSWID's original formation are contained within the PSWID Bylaws. It is the opinion of Brooke that PSWID's refusal to express it's position on matters of such critical concern to the communities of Pine and Strawberry is a failure of the present Board and it's Chairman and constitutes sufficient cause for removal from office.

I would appreciate your thorough review of this matter and conclusion with regard to Mr. Matthews' contention that the PSWID Bylaws prohibit the Board from stating a position with regard to such matters.

Jerry DeRose
Gila County Attorney's Office
November 19, 1998

Thank you for your consideration in this matter.

Sincerely,

Robert T. Hardcastle
President

Enclosures (as applicable)

cc: RTH correspondence file
PSWID file
HM, PSWID
DS, JGH, MJ, JB, LK, WM
c:\brookutilities\aformletter

EXHIBIT

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conscientiously address water storage needs for the area based on reasonable numbers. I suspect that the ADEQ standard would yield a much lower amount than my example of what is truly needed for the Pine area as the ADEQ protocol does not have a component to deal with the nature of the water demand fluctuations that the system is clearly subjected to. Solely relying on a storage calculation formula that addresses only minimum standards while not considering the realities of the situation, in my opinion, is an irresponsible water management practice. Further requirements relevant to fire flow are surely applicable; assuming such an addition to the water system was to provide some form of fire protection. However, I am not familiar with the Pine/Strawberry Fire District's storage and flow requirements.

#3.10

a) See 3.9 above.

b) See 3.9 above.

c) This is dependent on many factors such as, land acquisition costs, site preparation costs, tank construction, permitting, and so on. Without a qualified engineer's assessment, the question cannot accurately address this portion of your question.

d) See 3.10c above.

e) See 3.10c above.

3.11 In his surrebuttal testimony, Mr. Ploughe referred to the PSWID commissioned Morrison and Maierle report on several occasions. Though he disagreed with some aspects of the report, it clearly indicates there is reasonable groundwater potential below Pine, even though the author ultimately concludes otherwise. Evidence for this is presented where water level data is shown relevant to a well referred to as the Strawberry Hollow Well in Pine in figure 6-7. The significance of the groundwater elevation at this site was simply overlooked. This data indicates that a well drilled 900-1,000 feet deep, in that area of Pine, AZ, would encounter a deep groundwater source. While the Strawberry Hollow well water level elevation is reported accurately in the report, the subsurface lithology encountered is not. On this same figure, the Strawberry Hollow Well is presented as drilled approximately 200ft. into Precambrian rocks. This is not accurate. The well never encountered the Precambrian rocks and

therefore penetrates as much as 400ft. of the saturated Redwall/Martin aquifer system. In consequence, the Redwall and Martin Formations are thicker and deeper than predicted in the report's figure 6-7. To date, no additional written technical reports have been published with information regarding the Strawberry Hollow Well.

#3.12 In meetings of the Mogollon Rim Water Resources Management Study Technical Committee, Brooke Utilities Involvement was discussed on several occasions. In particular, a need for water usage data from Brookes was identified very early. Mr. Ploughe has attached the meeting minutes of the Technical Committee, where mention of a few of the many attempts to contact Brooke is recorded. Encouragingly, since the December 16th meeting, Ms. Myndi Brogdon of Brooke Utilities has been present and has indicated a willingness to provide needed information. This is much appreciated. Still, to his knowledge, no data has been provided as yet, although Myndi has assured the Committee that some data from Brooke areas other than Pine will be forthcoming.

#3.13 The ultimate source of federal funding for any potential water infrastructure and/or development project is subject to congressional approval and/or action. The BOR Staff is more familiar with the actual specific potential funding mechanisms and types of funding than Mr. Ploughe. However, he is aware that there is pending legislation amending the Small Reclamation Projects Act currently before Congress. It is Mr. Ploughe's understanding that this pending legislation would apply to the region. Again, the BOR staff is more familiar with such specific funding options. The federal process will require a demonstration of need and an assessment of options and their acceptability. The challenge is to identify any large-scale efforts required for presumably viable options such that the needs can be appropriately defined along with an overall assessment of the potential options. The result of such an overall assessment could yield the BOR's (federal) interest should it be large enough in scale to justify a feasibility assessment. This is primarily what the current BOR study will attempt to address. In addition, once the study demonstrates what the viable options are, non-federal funding sources could also be pursued. Such as the States Water Infrastructure Financing Authority, WIFA, or the Greater Arizona Development Authority, GADA. Ultimately, the BOR study is a first step towards potential federal and even State funding options.

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#3.14 See response to #3.11 above.

#3.15 See previous testimony at page 6 lines 4-12, in Mr. Ploughe's surrebuttal testimony submitted December 22nd 2003 and responses to 3.9 and 3.10 above.

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The Payson Roundup

Archived stories

Public has been kept in the dark about PSWID

Tuesday, February 10, 2004

Editor:

I left a meeting of the Gila County Supervisors held in Payson in early September 2003, with the impression that the Pine Strawberry community would be kept informed about Pine Strawberry Water Improvement District (PSWID) business.

Since September, Gila County Supervisors have made no report to the public about the status of PSWID. It is known that a citizen's advisory group has been formed. However, there has been no public announcement about how to contact members of this group, the purpose of this group, and the date and times of meetings. It is known that an attorney and consultant have been hired for PSWID. The public has not been provided with any explanation about why is was necessary to hire these people, nor has the public been told how much is being spent for fees related to these people.

Why are the County Supervisors not providing the Pine Strawberry community with information about PSWID? Isn't it time that the Gila County Supervisors end the secrecy about PSWID affairs and provide an explanation of how they are spending taxpayer money?

Bernice E. Winandy, Pine

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The Payson Roundup

Archived stories

County water meetings should be held in Rim country

Tuesday, February 10, 2004

Editor:

As I am paying taxes to Gila County for the PSWID, I feel it only fair that I have a right to attend the meetings of the PSWID. These meetings should be held within our district so that all citizens, young and old, can observe how, or where, Mr. Christensen and Mr. Nelson are spending our tax dollars.

An audit of the PSWID funds should be brought up to date and submitted to the taxpayers at an open meeting in Pine.

I think the supervisors should look into the devious ways that a few in our district dissolved our board for their personal benefit.

I beg you to reconsider your decision to remove our board and return it to the taxpayers of Pine and Strawberry with an election of a new board immediately. Then, we can continue with the charter of the PSWID to locate another source of water for our community.

We did not form the district to buy out a water company, which, by the way, has been financially able to make this the best functioning water company that Pine has ever had.

Elizabeth D. Kelly, Pine

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The Payson Roundup

Archived stories

'Renegade processes' are taking over

Tuesday, February 10, 2004

Editor:

As a citizen of Pine, Arizona, I am astounded at the direction our PSWID (Pine, Strawberry Water Improvement District) has taken. Since the PSWID board has been shut down and Mr. (Ron) Christensen (County Supervisor) has appointed new members to an advisory board, the PSWID rate payers of Pine and Strawberry have been left out of all decision meetings.

The advisory board includes Ray Pugel, Loren Peterson and several others who are in the Real Estate and Development business.

The "board" has apparently hired an attorney, with the money from PSWID, which are our tax monies, to pursue the purchase of the Pine, Strawberry water companies from Brooke Utilities.

With this action, we, the property owners, will no longer have input, through ACC, over our taxes or rates -- which could include up to $12 million for a buyout and extensive infrastructure improvements.

We will be operating at the whim of the real estate developers and the county supervisors who apparently are biased in favor of this action.

Please don't let us down and allow these renegade processes to continue.

Thank you for your time.

Barbara Privette, Pine

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EXHIBIT

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the alternate strategy of being "just" somewhat less than the cost of hauling water by truck Hardcastle Dt. 27 17-20. In terms of the effects on the current rate-case of errors, misstatements, or wrong information supplied by the Company, the situation of PWCo reflecting the $17,040 in CWIP on records of PWCo makes it clear that sloppy and misleading records consistently occur at PWCo. However, Hardcastle wants to just pass the ownership situation off as an error by stating at Rt. 22 21-23 that "there is obviously a serious error with respect to that listing" and at Rt.23 5-6 that "In other words, our plant detail schedule in the last rate case was mistaken, at least with respect to Project Magnolia". The position of Hardcastle at Rt. 27 7-10 that the District recognizes that Project Magnolia is owned by Brooke Utilities" based on Jones testimony Dt. at 6 and the *Investigation of Groundwater Availability* at 3 is groundless since Mr. Jones and the authors of the study were simply re-stating what PWCo has claimed is their rate hearing application.

#4.1-15 Incorrect Statements Related to Failure of Water Quality/Operating Issues/Reporting Issues: PWCo and SWCo both failed to submit required Consumer Confidence reports (classed as a "major" violations) to ADEQ and they did not report that fact for PWCo at Interrogatory 18. Again, this type response goes to witness credibility and brings into question cost of necessary operational controls or procedures.

#4.1-16 Misuse of the NARUC System of Accounting/Incorrect Classification of Transportation Expenses: PWCo has regularly misclassified expenses in various categories. For example, transportation expenses to be recorded in account #650 (according to the NARUC system of accounts) are to "include all truck, automobile, construction equipment, and other vehicle expenses chargeable to utility operations, except depreciation and insurance." Clearly, wheeling charges do not belong in this account. Three lines above in the NARUC Chart of Accounts on p.120 is the correct account #636 that should be used for "wheeling" charge services provided on a contractual basis, such account titled "Contractual Services-Other." Bourassa admits at Interrogatory 28 that Transportation expenses for the year 2000 were misclassified at the E-2 schedule and that "transportation" has been used to account for the cost of contractual services for wheeling provided by Brooke. The use of the wrong accounting categories adds to confusion, misunderstanding, and improper analysis. Costs of wheeling, done under

EXHIBIT

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

BRIAN C. McNEIL
Executive Secretary

ARIZONA CORPORATION COMMISSION

December 9, 2003

JAY SHAPIRO
DEC 11 2003
ACTION

Mr. Jay L. Shapiro
Mr. Patrick Black
Fennemore Craig
3003 North Central Avenue
Suite 2600
Phoenix, Arizona 85012

Re: Docket No. W-03512A-03-0279 (Pine Water Company Rate Case)

Dear Counselors:

On December 8, 2003, I attended the public comment session in Pine regarding the proposed rate increase for your client, Pine Water Company. I estimate that at least 150 people attended the meeting; many of them provided excellent comments and raised important questions. As the evidentiary record continues to be developed, I would like you to respond to the following key questions raised by various Pine Water customers who provided public comment.

1. Why does not a moratorium exist on new hookups until reliable water sources are secured?

2. Why should customers be required to pay a base monthly service charge during times when no water is available to them?

3. Why should customers residing in areas that have adequate water pressure, such as Portal III, be required to pay charges for hauling additional water supplies?

4. How can the company better communicate the status of its water supply to its customers in an understandable, factual and timely manner?

5. Is the company investigating new groundwater sources? Is the statement "there are no new groundwater sources available" factual? Is a groundwater resource study available to Pine residents?

6. Has the company drilled any new wells or deepened existing wells in the past three years? Does the company plan to drill new wells or deepen existing wells in the imminent future?

7. Would added storage capacity alleviate water supply problems, especially during times of likely disruptions (i.e., holidays, weekends, summertime)?

8. Can meters be read at the same time each month so a customer's bill does not vary from month to month?

I look forward to your responses to these questions.

Sincerely,

Jeff Hatch-Miller
Commissioner

CC: Chairman Marc Spitzer
Commissioner Bill Mundell
Commissioner Mike Gleason
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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-

DIRECT TESTIMONY

OF

THOMAS J. BOURASSA, CPA

EXHIBIT
A-4

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I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Thomas J. Bourassa. My business address is 727 W. Maryland Ave. #12, Phoenix, Arizona 85013.

Q. WHAT IS YOUR PROFESSION AND BACKGROUND?

A. I am a Certified Public Accountant and am self-employed, providing consulting services to utility companies as well as general accounting services. I have a B.S. in Chemistry/Accounting from Northern Arizona University (1980) and an M.B.A. with an emphasis in Finance from the University of Phoenix (1991).

Q. COULD YOU BRIEFLY SUMMARIZE YOUR PRIOR WORK AND REGULATORY EXPERIENCE?

A. Yes. I was employed by High-Tech Institute, Inc., and served as Controller and Chief Financial Officer, prior to becoming a private consultant. Prior to working for High-Tech Institute I worked as a division Controller for the Apollo Group, Inc. Before joining the Apollo Group I was employed at Kozoman and Kermode, CPA's. In that position, I prepared compilations and other write-up work for water and wastewater utilities, as well as tax returns.

In my private practice, I have prepared and/or assisted in the preparation of several water and wastewater utility rate applications, including Vail Water Company, E&T Water Company, Ponderosa Utility Company, Diablo Village Water Company, New River Utility Company, Far West Water & Sewer, Sedona Venture Water and Sewer, Bella Vista Water Company, Rio Verde Utilities, Gold Canyon Sewer Company, Green Valley Water Company, the Town of Oro Valley, and, most recently, Arizona-American Water Company.

II. PURPOSE OF TESTIMONY, SUMMARY AND CONCLUSIONS

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying in this proceeding on behalf of Pine Water Company, Inc. ("Pine Water" or the "Company"). Pine Water is seeking permanent increases in its rates and charges for water utility service.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. I will testify in support of the Company's proposed rates and rate design. My testimony will focus on the revenue requirement, rate base and income statement, cost of capital and proposed return on rate base, as well as the proposed rate design and rates. I am sponsoring Schedules A through F, and H, which are filed concurrently herewith in support of this application. I was responsible for the preparation of these schedules based on my investigation and review of the relevant books and records for Pine Water and my discussions with Company representatives.

Q. HOW WILL YOUR TESTIMONY BE ORGANIZED?

A. My direct testimony is presented in three parts. The first part addresses rate base and income statement. The second part addresses the cost of capital and proposed rate of return. The third part addresses the rate design and proposed rates and charges. I will also testify concerning the other schedules required under the standard filing requirements set by the Arizona Corporation Commission ("Commission").

Q. WOULD YOU PLEASE SUMMARIZE THE COMPANY'S RATE CASE?

A. Yes. The test year proposed by Pine Water is the twelve-month period ending December 31, 2002. The test year as proposed includes pro forma adjustments based on known and measurable data and necessary to obtain a normal or realistic relationship between revenue, expenses and rate base. A return of 10.93 percent

on the Company's fair value rate base is requested. The revenue needed to provide that return for Pine Water is approximately $923,000. The increase in revenues needed to provide that return for Pine Water is approximately $269,000. This represents an increase of approximately 41% over the adjusted and annualized test year revenues.

Q. WHY IS THE COMPANY NOW SEEKING RATE INCREASES?

A. Unfortunately, Pine Water has been faced with severe water supply problems in the past few years as the demands on the limited water supply in the area have increased and Arizona's ongoing drought conditions have persisted. Since its last rate proceeding, Pine Water has experienced almost no growth in revenues from new customers due to the limits on its water supply, while the increased costs associated with augmenting water supplies and operating the system, have exceeded revenues. The ever increasing operating expenses are due primarily to the need to augment water supplies, both through Project Magnolia, described in Mr. Hardcastle's direct testimony, and by hauling water during times of critical shortage, an endeavor that increases operating expenses ten times. In addition, the Company also faces the possibility of having to commit substantial amounts of capital for new plant as ratepayers, Gila County and this Commission call for Pine Water to do even more to address the water supply problems that plague its certificated service area.

Q. BEFORE YOU BEGIN YOUR TESTIMONY ON THE RATE BASE AND INCOME STATEMENT, WOULD YOU PLEASE DESCRIBE THE SCHEDULES LABELED AS A, E, AND F?

A. Yes, all other schedules are discussed in detail below. The A-1 Schedule is a summary of the rate base, adjusted operating income, current rate of return, required rate of return, operating income deficiency, and the increase in gross

revenue. Revenues at present and proposed rates and customer classifications are also shown on this schedule.

The A-2 Schedule is a summary of results of operations for the test year, prior years, and a projected year at present and proposed rates.

Schedule A-3 contains the capital structure for the test year and the two prior years.

Schedule A-4 contains the plant construction, and plant in service for the test year and prior years. The projected plant additions are also shown on this schedule.

Schedule A-5 is a summary of changes in financial position (cash flow) for the prior two years, the test year at present rates, and a projected year at present and proposed rates for those systems.

The E Schedules are based on Pine Water's actual operating results, as reported by Pine Water in the annual reports filed with the Commission. The E-1 Schedule contains the Comparative Balance Sheet data for the years 2000, 2001, and 2002.

Schedule E-2, page 1, contains the Income Statement for the years 2000, 2001, and 2002.

Schedule E-3 contains the Statements of Changes in financial position for the test year and for the two prior years.

Schedule E-4 provides the changes in stockholder's equity.

The E-5 Schedule contains the plant in service at the end of the test year, and one year prior to the end of the test year.

The E-7 Schedules contains Operating Statistics for the year ended December 31, 2000, 2001, and 2002. The operating statistics include the number of customers, and revenue per customer, and pumping power cost per 1,000

gallons of water sold.

Schedule E-8 contains the taxes charged to operations.

The accountant's notes to the financial statements and the financial assumptions used in preparing the rate filing schedules are shown on schedule E-9 and F-4, respectively, in accordance with the Commission's standard filing requirements. The Company does not cause audited financial statements to be prepared, and none are available.

The F-1 Schedule contains the results of operations at the present rates (actual and adjusted), and at proposed rates.

Schedule F-2 contains the summary of changes in financial position (cash flow) for the prior two years, the test year at present rates, and a projected year at present and proposed rates.

The F-3 Schedule has the projected construction requirements for 2002, 2003, and 2004.

Schedule F-4 contains the assumptions used in developing the adjustments and projections contained in the rate filing.

III. RATE BASE AND INCOME STATEMENT

A. Rate Base

Q. WOULD YOU PLEASE EXPLAIN THE RATE BASE SCHEDULES, LABELED AS THE B SCHEDULES?

A. Yes. I will start with Schedule B-5, which is the working capital allowance produced by using the "formula method" of computing the working capital allowance. The Company's requested a working capital allowance is reflected on Schedules B1 and B2.

Q. HAVE YOU PREPARED A SCHEDULE SHOWING ADJUSTMENTS TO THE ORIGINAL COST RATE BASE?

A. Yes. Schedule B-2 shows adjustments to original cost rate base. There is only one adjustment to rate base. This adjustment, labeled as Adjustment 1, increases plant for post test year plant additions that will be completed by the end of 2003.

Q. DO THE PLANT AND ACCUMULATED DEPRECIATION SHOWN ON SCHEDULE B-2 REFLECT THE LAST COMMISSION RATE ORDER?

A. Yes. The plant shown on Schedule B-2 started with the Commission determined plant from the last rate case. Plant additions and retirements since the last test year have been added to and deducted from total plant shown on schedule B-2.

Schedule B-1 is the summary of the fair value rate base which is also reflected on Schedule A-1. The fair value rate base ("FVRB") shown on Schedule B-1 and A-1 is based on the original cost rate base, as adjusted. The Company is requesting the original cost rate base be used as the FVRB in this proceeding.

B. <u>Income Statement</u>

Q. LET'S MOVE ON TO THE INCOME STATEMENT, MR. BOURASSA. WOULD YOU PLEASE EXPLAIN THE ADJUSTMENTS YOU ARE PROPOSING TO THE INCOME STATEMENT AS SHOWN ON SCHEDULES C-1 AND C-2?

A. Schedule C-1 shows the Company's operating income and expenses for the test year, the adjusted test year, and the test year at proposed rates. The details of the adjustments shown on Schedule C-1 are shown on Schedule C-2. The adjustments to operating revenues and expenses were made to obtain a more normal or realistic relationship between revenues, expenses and rate base.

Adjustment 1 removes sales taxes recorded in revenues in the test year from test year revenues.

Adjustment 2 increases revenues to eliminate billing adjustments recorded in revenues during the test year.

Adjustment 3 removes water hauling costs recorded in the test year. These costs will be covered by the Company's proposed adjuster mechanism discussed later in my testimony.

Adjustment 4 decreases operating and maintenance expenses to a level expected in future years dealing with repairs to aging plant and addressing water loss issues. Maintenance expenses increased dramatically from 2001 to 2002 and are primarily the result of repairing system leaks to prevent water loss.

Depreciation expense is annualized in adjustment 5. The proposed depreciation rate for each component of utility plant is on shown on Schedule C-2, page 6. The Company currently has two different rates for its plant. The old Williamson system currently has a composite rate of 2.35% and the old E&R system has a composite rate of 2.62%. The Company is proposing individual rates for each plant account. This produces a composite rate of 3.64% for the test year. The depreciation calculations include plant that is currently under construction and will be completed by December 31, 2003, as well as amortization of the Company's contributions-in-aid of construction.

The adjustment labeled as 6 increases the property taxes based on proposed revenues.

Q. YOU COMPUTED THE PROPERTY TAXES AT PROPOSED RATES?

A. Yes. I used the method employed by the Arizona Department of Revenue - Centrally Valued Properties ("ADOR" or "the Department"). This method determines the full cash value by using twice the average of three years of revenue, plus an addition for CWIP, and a deduction for the book value of transportation equipment.

The assessed value (25% of full cash value) multiplied by the property tax rate results in the property tax. In the instant case, I used the unadjusted revenues

for 2002 (excluding sales tax), the adjusted revenues for 2002, and the revenues at proposed rates.

Q. IS THIS SYNCHRONIZATION OF PROPERTY TAX EXPENSE WITH REVENUES PROPER RATE MAKING?

A. Yes it is. For example, an adjustment of this nature was specifically addressed and approved in Decision No. 60826 (April 13, 1998) for Far West Water Company. Like income taxes, property taxes must be adjusted to ensure that the new rates are sufficient to produce the authorized return on rate base, otherwise the utility faces immediate loss of adequate revenue to cover operating expenses. In contrast, Staff normally proposes that property taxes and resulting full cash value be computed using three historic years. Again, however, this method of computing adjusted property taxes ensures that the utility will not earn its authorized rate of return because property tax expense is a direct function of revenues and will increase as revenues increase.

Q. WHAT ABOUT THE LAG FROM THE TIME THAT NEW RATES CHARGED CUSTOMERS GO INTO EFFECT AND THE DATE THAT THE PROPERTY TAX IS ACTUALLY PAID?

A. If new rates went into effect on January 1, 2003, by way of illustration, the property tax bill based on these new rates would be received around September 2004. However, the Company should be accruing property taxes to match the revenues collected so there will be no mismatch between revenues and expenses. Further, the property taxes resulting from my calculation are based upon a portion of proposed revenues. To properly consider the future impact of the rate increases, I should have computed the proposed property taxes based only on proposed revenues rather than averaging proposed and historic revenues. Consequently, this adjustment is conservative.

Q. PLEASE CONTINUE WITH YOUR DESCRIPTION OF THE INCOME STATEMENT ADJUSTMENTS.

A. Adjustment 7 reflects rate case expense. The costs associated with the instant rate proceeding are amortized over 3 years. I should note that the rate case expense might be viewed as high for a Class "C" water utility. However, this rate proceeding, and the problems the Company faces are extraordinary. For instance, in this rate filing, Pine Water was under Commission order to prepare a new rate design, a customer education program, and a plan for addressing ongoing water supply problems. Pine Water is a small company facing big problems and it cannot seek the relief it needs and meet Commission directives without significant outside assistance, which results in what might be viewed as higher than expected rate case expense for a Class "C" rate case.

Adjustment 8 removes other income and expenses to eliminate their effects on the determination of the revenue requirement.

Adjustment 9 increases interest expense to reflect additional interest from the new debt of $178,000.

Adjustment 10 reduces legal costs during the test year to an amount expected on a going-forward basis. High legal costs have been incurred in recent years and are expected continue as Pine Water deals with continuing water supply issues as well as the defense of its CC&N against Gila County and local development interests intent on increasing development of the Pine area despite the water supply problems.

Adjustment 10 increases office expense for the estimated annual costs of implementing a Customer Education Program. This program, ordered by the Commission in Decision 65435 (December 9, 2002), is part of Pine Water's efforts to educate customers about conservation.

Adjustment 12 increases revenues from the annualization of customers.

Q. DOES THAT CONCLUDE YOUR TESTIMONY ON THE RATE BASE AND INCOME STATEMENT?

A. Yes.

IV. RATE OF RETURN

Q. WHAT IS THE PURPOSE OF THIS PHASE OF YOUR TESTIMONY?

A. I will testify regarding the appropriate overall rate of return to allow Pine Water to provide quality service to its customers while fairly compensating shareholders for their investment. The equity rate of return is adjusted for business risk and/or financial risk. The equity return must provide meaningful interest and debt service coverage, as applicable.

Q. HOW WILL THIS PORTION OF YOUR TESTIMONY BE ORGANIZED?

A. My rate of return testimony is organized as (A) proposed conversion of inter-company payable to long-term debt and equity; (B) summary of the equity return and overall rate of return; (C) discussion of cost of capital in general; (D) Overview of the cost of capital; (E) cost of common equity capital for Pine Water; (F) specific risks faced by Pine Water, and (G) test of financial integrity for Pine Water.

A. Proposed Conversion Of Inter-Company Payable To Equity And Long-Term Debt

Q. PLEASE EXPLAIN THE COMPANY'S PROPOSAL TO CONVERT THE INTER-COMPANY PAYABLE AT DECEMBER 31, 2002 TO EQUITY AND LONG-TERM DEBT.

A. As shown on Schedule E-1, Pine Water has an inter-company payable balance of $533,599 to its parent, Brooke Utilities, Inc. ("Brooke Utilities"), as of December 31, 2002. This liability has grown appreciably since 1999 and has not been paid.

The probability that Pine Water can pay this obligation in a timely manner, even under the proposed rates, is very low. As a consequence, the Company proposes to convert $355,599 and $178,000 of the inter-company payable to equity and long-term debt, respectively. This will relieve some of the financial pressure on Pine Water by eliminating a large portion of the payable altogether and provide for a repayment of the balance over a reasonable period of time. Cost of capital schedules, D-1 and D-2, reflect the proposed conversion.

Q. WHY DOES THE COMPANY OWE THIS SIGNIFICANT SUM TO BROOKE UTILITIES?

A. The amounts owed relate to wheeling charges owed to Brooke Utilities for deliveries of water through Project Magnolia, the water transmission project owned and operated by Brooke Utilities, described in more detail in Mr. Hardcastle's direct testimony. Pine Water has not been able to pay all its operating expenses as well as fund plant additions in the past few years. Operating expenses have exceeded revenues for several years as reflected by operating losses. In order to pay the Company's obligations to others, it did not pay its obligations to Brooke Utilities. In essence, the Company used short-term debt to fund long-term assets (the plant additions), as well as fund its cash flow needs for operating expenses.

Q. WHAT ARE THE PROPOSED TERMS OF THE LOAN?

A. The Company proposes a 5 year note at an interest rate of 10 percent.

Q. IS THE LOAN FOR PLANT?

A. Yes, because the money that could have been paid to Brooke Utilities was used to build plant. Pine Water has added approximately $103,000 of plant since 2000 and will add approximately another $75,000 of plant by the end of 2003.

Q. COULDN'T PINE WATER GET A BANK LOAN AT A LOWER

INTEREST RATE?

A. No, the Company is not credit worthy. Its current financial condition and current cash flow preclude it from finding a willing 3rd party lender. If Pine Water could find a willing 3rd party lender, a loan would be considered high risk and would receive a corresponding high interest rate. Ten percent is not unreasonable and is far less than would be offered by lenders, if one were willing, given Pine Water's current financial condition.

Q. DOES THE CONVERSION OF THIS PAYABLE TO EQUITY AND DEBT IMPROVE PINE WATER'S FINANCIAL CONDITION?

A. Yes. The conversion will eliminate the negative common equity balance and raise it to over $200,000. Further, the loan provides Pine Water the ability to pay over an extended period of time, releasing pressure on its cash flow needs. The debt ratio will be reduced from over 70% to approximately 38%. While this is still a high debt ratio for a small company, it is greatly improved by the conversion.

The current ratio, a measure of liquidity, also improves from .06 to .33. The current ratio is still very low, at the low end of the comparable companies used in my analysis of cost of capital. Anything less than 1.0 is a sign of a firm's inability to pay its obligations in a timely manner. However, under the Company's proposed rates, the current ratio should improve over time to a healthier level.

Q. WILL PINE WATER BE ABLE TO SERVICE THE LOAN?

A. If the Company's proposed revenue increases are approved there would be sufficient cash flow by the time loan repayment begins to meet the obligation.

B. <u>Rate Of Return Summary</u>

Q. WOULD YOU PLEASE SUMMARIZE YOUR RECOMMENDED EQUITY RETURN?

A. Yes. My findings and recommendations are as follows:

- The actual and estimated costs of equity derived from my analysis range from 9.27% for 10.50% for large publicly traded companies for 2003 and 10.50% to 11.50% for the years 2005-2007.
- Pine Water's cost of common equity cannot be calculated because it is not publicly traded.
- Pine Water faces tremendous business and financial risks that cannot be ignored and must be considered in the determination of the cost of equity. These risks demand a significantly higher rate of return compared to large publicly traded water companies.
- In my opinion, the cost of equity for Pine Water should be no less than 12.00% to compensate investors for the risk on their investment.
- The overall cost of capital using a 12.00% cost of equity, after converting the inter-company payable to equity and debt, as proposed, is 10.93%
- In my opinion, the overall cost of capital of 10.93% is required for Pine Water's ability to maintain and support its credit and attract capital necessary to fund the needed water augmentation plant improvements.

The computations for actual and estimated equity returns are summarized on Schedule D-4.1. The methods employed to derive the cost of capital were authorized, actual and projected comparable earnings from Value Line and from the C.A. Turner publication, and the discounted cash flow method. A higher equity return (than the Value Line expected return of 10.50% for 2003), and results of the discounted cash flow method of 9.27% is requested due to the substantial risks faced by Pine Water which is much smaller than the companies from which the 10.50% and 9.27% returns were derived.

The common equity return computations are shown on Schedules D-4

through D-4.24, respectively. A summary comparison of the financial integrity of Pine Water to the seven nationally water companies from Value Line is set forth in Schedule D-4.7. Pine Water is categorized as "Distressed."

C. Discussion Of Cost Of Capital In General

Q. HOW WILL THIS PORTION OF YOUR TESTIMONY BE ORGANIZED?

A. My testimony starts with a discussion of the factors that must be considered in determining an investor's required return, such as risk, and the legal standards that need to be analyzed and met when determining a utility's cost of capital or rate of return. In light of these standards, and after recognition of all risk factors, a rate of return on an original cost rate base was developed for setting rates on a prospective basis, using seven nationally traded water utilities from Value Line, dated January 31, 2003 (from both the standard and the Small and Mid-Cap editions). I have included Southwest Water in my computations to use the same sample group as the Commission Staff. Notably, however, Southwest's amount of revenue from water sales, which is only 41% of the Company's total revenue, while the remaining six water companies derive at least 90% of their revenue from water sales. These seven water companies listed in Value Line are traded on the New York Stock Exchange, the American Stock Exchange, or the NASDQ (National Over-The-Counter Exchange). All are considered "large" utilities, when compared to Pine Water. The market values of the seven water companies range from a high market value of $1.443 billion to $129 million at December 31, 2002.

To test whether the return determined for my sample companies is realistic, attainable and/or sustainable, I examined these seven nationally traded water utilities' financial integrity and compare that to Pine Water.

Q. HAVE YOU PREPARED EXHIBITS TO DEMONSTRATE THE COST OF CAPITAL AND FAIR RATE OF RETURN IN THIS PROCEEDING?

A. Yes. These Schedules are labeled as "D".

Q. HOW DID YOU DERIVE YOUR COST OF COMMON EQUITY?

A. I computed the required investor returns by using Value Line's nationally traded water utilities that have organized trading on national markets to derive investor expected returns using the Discounted Cash Flow method ("DCF"), the rates of return currently being earned by the water companies followed by C. A. Turner, and the authorized rate of returns for these same companies, and the expected rate of returns from Value Line for 2003 and the years 2005 - 2007. Schedules D-4.1 through D-4.6 contain the results of the DCF. Using the water companies listed in the January 31, 2003 Value Line, the DCF method produced an investor expected return on common equity of 9.27% using spot prices at April 16, 2003.

This return has not been adjusted for the magnitude of the risks faced by Pine Water. (*See* Schedule D-4.8). To these unadjusted investor expected returns, risk factors would have to be added. There is a high degree of financial and business risk associated with an investment in Pine Water compared to the nationally traded water utilities. In my opinion, the cost of equity for Pine Water, adjusted for risk, produces an investor expected return of no less than 12.00% on common equity.

Q. PLEASE DESCRIBE HOW YOU COMPUTED THE COST OF CAPITAL USING THE DCF METHOD?

A. In the DCF method, the dividend yield and dividend growth are added to derive the estimated return on common equity.

Q. I NOTE THAT YOU HAVE NOT COMPUTED COST OF CAPITAL BASED ON THE CAPITAL ASSET PRICING MODEL, OR CAPM. WOULD YOU EXPLAIN WHY YOU DID NOT USE THE CAPITAL ASSET PRICING MODEL?

A. The Capital Asset Pricing Model method is producing a very low return due to the Federal Reserve System keeping interest rates extremely low to stimulate the economy. Returns on United States Government debt instruments maturing in 5 years or less are probably at the lowest level that has been seen for a number of years. Unless one uses a long-term government obligation, the results produced by the CAPM method do not appear reasonable.

Q. PLEASE EXPLAIN HOW REGULATORY COMMISSIONS ESTABLISH THE PRICE THAT CONSUMERS SHOULD PAY FOR UTILITY SERVICES?

A. The determination of the prices a utility can charge may be separated into two distinct issues: (1) the relative structure of prices and (2) the overall level of prices. The latter is normally determined first and simply relates to the total revenue that the utility should receive in a given time period and for a given amount of service ("Revenue Requirement"). The former refers to the specific process for determining the rates to be charged various classes and types of customers for the particular services provided. Obviously, these rates should also produce the targeted revenue requirement.

Q. FOCUSING ONLY ON THE REVENUE REQUIREMENT ASPECT, HOW SHOULD RATES FOR A REGULATED UTILITY BE DETERMINED?

A. It is widely accepted that, under regulation, a utility should be authorized to charge rates equal to its cost of service.

Q. HOW IS COST OF SERVICE MEASURED?

A. Cost of service is defined as the sum of: (1) reasonable operating expenses; (2) depreciation and amortization expenses; (3) taxes; and (4) a fair return on the net property valuation. This is summarized in the following simple equation: $r = e + d + t + (p - d)k$ where r represents the total revenue requirement (cost of service);

e represents all allowable operating expenses; d represents depreciation and amortization expenses; t represents taxes; p represents the gross value of the utility's property; d is accumulated depreciation and amortization; and k is the rate of return allowed on the utility company's rate base expressed as a percentage. As the formula suggests, the rate making process is broken down into three separate steps: a determination of the utility's allowable operating expenses (e); identification of the utility's rate base (p - d); and the determination of a reasonable rate of return (p-d)k.

Q. PLEASE ELABORATE FURTHER ON EACH OF THESE THREE STEPS.

A. Historically, two of the three basic steps in the rate determination process have proven to be the most controversial, i.e., net valuation of the utility's tangible property (p - d) and identification of a reasonable rate of return (k). The reasonable operating costs of an efficiently run utility have proven to be somewhat less contentious. Often, however, there is considerable disagreement between utilities and regulatory bodies regarding what represents reasonable costs of doing business as well as how certain costs should be calculated and/or allocated.

Q. WHY HAS THERE BEEN SO MUCH CONTROVERSY WITH RESPECT TO THE VALUATION OF UTILITY PROPERTY?

A. Because the valuation of plant and equipment is the largest component of rate base. Accordingly, the method of measurement becomes a critical issue to the utility since its cost of service or total revenue requirement, other things remaining the same, increases directly with the size of its rate base.

Q. WHAT PRINCIPAL VALUATION METHODS MAY BE APPLIED TO A UTILITY'S PROPERTY IN ORDER TO MEASURE THAT COMPONENT OF RATE BASE?

A. Essentially, there are three valuation methods that have historically been used: (1)

actual or historical cost less depreciation; (2) reproduction cost new less depreciation ("RCND"); (3) and fair value. Historical or actual cost includes both the construction and acquisition cost of the properties. RCND is the cost of duplicating the existing plant and equipment at current prices, less depreciation. Fair value is a composite method which could consider both actual cost and RCND. Arizona is a fair value jurisdiction. The fair value method originated following the decision of the United States Supreme Court in *Smyth vs. Ames*, 169 U.S. 466 (1898), which was the law of the land at the time Arizona achieved statehood. Thus, this doctrine became embodied in the Arizona Constitution (Article 15, Section 14). In the instant case, Pine Water is only filing an original cost rate base. That is, the fair value of the investment (the original cost of the plant, less the accumulated depreciation plus/minus other additions and deductions to the Company's rate base, that is being used to provide service to the Company's customers is entitled to a fair return. As original cost is be used for fair value that return should be a fair and reasonable return on the equity investment and the debt investment used to finance the Company's rate base.

Q. WHAT IS THE SIGNIFICANCE OF THESE THREE METHODS?

A. Each of these methods of evaluation would yield approximately the same result if nominal factor input prices were constant over time. However, price stability has not been the rule throughout most of this century. As a result, this factor alone accounts for much of the controversy over the appropriate valuation of tangible property.

The effect of price instability on the method of valuation may be illustrated as follows. Assume that actual historic cost is the selected method of valuation in a period that is marked by inflation. The most obvious effect is that during this inflationary period, other things remaining the same, the use of original cost rate

base results in a declining real rate of return. This is true because, as inflation progresses, a return that remains constant in dollars represents less purchasing power than before the increase in prices. In those circumstances, both common stockholders and bondholders are affected. The common stockholder may suffer a decline in the real value of his or her investment. Moreover, dividends will be paid in dollars with less purchasing power than that of the dollars invested. Similarly, bondholders in a period of inflation would be affected both because bond coverage would not rise as it would in a non-regulated industry and because principal and interest payments will be made in "cheaper" dollars.

Q. I REALIZE THAT YOU ARE NOT AN ATTORNEY, BUT COULD YOU DESCRIBE THE HISTORICAL CONTROVERSIES CONCERNING RATE BASE AND HOW THEY WERE RESOLVED?

A. Yes. In a landmark United States Supreme Court decision, *Federal Power Commission vs. Natural Gas Pipeline Company*, 315 U.S. 575 (1942), the Court ruled that the U.S. Constitution did not require regulatory agencies to use any one formula or combination of formulae in the rate making process. A majority of the Court held that it was the result reached, not the method employed, that was controlling. In other words, it was not the theory, but the impact of the rate order that counted for Constitutional purposes. Later, in *FPC v. Hope Natural Gas*, 320 U.S. 591, 603 (1944), the Court underlined and amplified this "end result" doctrine stating that:

> The fixing of just and reasonable rates involves a balancing of the investor and the consumer interests. The investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue for not only operating expenses, but also for the capital cost of the business. These include service on the debt and dividends on the stock. By that standard, the return to the

> equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return moreover, should be sufficient to assure confidence to the financial integrity of the enterprise so as to maintain its credit and to attract capital.

This clarified the earlier opinion of the Court in *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-93 (1923):

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments on other business undertaking which are attended by corresponding risks and uncertainties. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management to maintain and support its credit and enable it to raise money necessary for the proper discharge of its public duties.

Taken together, the *Natural Gas Pipeline*, *Hope Natural Gas* and *Bluefield Water Works* decisions provide the foundation for virtually all later cases dealing with the issue of rate of return. In summary:

1) The rate of return should be similar to the return in businesses with similar or comparable risks;

2) The return should be sufficient to ensure confidence in the financial integrity of the utility;

3) The return should be sufficient to maintain and support the utility's credit; and

4) The return should enable the utility to attract capital necessary for the proper discharge of its duties.

Q. YOU CITED THE HOPE CASE IN YOUR RESPONSE TO MY LAST

QUESTION. IS THE HOPE CASE'S "END RESULT" TEST CONSISTENT WITH ARIZONA LAW?

A. No, due to the fair value requirements set forth in the Arizona Constitution, as cited in the *Simms v. Round Valley Light & Power* case.

Q. HOW HAVE THESE TESTS OF REASONABLENESS BEEN APPLIED IN REGULATORY PROCEDURES?

A. As practitioners in the field know, the application of the "reasonableness" criteria laid down in these Supreme Court cases has resulted in new areas of controversy. For example, the increasing regulatory emphasis on objectivity in determining rate of return has resulted in a proliferation of quasi-mechanical techniques and formulae for use in rate of return determination. As will be discussed more fully below, none of the techniques introduced has been universally accepted.

While there is no consensus regarding the best method of measuring return, there is general agreement that the cost of capital is the most acceptable basis for determining a fair rate of return on an original cost rate base. The method of computing the cost of capital is quite straight-forward: it is the composite, weighted cost of the various classes of capital (debt, preferred stock, common equity, and retained earnings) used by the utility. The weighting is done by calculating the proportion that each class of capital bears to total capital. The capital cost concept is a direct application of the judicially enunciated capital attraction/financial integrity test and is based upon the theory that the utility should be allowed a rate of return sufficient to maintain the financial integrity of the enterprise and to allow the utility to attract new capital when necessary.

D. <u>Overview Of The Cost Of Capital</u>

Q. COULD YOU BRIEFLY COMMENT ON THE ECONOMIC AND FINANCIAL STANDARDS GOVERNING THE COST OF CAPITAL?

A. The cost of capital to an enterprise at any given time is the result of supply and demand forces, both general and firm specific, economic and business conditions, prospects for inflation, and individual judgments regarding alternative opportunities in the marketplace where capital is hired. If, in the opinion of those who save and commit capital, the prospective return from a given investment is not equal to that from other investments of corresponding risk, the capital will tend to be shifted to the other investments. In this way, the free market system promotes an efficient allocation of scarce resources by directing capital, through appropriate pricing signals, to its most productive uses. Therefore, the cost of capital is an opportunity cost. It is the prospective return to investors from investments of similar risk. This alternative return or opportunity cost is, by definition, the utility's cost of obtaining and maintaining its capital.

Q. IS THE COST OF CAPITAL OR OPPORTUNITY COST CONCEPT YOU DESCRIBED CONSISTENT WITH THE LEGAL CRITERIA GOVERNING THE FAIR RATE OF RETURN?

A. Yes. The cost of capital should be commensurate with the return being realized on alternative investments of corresponding risk and is ordinarily sufficient to promote and maintain confidence in the financial integrity of the utility and to sustain its credit. Furthermore, it is also consistent with the competitive value standard, which states that public utility regulation should attempt to approximate the financial conditions that would exist under competitive conditions, particularly the profits that would be earned if the industry were competitive.

Q. HOW IS THE COST OF CAPITAL FOR A PARTICULAR UTILITY DETERMINED?

A. The measurement of a utility's cost of capital is a complex topic. It requires an analysis of the factors influencing the cost of various types of capital, i.e., interest

on long-term debt, dividends on preferred stock, and earnings on common stock equity. Each of these sources of funds has a cost. The unit cost of the various component sources of capital is an important input into the calculation of a utility's overall cost of capital.

The data for such an analysis comes from the capital market where the firm raises funds by issuing common stock, selling bonds, and by borrowing (both long and short term) from banks and other financial institutions. In the highly competitive capital markets, the cost of capital, whether the capital is in the form of debt or equity, is determined by two important factors:

1) The pure or real rate of interest, often called the risk-free rate of interest; and

2) The uncertainty premium (the compensation the investor requires over and above the real or pure rate of interest for subjecting his capital to uncertainty).

The pure rate of interest essentially reflects both the time preference for, and the productivity of, capital. From the standpoint of the individual, it is the rate of interest required to induce the individual to forego present consumption and offer the funds thus saved to others for a specified length of time. Moreover, the pure rate of interest concept is based on the assumption that no uncertainty affects the investment undertaken by the individual, i.e., there is no doubt that the periodic interest payments will be made and the principal returned at the end of the time period. In reality, investments without risk do not exist. Every commitment of funds involves some degree of uncertainty. U.S. Government obligations, however, may at times approach something like a risk free rate of interest. It must be pointed out, however, that U.S. Treasury obligations are only "risk free" in the sense that they are hopefully free of default risk. Holders of

these obligations still face the dangers of purchasing power loss (inflation risk) and the loss of capital values if real interest rates rise (interest rate risk).

Turning to the second factor affecting the cost of capital, it is generally accepted that the higher the degree of uncertainty, the higher will be the cost of capital. This comes from the fact that investors are perceived to be risk adverse and require that the rate of return increase as the risks (uncertainty) of an investment increase.

Q. HOW DOES THE RISK-RETURN TRADE-OFF CONCEPT WORK IN THE CAPITAL MARKET?

A. As I have already suggested, the allocation of capital in a free market economy is based upon the relative risk of and expected return from an investment. In general, investors tend to rank investment opportunities in order of their relative risk occurrence. Investment alternatives where the expected return is commensurate with the perceived risk become viable investment options. If all other factors remain equal, the greater the risk, the higher the rate of return investors will demand to compensate for the possibility of loss of either the principal amount invested or the expected annual income from such investment.

Q. WOULD YOU PLEASE DISCUSS IN MORE DETAIL THE IMPACT OF RISK ON CAPITAL COSTS?

A. Yes. With reference to specific utilities, risk is often discussed under two separate headings, the first being business risk and the second being financial risk.

Business risk, the basic risk associated with any business undertaking, is the uncertainty associated with the enterprise's day-to-day operations. In essence, it is a function of the normal day-to-day business environment, both locally and nationally. Business risks include the condition of the economy and capital markets, the state of labor markets, regional stability, government regulation,

technological obsolescence, and other similar factors that may impact demand for the business product and its cost of production.

Another risk utilities face is the ever-changing regulatory climate. Water utilities are subject to strict regulation because of the health and risks associated with their operations. The environmental rules are continually changing, as the Environmental Protection Agency is charged with determining new contaminants, and reevaluating the existing standards.

Q. PLEASE CONTINUE.

A. The greater the degree of uncertainty regarding the risk factors, the greater the risk. The greater the risk, the greater the compensation required by the investor for her or his investment. Moreover, the smaller the utility, the greater the impact on net income.

Financial risk, on the other hand, concerns the distribution of business risk to the various capital investors in the utility. As discussed earlier, permanent capital is normally divided into three categories: long term debt, preferred stock, and common equity. Because common equity owners have only a residual claim on earnings after debt and preferred stockholders are paid, financial risk tends to be concentrated in that element of the firm's capital. Thus, a decision by management to raise additional capital through the issue of senior debt concentrates even more of the financial risk of the utility onto common equity owners.

Although usually discussed separately, the two types of risks are interrelated. Specifically, a common equity investor may seek to offset exposure to high financial risk by investing in a firm with a perceived low degree of business risk. In other words, the total risk to an investor would be high if the enterprise was characterized as a high business risk with a large portion of its

permanent capital financed with senior debt. To attract capital under these circumstances, the firm would have to offer higher rates of return to its common equity investors.

Q. IS THERE A RELATIONSHIP BETWEEN A UTILITY'S CAPITAL STRUCTURE AND ITS COST OF CAPITAL?

A. Generally, it is well understood that when a firm engages in debt financing, it exposes itself to risks that, once debt becomes significant relative to the total capital structure, increase in a geometric fashion compared to the linear percentage increase in the debt ratio itself. This risk is illustrated by considering the effect of leverage on net earnings. For example, as leverage increases, the equity ratio falls. This creates two adverse effects on the investor. First, equity earnings decline rapidly and may even disappear. Second, the "cushion" of equity protection for debt falls. A decline in the protection afforded debt holders, or the possibility of a serious decline in debt protection, will act to increase the cost of debt financing. From the above example one may conclude that each new financing, whether using debt or equity, effects the marginal cost of future financing by any alternative method. For a firm that is already believed to be too highly leveraged, this additional borrowing would cause the marginal cost of both equity and debt funds to increase. On the other hand, if the same firm were instead to employ equity funding, this could actually reduce the real marginal cost of additional borrowing, even if the particular equity issuance were at a higher unit cost than an equivalent amount of debt.

The theoretical optimum ratio of debt to equity in the capital structure will vary considerably from one industry to another and, to a very significant extent, among companies within a given industry, based on size of the utility and its ability (or inability) to attract capital. This variability complicates the problem of

establishing criteria to serve as guides in postulating a theoretical optimum financial structure. As a result, it is necessary to settle for broad general principles rather than rules of precision. With respect to utilities, an appropriate rule of thumb might be as follows:

1) The capital structure for a given utility should fall within a reasonable range given the utility's particular circumstances. If the capital structure approximates the industry range, it is within a range of reasonableness and no additional test is necessary, especially if both firm-specific business and financial risks have been taken into consideration in selecting the industry range of capital structures.

2) A theoretically balanced capital structure is one which will provide debt with adequate protection, yet contains enough leverage to produce equity earnings sufficient to attract new equity capital (but not so large a degree of leverage as to introduce earnings instability and render equity investment speculative). For smaller utilities, financial leverage often has detrimental impacts with very slight increases in expenses. As a consequence, smaller utilities cannot support the same percentage of debt in their capital structure as a larger utility.

Q. FROM YOUR TESTIMONY, I WOULD CONCLUDE THAT THE TERMS "RISK" AND "UNCERTAINTY" HAVE THE SAME MEANING. IS THAT TRUE?

A. Technically, no. Risk is susceptible to measurement and thus to predictability within the limits of probability analysis. Risks such as death, fire, illness, etc., are readily insured against when large numbers are used. Uncertainty, on the other hand, is not susceptible to measurement and thus cannot be predicted and insured against. It is uncertainty, in this sense, which is the basis of competitive profits and that which the investors weigh in establishing their required return. Investors

consider and analyze the various factors that impact the uncertainty of an investment. Based on their subjective evaluation of the relative uncertainty associated with alternative investments, they select the most desirable investments in terms of expected returns or profits. In regulatory proceedings and by common convention, however, the two terms are used interchangeably, and I will follow this convention in my testimony.

Q. WOULD YOU BRIEFLY DESCRIBE THE APPROACH YOU FOLLOWED IN YOUR COST OF CAPITAL STUDY?

A. As previously noted, the proper measure of the cost of capital to a firm or the fair rate of return on capital is the opportunity rate of return on investments of equivalent risk. Thus, the development of an appropriate return for a regulated enterprise involves, first, a determination of the level of risk associated with that enterprise and, second, the calculation of the return appropriate to that risk level. This return must allow the utility to attract new capital when necessary, without diluting the financial positions of current investors.

There are several elements to determining firm-specific risk. The capital structure of the utility will be evaluated in terms of its impact upon the financial risk of the enterprise and on equity investors in particular. Some of the factors that have an impact on business risk in that industry will also be examined. The next step will be to analyze the various components of capital cost to the company. The final step will compare the company's capital structure to those of the selected comparison group. Based on what is determined to be an appropriate capital structure, an overall cost of capital or rate of return for the company will be determined. This expanded capital structure will consist of the traditional long-term debt and equity, plus advances in aid of construction, contributions in aid of construction, deferred investment tax credits and deferred income taxes. (*See*

Schedule D-4.13).

E. <u>Cost Of Common Equity Capital For Pine Water</u>.

Q. HOW IS THE COST OF COMMON EQUITY DETERMINED?

A. A variety of techniques and methods are presently employed by analysts in estimating the cost of common equity. These methods fall into three general categories:

1) Subjective analysis;
2) Comparative analysis; and
3) Financial theory models.

Q. BRIEFLY DESCRIBE EACH OF THE THREE APPROACHES TO RATE OF RETURN ANALYSIS.

A. The subjective approach to estimating the cost of common equity is generally based upon experience in the financial markets and an "intuitive" feel for capital cost. In general, the subjective approach is much less precise than the other two methodologies and, therefore, is a less useful approach than the alternatives. The comparative earnings approach to the determination of common equity cost is a direct outgrowth of the seminal judicial opinions on rate of return. The *Bluefield* opinion suggests that opportunity cost, as defined in the economic literature, is the appropriate measure of the actual cost of common equity for a regulated utility. The proper application of this technique involves the direct observation of market returns, an assessment of the persistence of those returns, and an evaluation of the risk accepted to earn that return. Financial models are a relatively recent addition to the regulatory process. The use of these models involves the application of quantitative techniques to risk and return measurement.

Q. YOU STATED EARLIER THAT YOU USED SEVEN NATIONALLY TRADED WATER COMPANIES FROM VALUE LINE TO DERIVE A

COST OF EQUITY USING THE DISCOUNTED CASH FLOW METHOD. WHY ARE YOU USING THESE COMPANIES AND NOT PINE WATER ITSELF?

A. The DCF method measures the dividend yield and the growth in dividends expected by investors to derive the investor expected or required return. Calculating dividend yield requires some measure of market price for the utility's common stock. There is no market price available for Pine Water's stock because its stock is not publicly traded.

Q. HOW DID YOU DETERMINE THE COST OF EQUITY FOR PINE WATER?

A. Using the seven water utilities published by Value Line, I used the estimate of what investors in nationally traded water utility common stock should expect based on Value Line's projected equity return. Because Value Line is widely read, it provides an excellent indication of investors' expectations. I also computed the returns using the Discounted Cash Flow method and I relied on the return data published by C.A. Turner Utility Reports.

Q. HAVE THESE SAME SEVEN WATER COMPANIES AND THE DISCOUNTED CASH FLOW METHOD BEEN USED BY STAFF TO DERIVE THE INVESTOR EXPECTED RETURN ON COMMON EQUITY?

A. Yes. Staff has used these seven water utilities in other rate proceedings. Staff has also used the Discounted Cash Flow method to derive the common equity return. Additionally, Staff is now using the Value Line growth estimates as a part of a series of growth rates to estimate the return on common equity.

Q. WOULD YOU DESCRIBE THE DCF METHOD AND HOW IT CAN BE USED TO DERIVE THE INVESTORS' REQUIRED RETURN ON

1 **EQUITY?**

2 A. The dividend yield is the first component of the DCF method. It is defined as the
3 expected annual dividend (the next dividend) divided by the present market price
4 of the stock. To compute the dividend yield, I divided the actual dividend by the
5 "spot prices" of the stock prices as of April 16, 2003. The resulting dividend yield
6 was then multiplied by the dividend growth rates. I computed some of growth
7 rates and used the growth rates as published by Value Line to derive the expected
8 dividend yield. Additionally, I reviewed the average of the 52-week high and low
9 prices, as well as prices at February 28, 2003, and March 31, 2003. The prices for
10 the 52-week high and low approximately matched the April 16, prices. The prices
11 at February 28, and March 31, 2003 were lower than the prices at April 16, 2003.

12 **Q. IS THIS THE SAME METHOD THAT IS USED BY STAFF TO**
13 **COMPUTE EXPECTED DIVIDEND YIELD?**

14 A. Yes, Staff multiplies the actual dividend yield by 1 plus the dividend growth
15 estimate to derive the projected dividend yield. However, Staff favors spot prices,
16 thus I am using spot prices to minimize dispute.

17 **Q. PLEASE CONTINUE.**

18 A The expected dividend growth is the other component in the Discounted Cash
19 Flow method. The investor in utility common stock anticipates regular growth in
20 the annual dividend. This is compensation for the additional risk the common
21 stock investor assumes. The returns were then averaged to measure the overall
22 market for water companies.

23 **Q. WHAT IS THE DIVIDEND GROWTH FACTOR?**

24 A. The dividend growth factor is the growth in the dividends per share from one
25 period to another period. I used the average of (1) actual 5-year earning per share
26 growth, projected earnings per share growth; (2) 5-year actual dividend per share

growth; (3) projected dividend per share growth rate; (4) 5-year intrinsic growth rates; and (5) projected intrinsic growth rates to derive the growth rate.

Q. WOULD YOU PLEASE DESCRIBE HOW THE ABOVE GROWTH RATES ARE COMPUTED?

A. Yes. The actual 5-year earnings per share growth rate is from Value Line. The growth rate is an average of all the water companies. There was no number listed for Middlesex Water, so I computed a growth rate for that company.

The projected earnings per share growth rate is also from Value Line. The five year projection is only available for American States Water, California, and Philadelphia Suburban.

The 5-year dividend growth rate is also from Value Line. This measures the change in dividends (the growth) during the 5-year time frame.

Value Line uses the 1999 - 2001 dividends, as the basis for its projection of dividend growth to 2005 – 2007. The five year projection is only available for American States Water, California, and Philadelphia Suburban.

The 5-year intrinsic growth rate is basically the earned return on equity multiplied by the retention rate (earnings, not paid out as dividends), with a computation of the market value to the most recent stock market price, plus an addition for stock sales by the water companies. This is just a modification of the equity earning percentage times the retention ratio.

The projected intrinsic growth rate is basically the same as the 5-year intrinsic growth rate, with Value Line's estimated book value growth rate used. The projections are only available for American States Water, California, and Philadelphia Suburban.

Q. WHAT IS THE COST OF EQUITY FOR THE VALUE LINE GROUP OF WATER UTILITIES USING THE DISCOUNTED CASH FLOW

METHOD?

A. An investor in these water companies can expect to achieve an unadjusted return of 9.27% without the company-specific business risk associated with Pine Water. However, there is a major problem with the discounted cash flow method. The shares of stock in the smaller water utilities in the Value Line comparable companies are selling at higher prices due to the possibility of being acquired by the larger water utilities, or foreign entities.

Q. IS THE 9.27% RETURN PRODUCED BY THE DISCOUNTED CASH FLOW METHOD BASED ON ONE SHARE OF STOCK FROM EACH COMPANY?

A. Yes, I used one share of stock from each company. Measuring the return on one share of each of the evaluated water utilities results in the use of the portfolio approach, which is favored by Staff. Again to minimize dispute, I will use Staff's approach.

Q. WHAT RETURNS ARE BEING EARNED BY THE WATER UTILITIES FOLLOWED BY C.A. TURNER?

A. The water utilities followed by C.A. Turner are currently earning an average of 11.07% on equity, based on the published April 2003 data. The authorized rate of return is an average of 10.50%.

Q. WHAT RATES OF RETURN IS VALUE LINE PROJECTING?

A. Value Line projects a return for 2003 of 10.50%, and 11.50% for 2005 to 2007.

F. <u>Pine Water Specific Risks</u>

Q. WHAT RATE OF RETURN DO YOU CONCLUDE AN INVESTOR IN PINE WATER WOULD REQUIRE?

A. An equity or debt investor in a water utility such as Pine Water would not accept a return computed using the unadjusted return produced by the discounted cash flow

or comparable earnings methods because of the number of additional risks faced by the Company. These risks include:

- Inability to construct the necessary water plant (lack of internal cash flow to fund plant additions) and pay dividends;
- Low depreciation rate, coupled with a very high percentage of the Company's plant financed with contributions in aid of construction, further lowering the depreciation expense collected from customers.
- High financial risk due to substantial financing of plant with contributions in aid of construction.
- Service territory located in an area with severe water supply problems and coupled with a State wide drought, substantially impacts water sales from year- to- year. Water supply severely limits customer growth and growth in revenues. In addition, the Commission may not accept an adjustment to water sales to reflect a "normal" water supply year. Thus, depending on the water supply in the test year, the Company can expect to sell more or less water in the ensuing years. In the case of Pine Water, until a solution to the water supply problem can be addressed, the water sales in the instant test year for all intent and purposes is at or near the maximum. So, growth in water sales is unlikely to out pace growth in operating expenses. Thus, the rate of return proposed in the instant case may never be realized.
- High financial risk due the amount of financing needed to fund future plant requirements to address the water supply problems. As the Water Supply Augmentation Plan (Direct Testimony of Robert T. Hardcastle, Exhibit B) shows, substantial amounts of capital will need to be raised to explore new water resources with no guarantee that such investment will yield "wet" water. Much of this will need to be raised through long-term debt and/or

equity. With additional long-term debt, there will be increased financial risk to the stockholders. With additional equity investment, whether new or residual (retained earnings), investors will be faced with a significant risk of not earning a return on the additional capital because it is not clear which projects will be successful. The reason for this is that significant amounts of the firm's capital will have to be invested just to find out which projects to build, if any. Again, the projects may have only a marginal impact on water supplies.

- Use of a historic test year versus a forecasted test year.
- Increasing regulatory requirements imposed by U.S.E.P.A. and the Arizona Department of Environmental Quality, and rapidly changing regulatory recommendations by Staff.
- Small size. Pine Water would not even be considered a micro cap stock, if the stock were traded on an organized market, which makes financing much more difficult and expensive.
- Small size also makes the inconsistent regulatory climate much more expensive (impact on net income of a small utility compared to a "large" utility).
- Lack of ready access to capital markets.
- Inability to collect property taxes that actually will be incurred.
- Lack of diversification (e.g., multiple service areas and multiple regulatory bodies).
- Inability to pay dividends. An investment in the nationally traded water utilities results in dividends, or a cash return today. An investments in the Company results in calls for more investment.

Put simply, Pine Water is a very small business when compared to the

Value Line water utilities and the C.A. Turner water utilities. Its small size, limited revenues and cash flow, small customer base and lack of diversification (e.g., multiple service areas and multiple regulatory bodies), coupled with substantial resources and operational limitations, create significant business risk. This additional risk must be accounted for in determining the investor expected rate of return on common equity for Pine Water.

Q. DID YOU EXAMINE THE DIVIDENDS BEING PAID BY THESE NATIONALLY TRADED WATER COMPANIES TO THE BOOK EQUITY OF THESE SAME COMPANIES?

A. Yes, as a measure of the reasonableness of the equity return I am recommending. For the years ended 2002, 2001, and 2001, the dividends per share as a percent on per share book equity was 6.70%, 6.95%, and 7.03%. If you divide these returns by the payout ratio, you get rates of return of 10.15%, 9.92%, and 9.82% for 2002, 2001, and 2000.

Q. DOES THIS COMPUTATION MEASURE MARKET RETURNS?

A. No, but considering that I am recommending a return of 12.00% on a much riskier investment, Pine Water, the 10.15% return on equity confirms that the 12.00% requested return is reasonable and actually below what should be expected.

G. <u>Test Of Financial Integrity For Pine Water</u>

Q. DID YOU EXAMINE FINANCIAL DATA TO DETERMINE THE FINANCIAL INTEGRITY OF THE SEVEN NATIONALLY TRADED VALUE LINE WATER UTILITIES, WHICH YOU TERM THE "COMPARABLE COMPANIES?"

A. Yes. I examined dividends as a percentage return on book equity, interest coverage, earning retention ratios, dividend pay-out ratios, capital structures financing net plant (which include common and preferred equity, debt, advances

and contributions in aid of construction, and deferred income taxes), market to book ratios, the ratio of cash flow to change in gross plant, internal generation of cash as a percent of debt, safety margin, compound earnings growth, compound growth in book value, price earnings ratio, and earned returns on average common equity.

I computed the test of financial viability from Viability Policies and Assessment Method for Small Water Utilities, published by the National Regulatory Research Institute in June 1992 for both the Value Line companies and for Pine Water before and after the proposed conversion of the inter-company payable to debt and equity.

Both Pine Water's pre-conversion score and post-conversion score is lower than the comparable companies' scores. In fact, while there is improvement in the score after conversion, both scores are categorized as "Distressed." The reasons are due to fact that the Company has not paid a dividend on it stock, as the comparable water utilities have, and the fact that the common equity and retained earnings at the end of the test year are negative. The dollar amount of retained earnings substantially decreases Pine Water's final scores.

Q. PLEASE DESCRIBE THESE VARIOUS RATIOS AND THEIR SIGNIFICANCE IN MEASURING THE RELATIVE RISK OF AN EQUITY INVESTMENT?

A. The dividend as a percentage of book equity tells the investor the "cash return" percent return on book equity. This could be termed the rent on the funds the investors have provided. The dividend over the three year period has been as high as 7.10% and as low as 6.98%. The average has been 7.05%. Pine Water has never paid a dividend. Note that the computation using total equity and total dividends paid results in slightly different "cash return" than if the equity and

dividends are computed on a per share basis.

The interest coverage tells the debt investor the degree of risk to the timely receipt of interest payments. Schedule D-4.10 shows that the comparable companies have a pre-tax interest coverage of 3.33 to 1 for 2002, with an average coverage of 3.290 to 1 for the period 2000 to 2002. Pine Water had an interest coverage of a negative 30.82 for 2002, and an average interest coverage of negative 18.37 to 1 for the period 2000 to 2002.

The earnings retention ratio (shown on Schedule D-4.11) indicates how much of the current earnings have not been paid out in the form of dividends. This gives analysts/investors the ability to assess the chances of a dividend increase. A high retention ratio (low dividend pay-out ratio) for a utility indicates possible increased dividends in the future. The reinvestment of earnings also strengthens the common equity component of the capital structure lessening the financial risk. Schedule D-4.11 shows that the ratio has increased from 2000 compared to 2002 for the comparable companies. This ratio will be improved by rate increases, which lead to higher earnings and a higher retention ratio. Pine Water had a retention of 100% for all years, as it has never paid a dividend.

One minus the retention ratio results in the dividend pay-out ratio. The dividend pay-out ratio data is shown on Schedule D-4.12. The pay-out ratio has decreased from to 2000 to 2002. This would indicate that a dividend increase is possible. Pine Water's dividend pay-out ratio is zero, as the Company has not paid a dividend.

The comparable companies and Pine Water's capital structures (financing net plant) are shown on Schedule D-4.13. They tell the analyst/investor how each utility is financing its net plant. For the comparable companies, equity is approximately 32.52% of total capitalization (common and preferred equity) in

2002. The balance, or 67.48%, is financed by long-term debt, deferred income taxes, advances in aid of construction and contributions in aid of construction.

For Pine Water, the test year common equity before conversion equals a negative 34.96% of total capitalization, with the balance of 134.96% being financed with long-term debt and deferred credits at December 31, 2002. After conversion, common equity equals 21.29% of total capitalization, with the balance of 88.71% being financed with long-term debt and deferred credits. The deferred credits represent advances and contribution in aid of construction. The majority of the deferred credits are contributions in aid of construction, which get no return or depreciation recovery from customers. For the test year before conversion, Pine Water has over 4 times the deferred items financing the rate base as do the comparable companies. After conversion, Pine Water still has well over 1 1/2 times the deferred items financing rate base as the comparable companies. As the infrastructure wears out, the Company has to fund its replacement. This creates very high financial risk.

Page 3 of Schedule D-4.13 shows the impact of the financing of rate base with contributions in aid of construction. Assuming that an equity return of 12.00% was granted, the comparable companies would require an overall rate of return of 6.74% versus Pine Water's rate of return of a negative 2.82% before conversion and 4.52% after conversion. Even if you gross-up the equity returns for income taxes, the difference in the rates of return is substantial, and highlights the additional risk of the Company.

The market to book ratio shown on Schedule D-4.14 tells the reader how the investment community views the utility's book value per share compared to its market value per share. Water utilities are capital intensive. Therefore, it is reasonable to assume that investors realize that the book value of the assets is

considerably less than the current replacement value. It follows that common stock should be expected to sell at a premium compared to book value. Furthermore, stock must sell above book value to avoid dilution to the existing stock when additional stock is sold. At the end of 2002, the ratio of market to book is approximately 210%. The computations are shown on Schedule D-4.14. The Company's stock is not traded publicly, and thus computations are not shown.

Q. PLEASE CONTINUE.

A. The ratio of cash flow to change in gross plant tells the investor how much of the utility's plant additions are financed internally by earnings and depreciation. Additionally, this ratio indicates the possibility of a dividend increase, if there is excess cash flow. The seven comparable companies have internally generated funds accounting for approximately 64% of plant additions during 2002. As shown on Schedule D-4.15, Pine Water generated a negative 291% of its plant additions in the same manner for the year ended 2002. Again, there is a substantial difference, indicating the risk faced by the Company.

The internal generation of cash as a percent of debt is a measure of how quickly the utility could repay its debt from internal sources, assuming that no additional plant is added from these internal sources. Schedule D-4.16 contains the data for the comparable companies and Pine Water. The three-year average is 18.6% for the comparable companies (2000 to 2002). Pine Water's internal generation is a negative 262% for 2002.

The safety margin, shown on Schedule D-4.17, tells the investor the extent to which sales could decline, or expenses could increase, before the utility would experience a net loss. The three year average for the comparable companies is approximately 18.70%. Pine Water has a safety margin of approximately 1.8% for this same time period. In small water utilities, even slight changes in revenues

and expenses have a major impact on the safety margin. This is the "small size" risk I referred to previously.

The earnings growth allows the investor to determine if the dividend growth can be maintained. As shown on schedule D-4.19, the compound growth has been approximately 6.9% for the period 2000 through 2002, for the comparable companies. As costs of meeting the Safe Drinking Water Act and replacement of plant continue to increase, one can expect the comparable companies to continue to seek rate increases to maintain reasonable earnings. Pine Water's income growth rate was a negative 27.60% for the three year period.

The growth in book value tells the investor the amount of income that is being reinvested or retained in the business to fund needed plant additions, and strengthen the capital structure. This ratio is similar to the earnings retention ratio. Additionally, the book value would grow if the company sold additional shares of stock and/or equity additions were made. The comparable companies have a compound growth rate of 2.90% for the period 2000 through 2002 and shown on Schedule D-4.20. This growth was achieved primarily via earnings with some stock sales. Pine Water book value decreased 173.42% during this same period.

The price earnings ratio describes the level at which investors are valuing the earnings. As shown on Schedule D-4.21, the price earnings ratio has decreased from 2000 to 2002. A part of the price earning ratio is based on earning, while another factor is the possible acquisition of the smaller nationally traded utilities, by larger utilities. As Pine Water is not publicly traded, no price earnings ratio was computed.

The return on common equity tells the investor what return has been earned on book equity in the past. Note that the earned return (not the allowed return) on average common equity for the comparable companies has been 10.50% for the

period 2000 through 2002.

Pine Water's return on average equity was 17.66% for the three-year period. *See* Schedule D-4.22. This statistic is misleading, though, because the equity balance declined from $45,000 in 2000 to a negative $152,000 in 2002. Further, Pine Water has a much lower Financial Viability than the comparable companies. Its score of a negative 6.30, before conversion, and a negative 2.70, after conversion, would result in a score of "Distressed." The comparable companies have a score of 3.26, which is scored as "Weak." The scores are shown on Schedule D-4.23

Q. WHAT IS YOUR CONCLUSION ON THE EQUITY RETURN FOR PINE WATER?

A. An investor in the stock of a smaller Arizona utility is entitled to more return because he or she has more business and financial risk than an investor in the nationally traded water utilities. Investors in the nationally traded companies from Value Line and C.A. Turner would not encounter many of the risks faced by Pine Water. In the alternative, if the investors do face risks similar to Pine Water, the risks are not of the same magnitude. Higher risk requires a higher authorized return.

All of the nationally traded water utilities will experience additional business risk due to changes in water quality standards and other regulatory changes, and changes (increases and decreases) in the cost of short-term and intermediate debt. However, the impact of these uncertainties on Pine Water will be much greater due to its very small size in contrast to the size of the nationally traded water utilities.

It is important to note that the stockholders of Pine Water are not receiving a "cash" return in the form of regular dividends on their investment. In contrast,

all of the companies that have been compared to Pine Water are paying dividends. An investor offered the choice of $1.00 dividend today or $1.00 dividend ten or twenty years from today, would surely choose the $1.00 today.

Q. IS IT YOUR OPINION THAT PINE WATER SHOULD BE GRANTED A HIGHER RETURN ON EQUITY THAN MERELY THE COMPUTED RETURN FROM THE DISCOUNTED CASH FLOW, OR COMPARABLE EARNINGS METHODS?

A. Yes. As I previously testified, the discounted cash flow computations are being distorted by water utilities buying other water utilities. Business risks faced by Pine Water would substantially increase due to the unadjusted returns on equity from the discounted cash flow computations.

Q. WILL PINE WATER EARN YOUR RECOMMENDED 12.00% ON EQUITY UNDER THE PROPOSED RATES?

A. No. Expenses will continue to increase beyond the adjustments proposed on Schedule C-1 causing the return on equity to be unrealized. Pine Water also has severely limited growth in revenues. So, it is unlikely growth in revenues will out pace the increases in operating expenses. Additionally, plant additions will lower the rate of return.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY ON THE COST OF CAPITAL AND APPROPRIATE EQUITY RETURN?

A. Yes, it does.

V. <u>PROPOSED RATES AND CHARGES</u>

Q. WHAT ARE PINE WATER COMPANY'S PRESENT RATES?

A. Pine Water currently has two different rate structures due to the acquisition and reorganization of the former Williamson and E&R water systems. Rate Schedules for the old E&R system are identified as Rate Structure A and the old Williamson

system as Rate Structure B. The Company's present monthly minimum charges are listed below:

RATE STRUCTURE A

Meter Size	Monthly Minimum	Gallons included in Monthly Minimum
5/8 x 3/4	$18.45	0
3/4	$21.22	0
1	$24.54	0
1-1/2	$36.90	0
2	$64.58	0
3	$92.25	0
4	$147.60	0
6	N/A	0

The Commodity rate is:

$3.49 per 1,000 gallons (for usage from 1 to 4,000 gallons)

$5.95 per 1,000 gallons (for usage over 4,000 gallons)

RATE STRUCTURE B

Meter Size	Monthly Minimum	Gallons included in Monthly Minimum
5/8 x 3/4	$20.35	0
3/4	$30.53	0
1	$50.88	0
1-1/2	$101.75	0
2	$162.80	0
3	$305.25	0
4	$508.75	0

6	$1,017.50	0

The Commodity rate is:

$3.50 per 1,000 gallons (for usage over 0 gallons)

Q. WHAT ARE THE PROPOSED RATES?

A. The Company is proposing a single rate structure rather than the two that are currently in place, because there no longer is any justification for separate rate structures. The proposed monthly minimum charges are:

Meter Size	Monthly Minimum	Gallons included in Monthly Minimum
5/8 x 3/4	$22.14	0
3/4	$33.21	0
1	$55.35	0
1-1/2	$110.70	0
2	$177.12	0
3	$354.24	0
4	$553.50	0
6	$1107.00	0

The Company is proposing winter and summer rate schedules to promote conservation during periods of peak demand on the water supply. Winter months include: October, November, December, January, February, March, and April. Summer months include: May, June, July, August, and September. Highest use occurs in the summer months.

The proposed summer commodity rate for 3/4 inch and smaller meter size is $5.80 per 1,000 gallons for usage from 1 to 2,000 gallons. For water usage above 2,000 gallons and up to 8,000 gallons, the usage charge is $10.14 per

thousand. For water usage above 8,000 gallons, the commodity rate is $14.14 per thousand.

The proposed summer commodity rate for 1 inch and larger meter size is $5.80 per 1,000 gallons for usage from 1 to 10,000 gallons. For water usage above 10,000 gallons and up to 25,000 gallons, the usage charge is $10.14 per thousand. For water usage above 25,000 gallons, the commodity rate is $14.14 per thousand.

The proposed winter commodity rate for 3/4 inch and smaller meter size is $4.28 per 1,000 gallons for usage from 1 to 2,000 gallons. For water usage above 2,000 gallons and up to 8,000 gallons, the usage charge is $7.50 per thousand. For water usage above 8,000 gallons, the commodity rate is $11.50 per thousand.

The proposed winter commodity rate for 1 inch and larger meter size is $4.28 per 1,000 gallons for usage from 1 to 10,000 gallons. For water usage above 10,000 gallons and up to 25,000 gallons, the usage charge is $7.50 per thousand. For water usage above 25,000 gallons, the commodity rate is $11.50 per thousand.

Q. HOW DID YOU COMPUTE THE MONTHLY MINIMUMS BASED ON METER SIZES?

A. The monthly minimums are based on the flow capacity of each meter with the 5/8-inch meter being the base meter for pricing.

Q. WHAT IS THE RATE IMPACT ON RESIDENTIAL CUSTOMERS USING THE MONTHLY AVERAGE WATER USAGE?

For rate schedule 14 A:

- Customers on 5/8 meters who consume the average quantity of water in the summer (2,731 gallons per month) will experience a rate increase of $13.42 per month, or an increase of approximately

49%.

- Customers on 5/8 meters who consume the average quantity of water in the winter (1,988 gallons per month) will experience a rate increase of $5.46 per month, or an increase of approximately 22%.

For rate schedule 14 B:

- Customers on 5/8 meters who consume the average quantity of water in the summer (2,614 gallons per month) will experience a rate increase of $10.46 per month, or an increase of approximately 36%.
- Customers on 5/8 meters who consume the average quantity of water in the winter (1,707 gallons per month) will experience a rate increase of $3.13 per month, or an increase of approximately 12%.

Q. IS THE COMPANY REQUESTING ANY OTHER CHANGES IN ITS RATES AND TARIFFS?

A. Yes. The Company is requesting a change to the reconnection fee. The Company is also requesting other new charges. In particular:

- Cut Lock Fee for damages, removal, or otherwise tampering with a lock placed on the meter by the Company.
- Meter Removal Fee for removal of a meter due to water theft, tampering or failure to meet back flow assembly and testing.
- Illegal Supply Fee for customers who illegally supply water across property lines.
- Water Theft Fee for water loss created by a customer on customer's property though illegal or unauthorized activities resulting in water loss.
- Emergency Conservation Response Fee for after hours customer requests for immediate leak control on his/her property.

- Cross Connection Exposure Fee for property owners who do not meet or provide evidence of compliance with Commission requirements for backflow prevention device installation and testing.

The increases and new charges are shown on Schedule H-3, Page 3.

Q. WHAT OTHER CHARGES IS THE COMPANY PROPOSING?

A. The Company is proposing an adjuster mechanism to recover water sharing and water hauling costs. A similar adjuster is pending a decision by the Commission in the Company's interim rate filing.

Q. WHY IS THE COMPANY REQUESTING AN ADJUSTER?

A. The Company needs some assurance of recovery of increased purchased water costs as well as water hauling costs during times of critical water shortage. Historically, water hauling costs have been 10 times the normal costs of production and could increase dramatically in the future.

Q. HOW WOULD THE ADJUSTER MECHANISM WORK?

A. All the costs incurred would be collected from customers in the month following the month the costs are incurred. A per-gallon rate would be calculated by dividing the actual costs by the number of gallons sold. The per-gallon rate would then be multiplied by the customer usage to derive the amount to be billed.

Q. WOULD THERE BE A BASELINE?

A. Yes. The baseline is the adjusted test year purchased water expense amount of $64,262. This amount represents purchased water from water sharing agreements.

Q. ARE THERE ANY ADDITIONAL CHARGES THE COMPANY IS PROPOSING?

A. Yes. The Company's is proposing a $10 per month Water Exploration Surcharge. The purpose of this surcharge is to help allocate the risk of capital investment in an uncertain hydrological environment. For example, monies collected from the

surcharge could be used to help pay the upfront costs of determining which of the alternative water supply augmentation projects is viable. The Water Supply Augmentation Plan outlines several projects under consideration to address the chronic water supply problems in the Pine Water service area. These projects range from as low as $100,000 to as high as $5,000,000. The situation the Company faces is that it could costs hundreds of thousands or even millions of dollars just to find out which of the alternatives is viable. The surcharge will offset some of this risk. The surcharge will also help defray some of the costs of constructing plant, if there are funds left after exploring the viability of the alternatives.

Q. HOW LONG WILL THIS SURCHARGE BE COLLECTED?

A. For a minimum of 24 months, after which it might need to be revisited. For example, if it turns out the project identified as most viable is also the most costly, say $5,000,000, the Company would need to extend and possibly increase the surcharge. This is because the Company will not be able to service millions of dollars of debt.

Q. HOW MUCH WILL BE COLLECTED FROM CUSTOMERS?

A. The Company now has nearly 2,000 customers. At $10 from each customer per month for 24 months, the total amount collected would be over $450,000.

Q. WOULD THESE FUNDS BE SEGREGATED FROM OTHER COMPANY FUNDS?

A. Yes. The funds collected would be segregated and kept in an interest bearing account until used. Collection and expenditure would also be subject to certain reporting requirements.

Q. HOW WILL THESE AMOUNTS BE TREATED FOR ACCOUNTING AND RATEMAKING?

A. Any of the funds used for plant projects completed and placed into service will be booked as contributions-in-aid of construction. Amounts expended to explore alternatives that are abandoned (not viable) will be used to offset expenses paid.

Q. WHAT KINDS OF UPFRONT COSTS ARE REQUIRED TO DETERMINE A PROJECT'S VIABILITY?

A. Hydrological studies, condemnation valuations, exploration wells, environmental impact studies, as well as their associated legal costs, are among the types. *See* Direct Testimony of Robert T. Hardcastle, Exhibit B.

Q. HOW WILL THIS FUND BE MONITORED?

A. The Company will submit quarterly or semi-annual reports to the Commission detailing the amount collected, amounts expended, interest earned, and balance of the fund. Expenditures will be supported by invoices, descriptions of what the funds were used for, and any other supporting documentation necessary to determine the nature of the expenditure. This report will also be made available to customers upon request.

Q. HOW DOES THE COMPANY EXPECT TO FINANCE THE PLANT ADDITIONS ONCE A VIABLE ALTERNATIVE IS IDENTIFIED?

A. There is no doubt that the Company will not be able to fund any of the more expensive alternatives through internally generated cash and long-term debt alone. The Company may need to seek approval at the end of 24 months to extend the collection period or even increase the surcharge to supplement the cash requirements to construct the project. Again, additional funds collected and used would be treated as contributions-in-aid of construction.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Pine Water Company
Test Year Ended December 31, 2002
Computation of Increase in Gross Revenue
Requirements As Adjusted

Exhibit
Schedule A-1
Page
Witness: Bourassa

Line No.			
1	Fair Value Rate base	$	680,032
2			
3	Adjusted Operating Income		(132,713)
4			
5	Current Rate of Return		-19.52%
6			
7	Required Operating Income	$	74,324
8			
9	Required Rate of Return on Fair Value Rate Base		10.93%
10			
11	Operating Income Deficiency	$	207,036
12			
13	Gross Revenue Conversion Factor		1.2993
14			
15	Increase in Gross Revenue		
16	Requirement	$	268,993

Line No.	Customer Classification	Present Rates	Proposed Rates	Dollar Increase	Percent Increase
18					
21	5/8 Inch Meter - Residential	$626,494	$880,998	$ 254,504	40.62%
22	3/4 Inch Meter - Residential	468	832	364	77.78%
23	1 Inch Meter - Residential	4,441	8,207	3,766	84.81%
24	2 Inch Meter - Residential	194	531	338	174.26%
25	5/8 Inch Meter - Commercial	2,003	3,698	1,695	84.64%
26	1 Inch Meter - Commercial	2,647	4,473	1,826	68.97%
27	2 Inch Meter - Commercial	5,977	11,347	5,370	89.84%
28					
29	Revenues from Annualization	3,539	4,460	922	26.04%
30				-	0.00%
31				-	0.00%
32	Miscellaneous Revenues	8,436	8,436	-	0.00%
33				-	0.00%
34	Total of Water Revenues	$654,199	$922,984	$ 268,785	41.09%

35
36
37
38 SUPPORTING SCHEDULES:
39 B-1
40 C-1
41 C-3
42 H-1
43
44

Pine Water Company
Test Year Ended December 31, 2002
Summary of Results of Operations

Exhibit
Schedule A-2
Page 1
Witness: Bourassa

Line No.	Description	Prior Years Ended 12/31/00	Prior Years Ended 12/31/01	Test Year Actual 12/31/02	Test Year Adjusted 12/31/02
1	Gross Revenues	$ 601,693	$ 685,233	$ 670,447	$ 654,048
2					
3	Revenue Deductions and	623,020	863,026	907,584	786,760
4	Operating Expenses				
5					
6	Operating Income	$ (21,328)	$ (177,793)	$ (237,137)	$ (132,713)
7					
8	Other Income and	494,709	23	408	-
9	Deductions				
10					
11	Interest Expense	7,127	8,925	7,694	20,824
12					
13	Net Income	$ 466,254	$ (186,695)	$ (244,423)	$ (153,536)
14					
15	Earned Per Average				
16	Common Share	466.25	(186.69)	(244.42)	(153.54)
17					
18	Dividends Per				
19	Common Share	-	-	-	-
20					
21	Payout Ratio	-	-	-	-
22					
23	Return on Average				
24	Invested Capital	52.10%	-17.64%	-22.98%	-14.68%
25					
26	Return on Year End				
27	Capital	43.92%	-17.70%	-22.80%	-15.07%
28					
29	Return on Average				
30	Common Equity	932.61%	-101.04%	793.99%	-122.01%
31					
32	Return on Year End				
33	Common Equity	167.64%	-204.20%	159.76%	-312.91%
34					
35	Times Bond Interest Earned				
36	Before Income Taxes	66.42	(19.92)	(30.82)	(23.11)
37					
38	Times Total Interest and				
39	Preferred Dividends Earned				
40	After Income Taxes	66.39	(19.92)	(30.82)	(17.25)
41					
42					
43	SUPPORTING SCHEDULES				
44	C-1				
45	E-2				
46	F-1				

Pine Water Company
Test Year Ended December 31, 2002
Summary of Capital Structure

Exhibit
Schedule A-3
Page 1
Witness: Bourassa

Line No.	Description:	Prior Years Ended 12/31/00	Prior Years Ended 12/31/01	Test Year 12/31/02	Projected Year 12/31/03
1					
2					
3	Long-Term Debt	93,080	75,166	55,353	233,353
4					
5	Total Debt	$ 93,080	$ 75,166	$ 55,353	$ 233,353
6					
7					
8	Preferred Stock	-	-	-	-
9					
10	Common Equity	278,121	91,427	(152,996)	202,603
11					
12					
13	Total Capital & Debt	$ 371,201	$ 166,594	$ (97,643)	$ 435,956
14					
15					
16	Capitalization Ratios:				
17					
18	Long-Term Debt	25.08%	45.12%	-56.69%	53.53%
19					
20	Total Debt	25.08%	45.12%	-56.69%	53.53%
21					
22					
23	Preferred Stock	-	-	-	-
24					
25	Common Equity	74.92%	54.88%	156.69%	46.47%
26					
27					
28	Total Capital	100.00%	100.00%	100.00%	100.00%
29					
30					
31	Weighted Cost of				
32	Senior Capital	2.51%	4.51%	-5.67%	5.35%
33					
34					
35					
36					
37					
38	SUPPORTING SCHEDULES:				
39	E-1				
40	D-1				

Pine Water Company
Test Year Ended December 31, 2002
Construction Expenditures
and Gross Utility Plant in Service

Exhibit
Schedule A-4
Page 1
Witness: Bourassa

Line No.		Construction Expenditures	Net Plant Placed in Service	Gross Utility Plant in Service
1				(a)
2	Prior Year Ended 12/31/1999	-		1,768,176
3				
4	Prior Year Ended 12/31/2000	20,701	20,702	1,788,878
5				
6	Prior Year Ended 12/31/2001	35,129	35,129	1,824,007
7				
8	Test Yearr Ended 12/31/2002	67,587	67,588	1,891,594
9				
10	Projected Year Ended 12/31/2003	75,435	75,435	1,967,029
11				
12	(a) Unadjusted			
13				
14				
15	SUPPORTING SCHEDULES:			
16	B-2			
17	E-5			
18	F-3			
19				
20				
21				
22				
23				
24				
25				
26				
27				

Pine Water Company
Test Year Ended December 31, 2002
Summary Statements of Cash Flows

Exhibit
Schedule A-5
Page 1
Witness: Bourassa

Line No.		Prior Year Ended 12/31/00	Prior Year Ended 12/31/01	Test Year Ended 12/31/02	Projected Year Present Rates 12/31/03	Projected Year Proposed Rates 12/31/03
5	Cash Flows from Operating Activities					
6	Net Income	$ 466,254	$ (186,695)	$ (244,424)	$ (153,551)	$ 53,500
7	Adjustments to reconcile net income to net cash					
8	provided by operating activities:					
9	Depreciation and Amortization	24,559	21,908	23,254	35,496	35,496
10	Deferred Income Taxes	-	-	-	-	-
11	Accumulated Deferred ITC	-	-	-	-	-
12	Changes in Certain Assests and Liabilities:				-	-
13	Accounts Receivable	(1,944)	(4,703)	1,663	-	-
14	Materials & Supplies	-	-	-	-	-
15	Prepaid Expenses	9,530	810	810	-	-
16	Misc Current Assets and Deferred Expense	(498,225)	-	-	-	-
17	Accounts Payable and Accrued Liabilities	(270,406)	220,511	290,044	37,515	37,515
18	Accrued Income Taxes	-	-	-	-	-
19	Net Cash Flow provided by Operating Activities	$ (270,232)	$ 51,831	$ 71,347	$ (80,540)	$ 126,511
20	Cash Flow From Investing Activities:					
21	Capital Expenditures	(20,701)	(35,129)	(67,587)	(75,435)	(75,435)
22	Plant Held for Future Use	-	-	-		
23	Non-Utility Property	-	-	-		
24	Net Cash Flows from Investing Activities	$ (20,701)	$ (35,129)	$ (67,587)	$ (75,435)	$ (75,435)
25	Cash Flow From Financing Activities					
26	(Decrease) Increase in Net Amounts due to Parent and					
27	Affiliates	-	-	-	(533,599)	(533,599)
28	Customer Deposits	625	4,702	946	-	-
29	Changes in Advances for Construction	28,364	(3,490)	15,108	-	-
30	Changes in Contributions for Construction	-	-	-	-	-
31	Proceeds from Long-Term Debt Borrowing	261,944	-	-	178,000	178,000
32	Repayments of Long-Term Debt	-	(17,914)	(19,814)	(51,076)	(51,076)
33	Dividends Paid	-	-	-	-	-
34	Deferred Financing Costs	-	-	-	-	-
35	Proceeds from Additional Paid-in-Capital				355,599	355,599
36	Net Cash Flows Provided by Financing Activities	$ 290,933	$ (16,702)	$ (3,760)	$ (51,076)	$ (51,076)
37	Increase(decrease) in Cash and Cash Equivalents	-	-	-	(207,051)	(0)
38	Cash and Cash Equivalents at Beginning of Year	-	-	-	-	-
39	Cash and Cash Equivalents at End of Year	$ -	$ -	$ -	$ (207,051)	$ (0)

43 SUPPORTING SCHEDULES:
44 E-3
45 F-2

Pine Water Company
Test Year Ended December 31, 2002
Summary of Fair Value Rate Base

Exhibit
Schedule B-1
Page 1
Witness: Bourassa

Line No.		Original Cost Rate base
1		
2	Gross Utility Plant in Service	$ 1,967,029
3	Less: Accumulated Depreciation	1,228,209
4		
5	Net Utility Plant in Service	$ 738,820
6		
7	Less:	
8	Advances in Aid of	
9	Construction	52,072
10	Contributions in Aid of	
11	Construction - Net of amortization	463,392
12	Customer Meter Deposits	21,356
13	Deferred Income Taxes & Credits	-
14	Investment tax Credits	-
15	Plus:	
16	Unamortized Finance	
17	Charges	-
18	Deferred Tax Assets	369,000
19	Allowance for Working Capital	109,032
20	Citizens Acquisition Adjustment	-
21		
22	Total Rate Base	$ 680,032
23		
24		
25		
26	SUPPORTING SCHEDULES:	
27	B-2	
28	B-3	
29	B-5	
30	E-1	
31		

RECAP SCHEDULES:
A-1

Pine Water Company
Test Year Ended December 31, 2002
Original Cost Rate Base Proforma Adjustments

Exhibit
Schedule B-2
Page 1
Witness: Bourassa

Line No.		Actual at End of Test Year	Proforma Adjustments Label	Proforma Adjustments Amount	Adjusted at end of Test Year
1	Gross Utility				
2	Plant in Service	$ 1,891,594	(1)	75,435	$ 1,967,029
3					
4	**Less:**				
5					
6	Accumulated				
7	Depreciation	1,228,209			1,228,209
8					
9	Net Utility Plant				
10	in Service	$ 663,385			$ 738,820
11					
12	**Less:**				
13	Advances in Aid of				
14	Construction	$ 52,072			$ 52,072
15	Contributions in Aid of				
16	Construction - Net	463,392			463,392
17					
18	Customer Meter Deposits	21,356			21,356
19	Deferred Income Taxes	-			-
20	Investment Tax Credits	-			-
21	**Plus:**				
22					
23	Deferred Tax Assets	369,000			369,000
24					
25	Working capital	109,032			109,032
26					
27					
28	Total	$ 604,597			$ 680,032
29					
30					
31	ADJUSTMENTS:				
32	(1) Plant to be completed by 12/31/2003				
33					
34					
35					
36					
37					
38					
39					
40	SUPPORTING SCHEDULES:				RECAP SCHEDULES:
41	E-1				B-1
42					

Pine Water Company
Test Year Ended December 31, 2002
Computation of Working Capital

Exhibit
Schedule B-5
Page 1
Witness: Bourassa

Line No.			
1	Cash Working Capital (1/8 of Allowance		
2	Operation and Maintenance Expense)	$	89,381
3	Pumping Power (1/24 of Pumping Power)		1,539
4	Material and Supplies Inventories		-
5	Prepayments		18,111
6			
7			
8	Total Working Capital Allowance	$	109,032
9			
10			
11	Working Capital Requested	$	109,032
12			
13			
14	SUPPORTING SCHEDULES:	RECAP SCHEDULES:	
15	E-1	B-1	
16			

Pine Water Company
Test Year Ended December 31, 2002
Income Statement

Exhibit
Schedule C-1
Page 1
Witness: Bourassa

Line No.		Test Year Book Results	Label	Adjustment	Test Year Adjusted Results	Proposed Rate Increase	Adjusted with Rate Increase
1	**Revenues**						
2	Metered Water Revenues	$ 662,011	(1)(2)(12)	(16,399)	$ 645,612	269,012	$ 914,623
3	Unmetered Water Revenues	-			-		-
4	Other Water Revenues	8,436			8,436		8,436
5		$ 670,447		$ (16,399)	$ 654,048	$ 269,012	$ 923,059
6	**Operating Expenses**						
7	Salaries and Wages	$ 125,296			$ 125,296		$ 125,296
8	Pension & Benefits	6,105			6,105		6,105
9	Purchased Water	103,532	(3)	(39,270)	64,262		64,262
10	Purchased Power	36,942			36,942		36,942
11	Chemicals	604			604		604
12	Materials & Supplies	59,423	(4)	(16,500)	42,923		42,923
13	Regulatory Water Testing	7,758			7,758		7,758
14	Contractual Services - Engineering	-			-		-
15	Contractual Services - Accounting	38,328			38,328		38,328
16	Contractual Services - Legal	104,161	(10)	(37,730)	66,430		66,430
17	Contractual Services - Other	19,368			19,368		19,368
18	Overhead Allocation - G&A	71,092			71,092		71,092
19	Rental of Equipment	-			-		-
20	Transportation Expenses	176,144		-	176,144		176,144
21	Worker's Comp	2,271			2,271		2,271
22	Insurances Medical/Dental	12,663			12,663		12,663
23	Telephone	2,631			2,631		2,631
24	Dues & Subscriptions	299			299		299
25	Bad Debt Expense	2,153			2,153		2,153
26	Misc Expenses	202			202		202
27	Office Supplies	-	(11)	4,080	4,080		4,080
28	Licenses & Permits	1,000			1,000		1,000
29	Repairs & Maintenance - Bldg	-			-		-
30	R&M Vehicles	-			-		-
31	Sales Tax Expense	41,363	(2)	(41,742)	(380)		(380)
32	Utiltiy Reg. Assess. Fee	272			272		272
33	CAWCD Costs	21,501			21,501		21,501
34	Rate Case Expense	-	(7)	50,000	50,000		50,000
34	Depreciation Expense	23,254	(5)	12,243	35,496		35,496
35	Other Taxes and Licenses	45			45		45
36	Property Taxes	51,177	(6)	(5,938)	45,239		45,239
37	Income Tax	-			(45,951)		16,010
38					-		-
39	**Total Operating Expenses**	$ 907,584		$ (74,858)	$ 786,774	$ -	$ 848,735
40	**Operating Income**	$ (237,137)		$ 58,459	$ (132,727)	$ 269,012	$ 74,324
41	**Other Income (Expense)**						
42	Interest Income	-			-		-
43	Other income	408	(8)	(408)	-		-
44	Income Tax Provision	-			-		
45	Interest Expense	(7,694)	(9)	(13,130)	(20,824)		(20,824)
46	Other Expense	-			-		-
47	Gain/Loss Sale of Fixed Assets	-			-		-
48	**Total Other Income (Expense)**	$ (7,287)		$ (13,537)	$ (20,824)	$ -	$ (20,824)
49	**Net Profit (Loss)**	$ (244,423)		$ 44,922	$ (153,551)	$ 269,012	$ 53,500
50							
51	SUPPORTING SCHEDULES:					RECAP SCHEDULES:	
52	C-2					A-1	
53	E-2						
54							

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses

Exhibit
Schedule C-2
Page 1
Witness: Bourassa

Adjustments to Revenues and Expenses

Line No.		1 Remove Sales Tax Recorded in Revenues	2 Add Back Billing Adjustments	3 Remove Water Hauling and Water Hauling Costs	4 Reclassify Mantenance Expenses to Plant	5 Depreciation Expense	6 Property Taxes	Subtotal
3	Revenues	(41,742)	21,804					(19,938)
5	Expenses	(41,742)		(39,270)	(16,500)	12,243	(5,938)	(91,208)
7 8	Operating Income	-	21,804	39,270	16,500	(12,243)	5,938	71,270
10 11	Interest Expense							-
12 13 14	Other Income / Expense							
16	Net Income	-	21,804	39,270	16,500	(12,243)	5,938	71,270

Adjustments to Revenues and Expenses

		7 Rate Case Expense	8 Remove Other Income/Expense	9 Interest Expense	10 Legal Costs	11 Customer Education Program	12 Revenue Annualization	Subtotal
23	Revenues						3,539	(16,399)
25	Expenses	50,000			(37,730)	4,080		(74,858)
27 28	Operating Income	(50,000)	-	-	37,730	(4,080)	3,539	58,459
30 31	Interest Expense			(13,130)				(13,130)
32 33 34	Other Income / Expense		408					408
36	Net Income	(50,000)	408	(13,130)	37,730	(4,080)	3,539	45,737

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 1

Exhibit
Schedule C-2
Page 2
Witness: Bourassa

Line No.				
1	Remove Sales Taxes Recorded in Revenues			
2				
3				**Amount**
4	Sales Taxes Recorded in Revenues During Test Year			
5		Month		
6		January	$ 3,022	
7		February	3,222	
8		March	3,106	
9		April	3,361	
10		May	3,829	
11		June	4,231	
12		July	2,874	
13		August	3,656	
14		September	3,812	
15		October	3,712	
16		November	3,474	
17		December	3,442	
18	Total Adjustments			$ 41,742
19				
20	Adjustment to Revenues and/or Expenses			$ (41,742)
21				
22				
23				
24				

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment 2

Exhibit
Schedule C-2
Page 3
Witness: Bourassa

Line No.			
1	Add Back Billing Adjustments in 2002		
2			
3	Billing Adjustment Recorded in Test Year		
4	Month		Amount
5	January	3,829	
6	January	1	
7	February	23	
8	March	322	
9	March	220	
10	April	819	
11	May	17	
12	June	2,116	
13	June	85	
14	July	14,122	
15	August	84	
16	Sept	100	
17	October	32	
18	Nov.	0	
19	December	35	
20			
21			
22	Total Adjustments		$ 21,804
23			
24	Adjustment to Revenues and/or Expenses		21,804
25			
26			
27			
28			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 3

Exhibit
Schedule C-2
Page 4
Witness: Bourassa

Line No.			
1	Remove Hauling and Water Sharing Agreements Included in Adjuster Mechanism		
2			
3			
4	Water Hauling Costs for 2002	$ 39,270	
5			
6			
7			
8			$ 39,270
9			
10			
11			
12	Adjustment to Revenues and/or Expenses		$ (39,270)
13			
14			
15			
16			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 4

Exhibit
Schedule C-2
Page 5
Witness: Bourassa

Line No.		Amount
1	Maintenance and Repair Reclassified to Plant	
2		
3		
4	Propjected Repairs and Maintenance Expense	42,923
5	Test Yaar Repairs and Maintenance	59,423
6		
7		
8		
9	Total	$ (16,500)
10		
11		
12		
13	Adjustment to Revenues and/or Expenses	$ (16,500)
14		
15		
16		
17		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 5

Exhibit
Schedule C-2
Page 6
Witness: Bourassa

Line No.

1 Depreciation Expense

Account No.	Description	Original Cost	Rate	Depreciation Expense
301	Organization	$ -	0.00%	$ -
302	Franchises	-	0.00%	-
303	Land and Land Rights	16,930	0.00%	-
304	Structures and Improvements	160,067	3.33%	5,330
305	Collecting and Impounding Rese	-	2.50%	-
306	Lake, River and Other Intakes	-	2.50%	-
307	Wells and Springs	65,994	3.33%	2,198
308	Infiltration Galleries and Tun	-	6.67%	-
309	Supply Mains	479	2.00%	10
310	Power Generation Equipment	-	5.00%	-
311	Pumping Equipment	131,293	12.50%	16,412
320	Water Treatment Equipment	5,320	3.33%	177
330	Distribution Reservoirs and St	247,073	2.22%	5,485
331	Transmission and Distribution	990,291	2.00%	19,806
333	Services	80,461	3.33%	2,679
334	Meters and Meter Installations	193,687	8.33%	16,134
335	Hydrants	-	2.00%	-
336	Backflow Prevention Devices	-	6.67%	-
339	Other Plant and Miscellaneous	-	6.67%	-
340	Office Furniture and Equipment	-	6.67%	-
341	Transportation Equipment	-	20.00%	-
342	Stores Equipment	-	4.00%	-
343	Tools, Shop and Garage Equipme	-	5.00%	-
344	Laboratory Equipment	-	10.00%	-
345	Power Operated Equipment	-	5.00%	-
346	Communication Equipment	-	10.00%	-
347	Miscellaneous Equipment	-	10.00%	-
348	Other Tangible Plant	-	0.00%	-
	TOTALS	$ 1,891,594		$ 68,230

Proforma Plant (to be completed by 12/31/2002)	$ 75,435	3.6396%	2,746
Maintenance and Repairs Reclassified to Plant	$ (16,500)	3.6396%	(601)
Less: Amortization of Contributions	$ 958,323	3.6396%	(34,879)
Total Depreciation Expense			$ 35,496
Test Year Depreciation Expense			23,254
Increase (decrease) in Depreciation Expense			12,243
Adjustment to Revenues and/or Expenses			$ 12,243

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 6

Exhibit
Schedule C-2
Page 7
Witness: Bourassa

Line No.		
1	Property Taxes	
2		
3	Unadjusted Revenues in year ended 12/31/02 (excluding sales tax)	$ 628,705
4	Adjusted Revenues in year ended 12/31/02	654,048
5	Proposed Revenues	923,059
6	Average of three year's of revenue	$735,270
7	Average of three year's of revenue, times 2	$1,470,541
8	Add:	
9	Construction Work in Progess at 10%	
10	Deduct:	
11	Book Value of Transportation Equipment	-
12		
13	Total Book Value of Transportation Equipment	$ -
14		
15	Full Cash Value	$ 1,470,541
16	Assessment Ratio	25%
17	Assessed Value	367,635
18	Property Tax Rate	12.31%
19		
20	Property Tax	45,239
21	Tax on Parcels	-
22		
23	Total Property Tax at Proposed Rates	$ 45,239
24	Property Taxes in the test year	51,177
25	Change in Property Taxes	$ (5,938)
26		
27		
28	Adjustment to Revenues and/or Expenses	$ (5,938)
29		
30		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 7

Exhibit
Schedule C-2
Page 8
Witness: Bourassa

Line No.			
1	Rate Case Expense		
2			
3	Rate Case expense	$	150,000
4	Amortization Period (Years)		3
5	Annual Amortization Expense	$	50,000
6			
7			
8			
9	Adjustment to Revenues and/or Expense		50,000
10			
11			

Pine Water Company
Test Year Ended December 31, 2001
ADJUSTMENTS TO REVENUES AND/OR EXPENSES
Adjustment Number 8

Exhibit
Schedule C-2
Page 9
Witness: Bourassa

Line No.			
1	Remove Other Income/Expense to Eliminate Effects on Rates		
2			
3	Test Year Other Income	$	408
4			
5			
6	Increase (decrease) in Revenues/ Expenses	$	(408)
7			
8	Adjustment to Revenue and/or Expense	$	(408)
9			
10			
11			

Pine Water Company
Test Year Ended December 31, 2001
ADJUSTMENTS TO REVENUES AND/OR EXPENSES
Adjustment Number 9

Exhibit
Schedule C-2
Page 10
Witness: Bourassa

Line No.			
1	Projected 2003 Interest Expense		
2			
3	Projected 2003 Interest Expense	$	20,824
4			
5	Test year Interest Expense		7,694
6			
7	Increase (decrease) in Revenues/ Expenses	$	13,130
8			
9			
10			
11			
12	Adjustment to Revenue and/or Expense	$	(13,130)
13			
14	SUPPORTING SCHEDULES:		
15	C-2, page 10a		
16	C-2, page 10b		
17			
18			

Pine Water Company
Amortization Schedule

Exhibit
Schedule C2
Page 10a
Witness: Bourassa

Line No.		
1	Principal	$ 104,000.00
2	No. of Months	60
3	Annual Interest Rate	10.00%
4	Monthly Payment	$ 2,209.69
5		

6	Date	Pay No.	Principal	Interest	Payment	Balance
7	May-00	1	$ 1,343.03	$ 866.67	$2,209.69	$ 104,000.00
8	Jun-00	2	1,354.22	855.47	2,209.69	102,656.97
9	Jul-00	3	1,365.50	844.19	2,209.69	101,302.76
10	Aug-00	4	1,376.88	832.81	2,209.69	99,937.25
11	Sep-00	5	1,388.36	821.34	2,209.69	98,560.37
12	Oct-00	6	1,399.93	809.77	2,209.69	97,172.01
13	Nov-00	7	1,411.59	798.10	2,209.69	95,772.09
14	Dec-00	8	1,423.36	786.34	2,209.69	94,360.50
15	Jan-01	9	1,435.22	774.48	2,209.69	92,937.14
16	Feb-01	10	1,447.18	762.52	2,209.69	91,501.93
17	Mar-01	11	1,459.24	750.46	2,209.69	90,054.75
18	Apr-01	12	1,471.40	738.30	2,209.69	88,595.51
19	May-01	13	1,483.66	726.03	2,209.69	87,124.12
20	Jun-01	14	1,496.02	713.67	2,209.69	85,640.46
21	Jul-01	15	1,508.49	701.20	2,209.69	84,144.44
22	Aug-01	16	1,521.06	688.63	2,209.69	82,635.95
23	Sep-01	17	1,533.74	675.96	2,209.69	81,114.89
24	Oct-01	18	1,546.52	663.18	2,209.69	79,581.15
25	Nov-01	19	1,559.40	650.29	2,209.69	78,034.63
26	Dec-01	20	1,572.40	637.29	2,209.69	76,475.23
27	Jan-02	21	1,585.50	624.19	2,209.69	74,902.83
28	Feb-02	22	1,598.71	610.98	2,209.69	73,317.33
29	Mar-02	23	1,612.04	597.66	2,209.69	71,718.61
30	Apr-02	24	1,625.47	584.22	2,209.69	70,106.58
31	May-02	25	1,639.02	570.68	2,209.69	68,481.11
32	Jun-02	26	1,652.68	557.02	2,209.69	66,842.09
33	Jul-02	27	1,666.45	543.25	2,209.69	65,189.41
34	Aug-02	28	1,680.33	529.36	2,209.69	63,522.97
35	Sep-02	29	1,694.34	515.36	2,209.69	61,842.63
36	Oct-02	30	1,708.46	501.24	2,209.69	60,148.29
37	Nov-02	31	1,722.69	487.00	2,209.69	58,439.84
38	Dec-02	32	1,737.05	472.64	2,209.69	56,717.14
39	Jan-03	33	1,751.53	458.17	2,209.69	54,980.09
40	Feb-03	34	1,766.12	443.57	2,209.69	53,228.57
41	Mar-03	35	1,780.84	428.85	2,209.69	51,462.45
42	Apr-03	36	1,795.68	414.01	2,209.69	49,681.61
43	May-03	37	1,810.64	399.05	2,209.69	47,885.93

2003	
Current Portion	22,192.32
Interest Expense	4,323.99
Total Debt Service	26,516.31

Pine Water Company
Amortization Schedule
Proposed Long-Term Debt From Ineter-Company Payable

Exhibit
Schedule C2
Page 10b
Witness: Bourassa

Line No.		
1	Inter-Company Payable Balance at 12/31/2002	$ 533,599
2	Amount Converted to Long-Term Debt	178,000
3	Amount Converted to Equity	355,599
4		
5	Principal	$ 178,000
6	No. of Months	60
7	Annual Interest Rate	10.00%
8	Monthly Payment	$ 3,781.97
9		

Line No.	Pay No.	Principal	Interest	Payment	Balance		
10							
11	1	$ 2,298.64	$ 1,483.33	$3,781.97	$ 178,000.00	Year 1	
12	2	2,317.80	1,464.18	3,781.97	175,701.36	Current Portion	28,883.73
13	3	2,337.11	1,444.86	3,781.97	173,383.56	Interest Expense	16,499.96
14	4	2,356.59	1,425.39	3,781.97	171,046.45	Total Debt Service	45,383.69
15	5	2,376.23	1,405.75	3,781.97	168,689.87		
16	6	2,396.03	1,385.95	3,781.97	166,313.64		
17	7	2,415.99	1,365.98	3,781.97	163,917.61		
18	8	2,436.13	1,345.85	3,781.97	161,501.62		
19	9	2,456.43	1,325.55	3,781.97	159,065.49		
20	10	2,476.90	1,305.08	3,781.97	156,609.06		
21	11	2,497.54	1,284.43	3,781.97	154,132.17		
22	12	2,518.35	1,263.62	3,781.97	151,634.63		
23	13	2,539.34	1,242.64	3,781.97	149,116.27	Year 2	
24	14	2,560.50	1,221.47	3,781.97	146,576.94	Current Portion	31,908.23
25	15	2,581.84	1,200.14	3,781.97	144,016.44	Interest Expense	13,475.46
26	16	2,603.35	1,178.62	3,781.97	141,434.60	Total Debt Service	45,383.69
27	17	2,625.05	1,156.93	3,781.97	138,831.25		
28	18	2,646.92	1,135.05	3,781.97	136,206.20		
29	19	2,668.98	1,112.99	3,781.97	133,559.28		
30	20	2,691.22	1,090.75	3,781.97	130,890.30		
31	21	2,713.65	1,068.33	3,781.97	128,199.08		
32	22	2,736.26	1,045.71	3,781.97	125,485.43		
33	23	2,759.06	1,022.91	3,781.97	122,749.17		
34	24	2,782.06	999.92	3,781.97	119,990.10	Year 3	
35	25	2,805.24	976.73	3,781.97	117,208.05	Current Portion	35,249.44
36	26	2,828.62	953.36	3,781.97	114,402.81	Interest Expense	10,134.25
37	27	2,852.19	929.78	3,781.97	111,574.19	Total Debt Service	45,383.69
38	28	2,875.96	906.02	3,781.97	108,722.00		
39	29	2,899.92	882.05	3,781.97	105,846.04		
40	30	2,924.09	857.88	3,781.97	102,946.12		
41	31	2,948.46	833.52	3,781.97	100,022.03		
42	32	2,973.03	808.95	3,781.97	97,073.57		
43	33	2,997.80	784.17	3,781.97	94,100.54		
44	34	3,022.78	759.19	3,781.97	91,102.74		
45	35	3,047.97	734.00	3,781.97	88,079.96		
46	36	3,073.37	708.60	3,781.97	85,031.98	Year 4	
47	37	3,098.99	682.99	3,781.97	81,958.61	Current Portion	39,265.02
48	38	3,124.81	657.16	3,781.97	78,859.62	Interest Expense	6,118.67
49	39	3,150.85	631.12	3,781.97	75,734.81	Total Debt Service	45,383.69
50	40	3,177.11	604.87	3,781.97	72,583.96		
51	41	3,203.58	578.39	3,781.97	69,406.85		
52	42	3,230.28	551.69	3,781.97	66,203.27		
53	43	3,257.20	524.77	3,781.97	62,972.99		
54	44	3,284.34	497.63	3,781.97	59,715.79		
55	45	3,311.71	470.26	3,781.97	56,431.45		
56	46	3,339.31	442.66	3,781.97	53,119.74		
57	47	3,367.14	414.84	3,781.97	49,780.43		
58	48	3,395.20	386.78	3,781.97	46,413.29	Year 5	
59	49	3,423.49	358.48	3,781.97	43,018.09	Current Portion	39,594.60
60	50	3,452.02	329.96	3,781.97	39,594.60	Interest Expense	2,007.11
61	51	3,480.79	301.19	3,781.97	36,142.59	Total Debt Service	41,601.71
62	52	3,509.79	272.18	3,781.97	32,661.80		
63	53	3,539.04	242.93	3,781.97	29,152.01		
64	54	3,568.53	213.44	3,781.97	25,612.97		
65	55	3,598.27	183.70	3,781.97	22,044.43		
66	56	3,628.26	153.72	3,781.97	18,446.16		
67	57	3,658.49	123.48	3,781.97	14,817.91		
68	58	3,688.98	93.00	3,781.97	11,159.42		
69	59	3,719.72	62.25	3,781.97	7,470.44		
70	60	3,750.72	31.26	3,781.97	3,750.72		

Pine Water Company
Test Year Ended December 31, 2001
ADJUSTMENTS TO REVENUES AND/OR EXPENSES
Adjustment Number 10

Exhibit
Schedule C-2
Page 11
Witness: Bourassa

Line No.			
1	Normalize Legal Costs		
2			
3	2000 Legal Costs	$	7,448
4	2001 Legal Costs		87,682
5	2002 Legal Costs		104,161
6	Total of 3 years	$	199,290
7			
8	Average 3 years	$	66,430
9			
10	Test Year Legal Expense		104,161
11			
12	Increase (decrease) in Legal Costs	$	(37,730)
13			
14			
15	Adjustment to Revenue and/or Expense	$	(37,730)
16			
17			

Pine Water Company
Test Year Ended December 31, 2001
ADJUSTMENTS TO REVENUES AND/OR EXPENSES
Adjustment Number 11

Exhibit
Schedule C-2
Page 12
Witness: Bourassa

Line No.		
1	Projected Costs of Customer Education Program	
2		
3		
4	Printing	$640
5	Handling and preparation	$480
6	Postage	$2,960
7		
8	Total Customer Education Program Costs	$ 4,080
9		
10		
11	Adjustment to Revenue and/or Expense	$ 4,080
12		
13		
14		
15		
16		
17		
18		

Pine Water Company
Test Year Ended December 31, 2002
ADJUSTMENTS TO REVENUES AND/OR EXPENSES
Adjustment Number 12

Exhibit
Schedule C-2
Page 13
Witness: Bourassa

Line No.			
1	Revenue Annualization		
2			
3			
4	Revenes from annualization of customers	$	3,539
5			
6			
7			
8	Total	$	3,539
9			
10			
11	Adjustment to Revenue and/or Expense	$	3,539
12			
13			
14			
15	Supporting Schedule C-2, page 13-1		
16			
17			
18			

Pine Water Company
Revenue Annualization / 5/8 Inch Commercial Customers to Year End Number of Customers
Test Year Ended December 31, 2002

Exhibit
Schedule C-2
Page 13-1
Witness: Bourassa

Line No.		Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02
1	Year End Number of Customers	1,514	1,514	1,514	1,514	1,514	1,514	1,514
2	Actual Customers	1,478	1,479	1,482	1,491	1,497	1,508	1,515
3	Increase in Number of Customers/Bills	36	35	32	23	17	6	(1)
4	Average Revenue / Present Rates	$ 24.62	$ 24.67	$ 24.25	$ 25.44	$ 27.81	$ 29.55	$ 27.13
5	Revenue Annualization / Present Rates	$ 886	$ 863	$ 776	$ 585	$ 473	$ 177	$ (27)
6								
7	Increase in Number of Customers	36	35	32	23	17	6	(1)
8	Average Revenue / Proposed Rates	$ 29.91	$ 29.98	$ 29.45	$ 31.12	$ 41.38	$ 46.56	$ 39.34
9	Revenue Annualization / Proposed Rates	$ 1,077	$ 1,049	$ 942	$ 716	$ 703	$ 279	$ (39)
10	Additional Gallons to be Produced	1,850	1,864	1,739	2,078	2,771	3,271	2,551

		Month of Aug-02	Month of Sep-02	Month of Oct-02	Month of Nov-02	Month of Dec-02	Total Year
15	Year End Number of Customers	1,514	1,514	1,514	1,514	1,514	
16	Actual Customers	1,517	1,515	1,517	1,514	1,523	
17	Increase in Number of Customers/Bills	(3)	-	(9)	5	-	141
18	Average Revenue / Present Rates	$ 26.71	$ 27.47	$ 26.76	$ 25.22	$ 25.22	
19	Revenue Annualization / Present Rates	$ (80)	$ -	$ (241)	$ 126	$ -	$ 3,539
20							
21	Increase in Number of Customers	(3)	-	(9)	5	-	
22	Average Revenue / Proposed Rates	$ 38.10	$ 40.37	$ 34.03	$ 30.67	$ 30.67	
23	Revenue Annualization / Proposed Rates	$ (80)	$ -	$ (241)	$ 126	$ -	$ 4,460
24	Additional Gallons to be Produced	2,428	2,654	2,434	2,151	1,992	27,782

Pine Water Company
Test Year Ended December 31, 2002
Computation of Gross Revenue Conversion Factor

Exhibit
Schedule C-3
Page 1
Witness: Bourassa

Line No.	Description	Percentage of Incremental Gross Revenues
1	Federal Income Taxes	16.06%
2		
3	State Income Taxes	6.97%
4		
5	Other Taxes and Expenses	0.00%
6		
7		
8	Total Tax Percentage	23.03%
9		
10	Operating Income % = 100% - Tax Percentage	76.97%
11		
12		
13		
14		
15	1 = Gross Revenue Conversion Factor	
16	Operating Income %	1.2993
17		
18	SUPPORTING SCHEDULES:	RECAP SCHEDULES:
19		A-1
20		

Pine Water Company
Test Year Ended December 31, 2002
Summary of Cost of Capital

Exhibit
Schedule D-1
Page 1
Witness: Bourassa

Line No.	Item of Capital	Proposed End of Test Year: Dollar Amount	Percent of Total	Cost Rate	Weighted Cost	End of Projected Year: Dollar Amount	Percent of Total	Cost Rate	Weighted Cost
1	Long-Term Debt (a)	233,353	53.53%	10.00%	5.35%	182,087	41.55%	10.00%	4.16%
2									
3	Stockholder's Equity (a)	202,603	46.47%	12.00%	5.58%	256,103	58.45%	12.00%	7.01%
4									
5	Totals	435,956	100.00%		10.93%	438,191	100.00%		11.17%
6									
7	(a) Adjusted for proposed conversion of inter-company payable to debt and equity.								
8									
9	SUPPORTING SCHEDULES:								
10	D-1, page 2								
11	D-2								
12	D-3								
13	D-4								
14	E-1								
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									

Pine Water Company
Test Year Ended December 31, 2002
Summary of Cost of Capital

Exhibit
Schedule D-1
Page 2
Witness: Bourassa

Line No.		Actual End of Test Year Dollar Amount	Label	Adjustment	Adjusted End of Test Year Dollar Amount
1					
2	Stockholder's Equity	(152,996)	(a)	355,599	202,603
3					
4	Totals	(152,996)			202,603
5					
6					
7	(a) Propose converting $355,599 of $533,599 inter-company payable to equity.				
8					
9	SUPPORTING SCHEDULES:				
10	E-1				
11					
12					
13					
14					
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21					
22					
23					
24					
25					
26					
27					
28					
29					

Pine Water Company
Test Year Ended December 31, 2002
Cost of Long Term Debt

Exhibit
Schedule D-2
Page 1
Witness: Bourassa

Line No.	Description of Debt	Adjusted End of Test Year Amount Outstanding	Percent	Interest Rate	Composite Cost	End of Projected Year Amount Outstanding	Percent	Interest Rate	Composite Cost
1									
2	Long-Term Debt	55,353	23.72%	10.00%	2.37%	32,971	14.13%	10.00%	1.41%
3	Long-Term Debt (a)	178,000	76.28%	10.00%	7.63%	149,116	63.90%	8.00%	5.11%
4									
5									
6									
7									
8									
9									
10	Totals	233,353	100.00%		10.00%	182,087	78.03%		6.53%
11									
12	(a) Propose converting $178,000 of the $533,599 inter-company payable to long-term debt.								
13									
14									
15	Supporting Schdules:								
16	E1								
17									
18									

Pine Water Company
Test Year Ended December 31, 2002
Cost of Preferred Stock

Exhibit
Schedule D-3
Page 1
Witness: Bourassa

Line No.	Description of Issue	End of Test Year Shares Outstanding	End of Test Year Amount	End of Test Year Dividend Requirement	End of Projected Year Shares Outstanding	End of Projected Year Amount	End of Projected Year Dividend Requirement
1							
2							
3	NOT APPLICABLE, NO PREFERRED STOCK ISSUED OR OUTSTANDING						
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17	SUPPORTING SCHEDULES:			RECAP SCHEDULES:			
18	(a) E-1			(a) D-1			
19							
20							

Pine Water Company, Inc.
Test Year Ended December 31, 2002
SUMMARY OF RETURN ON COMMON EQUITY

Exhibit
SCHEDULE D-4
PAGE 1
Witness: Bourassa

LINE NO.		From:	To:
1	Equity Return Computations Ranges		
2			
3		10.28%	11.00%
4			
5	Average of Above		10.64%
6			
7	Requested Risk Primium to Compensate for Business Risk		1.36%
8			
9			
10	Requested Equity Return (Average of Above)		
11	to Compensate for Business and Financial Risk		12.00%
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Actual and Estimated Returns on Equity

Exhibit
Schedule D-4.1
Page 1
Witness: Bourassa

Line No.		Equity Return Actual and Projected for: 2003	2005-07
1			
2			
3			
4			
5			
6	Comparable Earnings		
7	Composite Statistics Water Utility		
8	Industry: (a)	10.50%	11.50%
9			
10	Authorized Returns on CA Turner		
11	Water Stocks		10.50%
12			
13	Earned Returns on CA Turner Water		
14	Stocks	11.07%	
15			
16			
17	Discounted Cash Flow Method	9.27%	
18	(Growth Rates (b))		
19			
20			
21	Average	10.28%	11.00%
22			
23			
24	(a) Data From Value Line, January 31, 2003		
25	(b) Growth Rates from Value Line January 31, 2003, and		
26	computed growth rates.		
27			
28			
29			
30			

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Returns on Equity of Nationally Traded Water
Utilities as Reported in C.A. Turner Utility Reports
April 2003

Exhibit
Schedule D-4.2
Page 1
Witness: Bouras

Line No.		Authorized Rate of Return	Current Rate of Return
1	American States Water Co.	10.00%	9.60%
2	Artesian Resources Corp.	10.50%	9.60%
3	California	10.48%	9.60%
4	Connecticut Water Service	12.70%	11.60%
5	Middlesex Water Co.	10.25%	9.80%
6	Pennichuck Corporation	10.33%	8.40%
7	Philadelphia Suburban	10.32%	13.90%
8	SJW Corp.	9.95%	9.40%
9	Southwest Water	10.00%	12.10%
10	York Water		16.70%
11	Simple Averages	10.50%	11.07%
12			
13			
14			
15			
16			
17			
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31			

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Value Line Cover Page

Exhibit
Schedule D-4.3
Page 1
Witness: Bourassa

Line No.	
1	Cover Page for Value Line, Dated January 31. 2002
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

D4.3 page 2

The high costs of maintaining and upgrading the country's water and wastewater distribution systems have led to widespread consolidation in the Water Utility Industry.

The water utility stocks in this review are not timely for year-ahead investment. Conservative investors may, however, find an appealing choice here, based upon above-average Safety ranks and healthy dividend payouts.

The Need For Consolidation

Long-term trends in the Water Utility Industry indicate that infrastructure costs will continue to escalate. Water Utilities must maintain and upgrade existing facilities in order to remain in compliance with increasingly strict rules mandated by the Environmental Protection Agency (EPA) and other local regulators. Many of the water/wastewater systems that are presently in use were originally built about 100 years ago. The EPA and other industry sources indicate that hundreds of billions of dollars over the next 20 years will be needed to repair the nation's entire water system. The Water Infrastructure Network believes that there will be a $12 billion annual shortfall for wastewater infrastructure over that period, and long-term help from the federal government is needed to solve the problem. Also, transportation costs will continue to rise, as nearby sources of water are used up and farther-away, more-expensive sources of water are utilized. Water is difficult and expensive to move, because it is heavy and cannot be compressed. Increased federal spending will cover some of the industry's long-term costs, but water companies will probably foot most of the bill.

The costs of staying in compliance with numerous laws are particularly burdensome for smaller utilities because they have a smaller base of customers over which they can spread costs. Small and mid-sized water companies usually welcome takeover offers from large-scale suitors and the significant capital resources they bring. The larger utilities benefit from economies of scale, which enables them to reduce costs. They also gain enhanced geographic diversity from acquisitions, which reduces their susceptibility to weather fluctuations that may cause undesirable volatility in earnings. The heavy regulatory oversight that the industry faces means that some local regulators are bound to be more cooperative with utilities than officials from a different locale. A multistate territory helps to limit a company's exposure to especially onerous regulatory atmospheres.

INDUSTRY TIMELINESS: 79 (of 98)

In the past few years, large foreign utilities have swallowed up domestic water companies. Germany-based RWE AG recently completed its acquisition of American Water Works, formerly this country's largest investor-owned water utility. The buying spree significantly reduced the number of independent water utilities in the U.S., making *Philadelphia Suburban* the largest publicly traded one.

Regulatory Challenges

This will probably be an especially tough year for water utilities, since many will have to operate under a cloud of government deficits. Lawmakers will become more unlikely to commit scarce public funds towards major infrastructure projects. For example, the U.S. Senate recently rejected an effort to add $5 billion for water and wastewater plants to a $390 billion spending bill, citing President Bush's insistence on limiting federal spending growth. The added difficulty in securing public funding is especially hard at the moment because the industry is pouring out money in an effort to improve its security and protect the nation's water-distribution system from potential attacks.

Meeting Governmental Regulations

The Safe Drinking Water Act (SDWA) of 1974 (amended in 1996) authorizes the EPA to work with state and local governments to periodically test for impurities in drinking water. The EPA regulates what levels of contaminants are acceptable per a specified amount of water. These standards have been developed taking into account the health effects of chemicals, measurement capabilities, and technical feasibility. Water utilities spend a large portion of their annual capital budgets on infrastructure improvements in order to stay in compliance with the SDWA, the Clean Water Act and numerous state and local laws.

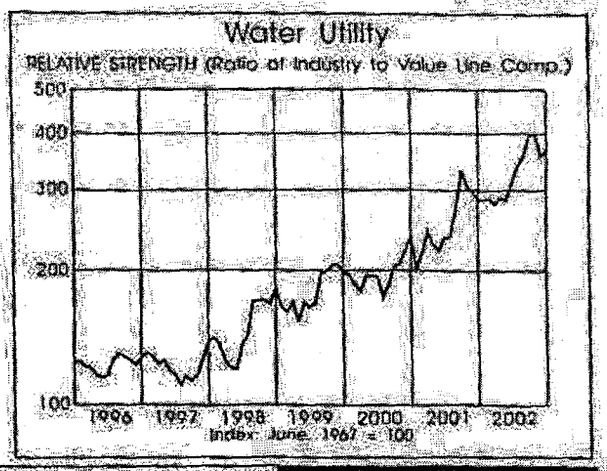
Investment Advice

None of the stocks in the industry are ranked to outperform the year-ahead market. Nonetheless, *Philadelphia Suburban* and *California Water* have above-average Safety ranks. Although they offer limited total-return potential over the coming 3 to 5 years, income-oriented investors might find one of these choices appealing, based upon a favorable risk profile.

Joseph Espaillat

Composite Statistics: Water Utility Industry

1998	1999	2000	2001	2002	2003		05-07
455.3	697.2	704.2	751.6	795	850	Revenues ($mill)	1040
51.8	72.4	65.9	95.4	90.5	115	Net Profit ($mill)	170
32.4%	40.8%	41.2%	49.8%	40.5%	40.5%	Income Tax Rate	40.5%
--	--	--	--	Nil	.5%	AFUDC % to Net Profit	.5%
48.0%	51.1%	50.3%	52.4%	54.0%	50.5%	Long-Term Debt Ratio	50.0%
51.2%	48.3%	49.3%	47.2%	45.5%	49.5%	Common Equity Ratio	50.0%
1062.3	1424.7	1661.0	1840.7	1980	2125	Total Capital ($mill)	2715
1502.8	2100.3	2342.5	2532.3	2715	2940	Net Plant ($mill)	3565
7.5%	7.4%	7.0%	6.8%	6.5%	7.0%	Return on Total Cap'l	7.0%
11.0%	11.5%	10.7%	10.6%	10.0%	10.5%	Return on Shr. Equity	11.5%
11.1%	11.5%	10.8%	10.7%	10.0%	10.5%	Return on Com Equity	11.5%
3.3%	3.8%	3.6%	3.3%	2.5%	3.5%	Retained to Com Eq	3.5%
70%	68%	67%	69%	74%	67%	All Div'ds to Net Prof	63%
19.5	19.5	18.6	22.6	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	13.5
1.01	1.11	1.21	1.16			Relative P/E Ratio	.90
3.8%	3.5%	3.5%	3.1%			Avg Ann'l Div'd Yield	3.0%



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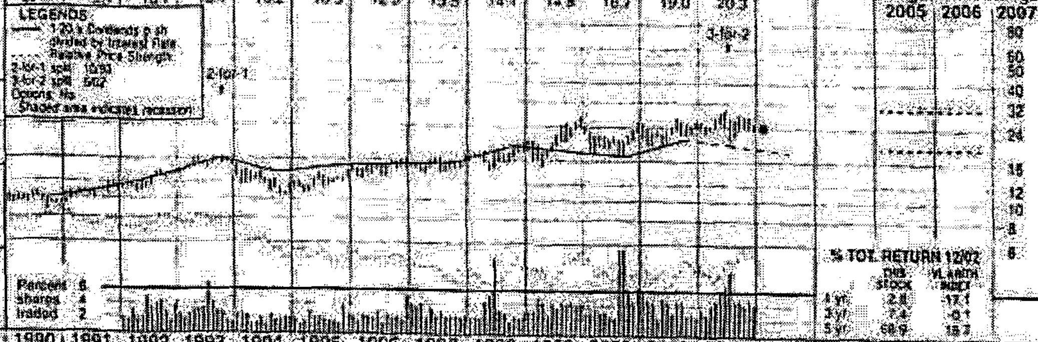
AMER. STATES WATER NYSE-AWR

RECENT PRICE 24.10 | P/E RATIO 20.3 (Trailing: 15.6; Median: 14.0) | RELATIVE P/E RATIO 1.30 | DIV'D YLD 3.7% | VALUE LINE 1421

TIMELINESS 4 Lowered 12/27/02
SAFETY 3 New 2/4/00
TECHNICAL 2 Raised 1/17/03
BETA .65 (1.00 = Market)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
High:	11.9	13.8	16.3	14.7	14.0	16.1	17.1	19.5	26.5	25.3	28.4	29.0
Low:	9.1	10.7	13.1	10.2	10.5	12.6	13.5	14.1	14.8	16.7	19.0	20.3

LEGENDS
— 1.20 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
2-for-1 split 10/93
3-for-2 split 6/02
Options: No
Shaded area indicates recession



2005-07 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	30	(+25%)	9%
Low	19	(-20%)	-1%

Insider Decisions

	M	A	M	J	J	A	S	O	N
to Buy	1	0	0	0	1	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	1	0	0	0	0	0	0

Institutional Decisions

	1Q2002	2Q2002	3Q2002
to Buy	40	39	39
to Sell	25	44	39
Hld's(000)	5461	5529	5713

% TOT. RETURN 12/02

	THIS STOCK	VL ARITH. INDEX
1 yr.	2.8	-17.1
3 yr.	7.4	-0.1
5 yr.	68.9	15.7

1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	© VALUE LINE PUB., INC.	05-07
7.95	8.35	8.58	9.12	8.58	9.15	10.10	9.27	10.43	11.03	11.37	11.44	11.07	12.91	12.17	13.05	13.50	13.14	Revenues per sh	16.05
1.07	1.34	1.13	1.44	1.49	1.78	1.81	1.67	1.58	1.75	1.75	1.85	2.04	2.25	2.20	2.53	2.45	2.55	"Cash Flow" per sh	3.25
.81	.80	.65	.92	.94	1.19	1.15	1.11	.95	1.03	1.13	1.04	1.08	1.19	1.28	1.35	1.25	1.35	Earnings per sh A	1.80
.63	.64	.67	.69	.72	.73	.77	.79	.80	.81	.82	.83	.84	.85	.86	.87	.87	.88	Div'd Decl'd per sh B■	.95
2.17	2.45	2.39	2.46	2.63	2.77	2.31	1.90	2.43	2.19	2.40	2.58	3.11	4.30	3.83	3.18	3.30	2.55	Cap'l Spending per sh	4.15
6.73	7.11	7.07	7.31	7.54	8.39	8.85	9.55	10.07	10.29	11.01	11.24	11.49	11.82	12.74	13.22	13.80	15.10	Book Value per sh	17.35
9.27	9.31	9.35	9.39	9.43	9.91	9.95	11.71	11.77	11.77	13.33	13.44	13.44	13.44	15.12	15.12	15.20	15.80	Common Shs Outst'g C	18.80
11.9	10.8	14.2	9.7	10.2	8.8	10.5	13.4	12.8	11.6	12.5	14.5	15.5	17.1	15.9	16.7	19.7		Avg Ann'l P/E Ratio	13.0
.91	.67	1.18	.73	.76	.55	.64	.79	.84	.78	.79	.84	.81	.97	1.03	.86	1.03		Relative P/E Ratio	.85
6.5%	7.2%	7.4%	7.7%	7.5%	7.0%	6.3%	5.3%	6.6%	6.7%	5.8%	5.5%	5.0%	4.2%	4.2%	3.9%	3.5%		Avg Ann'l Div'd Yield	4.1%

CAPITAL STRUCTURE as of 9/30/02
Total Debt $260.0 mill. Due in 5 Yrs $33.3 mill.
LT Debt $245.2 mill. LT Interest $17.1 mill.
(Total interest coverage: 3.4x) (54% of Cap'l)

Leases, Uncapitalized: None
Pension Liability None

Pfd Stock None. Pfd Div'd None.

Common Stock 15,167,149 shs. (46% of Cap'l) as of 11/8/02
MARKET CAP: $375 million (Small Cap)

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003		05-07
100.7	108.5	122.7	129.8	151.5	153.8	148.1	173.4	184.0	197.5	205	220	Revenues ($mill)	270
11.6	12.0	11.3	12.2	13.5	14.1	14.6	16.3	19.0	20.4	19.0	22.5	Net Profit ($mill)	30.5
38.3%	31.3%	43.9%	41.9%	43.3%	41.1%	40.9%	46.0%	45.7%	43.0%	42.5%	42.5%	Income Tax Rate	43.0%
--	--	--	--	--	--	--	--	--	--	Nil	Nil	AFUDC % to Net Profit	Nil
48.2%	41.5%	43.5%	46.5%	41.5%	43.0%	43.6%	51.0%	47.5%	54.5%	54.0%	49.0%	Long-Term Debt Ratio	51.0%
50.5%	57.4%	55.5%	52.8%	57.3%	56.3%	55.7%	48.4%	51.9%	44.7%	46.0%	51.0%	Common Equity Ratio	49.0%
174.7	203.0	213.5	229.5	256.0	268.4	277.1	328.2	371.1	447.6	455	500	Total Capital ($mill)	595
277.5	295.0	314.9	335.0	357.8	383.6	414.8	449.6	509.1	530.8	565	600	Net Plant ($mill)	715
8.8%	7.5%	7.1%	7.2%	6.9%	6.9%	7.0%	6.5%	6.4%	6.1%	6.0%	6.0%	Return on Total Cap'l	6.5%
12.5%	10.1%	9.4%	9.9%	9.0%	9.2%	9.4%	10.0%	9.2%	10.1%	9.0%	9.0%	Return on Shr. Equity	10.5%
13.0%	10.2%	9.5%	10.2%	9.0%	9.2%	9.4%	10.1%	9.3%	10.1%	9.0%	9.0%	Return on Com Equity	10.5%
4.4%	2.9%	1.6%	2.1%	2.4%	1.8%	2.1%	2.9%	3.0%	3.6%	2.5%	3.0%	Retained to Com Eq	5.0%
67%	72%	84%	79%	73%	80%	78%	72%	68%	65%	70%	65%	All Div'ds to Net Prof	53%

CURRENT POSITION ($MILL.)

	2000	2001	9/30/02
Cash Assets	5.8	30.5	11.7
Receivables	10.5	10.6	14.1
Inventory (Avg Cst)	1.1	1.0	1.1
Other	35.1	45.7	53.7
Current Assets	52.5	87.8	80.6
Accts Payable	11.9	13.9	18.1
Debt Due	45.7	20.8	14.8
Other	22.6	28.9	31.9
Current Liab.	80.2	63.6	64.8
Fix. Chg. Cov.	332%	327%	341%

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '99-'01 to '05-'07
Revenues	3.0%	3.0%	4.0%
"Cash Flow"	4.0%	6.0%	5.5%
Earnings	2.5%	4.0%	6.0%
Dividends	2.0%	1.0%	1.5%
Book Value	5.0%	4.0%	5.5%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
1999	36.1	42.1	51.6	43.6	173.4
2000	38.7	45.4	55.3	44.6	184.0
2001	40.3	49.9	59.4	47.9	197.5
2002	44.5	52.8	61.6	46.1	205
2003	44.0	56.0	65.0	54.0	220

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
1999	.22	.33	.49	.15	1.19
2000	.21	.29	.57	.21	1.28
2001	.21	.33	.63	.18	1.35
2002	.25	.36	.50	.14	1.25
2003	.19	.35	.61	.19	1.35

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	.213	.213	.213	.213	.85
2000	.213	.213	.219	.217	.86
2001	.217	.217	.217	.217	.87
2002	.217	.217	.217	.221	.87
2003					

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Southern California Water Company, it supplies water to 75 communities in 10 counties. Service areas include the greater metropolitan areas of Los Angeles and Orange Counties. The company also provides electric utility services to approximately 21,800 customers in the city of Big Bear Lake and in areas of San Bernardino County. Acquired Chaparral City Water of Arizona (10/00); 11,400 customers. Has about 500 employees. Off. & dir. own less than 1% of common stock (3/02 Proxy). Chairman: Lloyd Ross. President & CEO: Floyd Wicks. Incorporated: CA. Add.: 630 East Foothill Boulevard, San Dimas, CA 91773. Tel.: 909-394-3600. Web: www.gswater.com.

American States Water Company earnings are under pressure. The California Public Utilities Commission (CPUC) has been difficult for the state's utilities to work with recently. It has been characterized by late decisions on rate cases, and American States' rate filings have been no exception. The company had to wait until this January before receiving $2.7 million in annual rate relief to offset the costs of a 2002 Infrastructure Replacement Program and other expenses, though the decision was originally expected in early 2002. The lack of timely approval of revenue increases prompted management to announce that 2002 share earnings would likely be under $1.35. It estimates that the regulatory delays reduced last year's share net by $0.09. Also, the impact of removing balancing-account treatment for supply costs hurt share earnings by $0.11. Flat water consumption probably didn't help 2002 revenues either.

We think the company will post a 2003 share-net advance of about 8%. Despite the regulatory delays, revenues will likely rise with the help of rate increases and population growth. The company expects to be awarded about $3.5 million in annual rate relief for a 2003 IRP (effective in the second quarter), and other rate increases should also be ordered. Although top-line growth is not as predictable as it used to be, management has been able to keep operating costs down, and we believe that this will continue.

American has modest earnings prospects out to 2005-2007. It should continue to receive rate increases over the period to offset infrastructure costs. Moreover, small acquisitions and population growth will probably fuel further top-line advances. We expect the company to look for attractive takeover targets outside of California in an effort to diversify its operations, since it has been subjected to a burdensome regulatory climate in the state.

These shares are ranked to underperform the year-ahead market, due to poor price and earnings trends. Moreover, the stock offers below-average total-return potential over the coming 3- to 5-year period. Income-oriented investors can find more-attractive investment opportunities elsewhere.

Joseph Espaillat *January 31, 2003*

(A) Primary earnings. Excludes nonrecurring gains: '91, 73¢; '92, 13¢. Next earnings report due early February.

(B) Next dividend meeting early February. Next ex date: mid-Feb. Div'd payment dates: 1st of March, June, Sept., Dec. ■ Div'd reinvestment plan available.

(C) In millions, adjusted for splits.

Company's Financial Strength	B+
Stock's Price Stability	85
Price Growth Persistence	45
Earnings Predictability	85

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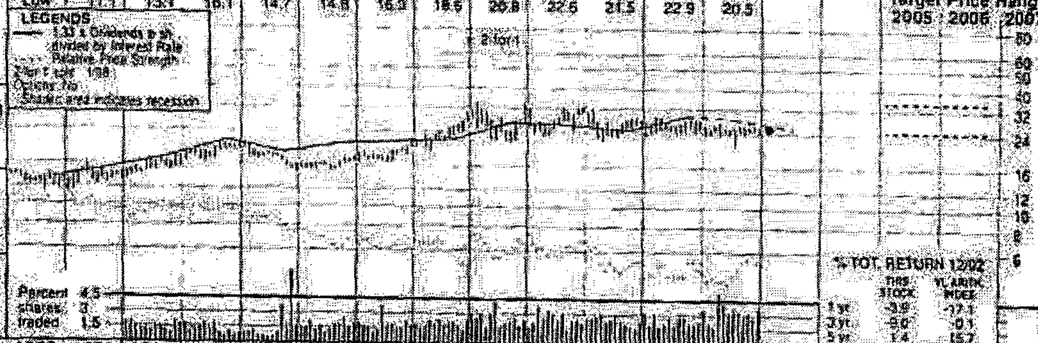
CALIFORNIA WATER NYSE-CWT

RECENT PRICE 25.60 | P/E RATIO 19.7 (Trailing: 21.9, Median: 15.0) | RELATIVE P/E RATIO 1.26 | DIV'D YLD 4.4% | VALUE LINE 1422

TIMELINESS 3 Raised 5/13/02
SAFETY 2 Lowered 5/17/96
TECHNICAL 2 Raised 10/11/02
BETA .55 (1.00 = Market)

High	15.6	17.5	20.6	20.5	17.6	21.9	29.8	33.8	32.0	31.4	28.6	26.9
Low	11.1	13.1	16.1	14.7	14.8	16.3	18.5	20.8	22.5	21.5	22.9	20.5



2005-07 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	35	(+35%)	11%
Low	25	(Nil)	4%

Insider Decisions

	M	A	M	J	J	A	S	O	N
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	0	4	0	0	0	0	0

Institutional Decisions

	1Q2002	2Q2002	3Q2002
to Buy	21	23	26
to Sell	20	19	15
Hld's(000)	2556	2528	2633

% TOT. RETURN 12/02

	THIS STOCK	VL ARITH. INDEX
1 yr.	-3.9	-17.1
3 yr.	-9.0	-0.1
5 yr.	1.4	15.7

1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	© VALUE LINE PUB., INC.	05-07
9.89	10.13	10.03	10.33	10.93	11.16	12.29	13.34	12.59	13.17	14.48	15.48	14.76	15.96	16.16	16.25	17.45	16.65	Revenues per sh	18.60
1.79	1.94	1.87	1.89	1.97	1.98	1.92	2.25	2.02	2.07	2.50	2.82	2.60	2.75	2.52	2.20	2.60	2.80	"Cash Flow" per sh	3.50
1.21	1.32	1.23	1.20	1.25	1.21	1.09	1.35	1.22	1.17	1.51	1.83	1.45	1.53	1.31	.94	1.20	1.45	Earnings per sh A	1.95
.70	.74	.80	.84	.87	.90	.93	.96	.99	1.02	1.04	1.05	1.07	1.09	1.10	1.12	1.12	1.13	Div'd Decl'd per sh B ■	1.17
2.04	1.75	2.12	2.40	2.36	3.03	3.09	2.53	2.26	2.17	2.83	2.61	2.74	3.44	2.45	4.09	4.95	2.85	Cap'l Spending per sh	4.00
8.37	8.85	9.30	9.65	10.04	10.35	10.51	10.90	11.56	11.72	12.22	13.00	13.38	13.43	12.90	12.95	13.15	14.80	Book Value per sh C	18.50
11.07	11.33	11.34	11.38	11.38	11.38	11.38	11.38	12.49	12.54	12.62	12.62	12.62	12.94	15.15	15.18	15.20	16.80	Common Shs Outst'g D	18.80
11.0	10.5	11.5	10.6	10.4	11.2	14.1	13.6	14.1	13.7	11.9	12.6	17.8	17.8	19.6	27.1	20.8		Avg Ann'l P/E Ratio	14.5
.75	.70	.95	.80	.77	.72	.85	.80	.92	.92	.75	.73	.93	1.01	1.27	1.39	1.08		Relative P/E Ratio	.95
5.3%	5.3%	5.7%	6.5%	6.7%	6.6%	6.1%	5.2%	5.8%	6.4%	5.8%	4.6%	4.2%	4.0%	4.3%	4.4%	4.5%		Avg Ann'l Div'd Yield	4.1%

CAPITAL STRUCTURE as of 9/30/02
Total Debt $260.3 mill. Due in 5 Yrs $39.5 mill.
LT Debt $241.5 mill. LT Interest $16.7 mill.
(LT interest earned: 4.8x; total int. cov.: 4.5x)

Pension Liability None

Pfd Stock $3.5 mill. Pfd Div'd $.15 mill.
139,000 shares, 4.4% cumulative ($25 par).

Common Stock 15,182,046 shs.
as of 10/31/02
MARKET CAP: $400 million (Small Cap)

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003		05-07
139.8	151.7	157.3	165.1	182.8	195.3	186.3	206.4	244.8	246.8	265	280	Revenues ($mill)	350
12.5	15.5	14.4	14.7	19.1	23.3	18.4	19.8	20.0	14.4	18.5	24.5	Net Profit ($mill)	37.0
39.7%	40.6%	40.0%	40.1%	38.3%	37.4%	36.4%	37.9%	42.3%	39.4%	40.0%	40.0%	Income Tax Rate	40.0%
--	--	--	--	--	--	--	--	--	--	Nil	Nil	AFUDC % to Net Profit	Nil
49.8%	50.4%	46.6%	49.2%	47.4%	45.4%	44.2%	45.9%	48.9%	50.3%	54.0%	51.0%	Long-Term Debt Ratio	47.5%
48.8%	48.2%	52.2%	49.7%	51.4%	53.5%	54.7%	52.0%	50.2%	48.8%	45.0%	48.5%	Common Equity Ratio	52.0%
245.1	257.1	276.9	296.0	299.9	306.7	308.6	333.8	388.8	402.7	445	510	Total Capital ($mill)	670
374.6	391.7	407.9	422.2	443.6	458.4	478.3	515.4	582.0	624.3	680	710	Net Plant ($mill)	900
7.2%	8.1%	7.1%	6.8%	8.3%	9.5%	7.8%	7.8%	6.8%	5.3%	6.0%	6.5%	Return on Total Cap'l	7.0%
10.2%	12.2%	9.7%	9.6%	12.1%	13.9%	10.7%	11.3%	10.0%	7.0%	9.0%	9.5%	Return on Shr. Equity	10.5%
10.4%	12.4%	9.9%	9.9%	12.3%	14.1%	10.9%	11.4%	10.1%	7.2%	9.0%	10.0%	Return on Com Equity	10.5%
1.5%	3.5%	1.3%	1.2%	3.8%	6.0%	2.8%	3.5%	1.8%	NMF	.5%	2.0%	Retained to Com Eq	4.0%
85%	71%	81%	86%	69%	58%	74%	70%	82%	115%	93%	78%	All Div'ds to Net Prof	59%

CURRENT POSITION ($MILL.)

	2000	2001	9/30/02
Cash Assets	3.2	1.0	3.0
Other	37.6	39.4	52.2
Current Assets	40.8	40.4	55.2
Accts Payable	26.5	24.0	29.1
Debt Due	16.1	26.6	18.5
Other	21.1	28.4	39.9
Current Liab.	63.7	79.0	87.5
Fix. Chg. Cov.	320%	212%	245%

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '99-'01 to '05-'07
Revenues	4.0%	4.0%	2.5%
"Cash Flow"	2.5%	2.5%	6.0%
Earnings	--	-5%	7.5%
Dividends	2.5%	1.5%	1.0%
Book Value	2.5%	2.0%	6.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	38.8	52.1	64.0	50.5	206.4
2000	46.6	66.0	76.8	55.6	244.8
2001	47.0	67.0	76.3	56.5	246.8
2002	51.6	69.2	81.4	62.8	265
2003	56.0	74.0	84.0	66.0	280

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	.20	.43	.62	.28	1.53
2000	.09	.40	.60	.22	1.31
2001	.01	.34	.39	.20	.94
2002	.12	.35	.50	.23	1.20
2003	.16	.41	.61	.27	1.45

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	.272	.271	.271	.271	1.09
2000	.275	.275	.275	.275	1.10
2001	.279	.279	.279	.279	1.12
2002	.28	.28	.28	.28	1.12
2003					

BUSINESS: California Water Service Group supplies water to about 2 million people (450,400 customers) through 25 separate water systems in 75 cities and communities in California, and Washington. Service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Dominguez Services Corp. (5/00); Rio Grande Corp. (11/00). Revenue breakdown, '01: residential, 70%; business, 18%; public authorities, 5%; industrial, 4%; other, 3%. '01 reported deprec. rate: 3.1%. Has about 785 employees; 13,000 shareholders. Chairman: Robert W. Foy. President & CEO: Peter C. Nelson. Inc.: Delaware. Address: 1720 North First Street, San Jose, California 95112-4598. Tel.: 408-367-8200. Internet: www.calwater.com.

California Water's revenues should advance 5%-6% in 2003 . . . Although the California Public Utilities Commission's (CPUC) administrative delays have hurt all of the state's utilities, including CWT, the company ought to receive significant rate relief this year. A rate case filed in July, 2001 will likely be decided in a couple of months. The company may recover $9 million to $10 million of its costs. Also, the CPUC recently authorized water utilities to recover balancing accounts existing before a procedural change in November, 2001 that eliminated balancing accounts. The decision will allow California Water to seek the recovery of up to $6.4 million (it has already filed to recover $4.6 million). Most of the sought amount reflects a 48% increase in electricity rates in 2001. Moreover, a step rate increase of $1.65 million for a previous general rate case went into effect in January.

. . . and share net will likely move ahead nicely. California Water is holding costs down in a number of ways. For example, a low interest-rate environment is allowing the company to refinance some of its debt at lower rates. Too, it is trying to keep the number of new hires to a minimum. In an effort to conserve cash in an unfriendly regulatory environment, the utility has cut back on its capital expenditures. The completion of a newly constructed water treatment plant also means lower capital expenditures in 2003. Investors should note that management plans two equity offerings this year that should raise about $40 million. This would help put CWT's debt-to-equity ratio closer to its long-term goal of 50%.

The company has modest share-earnings growth potential out to 2005-2007. We believe that the regulatory environment in California will improve over time. The recent appointment of a new president of the CPUC ought to speed the change along. Also, rate increases, small acquisitions, and population growth should sustain top-line advances.

These good-quality shares are ranked to move in tandem with the year-ahead market. Although the payout ratio is presently high, we believe that management will hold onto tradition and raise dividends slightly out to 2005-2007.

Joseph Espaillat *January 31, 2003*

(A) Base EPS. Excl. nonrecurring gain (loss): '97, 3¢; '00, (7¢); '01, 4¢; Q2 02, 8¢. Next earnings report due late April.
(B) Next dividend meeting late April. Goes ex early Feb. Div'd payment dates: mid-Feb., May, Aug., Nov. ■ Div'd reinvestment plan available.
(C) Incl. deferred charges. In '01: $28.8 mill., $1.90/sh.
(D) In millions. Adjusted for split.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	50
Earnings Predictability	70

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CONN. WATER SERVICES NDQ-CTWS

RECENT PRICE 26.20 | TRAILING P/E RATIO 23.0 | RELATIVE P/E RATIO 1.41 | DIV'D YLD 3.1% | VALUE LINE 4710

											High / Low
	12.44 / 10.11	12.56 / 10.11	13.56 / 11.00	16.11 / 12.22	19.00 / 13.33	24.67 / 12.67	23.50 / 17.00	32.21 / 19.50	31.00 / 20.35		

RANKS

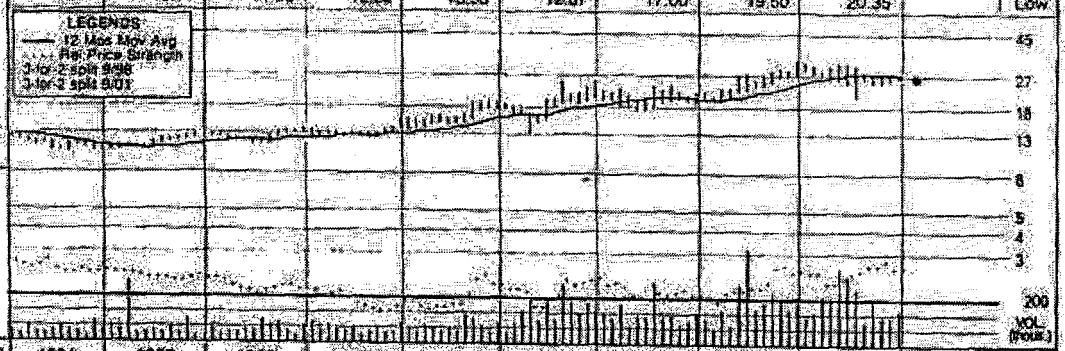
PERFORMANCE 2 Above Average

Technical 2 Above Average

SAFETY 3 Average

BETA .50 (1.00 = Market)

LEGENDS:
— 12 Mos Mov Avg
.... Rel. Price Strength
3-for-2 split 9/98
3-for-2 split 9/01



Financial Strength B++

Price Stability 65

Price Growth Persistence 50

Earnings Predictability 95

© VALUE LINE PUBLISHING, INC.	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003/2004
SALES PER SH	5.90	5.86	5.69	5.67	5.58	5.67	5.70	5.93	--	
"CASH FLOW" PER SH	1.38	1.42	1.46	1.51	1.59	1.65	1.73	1.78	--	
EARNINGS PER SH	.92	.96	.97	1.00	1.02	1.03	1.09	1.13	**1.24**[A,B]	**1.23**[C]/NA
DIV'DS DECL'D PER SH	.73	.75	.76	.77	.78	.79	.79	.80	--	
CAP'L SPENDING PER SH	1.01	1.38	1.62	1.98	1.12	1.42	1.43	1.86	--	
BOOK VALUE PER SH	7.43	7.74	8.03	8.26	8.52	8.61	8.92	9.25	--	
COMMON SHS OUTST'G (MILL)	6.46	6.69	6.78	6.79	6.80	7.28	7.28	7.65	--	
AVG ANN'L P/E RATIO	11.9	11.2	12.5	12.9	15.6	18.2	18.2	21.5	21.1	21.3/NA
RELATIVE P/E RATIO	.78	.78	.78	.74	.81	1.04	1.18	1.10	--	
AVG ANN'L DIV'D YIELD	6.7%	6.6%	6.2%	6.0%	4.9%	4.2%	4.0%	3.3%	--	
SALES ($MILL.)	38.1	39.4	38.6	38.5	37.9	42.6	41.5	45.4	--	*Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.*
OPERATING MARGIN	60.9%	60.8%	44.9%	45.5%	46.2%	48.7%	48.5%	56.1%	--	
DEPRECIATION ($MILL.)	3.1	3.2	3.3	3.5	3.9	4.5	4.7	5.0	--	
NET PROFIT ($MILL.)	5.9	6.4	6.6	6.8	7.0	7.5	8.0	8.7	--	
INCOME TAX RATE	44.7%	43.8%	37.0%	35.1%	34.3%	40.1%	35.7%	36.1%	--	
NET PROFIT MARGIN	15.4%	16.2%	17.1%	17.7%	18.4%	17.6%	19.2%	19.1%	--	
WORKING CAP'L ($MILL.)	d4.2	d4.7	d7.9	d10.4	d3.7	d3.8	.3	d3.3	--	
LONG-TERM DEBT ($MILL.)	54.6	54.5	54.4	54.5	62.5	65.4	64.7	64.0	--	
SHR. EQUITY ($MILL.)	48.8	52.8	55.2	58.8	58.7	63.3	65.7	71.6	--	
RETURN ON TOTAL CAP'L	7.6%	7.8%	7.6%	7.7%	7.3%	7.4%	7.6%	7.9%	--	
RETURN ON SHR. EQUITY	12.1%	12.1%	12.0%	12.0%	11.9%	11.8%	12.1%	12.1%	--	
RETAINED TO COM EQ	2.4%	2.7%	2.7%	2.8%	2.8%	3.1%	3.2%	3.6%	--	
ALL DIV'DS TO NET PROF	80%	78%	78%	77%	76%	74%	74%	71%	--	

A Adj. at analysts' changing earn. est. to last 18 days. B Lgs. 0 down, consensus 5-year earnings growth 3.0% per year. C Based upon 2 analysts' estimates. D Based upon 2 analysts' estimates.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	--	4.0%
"Cash Flow"	4.0%	3.0%
Earnings	2.5%	4.0%
Dividends	1.5%	1.5%
Book Value	3.0%	4.0%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/00	9.7	10.2	11.5	10.1	41.5
12/31/01	10.2	11.0	13.5	10.7	45.4
12/31/02	10.3	10.7	13.8		
12/31/03					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/99	.21	.25	.37	.20	1.03
12/31/00	.22	.25	.37	.25	1.09
12/31/01	.30	.25	.38	.20	1.13
12/31/02	.20	.24	.50	.24	
12/31/03	.21	.26			

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2000	.198	.198	.20	.20	.80
2001	.20	.20	.202	.202	.80
2002	.202	.202	.205	.205	.81
2003	.205				

INSTITUTIONAL DECISIONS

	1Q'02	2Q'02	3Q'02
to Buy	15	11	14
to Sell	13	17	12
Hld's(000)	1129	1077	1147

ASSETS ($mill.)	2000	2001	9/30/02
Cash Assets	.3	.1	.9
Receivables	4.8	8.2	9.9
Inventory (Avg cost)	.8	.9	1.0
Other	.32	.2	1.2
Current Assets	8.9	9.4	13.0
Property, Plant & Equip. at cost	254.6	283.7	--
Accum Depreciation	67.6	78.0	--
Net Property	187.0	205.7	210.0
Other	19.5	16.6	16.9
Total Assets	215.4	231.7	240.8
LIABILITIES ($mill.)			
Accts Payable	3.8	6.1	4.7
Debt Due	1.4	4.0	8.6
Other	1.4	2.6	.3
Current Liab	6.6	12.7	13.6

LONG-TERM DEBT AND EQUITY as of 9/30/02

Total Debt $72.5 mill. Due in 5 Yrs. NA

LT Debt $63.8 mill. (46% of Cap'l)

Including Cap. Leases NA

Leases, Uncapitalized Annual rentals NA

Pension Liability None in '01 vs. None in '00

Pfd Stock $.8 mill. Pfd Div'd Paid $.1 mill. (1% of Cap'l)

Common Stock 7,569,715 shares (53% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Connecticut Water Services, Inc. acts as the parent company of The Connecticut Water Co. and other subsidiaries, which supply water for residential, commercial, industrial, and municipal purposes in Connecticut. Sales and distributions are affected by seasonal weather fluctuations throughout the year. Profitability is dependent on numerous factors, such as the quantity of rainfall and temperature in a given period of time, industrial demand, prevailing rates of interest for short-term and long-term borrowings, energy rates, and compliance with environmental and water-quality regulations. Connecticut Water owns and operates 10 water filtration treatment plants, including the Guilford Well, Rockville, Westbrook Well, MacKenzie, Hunt Well Field, Stafford Springs, and Reynolds Bridge. In October, Connecticut Water completed its acquisition of the Unionville Water Company in a stock transaction valued at about $6.3 million. Has 181 employees. Chairman, C.E.O. & President: Marshall T. Chiaraluce. Inc.: CT. Address: 93 West Main Street, Clinton, CT 06413. Tel.: 860 669-8636. Internet: http://www.ctwater.com.

M.S.

January 31, 2003

TOTAL SHAREHOLDER RETURN

Dividends plus appreciation as of 12/31/2002

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
-0.78%	-15.95%	-12.04%	30.00%	110.14%

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MIDDLESEX WATER NDQ-MSEX

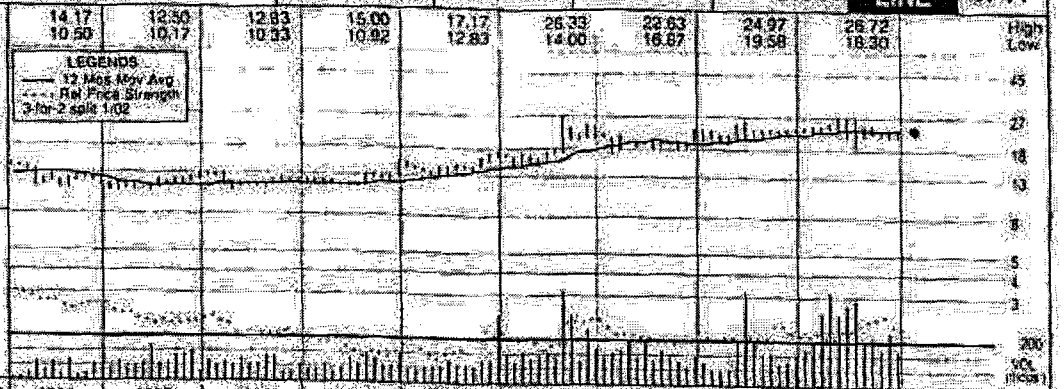
RECENT PRICE	TRAILING P/E RATIO	RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE
22.81	24.0	1.48	3.8%	4711

RANKS

PERFORMANCE	2	Above Average
Technical	2	Above Average
SAFETY	2	Above Average
BETA .55	(1.00 = Market)	

Financial Strength	B+
Price Stability	95
Price Growth Persistence	45
Earnings Predictability	65

	14.17 / 10.50	12.50 / 10.17	12.83 / 10.33	15.00 / 10.92	17.17 / 12.83	26.33 / 14.00	22.83 / 16.67	24.97 / 19.58	26.72 / 18.30	High / Low



© VALUE LINE PUBLISHING, INC.	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003/2004
SALES PER SH	5.97	6.08	6.03	6.29	5.85	7.13	7.18	7.62	--	
"CASH FLOW" PER SH	1.32	1.34	1.26	1.36	1.36	1.58	1.32	1.57	--	
EARNINGS PER SH	.89	.91	.80	.89	.94	1.01	.67	.88	.88 A*	1.03 C/NA
DIV'DS DECL'D PER SH	.70	.72	.74	.75	.77	.79	.82	.83	--	
CAP'L SPENDING PER SH	.99	1.44	.98	1.60	3.57	3.10	1.76	1.67	--	
BOOK VALUE PER SH	7.42	7.65	7.80	8.00	9.06	9.27	9.31	9.48	--	
COMMON SHS OUTST'G (MILL)	6.05	6.23	6.31	6.49	7.36	7.50	7.59	7.63	--	
AVG ANN'L P/E RATIO	13.8	12.2	14.4	13.4	15.2	17.8	28.7	24.6	25.9	22.1/NA
RELATIVE P/E RATIO	.91	.82	.90	.77	.79	1.00	1.87	1.26	--	
AVG ANN'L DIV'D YIELD	5.7%	6.3%	6.4%	6.3%	5.4%	4.4%	4.2%	3.8%	--	
SALES ($MILL.)	36.1	37.9	38.0	40.9	43.1	53.5	54.5	58.6	--	
OPERATING MARGIN	39.0%	38.8%	38.0%	37.2%	37.0%	33.6%	32.2%	47.2%	--	
DEPRECIATION ($MILL.)	2.7	2.8	2.9	3.1	3.8	4.3	4.8	5.3	--	
NET PROFIT ($MILL.)	5.5	5.7	5.2	5.9	6.5	7.9	5.3	7.0	--	
INCOME TAX RATE	35.6%	34.3%	32.8%	34.9%	31.3%	28.8%	33.1%	34.8%	--	
NET PROFIT MARGIN	15.2%	15.1%	13.6%	14.5%	15.1%	14.7%	9.7%	11.7%	--	
WORKING CAP'L ($MILL.)	4.6	4.2	2.0	d2.9	14.5	8.8	d2.7	d.9	--	
LONG-TERM DEBT ($MILL.)	49.5	53.0	53.0	52.9	78.0	82.3	81.1	88.1	--	
SHR. EQUITY ($MILL.)	47.6	50.3	51.9	56.2	71.7	74.8	74.7	76.4	--	
RETURN ON TOTAL CAP'L	7.1%	6.9%	6.4%	6.8%	5.7%	6.4%	4.9%	5.6%	--	
RETURN ON SHR. EQUITY	11.5%	11.3%	10.0%	10.4%	9.1%	10.6%	7.1%	9.1%	--	
RETAINED TO COM EQ	2.4%	2.4%	.8%	1.7%	1.8%	2.5%	NMF	.5%	--	
ALL DIV'DS TO NET PROF	80%	80%	92%	85%	81%	78%	121%	94%	--	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

A No. of analysts changing earn. est. in last 13 days: 0 up, 0 down, consensus 5-year earnings growth 6.0% per year. B Based upon one analyst's estimate. C Based upon one analyst's estimate.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	4.0%	9.0%
"Cash Flow"	2.5%	19.5%
Earnings	--	30.5%
Dividends	2.5%	1.5%
Book Value	4.0%	2.0%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/00	13.0	14.1	14.4	13.0	54.5
12/31/01	13.1	14.7	16.1	15.7	59.6
12/31/02	14.2	15.5	17.0		
12/31/03					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/99	.19	.33	.36	.13	1.01
12/31/00	.12	.17	.19	.19	.67
12/31/01	.11	.24	.30	.23	.88
12/31/02	.16	.24	.32	.16	
12/31/03	.15	.29			

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2000	.203	.203	.203	.207	.82
2001	.207	.207	.207	.21	.83
2002	.21	.21	.21	.215	.85
2003					

INSTITUTIONAL DECISIONS

	1Q'02	2Q'02	3Q'02
to Buy	19	21	18
to Sell	11	10	13
Hld's(000)	1000	1094	1058

ASSETS ($mill.)	2000	2001	9/30/02
Cash Assets	5.3	4.5	1.8
Receivables	5.3	9.5	10.3
Inventory (Avg cost)	1.0	1.0	1.1
Other	3.7	10.1	8.9
Current Assets	15.3	25.1	22.1
Property, Plant & Equip. at cost	227.1	242.7	--
Accum. Depreciation	38.8	43.6	--
Net Property	188.3	199.1	208.4
Other	15.8	12.2	12.5
Total Assets	219.4	236.4	243.0
LIABILITIES ($mill.)			
Accts Payable	2.4	2.4	2.1
Debt Due	5.3	10.6	17.9
Other	9.3	10.0	9.4
Current Liab	16.0	25.0	29.4

LONG-TERM DEBT AND EQUITY as of 9/30/02

Total Debt $105.4 mill. Due in 5 Yrs: NA
LT Debt $87.5 mill. Including Cap. Leases NA (53% of Cap'l)

Leases, Uncapitalized Annual rentals NA

Pension Liability $5.3 mill. in '01 vs. None in '00

Pfd Stock $4.1 mill. Pfd Div'd Paid $.3 mill. (2% of Cap'l)

Common Stock 7,745,169 shares (45% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Middlesex Water Company collects, treats, and distributes water for domestic, commercial, industrial, and fire-protection purposes. The company provides water services to retail customers primarily in eastern Middlesex County, NJ, where water services are furnished to approximately 57,000 retail customers, and in Delaware. The retail customers include residential customers, large industrial concerns, and commercial and light industrial facilities. The water utility plant consists of source of supply, pumping, water treatment transmission, distribution, and general facilities. Water is obtained from both surface and groundwater sources. It is also derived from groundwater sources equipped with electric-motor-driven, deep-well, turbine-type pumps. In December, Middlesex Water's Chairman and Chief Executive J. Richard Tompkins retired as CEO. Middlesex Water said President Dennis Sullivan will become CEO of the company. Has 184 employees. Chairman & C.E.O.: J. Richard Tompkins. Inc.: NJ. Address: 1500 Ronson Road, Iselin, NJ 08830. Tel.: (732) 634-1500. Internet: http://www.middlesexwater.com.

A.O.

January 31, 2003

TOTAL SHAREHOLDER RETURN

Dividends plus appreciation as of 12/31/2002

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
-5.89%	-18.67%	-3.99%	10.39%	73.58%

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PHILA. SUBURBAN NYSE-PSC

RECENT PRICE	P/E RATIO		RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE
20.18	20.4	(Trailing: 23.5) (Median: 16.0)	1.31	2.8%	1423

TIMELINESS 3 Lowered 2/1/02
SAFETY 2 Raised 5/11/95
TECHNICAL 2 Raised 1/10/03
BETA .70 (1.00 = Market)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
High:	5.2	5.3	6.6	8.3	8.9	9.5	14.2	19.2	19.2	20.0	24.6
Low:	3.8	4.4	5.0	5.5	5.5	6.6	7.3	12.1	12.6	10.6	15.7

Target Price Range 2005 2006 2007

LEGENDS
— 2.50 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
3-for-2 split 7/95
4-for-3 split 1/96
5-for-4 split 12/00
5-for-4 split 12/01
Options: Yes
Shaded area indicates recession

2005-07 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	35	(+75%)	12%
Low	25	(+25%)	8%

Insider Decisions

	M	A	M	J	J	A	S	O	N
to Buy	0	0	0	0	0	0	0	0	0
Options	0	1	0	1	0	0	0	0	0
to Sell	0	0	2	0	0	0	0	0	0

Institutional Decisions

	1Q2002	2Q2002	3Q2002
to Buy	69	68	99
to Sell	47	32	37
Hld's(000)	14776	16078	24196

Percent shares traded 4.5 3 1.5

% TOT. RETURN 12/02

	THIS STOCK	VL ARITH. INDEX
1 yr.	-6.4	-17.1
3 yr.	36.4	-0.1
5 yr.	37.5	15.7

1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	© VALUE LINE PUB., INC.	05-07
4.47	4.60	5.57	5.57	3.37	3.57	3.04	2.84	3.03	3.06	3.11	3.36	3.49	3.92	4.11	4.49	4.80	5.05	Revenues per sh	6.10
.71	.75	.83	.81	.72	.74	.65	.70	.70	.78	.84	.93	1.02	1.20	1.28	1.44	1.60	1.80	"Cash Flow" per sh	2.30
.39	.36	.37	.34	.41	.41	.39	.41	.43	.49	.50	.57	.66	.70	.78	.85	.90	1.00	Earnings per sh A	1.40
.29	.30	.30	.30	.32	.32	.33	.34	.35	.38	.38	.40	.43	.45	.47	.50	.54	.57	Div'd Decl'd per sh B ■	.87
.81	.92	1.10	1.44	1.28	.90	1.00	.78	.76	.87	.80	.96	1.36	1.50	1.61	1.81	1.95	2.10	Cap'l Spending per sh	2.55
3.46	3.52	3.60	3.65	3.50	3.45	3.48	3.81	4.01	4.30	4.48	4.73	5.34	5.71	6.42	6.91	7.50	8.10	Book Value per sh	9.85
22.48	23.59	22.62	23.56	24.39	24.65	30.72	35.53	35.87	38.25	39.65	46.46	49.32	51.06	57.30	58.38	66.00	69.50	Common Shs Outst'g C	72.00
12.8	14.0	12.3	12.9	10.2	10.8	12.5	14.4	13.5	12.0	13.6	17.9	22.5	21.2	19.2	23.6	23.6		Avg Ann'l P/E Ratio	22.0
.87	.94	1.02	.98	.76	.89	.76	.95	.89	.80	.84	1.03	1.17	1.21	1.18	1.21	1.24		Relative P/E Ratio	1.40
5.8%	6.0%	6.5%	6.9%	7.7%	7.2%	6.8%	5.9%	6.0%	5.2%	4.5%	3.9%	2.9%	3.0%	3.2%	2.5%	2.5%		Avg Ann'l Div'd Yield	2.2%

CAPITAL STRUCTURE as of 9/30/02
Total Debt $691.8 mill. Due in 5 Yrs $270.0 mill.
LT Debt $575.7 mill. LT Interest $40.0 mill.
(Total interest coverage: 3.4x)

Pension Liability None
Pfd Stock 5.8 mill. Pfd Div'd 5.1 mill.

Common Stock 67,809,954 shares as of 10/30/02

MARKET CAP: $1.4 billion (Mid Cap)

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003		05-07
93.3	101.3	108.5	117.0	122.5	136.2	151.0	257.3	275.5	307.3	325	350	Revenues ($mill)	440
11.5	14.7	15.6	19.0	19.8	23.2	28.8	35.0	50.7	58.5	61.0	70.0	Net Profit ($mill)	100
41.2%	41.5%	42.5%	40.4%	41.4%	40.6%	40.5%	39.4%	38.5%	39.3%	38.5%	39.0%	Income Tax Rate	39.0%
2.3%	5.6%	8%	1.6%	--	--	--	1.5%	4.2%	--	Nil	1.0%	AFUDC % to Net Profit	1.5%
56.8%	49.9%	50.2%	51.8%	54.1%	54.4%	52.7%	52.5%	52.0%	52.2%	54.0%	52.0%	Long-Term Debt Ratio	51.0%
39.5%	46.7%	47.4%	46.4%	44.0%	44.8%	46.5%	46.7%	47.8%	47.7%	46.0%	48.0%	Common Equity Ratio	49.0%
270.5	291.2	303.1	338.0	401.7	427.2	496.6	782.7	801.3	890.4	1050	1150	Total Capital ($mill)	1450
345.6	369.2	385.7	436.9	502.6	534.5	609.6	1135.4	1251.4	1388.1	1470	1600	Net Plant ($mill)	1950
6.7%	7.1%	7.0%	7.7%	8.8%	9.4%	7.5%	7.5%	7.4%	7.8%	7.0%	7.5%	Return on Total Cap'l	8.0%
9.6%	10.1%	10.4%	11.7%	10.7%	11.9%	12.3%	12.2%	11.7%	12.3%	12.0%	12.5%	Return on Shr. Equity	14.0%
9.9%	10.2%	10.3%	11.7%	11.2%	12.0%	12.4%	12.3%	11.7%	12.4%	12.0%	12.5%	Return on Com Equity	14.0%
1.5%	1.8%	2.1%	3.5%	2.8%	3.8%	4.5%	4.3%	4.7%	5.1%	5.0%	5.5%	Retained to Com Eq D	7.5%
85%	85%	81%	71%	75%	70%	64%	65%	60%	59%	60%	57%	All Div'ds to Net Prof	48%

CURRENT POSITION ($MILL.)

	2000	2001	9/30/02
Cash Assets	8.0	20.8	31.4
Receivables	51.2	56.3	61.4
Inventory (Avg Cst)	4.4	4.4	5.3
Other	7.1	8.1	4.4
Current Assets	70.7	89.6	102.5
Accts Payable	20.6	27.7	14.8
Debt Due	104.9	124.6	116.1
Other	47.7	50.3	62.3
Current Liab.	173.2	202.6	193.0
Fix. Chg. Cov.	289%	335%	320%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '99-'01 to '05-'07
Revenues	--	8.5%	6.5%
"Cash Flow"	5.5%	11.0%	10.0%
Earnings	7.0%	10.5%	10.5%
Dividends	4.0%	5.5%	6.0%
Book Value	6.0%	8.5%	7.5%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	58.6	66.2	69.3	63.2	257.3
2000	64.5	68.5	73.3	69.2	275.5
2001	70.2	77.3	84.7	75.1	307.3
2002	71.7	76.9	91.9	84.4	325
2003	85.0	88.0	91.0	86.0	350

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	.14	.19	.22	.15	.70
2000	.16	.19	.24	.19	.78
2001	.17	.22	.28	.18	.85
2002	.17	.20	.31	.22	.90
2003	.21	.25	.31	.23	1.00

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
1999	.109	.109	.115	.115	.45
2000	.115	.115	.115	.124	.47
2001	.124	.124	.124	.132	.50
2002	.132	.132	.132	.14	.54
2003					

BUSINESS: Philadelphia Suburban Corp., parent of Philadelphia Suburban Water Co. (PSWC), a regulated utility, provides water to approximately 2.0 million residents in Pennsylvania, Ohio, New Jersey, Illinois, Maine and North Carolina. Sold three of four non-water businesses in '93; sold telemarketing group in '93. Acquired Consumers Water '99. Water supply revenues '01: residential, 53%; commercial, 18%; industrial & other, 19%. Has about 550 employees, 20,920 stockholders. Vivendi S.A. controls 16.8% of common. Officers and directors own 1.5% of the common stock (4/02 Proxy). Chairman & CEO: Nicholas DeBenedictis. Incorporated: Pennsylvania. Address: 762 Lancaster Avenue, Bryn Mawr, PA 19010. Telephone: 610-527-8000. Internet: www.suburbanwater.com.

Philadelphia Suburban generated decent results in 2002. It benefited from 25 additional growth ventures (i.e., new contracts and acquisitions), plus higher water rates in New Jersey, Ohio, and Pennsylvania. But earnings were held back, to a certain extent, by decreased overall water consumption, arising mainly from drought restrictions in Pennsylvania and New Jersey and unfavorable weather conditions last June in certain Pennsylvania service areas. All things considered, we believe that PSC's share net reached $0.90 last year.

The company should continue to grow through the acquisition of public and private water systems, though future purchases are not included in our presentation due to timing issues and other uncertainties associated with that strategy. The cost of maintaining the water industry's infrastructure has been on the rise over the past several years, largely the result of environmental regulations calling for increased purification standards for drinking water. Given this operating environment, a number of smaller water firms have concluded that their interests are better served by selling out to larger players, like Philadelphia Suburban. The latest additions to PSC's portfolio include the wastewater system of Bridlewood, which serves 1,500 residents in Chester County, Pennsylvania; a water system serving 900 customers in Summit County, Ohio; White Rock Water Systems, which serves 825 residents in Cumberland County, Pennsylvania; and the assets of Brainards Mutual Water Association, serving 150 customers in Warren County, Pennsylvania.

These shares are ranked to perform only in line with the broader market averages for the coming six to 12 months. That's based on recent price and earnings momentum. Moreover, at the current quotation, it appears that some of the solid annual bottom-line growth we envision out to mid-decade has been accounted for, leaving the stock with below average long-term capital appreciation potential. But these shares have some positive attributes, including an Above Average Safety rank and good Price Stability rating.

Frederick L. Harris, III *January 31, 2003*

(A) Based on avg. shares outstanding. Excl. nonrec. gains (losses): '96, (9¢); '99, (47¢); '01, (43¢); '02, (47¢); '99, (14¢); '00, 3¢; '01, 2¢; '02, 1¢. Excl. gain from disc. operations: '96, 3¢. Next earnings report due late Apr. (B) Next dividend meeting early Feb. Goes ex mid-Feb. Div'd. payment dates: early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available. (C) In millions, adjusted for stock splits. (D) Return on common equity allowed by PA PUC in '91 rate adjustment: 12.0%. Return on avg. common equity in '01: 13.3%.

Company's Financial Strength	B+
Stock's Price Stability	80
Price Growth Persistence	50
Earnings Predictability	100

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SJW CORP. AMEX-SJW

RECENT PRICE	TRAILING P/E RATIO	RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE
83.90	17.9	1.10	3.3%	4712

RANKS

PERFORMANCE	3	Average
Technical	3	Average
SAFETY	2	Above Average
BETA .50		(1.00 = Market)
Financial Strength	B++	
Price Stability	95	
Price Growth Persistence	55	
Earnings Predictability	85	

1994	1995	1996	1997	1998	1999	2000	2001	2002	
42.50 / 31.75	37.88 / 31.25	48.25 / 32.00	60.50 / 46.00	71.50 / 48.50	121.00 / 57.25	122.00 / 95.00	107.00 / 89.50	90.40 / 76.00	High / Low

© VALUE LINE PUBLISHING, INC.	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003/2004
SALES PER SH	30.58	29.96	32.36	34.72	33.47	38.42	40.44	44.59	--	
"CASH FLOW" PER SH	5.29	5.90	8.59	7.58	7.57	8.58	7.39	8.95	--	
EARNINGS PER SH	3.05	3.55	5.75	4.80	4.54	5.20	3.50	4.60	4.75A,B	4.85C/NA
DIV'DS DECL'D PER SH	2.10	2.10	2.22	2.28	2.34	2.40	2.46	2.57	--	
CAP'L SPENDING PER SH	5.34	5.76	6.33	7.60	10.85	10.60	11.31	15.76	--	
BOOK VALUE PER SH	32.02	33.48	37.86	42.12	45.19	47.25	47.40	49.05	--	
COMMON SHS OUTST'G (MILL)	3.25	3.25	3.17	3.17	3.17	3.05	3.05	3.05	--	
AVG ANN'L P/E RATIO	12.0	9.9	6.8	11.2	13.1	15.5	33.1	18.5	17.7	17.3/NA
RELATIVE P/E RATIO	.79	.66	.43	.65	.68	.88	2.15	.95	--	
AVG ANN'L DIV'D YIELD	5.7%	6.0%	5.7%	4.3%	3.9%	3.0%	2.1%	3.0%	--	
SALES ($MILL)	99.4	97.4	102.6	110.1	106.0	117.0	123.2	136.1	--	
OPERATING MARGIN	37.0%	41.1%	34.4%	34.8%	36.0%	33.2%	30.2%	34.4%	--	
DEPRECIATION ($MILL)	7.3	7.6	8.7	8.9	9.6	10.2	11.9	13.2	--	
NET PROFIT ($MILL)	9.9	11.5	18.6	15.2	14.4	15.9	10.7	14.0	--	
INCOME TAX RATE	39.2%	40.2%	32.6%	39.9%	40.2%	35.9%	41.0%	34.5%	--	
NET PROFIT MARGIN	10.0%	11.8%	18.1%	13.8%	13.6%	13.6%	8.7%	10.3%	--	
WORKING CAP'L ($MILL)	d1.7	10.7	11.9	7.0	9.4	d3.0	d11.4	d3.8	--	
LONG-TERM DEBT ($MILL)	62.5	76.5	75.0	75.0	90.0	90.0	90.0	110.0	--	
SHR. EQUITY ($MILL)	104.1	108.9	120.0	133.8	143.2	143.9	144.3	149.4	--	
RETURN ON TOTAL CAP'L	7.5%	7.5%	11.0%	8.7%	7.4%	8.2%	5.9%	6.7%	--	
RETURN ON SHR. EQUITY	9.5%	10.6%	15.5%	11.4%	10.1%	11.0%	7.4%	9.4%	--	
RETAINED TO COM EQ	2.9%	4.2%	9.5%	6.0%	4.9%	5.9%	2.2%	4.1%	--	
ALL DIV'DS TO NET PROF	69%	61%	39%	48%	52%	46%	70%	58%	--	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

A No. of analysts changing estm. est. in last 18 days: 0 up, 0 down. Consensus 5-year earnings growth 4.0% per year. B Based upon one analyst's estimate. C Based upon one analyst's estimate.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	6.0%	10.5%
"Cash Flow"	4.5%	21.0%
Earnings	1.5%	31.5%
Dividends	0.0%	4.5%
Book Value	7.0%	3.5%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/00	23.6	33.1	39.3	27.3	123.2
12/31/01	24.2	35.4	44.2	31.3	136.1
12/31/02	27.7	38.7	46.2		
12/31/03					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/99	.55	1.34	1.78	1.52	5.20
12/31/00	.44	.89	1.63	.54	3.50
12/31/01	.22	1.37	2.10	.91	4.60
12/31/02	.57	1.31	1.90	.97	
12/31/03					

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2000	.615	.615	.615	.615	2.46
2001	.618	.652	.652	.652	2.57
2002	.69	.69	.69	.69	2.76
2003					

INSTITUTIONAL DECISIONS

	1Q'02	2Q'02	3Q'02
to Buy	19	12	14
to Sell	10	17	12
Hld's(000)	508	529	516

ASSETS ($mill.)	2000	2001	9/30/02
Cash Assets	.8	5.0	.6
Receivables	6.4	12.6	23.0
Inventory (Avg cost)	.4	.5	.0
Other	7.7	1.3	2.0
Current Assets	15.3	20.4	25.6
Property, Plant & Equip. at cost	462.9	517.5	--
Accum Depreciation	139.4	149.7	--
Net Property	323.5	367.8	390.2
Other	53.1	42.8	43.7
Total Assets	391.9	431.0	459.5
LIABILITIES ($mill.)			
Accts Payable	4	4	5.6
Debt Due	11.2	11.5	10.1
Other	15.1	12.3	19.7
Current Liab.	26.7	24.2	35.4

LONG-TERM DEBT AND EQUITY as of 9/30/02

Total Debt $120.1 mill. Due in 5 Yrs. NA
LT Debt $110.0 mill.
Including Cap. Leases NA
(42% of Cap'l)

Leases, Uncapitalized Annual rentals NA

Pension Liability None in '01 vs. None in '00

Pfd Stock None Pfd Div'd Paid None

Common Stock 3,045,147 shares
(59% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: SJW Corp. operates as a holding company with two wholly owned subsidiaries: San Jose Water Co. and SJW Land Co. San Jose Water Co. is a public utility in the business of providing water service to a population of approximately 988,000 in an area comprising about 138 square miles in the metropolitan San Jose area. SJW Land Co. owns and operates parking facilities adjacent to the company's headquarters and the San Jose Arena. It also owns commercial buildings in San Jose and a 70% limited partnership interest in 444 West Santa Clara Street, L.P. SJW produces, purifies, and distributes water. The company's water supply is obtained from wells, surface run-off, or diversion and by purchases from the Santa Clara Valley Water District. Has 289 employees. Chairman: Drew Gibson. Inc.: CA. Address: 374 West Santa Clara Street, San Jose, CA 95196. Tel.: 408 279-7810. Internet: http://www.sjwater.com.

A.O.

January 31, 2003

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 12/31/2002

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
0.91%	-1.97%	-6.09%	-28.64%	45.94%

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SOUTHWEST WATER NDQ-SWWC

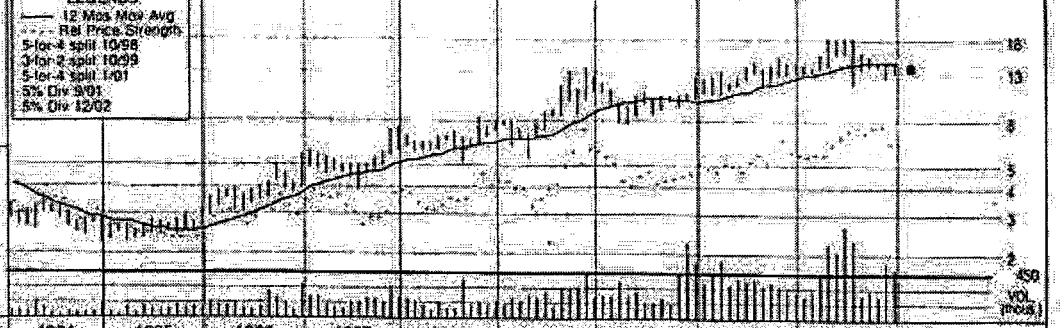
RECENT PRICE	TRAILING P/E RATIO	RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE
13.62	24.3	1.50	1.8%	4713

										High / Low
3.98 / 2.19	3.07 / 2.10	5.44 / 2.88	7.28 / 3.78	8.22 / 5.68	13.51 / 5.35	12.15 / 7.53	15.04 / 10.20	18.19 / 11.24		

RANKS

PERFORMANCE	3	Average
Technical	3	Average
SAFETY	3	Average
BETA .50		(1.00 = Market)

Financial Strength	B+
Price Stability	70
Price Growth Persistence	75
Earnings Predictability	90



© VALUE LINE PUBLISHING, INC.	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003/2004
SALES PER SH	6.17	7.11	7.81	8.25	8.27	9.06	11.00	11.99	--	
"CASH FLOW" PER SH	.56	.64	.68	.78	.87	.95	1.11	1.27	--	
EARNINGS PER SH	.13	.17	.22	.30	.37	.45	.56	.62	.69[A,B]	.75[C]/NA
DIV'DS DECL'D PER SH	.12	.12	.13	.14	.15	.16	.19	.20	--	
CAP'L SPENDING PER SH	1.05	1.23	1.39	1.09	1.16	.77	.81	1.58	--	
BOOK VALUE PER SH	3.39	3.60	3.53	3.71	3.97	4.48	5.05	5.65	--	
COMMON SHS OUTST'G (MILL)	8.25	7.99	8.47	8.61	8.73	8.93	9.52	9.64	--	
AVG ANN'L P/E RATIO	22.3	14.6	16.6	16.8	17.2	19.6	17.0	19.8	19.7	18.2/NA
RELATIVE P/E RATIO	1.46	.98	1.04	.97	.89	1.12	1.11	1.01	--	
AVG ANN'L DIV'D YIELD	4.2%	4.7%	3.4%	2.7%	2.3%	1.8%	2.0%	1.7%	--	
SALES ($MILL)	50.9	56.8	66.2	71.0	72.2	80.9	104.7	115.5	--	
OPERATING MARGIN	14.6%	14.3%	14.6%	16.0%	17.1%	17.0%	18.1%	20.8%	--	
DEPRECIATION ($MILL)	3.6	3.7	3.9	4.2	4.3	4.6	5.3	5.1	--	
NET PROFIT ($MILL)	1.1	1.4	1.9	2.6	3.4	4.2	5.4	6.2	--	
INCOME TAX RATE	40.1%	39.0%	41.6%	41.6%	39.5%	39.0%	37.0%	36.0%	--	
NET PROFIT MARGIN	2.1%	2.5%	2.9%	3.7%	4.6%	5.2%	5.1%	5.4%	--	
WORKING CAP'L ($MILL)	d2.2	d7.3	d4.1	d5.7	d2.7	1.7	1.2	4.8	--	
LONG-TERM DEBT ($MILL)	20.5	19.6	30.7	28.8	33.4	33.5	46.4	58.1	--	
SHR. EQUITY ($MILL)	28.5	29.3	30.4	32.4	35.1	40.5	48.6	55.0	--	
RETURN ON TOTAL CAP'L	4.4%	5.3%	5.5%	6.8%	7.1%	7.6%	7.6%	7.8%	--	
RETURN ON SHR. EQUITY	3.7%	4.9%	6.3%	8.0%	9.6%	10.3%	11.1%	11.4%	--	
RETAINED TO COM EQ	3%	1.5%	2.9%	4.5%	6.0%	7.0%	7.8%	7.8%	--	
ALL DIV'DS TO NET PROF	93%	69%	55%	45%	38%	33%	31%	32%	--	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

[A] No. of analysts changing earn. est. in last 13 days: 0 up, 0 down, consensus 5-year earnings growth 8.0% per year. [B] Based upon 2 analysts' estimates. [C] Based upon 2 analysts' estimates.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	8.5%	9.0%
"Cash Flow"	12.0%	14.0%
Earnings	25.5%	10.0%
Dividends	9.0%	7.5%
Book Value	7.5%	11.5%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/00	20.5	26.8	31.1	26.5	104.7
12/31/01	23.2	27.8	32.0	32.5	115.5
12/31/02	26.2	32.7	34.6		
12/31/03					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/99	.04	.12	.18	.11	.45
12/31/00	.05	.15	.23	.13	.56
12/31/01	.05	.17	.23	.17	.62
12/31/02	.06	.16	.18	.18	
12/31/03	.08	.20			

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2000	.044	.044	.044	.05	.18
2001	.05	.05	.05	.05	.20
2002	.053	.053	.053	.053	.21
2003	.061				

INSTITUTIONAL DECISIONS

	1Q'02	2Q'02	3Q'02
to Buy	7	25	24
to Sell	8	5	13
Hld's(000)	1818	2206	2096

ASSETS ($mill.)	2000	2001	9/30/02
Cash Assets	1.4	.8	1.2
Receivables	17.8	21.4	17.2
Inventory	.9	.0	.0
Other	7.6	9.0	11.0
Current Assets	26.8	31.2	29.9
Property, Plant & Equip. at cost	214.5	233.0	--
Accum Depreciation	55.7	61.9	--
Net Property	157.8	171.1	185.8
Other	12.1	22.9	26.0
Total Assets	196.7	225.2	241.5
LIABILITIES ($mill.)			
Accts Payable	6.0	6.2	5.5
Debt Due	5.2	5.0	3.1
Other	14.4	15.2	18.3
Current Liab	25.6	26.4	26.9

LONG-TERM DEBT AND EQUITY as of 9/30/02

Total Debt $60.8 mill. Due in 5 Yrs. NA
LT Debt $58.7 mill. Including Cap. Leases NA (50% of Cap'l)

Leases, Uncapitalized Annual rentals NA

Pension Liability None in '01 vs. None in '00

Pfd Stock $.5 mill Pfd Div'd Paid NIL

Common Stock 9,750,318 shares (50% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Southwest Water Co. provides water and water-related services to more than three-quarters of a million people located throughout California, New Mexico, Texas, and Mississippi. Water utility operations are conducted through subsidiaries Suburban Water Systems and New Mexico Utilities, Inc. (NMU). Suburban supplies water for residential, business, industrial, and public authority use, and for private and public fire protection services. It operates under jurisdiction of the California Public Utilities Commission. NMU, operating under jurisdiction of the New Mexico Public Regulation Commission, supplies water for residential and private fire protection customers. Has 989 employees. Chairman, C.E.O. & President: Anton C. Garnier. Inc.: DE. Address: 225 North Barranca Avenue, Suite 200, West Covina, CA 91791. Tel.: 626 915-1551. Internet: http://www.southwestwater.com.

A.O.

January 31, 2003

TOTAL SHAREHOLDER RETURN

Dividends plus appreciation as of 12/31/2002

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
-1.55%	-25.56%	0.12%	24.11%	107.61%

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WATER COMPANIES

COMPANY	LATEST 12 MONTHS EARNINGS AVAILABLE	PER SHARE EARNINGS	PER SHARE CURRENT ANNUAL DIVIDEND	DATA (1) BOOK VALUE (1)	DATA (1) STOCK PRICE (2)	DATA (1) COMMON SHARES OS MIL.	PERCENT (2) DIV PAYOUT	PERCENT (2) DIV YIELD	PERCENT (2) MKT/ BOOK	DIV/ BOOK (2)	PRICE EARN MULT
American States Water Co. (NYSE-AWR)	12/02	1.33	0.88	13.72	[illegible]	15.2	[illegible]	3.7	[illegible]	6.4	[illegible]
Artesian Resources Corp. (NDQ-ARTNA)	12/02	1.67	1.13	19.72	[illegible]	2.6	[illegible]	3.8	[illegible]	6.0	[illegible]
California Water Service Group (NYSE-CWT)	12/02	1.24	[illegible]	13.17	[illegible]	15.2	[illegible]	4.3	[illegible]	8.6	[illegible]
Connecticut Water Service, Inc. (NDQ-CTWS)	12/02	1.12	0.80	9.63	[illegible]	7.7	[illegible]	3.1	[illegible]	8.3	[illegible]
Middlesex Water Company (NDQ-MSEX)	12/02	0.97	0.87	9.80	[illegible]	7.7	[illegible]	3.9	[illegible]	8.8	[illegible]
Pennichuck Corporation (NDQ-PNNW)	12/02	0.96	[illegible]	12.64	[illegible]	2.4	[illegible]	4.0	[illegible]	6.9	[illegible]
Philadelphia Suburban Corp. (NYSE-PSC)	12/02	0.97	[illegible]	7.16	[illegible]	69.0	[illegible]	2.6	[illegible]	7.8	[illegible]
SJW Corporation (ASE-SJW)	12/02	4.67	[illegible]	50.71	[illegible]	3.0	[illegible]	3.7	[illegible]	3.7	[illegible]
Southwest Water Company (NDQ-SWWC)	12/02	0.48	[illegible]	6.33	[illegible]	9.3	[illegible]	1.9	[illegible]	3.9	[illegible]
York Water Company (NDQ-YORW)	12/02	0.59	[illegible]	5.82	[illegible]	6.3	[illegible]	3.3	[illegible]	9.3	[illegible]
AVERAGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.4	[illegible]	7.2	[illegible]

INTERNATIONAL COMPANIES

COMPANY	LATEST 12 MONTHS EARNINGS AVAILABLE	PER SHARE EARNINGS	PER SHARE CURRENT ANNUAL DIVIDEND	DATA (1) BOOK VALUE (1)	DATA (1) STOCK PRICE (2)	DATA (1) COMMON SHARES OS MIL.	PERCENT (2) DIV PAYOUT	PERCENT (2) DIV YIELD	PERCENT (2) MKT/ BOOK	DIV/ BOOK (2)	PRICE EARN MULT
BCE, Inc. (NYSE-BCE)	12/02	1.52	[illegible]	6.70	[illegible]	903.0	[illegible]	4.2	[illegible]	11.7	[illegible]
BT Group PLC (NYSE-BTY)	12/02	1.31	[illegible]	(0.44)	[illegible]	261.9	[illegible]	2.7	[illegible]	NM	[illegible]
Philippine Long Distance Tel. Co. (NYSE-PHI)	12/02	0.44	[illegible]	9.84	[illegible]	169.0	[illegible]	0.0	[illegible]	NM	[illegible]
Telecom Argentina (NYSE-TEO)	12/02	-6.56	[illegible]	1.31	[illegible]	197.0	[illegible]	0.0	[illegible]	NM	[illegible]
Telecom New Zealand (NYSE-NZT)	12/02	0.19	[illegible]	2.86	[illegible]	234.4	[illegible]	4.7	[illegible]	31.1	[illegible]
AVERAGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.3	[illegible]	21.1	[illegible]

WATER COMPANIES

COMPANY	OPER REV $ MILL (1)	% WAT REV	NET PLANT $ MILL	NET PLANT PER $ REV (1)
American States Water Co. (NYSE-AWR)	[illegible]	90	[illegible]	2.43
Artesian Resources Corp. (NDQ-ARTNA)	[illegible]	97	[illegible]	4.01
California Water Service Group (NYSE-CWT)	[illegible]	100	[illegible]	2.56
Connecticut Water Service, Inc. (NDQ-CTWS)	[illegible]	100	[illegible]	4.13
Middlesex Water Company (NDQ-MSEX)	[illegible]	100	[illegible]	3.08
Pennichuck Corporation (NDQ-PNNW)	[illegible]	73	[illegible]	2.49
Philadelphia Suburban Corp. (NYSE-PSC)	[illegible]	98	[illegible]	4.63
SJW Corporation (ASE-SJW)	[illegible]	98	[illegible]	1.81
Southwest Water Company (NDQ-SWWC)	[illegible]	41	[illegible]	0.91
York Water Company (NDQ-YORW)	[illegible]	100	[illegible]	4.80
AVERAGE	[illegible]	[illegible]	[illegible]	

COMPANY	S&P BOND RATING	MOODY'S BOND RATING	COMMON EQUITY RATIO (1)	% RETURN ON BOOK VALUE COMMON EQUITY (4)	% RETURN ON BOOK VALUE TOTAL CAPITAL	REGULATION ALLOWED ROE	REGULATION ORDER DATE
American States Water Co. (NYSE-AWR)	[illegible]	A2	[illegible]	9.4	[illegible]	10.00	[illegible]
Artesian Resources Corp. (NDQ-ARTNA)	[illegible]	NR	[illegible]	9.6	[illegible]	10.50	[illegible]
California Water Service Group (NYSE-CWT)	[illegible]	A1	[illegible]	9.6	[illegible]	10.48	[illegible]
Connecticut Water Service, Inc. (NDQ-CTWS)	[illegible]	NR	[illegible]	11.6	[illegible]	12.70	[illegible]
Middlesex Water Company (NDQ-MSEX)	[illegible]	A2	[illegible]	9.8	[illegible]	10.25	[illegible]
Pennichuck Corporation (NDQ-PNNW)	NR	NR	[illegible]	8.4	[illegible]	10.33	[illegible]
Philadelphia Suburban Corp. (NYSE-PSC)	[illegible]	NR	[illegible]	13.9	[illegible]	10.32	[illegible]
SJW Corporation (ASE-SJW)	[illegible]	NR	[illegible]	9.4	[illegible]	9.95	[illegible]
Southwest Water Company (NDQ-SWWC)	[illegible]	NR	[illegible]	12.1	[illegible]	10.00	[illegible]
York Water Company (NDQ-YORW)	NR	NR	[illegible]	16.7	[illegible]	-	[illegible]
AVERAGE	[illegible]		[illegible]	11.1	[illegible]	10.50	[illegible]

INTERNATIONAL COMPANIES

COMPANY	OPER REV $ MILL (1)	% TES REV LOCAL DR CURR	NET PLANT $ MILL	NET PLANT PER $ REV (1)
BCE, Inc. (NYSE-BCE)	[illegible]	[illegible]	[illegible]	1.02
BT Group PLC (NYSE-BTY)	[illegible]	46	[illegible]	1.10
Philippine Long Distance Tel. Co. (NYSE-PHI)	[illegible]	38	[illegible]	3.26
Telecom Argentina (NYSE-TEO)	[illegible]	62	[illegible]	2.98
Telecom New Zealand (NYSE-NZT)	[illegible]	19	[illegible]	0.76
AVERAGE	[illegible]	[illegible]	[illegible]	

COMPANY	S&P BOND RATING	MOODY'S BOND RATING	COMMON EQUITY RATIO (1)	% RETURN ON BOOK VALUE COMMON EQUITY (4)	% RETURN ON BOOK VALUE TOTAL CAPITAL	REGULATION ALLOWED ROE	REGULATION ORDER DATE
BCE, Inc. (NYSE-BCE)	NR	A3	[illegible]	13.2	[illegible]		[illegible]
BT Group PLC (NYSE-BTY)	[illegible]	Baa1	[illegible]	8.8	[illegible]		[illegible]
Philippine Long Distance Tel. Co. (NYSE-PHI)	[illegible]	Ba2	[illegible]	5.8	[illegible]		[illegible]
Telecom Argentina (NYSE-TEO)	[illegible]	Ca	[illegible]	NM	[illegible]		[illegible]
Telecom New Zealand (NYSE-NZT)	[illegible]	A3	[illegible]	NM	[illegible]		[illegible]
AVERAGE	[illegible]		[illegible]	9.2	[illegible]		[illegible]

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Dividends on Book Equity
Data From Value Line Publication of January 31,2003

Exhibit
Schedule D-4.4
Page 1
Witness: Bourassa

Line No.	ACC Staff Compan	Book Value Per Share 2002	Book Value Per Share 2001	Book Value Per Share 2000	Dividend Per Share 2002	Dividend Per Share 2001	Dividend Per Share 2000	Dividend on Book Value 2002	Dividend on Book Value 2001	Dividend on Book Value 2000
1	American States Water (	$ 14.05	$ 13.22	$ 12.74	$ 0.87	$ 0.87	$ 0.86	6.21%	6.58%	6.75%
2	California	15.79	12.95	12.90	1.12	1.12	1.10	7.09%	8.65%	8.53%
3	Connecticut Water Servi	10.07	9.25	8.92	0.81	0.80	0.79	8.07%	8.65%	8.86%
4	Middlesex Water Co.	9.85	9.48	9.31	0.88	0.83	0.82	8.94%	8.76%	8.81%
5	Philadelphia Suburban	7.04	6.91	6.42	0.54	0.50	0.47	7.67%	7.24%	7.32%
6	SJW Corp.	50.41	49.05	47.40	2.76	2.57	2.46	5.48%	5.24%	5.19%
7	Southwest Water	6.28	5.65	5.05	0.22	0.20	0.19	3.45%	3.54%	3.76%
8										
9	Simple Average of Dividends on Book Equity							6.70%	6.95%	7.03%
10										
11	Dividend Payout Ratio							66.04%	70.08%	71.63%
12										
13	Inplied equity return							10.15%	9.92%	9.82%
14	(Line 9 divided by line 11)									
15										
16										
17										
18										
19										
20										
21										
22										

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Growth Rates from Value Line Data
and/or Computed Growth Rates

Exhibit
Schedule D-4.5
Page 1
Witness: Bourassa

Line No.		
1	5-Year EPS Growth	6.89%
2	Projected EPS Growth	8.00%
3	5-Year DPS Growth	3.43%
4	Projected DPS Growth	2.83%
5	5-Year Intrinsic Growth, using :	5.08%
6	Projected Intrinsic Growth,	8.43%
7		
8	Average of Growth Rates	5.78%
9		
10		
11		

12–17		Historic 5 Year Earnings Per Share Growth	Projected 5 Year Earnings Per Share Growth Rate	Historic 5 Year Dividend Growth	Projected Dividend Growth	Intrinsic Growth Historic 5 Year Book Value Growth	Intrinsic Growth Rate with Projected Book Value Growth	Average of all Columns
18	American States Water	4.00%	6.00%	1.00%	1.50%	4.37%	7.06%	3.37%
19	California	2.50%	7.50%	1.50%	1.00%	2.25%	6.03%	2.95%
20	Connecticut Water	2.50%		1.50%		3.60%		2.53%
21	Middlesex Water (a)	1.74%		2.50%		5.04%		3.09%
22	Philadelphia Suburban	10.50%	10.50%	5.50%	6.00%	9.42%	12.20%	8.38%
23	SJW Corp.	1.50%		3.00%		4.50%		3.00%
24	Southwest Water	25.50%		9.00%		6.36%		13.62%
25	Averages	6.89%	8.00%	3.43%	2.83%	5.08%	8.43%	5.25%
26	(a) Growth rate computed on line 24, Column K							
27	Spot Yields From Schedules XX multiplied							
28	by (1 + averages on Line 10)	3.58%	3.62%	3.46%	3.44%	3.52%	3.63%	3.53%
29	Growth Estimates Above	6.89%	8.00%	3.43%	2.83%	5.08%	8.43%	5.25%
30	Estimated DCF	10.47%	11.62%	6.89%	6.28%	8.60%	12.06%	8.77%
31								
32	Average of EPS & BV Growth	10.47%	11.62%			8.60%	12.06%	10.69%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Estimate of Cost of Equity Using
Discounted Cash Flow Method

Exhibit
Schedule D-4.6
Page 1
Witness: Bourassa

Line No.	Company and Stock Exchange	Actual Dividend	4/16/03 Spot Price	Actual Dividend Yield Using Spot Price
1	American States Water - NYSE	$0.88	$24.13	3.65%
2	California Water - NYSE	1.12	26.29	4.26%
3	Connecticut Water - NASDA	0.80	25.35	3.16%
4	Middlesex Water -NASDA	0.86	21.92	3.92%
5	Philadelphia Suburban - NYSE	0.56	22.06	2.54%
6	SJW Corp.- ASE	2.92	80.50	3.63%
7	Southwest Water - NASDA	0.24	12.07	1.99%
8	Average Dividend Yield			3.31%
9				
10				
11				
12				
13			Dividend	iscounte
14			Yield	Cash Flow
15		Dividend	times	Method
16		Growth	Growth	for Equity
17		Estimate	Rate	Return
18	American States Water - NYSE	5.78%	3.86%	9.63%
19	California Water - NYSE	5.78%	4.51%	10.28%
20	Connecticut Water	5.78%	3.34%	9.12%
21	Middlesex Water	5.78%	4.15%	9.93%
22	Philadelphia Suburban - NYSE	5.78%	2.69%	8.46%
23	SJW Corp.	5.78%	3.84%	9.61%
24	Southwest Water - NASDA	5.78%	2.10%	7.88%
25				9.27%
26				

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Summary of Schedules D-4.9 through D-4.23, Except 4.18

Exhibit
Schedule D-4.7
Page 1
Witness: Bourassa

Line No.	Measure of Financial Integrity and Schedule Number	2002	2001	2000	Average of 2000-2002 If Applicable
1	Dividends Paid as a Percentage of Book Equity, Schedule D-4.9				
2	Simple Average of All Companies	6.98%	7.10%	7.10%	7.05%
3	**Pine Water Company, In** **Before**	0.00%	0.00%	0.00%	
4					
5	Interest Coverage (Pre-Tax), Schedule D-4.10				
6	All Companies Weighted	3.33	3.31	3.23	3.29
7	**Pine Water Company, In** **Before**	(30.82)	(19.92)	(2.99)	(18.37)
8					
9					
10	Retention Ratio, Schedule D-4.11				
11	Simple Average of All Companies	33.96%	29.92%	28.37%	
12	**Pine Water Company, Inc.**	100.00%	100.00%	100.00%	
13					
14					
15	Dividend Payout Ratio, Schedule D-4.12				
16	Simple Average of All Companies	66.04%	70.08%	71.63%	
17	**Pine Water Company, Inc.**	0.00%	0.00%	0.00%	
18					
19					
20	Capital Financing Net Plant, Schedule D-4.13				
21	COMMON EQUITY	32.10%	32.85%	33.99%	
22	PREFERRED STOCK	0.42%	0.50%	0.54%	
23	LONG-TERM DEBT	34.00%	34.33%	32.20%	
24	DEFERRED INCOME TAXES AND				
25	ADVANCES AND CONTRIBUTIONS	33.48%	32.32%	33.27%	
26	TOTALS	100.00%	100.00%	100.00%	
27					
28	**Pine Water Company, In** Before				
29	COMMON EQUITY	-34.96%	12.89%	42.04%	
30	LONG-TERM DEBT	17.18%	13.13%	-25.53%	
31	DEFERRED INCOME TAXES AND				
32	ADVANCES AND CONTRIBUTIONS	117.78%	73.98%	83.48%	
33	TOTALS	100.00%	100.00%	100.00%	
34					
35	**Pine Water Company, In** After				
36	COMMON EQUITY	21.29%	12.89%	42.04%	
37	LONG-TERM DEBT	24.53%	13.13%	-25.53%	
38	DEFERRED INCOME TAXES AND				
39	ADVANCES AND CONTRIBUTIONS	54.18%	73.98%	83.48%	
40	TOTALS	100.00%	100.00%	100.00%	
41					
42	Capital Financing Net Plant, Schedule D-4.13, and Rate of				
43	Return Assuming An Equity Return of 11.00%				
44					
45	Comparable Companies	6.74%			
46	Pine Water Company, Inc. Before Conversio	-2.82%			
47	Pine Water Company, Inc. After Conversion	4.52%			
48					
49	Market To Book Ratio, Schedule D-4.14				
50	Simple Average of All Companies	210.17%	274.43%	290.10%	
51	**Pine Water Company, Inc.**	(a)	(a)	(a)	

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Summary of Schedules D-4.9 through D-4.23, Except 4.18

Exhibit
Schedule D-4.7
Page 1
Witness: Bourassa

Line No.	Measure of Financial Integrity and Schedule Number	2002	2001	2000	Average of 2000-2002 If Applicable
1	Dividends Paid as a Percentage of Book Equity, Schedule D-4.9				
2	Simple Average of All Companies	6.98%	7.10%	7.10%	7.05%
3	**Pine Water Company, Inc Before**	0.00%	0.00%	0.00%	
4					
5	Interest Coverage (Pre-Tax), Schedule D-4.10				
6	All Companies Weighted	3.33	3.31	3.23	3.29
7	**Pine Water Company, Inc Before**	(30.82)	(19.92)	(2.99)	(18.37)
8					
9					
10	Retention Ratio, Schedule D-4.11				
11	Simple Average of All Companies	33.96%	29.92%	28.37%	
12	**Pine Water Company, Inc.**	100.00%	100.00%	100.00%	
13					
14					
15	Dividend Payout Ratio, Schedule D-4.12				
16	Simple Average of All Companies	66.04%	70.08%	71.63%	
17	**Pine Water Company, Inc.**	0.00%	0.00%	0.00%	
18					
19					
20	Capital Financing Net Plant, Schedule D-4.13				
21	COMMON EQUITY	32.10%	32.85%	33.99%	
22	PREFERRED STOCK	0.42%	0.50%	0.54%	
23	LONG-TERM DEBT	34.00%	34.33%	32.20%	
24	DEFERRED INCOME TAXES AND				
25	ADVANCES AND CONTRIBUTIONS	33.48%	32.32%	33.27%	
26	TOTALS	100.00%	100.00%	100.00%	
27					
28	**Pine Water Company, Inc** Before				
29	COMMON EQUITY	-34.96%	12.89%	42.04%	
30	LONG-TERM DEBT	17.18%	13.13%	-25.53%	
31	DEFERRED INCOME TAXES AND				
32	ADVANCES AND CONTRIBUTIONS	117.78%	73.98%	83.48%	
33	TOTALS	100.00%	100.00%	100.00%	
34					
35	**Pine Water Company, Inc** After				
36	COMMON EQUITY	21.29%	12.89%	42.04%	
37	LONG-TERM DEBT	24.53%	13.13%	-25.53%	
38	DEFERRED INCOME TAXES AND				
39	ADVANCES AND CONTRIBUTIONS	54.18%	73.98%	83.48%	
40	TOTALS	100.00%	100.00%	100.00%	
41					
42	Capital Financing Net Plant, Schedule D-4.13, and Rate of				
43	Return Assuming An Equity Return of 11.00%				
44					
45	Comparable Companies	6.74%			
46	Pine Water Company, Inc. Before Conversio	-2.82%			
47	Pine Water Company, Inc. After Conversion	4.52%			
48					
49	Market To Book Ratio, Schedule D-4.14				
50	Simple Average of All Companies	210.17%	274.43%	290.10%	
51	**Pine Water Company, Inc.**	(a)	(a)	(a)	

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Summary of Schedules D-4.9 through D-4.23, Except 4.18

Exhibit
Schedule D-4.7
Page 2
Witness: Bourassa

Line No.	Measure of Financial Integrity and Schedule Number	2002	2001	2000	Average of 2000-2002 If Applicable
1	Internal Cash Flow to Change in Gross Plant, Schedule D-4.15				
2	Simple Average of All Companies	64.25%	106.03%	74.07%	
3	**Pine Water Company, Inc.**	-291.42%	-400.19%	2505.65%	
4					
5					
6	Internal Cash Flow as a Percent of Long-Term Debt, Schedule D-4.16				
7	Simple Average of All Companies	18.38%	18.40%	19.60%	18.66%
8	**Pine Water Company, Inc.**	(b)	(b)	(b)	
9					
10					
11					
12	Safety Margin, Schedule D-4.17				
13	Simple Average of All Companies	19.01%	18.70%	18.24%	18.67%
14	**Pine Water Company, Inc.**	-36.46%	-27.25%	77.49%	1.80%
15					
16					
17	Weighted Earnings Per Share Compound Growth, Schedule D-4.19				
18	Simple Average of All Companies				6.93%
19	**Pine Water Company, Inc.**				-27.60%
20					
21					
22	Compound Growth in Book Value, Schedule D-4.20				
23	Simple Average of All Companies				2.90%
24	**Pine Water Company, Inc.**				-173.42%
25					
26					
27	Price Earnings Ratio, Schedule D-4.21				
28	Simple Average of All Companies	20.08	26.33	29.75	24.92
29	**Pine Water Company, Inc.**	(c)	(c)	(c)	(c)
30					
31	Return on Average Common Equity, Schedule D-4.22				
32	Simple Average of All Companies	10.66%	10.49%	10.36%	10.50%
33	**Pine Water Company, Inc.**	793.99%	-101.04%	1036.25%	17.66%
34					
35					
36	Test of Financial Viability, Schedule D-4.23				
37			Financial Viability Rating		
38	Simple Average of All Companies		3.26	Weak to Marginal	
39	**Pine Water Company, In** Before Conversion		(6.30)	Distressed	
40	**Pine Water Company, In** After Conversion		(2.68)	Distressed	
41					
42	(a) Not Applicable, as Stock is not publicly traded				
43	(b) Not Applicable, as no long-term debt				
44	(c) Not Computed, as stock not publicly traded				
45	(d) Distressed				

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Risk Factors to be Should be Considered
in Common Equity Return

Exhibit
Schedule D-4.8
Page 1
Witness: Bourassa

Line
NO.

1 Business and Financial Risks:

4 1 Extremely Small Size in Comparison to Nationally Traded Water
5 Utilties.

7 2 Lack of Ready Access to Outside Capital Markets.

9 3 Impact of Changes in Requirements at the:
10 Arizona Corporation Commission and,
11 Arizona Department of Environment Quality.

13 4 Inability to secure Expense Adjuster before, or after
14 a rate case. Thus, exposure to increasing
15 expenses, with the only way to recover expense is to
16 incur substantial expense via a rate case.

18 5 Low Depreciation Rates.

20 6 Lack of reasonable cash flow from operations.

22 7 Inability to actually collect from customer property taxes
23 which will be incurred.

25 8 Highly leverage capital structure.

Pine Water Company, Inc.
Test Year Ended December 31, 2002
DIVIDENDS AS A PERCENT OF COMMON EQUITY DOLLARS
Dollar Amounts in 000's

Exhibit
Schedule D-4.9
Page 1
Witness: Bourassa

Line No.		2002	2001	2000	Average of 2000 to 2002
1	American States Water Co.				
2	Average Book Equity at 9/30/02	208,967	198,689	175,785	583,440
3	Dividends on Common Stock	13,194	13,104	12,230	38,528
4	Dividends as a Percent of Equtiy	6.31%	6.60%	6.96%	6.60%
5	California Water Service				
6	Average Book Equity	197,918	197,727	196,709	592,354
7	Dividends on Common Stock	17,004	16,918	16,235	50,157
8	Dividends as a Percent of Equtiy	8.59%	8.56%	8.25%	8.47%
9	Connecticut Water Service				
10	Average Book Equity	75,379	67845	63,741	206,965
11	Dividends on Common Stock	6,277	6105	5,890	18,272
12	Dividends as a Percent of Equtiy	8.33%	9.00%	9.24%	8.83%
13	Middlesex Water				
14	Average Book Equity	74,396	71,463	70,562	216,420
15	Dividends on Common Stock	6,510	6,304	6,149	18,964
16	Dividends as a Percent of Equtiy	8.75%	8.82%	8.71%	8.76%
17	Philadelphia Suburban				
18	Average Book Equity	482,907	451,652	398,864	1,333,423
19	Dividends on Common Stock	36,789	34,234	30,406	101,429
20	Dividends as a Percent of Equtiy	7.62%	7.58%	7.62%	7.61%
21	SJW				
22	Average Book Equity	151,427	146,840	144,110	442,376
23	Dividends on Common Stock	8,405	7,834	7,491	23,730
24	Dividends as a Percent of Equtiy	5.55%	5.34%	5.20%	5.36%
25	Southwest Water				
26	Average Book Equity	58,265	51,651	44,029	153,944
27	Dividends on Common Stock	2,142	1,981	1,646	5,769
28	Dividends as a Percent of Equtiy	3.68%	3.84%	3.74%	3.75%
29					
30	Simple Average of All				
31	Companies	6.98%	7.10%	7.10%	7.05%
32					
33	Weighted Average of All				
34	Companies				
35	Average Book Equity	1,249,257	1,185,865	1,093,799	3,528,920
36	Dividends on Common Stock	90,321	86,480	80,047	256,849
37	Dividends as a Percent of Equtiy	7.23%	7.29%	7.32%	7.28%
38					
39	Pine Water Company, Before				
40	Average Book Equity	(153)	91	278	217
41	Dividends on Common Stock	0	0	-	-
42	Dividends as a Percent of Equtiy	0.00%	0.00%	0.00%	0.00%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
INTEREST COVERAGE (PRE-TAX) DOLLARS IN 000'S

Exhibit
Schedule D-4.10
Page 1
Witness: Bourassa

Line No.	COMPARATIVE COMPANIES	2002	2001	2000	Average of 2000-2002
1	American States Water Co.				
2	Operating Income	37,648	37,701	34,252	109,601
3	Income Tax	12,949	14,370	13,182	40,501
4	Total Available	50,597	52,071	47,434	150,102
5	Interest Expense	17,699	15,735	14,122	47,556
6	Interest Coverage	2.86	3.31	3.36	3.16
7	California Water Service				
8	Operating Income	30,297	25,151	33,196	88,644
9	Income Tax	12,568	9,728	11,571	33,867
10	Total Available	42,865	34,879	44,767	122,511
11	Interest Expense	16,841	16,029	14,646	47,516
12	Interest Coverage	2.55	2.18	3.06	2.58
13	Connecticut Water Service				
14	Operating Income	11,834	11,314	11,662	34,810
15	Income Tax	4,482	4,777	4,579	13,838
16	Total Available	16,316	16,091	16,241	48,648
17	Interest Expense	4,534	4,632	4,782	13,948
18	Interest Coverage	3.60	3.47	3.40	3.49
19	Middlesex Water				
20	Operating Income	12,467	11,493	9,938	33,898
21	Income Tax	3,878	3,714	2,637	10,228
22	Total Available	16,345	15,207	12,575	44,126
23	Interest Expense	5,143	5,042	4,997	15,183
24	Interest Coverage	3.18	3.02	2.52	2.91
25	Philadelphia Suburban				
26	Operating Income	98,458	95,364	84,208	278,030
27	Income Tax	42,046	38,976	34,105	115,127
28	Total Available	140,504	134,340	118,313	393,157
29	Interest Expense	40,395	39,859	40,360	120,614
30	Interest Coverage	3.48	3.37	2.93	3.26
31	SJW				
32	Operating Income	20,558	19,827	17,925	58,310
33	Income Tax	9,658	7,391	7,409	24,458
34	Total Available	30,216	27,218	25,334	82,768
35	Interest Expense	7,803	6,737	6,434	20,974
36	Interest Coverage	3.87	4.04	3.94	3.95
37	Southwest Water				
38	Operating Income	7,561	8,192	7,935	23,688
39	Income Tax	3,213	3,539	3,104	9,856
40	Total Available	10,774	11,731	11,039	33,544
41	Interest Expense	4,494	3,694	3,652	11,840
42	Interest Coverage	2.40	3.18	3.02	2.83
43	All Companies				
44	Operating Income	218,823	209,042	199,116	626,981
45	Income Tax	88,794	82,495	76,587	247,875
46	Total Available	307,617	291,537	275,703	874,856
47	Interest Expense	92,418	88,037	85,344	265,794
48	Interest Coverage	3.33	3.31	3.23	3.29
49	**Pine Water Company, Inc.**				
50	Operating Income	(237.14)	(177.79)	(21.33)	(436)
51	Income Tax	0	0	0	-
52	Total Available	(237.14)	(177.79)	(21.33)	(436)
53	Interest Expense	7.69	8.93	7.13	24
54	Interest Coverage	(30.82)	(19.92)	(2.99)	(18.37)
55					

Pine Water Company, Inc.
Test Year Ended December 31, 2002
RETENTION RATIO
(Amounts in $1,000's)

Exhibit
Schedule D-4.11
Page 1
Witness: Bourassa

Line No.		2002	2001	2000
1	American States Water Co.			
2	Net Income-Common	20,310	21,372	19,945
3	Dividends on Common Stock	13,194	13,104	12,230
4	Retention Ratio	35.04%	38.69%	38.68%
5	California Water Service			
6	Net Income-Common	19,073	14,965	19,963
7	Dividends Common	17,004	16,918	16,235
8	Retention Ratio	10.85%	-13.05%	18.67%
9	Connecticut Water Service			
10	Net Income-Common	8,742	8,401	7,858
11	Dividends on Common Stock	6,277	6,105	5,890
12	Retention Ratio	28.20%	27.33%	25.04%
13	Middlesex Water			
14	Net Income-Common	7,511	6,701	5,050
15	Dividends on Common Stock	6,510	6,304	6,149
16	Retention Ratio	13.32%	5.92%	-21.77%
17	Philadelphia Suburban			
18	Net Income-Common	67,155	60,005	52,784
19	Dividends on Common Stock	36,789	34,234	30,406
20	Retention Ratio	45.22%	42.95%	42.40%
21	SJW			
22	Net Income-Common	14,232	14,017	10,665
23	Dividends on Common Stock	8,405	7,834	7,491
24	Retention Ratio	40.95%	44.11%	29.76%
25	Southwest Water			
26	Net Income-Common	5,975	5,424	4,812
27	Dividends on Common Stock	2,142	1,981	1,646
28	Retention Ratio	64.15%	63.48%	65.79%
29				
30	Simple Average of All			
31	Companies	33.96%	29.92%	28.37%
32				
33	Average of All Companies		0	
34	Net Income-Common	137,023	125,461	116,265
35	Dividends on Common Stock	88,179	84,499	78,401
36	Retention Ratio	35.65%	32.65%	32.57%
37				
38	**Pine Water Company, Inc.**			
39	Net Income-Common	(244)	(187)	466
40	Dividends Common	0	0	0
41	Retention Ratio	100%	100%	100%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
DIVIDEND PAYOUT RATIO
(Amounts in $1,000's)

Exhibit
Schedule D-4.12
PAGE 1
Witness: Bourassa

Line No.		2002	2001	2000
1	American States Water Co.			
2	Net Income-Common	20,310	21,372	19,945
3	Dividends on Common Stock	13,194	13,104	12,230
4	Payout Ratio	64.96%	61.31%	61.32%
5	California Water Service			
6	Net Income-Common	19,073	14,965	19,963
7	Dividends on Common Stock	17,004	16,918	16,235
8	Payout Ratio	89.15%	113.05%	81.33%
9	Connecticut Water Service			
10	Net Income-Common	8,742	8,401	7,858
11	Dividends on Common Stock	6,277	6,105	5,890
12	Payout Ratio	71.80%	72.67%	74.96%
13	Middlesex Water			
14	Net Income-Common	7,511	6,701	5,050
15	Dividends on Common Stock	6,510	6,304	6,149
16	Payout Ratio	86.68%	94.08%	121.77%
17	Philadelphia Suburban			
18	Net Income-Common	67,155	60,005	52,784
19	Dividends on Common Stock	36,789	34,234	30,406
20	Payout Ratio	54.78%	57.05%	57.60%
21	SJW			
22	Net Income-Common	14,232	14,017	10,665
23	Dividends on Common Stock	8,405	7,834	7,491
24	Payout Ratio	59.05%	55.89%	70.24%
25	Southwest Water			
26	Net Income-Common	5,975	5,424	4,812
27	Dividends on Common Stock	2,142	1,981	1,646
28	Payout Ratio	35.85%	36.52%	34.21%
29				
30	Simple Average of All			
31	Companies	66.04%	70.08%	71.63%
32				
33	Average of All Companies			
34	Net Income-Common	142,998	130,885	121,077
35	Dividends on Common Stock	90,321	86,480	80,047
36	Payout Ratio	63.16%	66.07%	66.11%
37				
38	**Pine Water Company, Inc.**			
39	Net Income-Common	(244)	(187)	466
40	Dividends on Common Stock	0	0	0
41	Payout Ratio	0.00%	0.00%	0.00%
42				
43				

Pine Water Company, Inc.
Test Year Ended December 31, 2002
CAPITAL FINANCING OF NET PLANT IN $000

Exhibit
Schedule D-4.13
Page 1
Witness: Bourassa

Line No.	Comparative Companies	2002 DOLLAR AMOUNT	2002 PERCENT OF TOTAL	2001 DOLLAR AMOUNT	2001 PERCENT OF TOTA	2000 DOLLAR AMOUNT	2000 PERCENT OF TOTAL
1	American States Water Co.						
2	Common Equity	213,279	34.28%	204,654	32.84%	192,723	35.93%
3	Preferred Equity	-	0.00%	1,880	0.30%	1,920	0.36%
4	Long-Term Debt	231,089	37.14%	245,692	39.43%	176,452	32.89%
5	Deferred Items (a)	177,762	28.57%	170,952	27.43%	165,334	30.82%
6	Totals	622,130	100.00%	623,178	100.00%	536,429	100.00%
7							
8	California Water						
9	Common Equity	199,217	28.10%	196,619	31.15%	198,834	32.98%
10	Preferred Equity	3,475	0.49%	3,475	0.55%	3,475	0.58%
11	Long-Term Debt	250,365	35.31%	202,600	32.10%	187,098	31.03%
12	Deferred Items (a)	255,984	36.10%	228,531	36.20%	213,462	35.41%
13	Totals	709,041	100.00%	631,225	100.00%	602,869	100.00%
14							
15	Connecticut Water						
16	Common Equity	79,975	32.08%	70,783	32.31%	64,906	31.38%
17	Preferred Equity	847	0.34%	847	0.39%	772	0.37%
18	Long-Term Debt	64,734	25.96%	63,953	29.19%	64,658	31.26%
19	Deferred Items (a)	103,765	41.62%	83,475	38.11%	76,489	36.98%
20	Totals	249,321	100.00%	219,058	100.00%	206,825	100.00%
21							
22	Middlesex Water						
23	Common Equity	76,501	35.58%	72,290	34.36%	70,635	35.07%
24	Preferred Equity	4,063	1.89%	4,063	1.93%	4,063	2.02%
25	Long-Term Debt	87,483	40.69%	88,140	41.89%	82,109	40.77%
26	Deferred Items (a)	46,978	21.85%	45,909	21.82%	44,586	22.14%
27	Totals	215,025	100.00%	210,403	100.00%	201,393	100.00%
28	Philadelphia Suburban						
29	Common Equity	493,097	33.08%	472,717	34.82%	430,587	34.90%
30	Preferred Equity	172	0.01%	1,116	0.08%	1,760	0.14%
31	Long-Term Debt	582,910	39.11%	516,520	38.04%	465,295	37.71%
32	Deferred Items (a)	414,359	27.80%	367,351	27.06%	336,253	27.25%
33	Totals	1,490,538	100.00%	1,357,704	100.00%	1,233,895	100.00%

34 (a) Deferred Income Taxes, Investment Tax Credits, Advances and Contributions in Aid of
35 Construction, and other deferred items, such as Deferred Regulatory Items.

Pine Water Company, Inc.
Test Year Ended December 31, 2002
CAPITAL FINANCING OF NET PLANT IN $000

Exhibit
Schedule D-4.13
Page 2
Witness: Bourassa

Line No.	Comparative Companies	2002 DOLLAR AMOUNT	2002 PERCENT OF TOTAL	2001 DOLLAR AMOUNT	2001 PERCENT OF TOTA	2000 DOLLAR AMOUNT	2000 PERCENT OF TOTAL
1	**SJW**						
2	Common Equity	153,499	35.73%	149,354	36.71%	144,325	39.52%
3	Preferred Equity	-	0.00%	-	0.00%	-	0.00%
4	Long-Term Debt	110,000	25.60%	110,000	27.04%	90,000	24.64%
5	Deferred Items (a)	166,124	38.67%	147,504	36.25%	130,863	35.83%
6	Totals	$429,623	100.00%	$406,858	100.00%	$365,188	100.00%
7							
8	Southwest Water						
9	Common Equity	$61,324	25.86%	$55,205	27.76%	$48,097	28.12%
10	Preferred Equity	513	0.22%	513	0.26%	514	0.30%
11	Long-Term Debt	80,985	34.15%	64,830	32.60%	46,351	27.10%
12	Deferred Items (a)	94,299	39.77%	78,327	39.39%	76,103	44.49%
13	Totals	$237,121	100.00%	$198,875	100.00%	$171,065	100.00%
14							
15	Simple Average of All Companies						
16	Common Equity	182,413	32.10%	174,517	32.85%	164,301	33.99%
17	Preferred Equity	1,296	0.42%	1,699	0.50%	1,786	0.54%
18	Long-Term Debt	201,081	34.00%	184,534	34.33%	158,852	32.20%
19	Deferred Items (a)	179,896	33.48%	160,293	32.32%	149,013	33.27%
20	Totals	564,686	100.00%	521,043	100.00%	473,952	100.00%
21							
22	All Companies Combined						
23	Common Equity	1,276,892	32.30%	1,221,622	33.49%	1,150,107	34.67%
24	Preferred Equity	9,070	0.23%	11,894	0.33%	12,504	0.38%
25	Long-Term Debt	1,407,566	35.61%	1,291,735	35.42%	1,111,963	33.52%
26	Deferred Items (a)	1,259,271	31.86%	1,122,049	30.76%	1,043,090	31.44%
27	Totals	3,952,799	100.00%	3,647,301	100.00%	3,317,664	100.00%
28							
29	Pine Water Company, Inc.						
30	Common Equity	(153)	-34.96%	91	12.89%	278	42.04%
31	Preferred Equity	-	0.00%	-	0.00%	-	0.00%
32	Long-Term Debt	75	17.18%	93	13.13%	(169)	-25.53%
33	Deferred Items (a)	515	117.78%	525	73.98%	552	83.48%
34	Totals	438	100.00%	709	100.00%	662	100.00%
35							
36	Pine Water Company, After Conversion						
37	Common Equity	203	21.29%	91	12.89%	278	42.04%
38	Preferred Equity	-	0.00%	-	0.00%	-	0.00%
39	Long-Term Debt	233	24.53%	93	13.13%	(169)	-25.53%
40	Deferred Items (a)	515	54.18%	525	73.98%	552	83.48%
41	Totals	951	100.00%	709	100.00%	662	100.00%
42							

43 (a) Deferred Income Taxes, Investment Tax Credits, Advances and Contributions in Aid of
44 Construction, and other deferred items, such as Deferred Regulatory Items.

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Comparison of Capital Structure and Cost of Capital
Amounts in $000"s

Exhibit
Schedule D-4.13
Page 3
Witness: Bourassa

Line No.

1 Data from Schedule D-4.13, Pages 1 and 2

4 Capital Structures of All Companies Combined

	Dollar Amount of Capital	Percent of Total Capital	Cost Rate	Weighted Cost of Capital
Common Equity (a)	1,276,892	32.30%	12.00%	3.88%
Preferred Equity (a)	9,070	0.23%	6.00%	0.01%
Long-Term Debt (a)	1,407,566	35.61%	8.00%	2.85%
Deferred Items	1,259,271	31.86%	0.00%	0.00%
Totals & Weighted Cost of Capital	3,952,799	100.00%		6.74%

15 Capital Structure of
16 Pine Water Company, In Before Conversion

	Dollar Amount of Capital	Percent of Total Capital	Cost Rate	Weighted Cost of Capital
Common Equity (a)	(153)	-34.96%	12.00%	-4.20%
Preferred Equity (a)	-	0.00%	6.00%	0.00%
Long-Term Debt (a)	75	17.18%	8.00%	1.37%
Deferred Items	515	117.78%	0.00%	0.00%
Totals & Weighted Cost of Capital	438	100.00%		-2.82%

27 (a) Assumed Rates of Return

29 Capital Structure of
30 Pine Water Company, In After Conversion

	Dollar Amount of Capital	Percent of Total Capital	Cost Rate	Weighted Cost of Capital
Common Equity (a)	203	21.29%	12.00%	2.56%
Preferred Equity (a)	-	0.00%	6.00%	0.00%
Long-Term Debt (a)	233	24.53%	8.00%	1.96%
Deferred Items	515	54.18%	0.00%	0.00%
Totals & Weighted Cost of Capital	951	100.00%		4.52%

41 (a) Assumed Rates of Return

Pine Water Company, Inc.
Test Year Ended December 31, 2002
MARKET TO BOOK RATIO
(Amounts in $000's)

Exhibit
Schedule D-4.14
Page 1
Witness: Bourassa

Line No.	COMPANY	At December 31, 2002 MARKET VALUE	BOOK VALUE	RATIO OF MARKET VALUE TO BOOK VALUE	At December 31, 2001 MARKET VALUE	BOOK VALUE	RATIO OF MARKET VALUE TO BOOK VALUE	At December 31, 2000 MARKET VALUE	BOOK VALUE	RATIO OF MARKET VALUE TO BOOK VALUE
1	American States Water Co.	351,440	213,279	164.78%	528,409	204,654	258.20%	495,557	192,723	257.13%
2	American States Water Co. Data for 2002, at Sept. 30, 2002									
2										
3	California Water	359,054	199,217	180.23%	390,937	196,619	198.83%	408,402	198,834	205.40%
3										
4	Connecticut Water	200,319	79,975	250.48%	226,192	70,783	319.56%	232,929	64,906	358.87%
4										
5	Middlesex Water	162,924	76,501	212.97%	254,861	72,290	352.55%	236,491	70,489	335.50%
5										
6	Philadelphia Suburban	1,443,396	493,097	292.72%	1,562,723	472,717	330.58%	1,586,596	430,587	368.47%
6										
7	**SJW**	237,674	149,354	159.13%	259,721	149,354	173.90%	310,605	144,325	215.21%
7										
8	**Southwest Water**	129,307	61,324	210.86%	129,664	55,205	234.88%			
8										
9	Simple Average of All			210.17%			266.93%			290.10%
9	**Companies**									
10										
10	All Companies Combined	2,884,114	1,272,747	226.61%	3,352,506	1,221,622	274.43%	3,270,579	1,101,864	296.82%
9										
11										
10	**Pine Water Company, Inc.**									
12	Equity is not publicly traded									
11										
13										
12										

Pine Water Company, Inc.
Test Year Ended December 31, 2002
INTERNAL CASH FLOW TO CHANGE IN GROSS PLANT
AMOUNTS IN $000's

Exhibit
Schedule D-4.15
Page 1
Witness: Bourassa

Line No.	Companies	2002 CASH FLOW ($000's)	2002 CHANGE IN GROSS PLANT ($000's)	2002 RATIO	2001 CASH FLOW ($000's)	2001 CHANGE IN GROSS PLANT ($000's)	2001 RATIO	2000 CASH FLOW ($000's)	2000 CHANGE IN GROSS PLANT ($000's)	2000 RATIO
1	American States Water Co.	38,612	51,256	75%	39,323	38,048	103%	35,284	77,306	46%
2										
3	California Water	40,311	91,652	44%	34,191	58,377	59%	38,331	38,595	99%
4										
5	Connecticut Water	13,929	40,810	34%	13,238	19,932	66%	12,576	7,521	167%
6										
7	Middlesex Water	12,474	16,129	77%	11,753	12,599	93%	9,751	15,097	65%
8	Change Net Plant Used									
9	Philadelphia Suburban	111,477	122,726	91%	100,173	116,688	86%	86,884	168,729	51%
10										
11	**SJW**	28,245	34,692	81%	27,257	44,335	61%	22,512	30,630	73%
12										
13	**Southwest Water**	12,355	26,438	47%	11,484	4,202	273%	10,076	60,194	17%
14										
15	**Simple Average of all**									
16	**Companies**			64%			106%			74%
17										
18	All Companies Combined	257,403	383,703	67%	237,419	294,181	81%	215,414	398,072	54%
19										
20										
21	**Pine Water Company, Inc.**	(197)	68	-291%	(141)	35	-400%	519	21	2506%
22										
23										
24										
25	Cash flow computed as Net Income plus Depreciation Expense.									

Pine Water Company, Inc.
Test Year Ended December 31, 2002
INTERNAL CASH GENERATION AS A
PERCENT OF LONG-TERM DEBT
Amounts in $000's

Exhibit
Schedule D-4.16
Page 1
Witness: Bourassa

LINE NO.	Companies	Cash Flow 2002	Long Term Debt 2002	Cash Flow Ratio	Cash Flow 2001	Long Term Debt 2001	Cash Flow Ratio	Cash Flow 2000	Long Term Debt 2000	Cash Flow Ratio	Average of 2000 to 2002
1	American States Water Co.	38,612	231,089	16.71%	39,323	245,692	16.00%	35,284	176,452	20.00%	17%
2											
3	California Water	40,311	250,365	16.10%	34,191	202,600	16.88%	38,331	187,098	20.49%	18%
4											
5	Connecticut Water	13,929	64,734	21.52%	13,238	63,953	20.70%	12,576	64,658	19.45%	21%
6											
7	Middlesex Water	12,474	87,483	14.26%	11,753	88,140	13.33%	9,751	82,109	11.88%	13%
8											
9	Philadelphia Suburban	111,477	582,910	19.12%	100,173	516,520	19.39%	86,884	465,295	18.67%	19%
10											
11	**SJW**	28,245	110,000	25.68%	27,257	110,000	24.78%	22,512	90,000	25.01%	25%
12											
13	**Southwest Water**	12,355	80,985	15.26%	11,484	64,830	17.71%	10,076	46,351	21.74%	18%
14											
15	**Simple Average of all**										
16	**Companies**			18.38%			18.40%			19.60%	18.66%
17											
18	All Companies Combined	257,403	1,407,566	18.29%	237,419	1,291,735	18.38%	205,338	1,065,612	19.27%	18.60%
19											
20											
21	**Pine Water Company, Inc.**	(196,965)	75,166	-262.04%	(140,583)	93,080	-151.03%	518,694	(168,864)	-307.17%	-29332%
22											
23	Cash flow computed as Net Income plus Depreciation Expense.										

Pine Water Company, Inc.
Test Year Ended December 31, 2002
SAFETY MARGIN

Exhibit
Schedule D-4.17
Page 1
Witness: Bourassa

LINE NO.	COMPANY	2002	2001	2000	Combined 2000-2002
1	**AMERICAN STATES WATER CO.**				
2	Net Income	20,310	21,372	19,945	61,627
3	Income Tax	12,949	14,370	13,182	40,501
4	Preferred Dividend	29	84	86	199
5	Totals	33,288	35,826	33,213	102,327
6	Revenues	209,205	197,514	183,960	590,679
7	**Safety Margin**	15.91%	18.14%	18.05%	17.32%
8					
9	California Water				
10	Net Income	19,073	14,965	19,963	54,001
11	Income Tax	12,568	9,728	11,571	33,867
12	Preferred Dividend	-	-	-	-
13	Totals	31,641	24,693	31,534	87,868
14	Revenues	263,151	246,820	244,806	754,777
15	**Safety Margin**	12.02%	10.00%	12.88%	11.64%
16					
17	Connecticut Water				
18	Net Income	8,742	8,401	7,858	25,001
19	Income Tax	4,482	4,777	4,579	13,838
20	Preferred Dividend	38	38	38	114
21	Totals	13,262	13,216	12,475	38,953
22	Revenues	45,830	45,392	43,997	135,219
23	**Safety Margin**	28.94%	29.12%	28.35%	28.81%
24					
25	Middlesex Water				
26	Net Income	7,511	6,701	5,050	19,262
27	Income Tax	3,878	3,714	2,637	10,228
28	Preferred Dividend	255	255	255	765
29	Totals	11,643	10,670	7,942	30,255
30	Revenues	61,933	59,638	54,477	176,048
31	**Safety Margin**	18.80%	17.89%	14.58%	17.19%
32	Philadelphia Suburban				
33	Net Income	67,155	60,005	52,784	179,944
34	Income Tax	42,046	38,976	34,105	115,127
35	Preferred Dividend	52	106	106	264
36	Totals	109,253	99,087	86,995	295,335
37	Revenues	322,028	307,280	275,538	904,846
38	**Safety Margin**	33.93%	32.25%	31.57%	32.64%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
SAFETY MARGIN

Exhibit
Schedule D-4.17
Page 2
Witness: Bourassa

LINE NO.	COMPANY	2002	2001	2000	Combined 2000-2002
1	**SJW**				
2	Net Income	14,232	14,017	10,665	38,914
3	Income Tax	9,658	7,391	7,409	24,458
4	Preferred Dividend	-	-	-	-
5	Totals	23,890	21,408	18,074	63,372
6	Revenues	145,652	136,083	123,157	404,892
7	**Safety Margin**	16.40%	15.73%	14.68%	15.65%
8					
9	**Southwest Water**				
10	Net Income	5,975	5,424	4,812	16,211
11	Income Tax	3,213	3,539	3,104	9,856
12	Preferred Dividend	27	27	27	81
13	Totals	9,215	8,990	7,943	26,148
14	Revenues	130,800	115,547	104,741	351,088
15	**Safety Margin**	7.05%	7.78%	7.58%	7.45%
16					
17	**Simple Average of All Companies**	19.01%	18.70%	18.24%	18.67%
18					
19	All Companies Combined				
20	Net Income	142,998	130,885	121,077	394,960
21	Income Tax	88,794	82,495	76,587	247,875
22	Preferred Dividend	401	510	512	1,423
23	Totals	232,192	213,890	198,176	644,258
24	Revenues	1,178,599	1,108,274	1,030,676	3,317,549
25	**Safety Margin**	19.70%	19.30%	19.23%	19.42%
26					
27	**Pine Water Company, Inc.**				
28	Net Income	(244,422)	(186,695)	466,254	35,137
29	Income Tax	-	-	-	-
30	Preferred Dividend				-
31	Totals	(244,422)	(186,695)	466,254	35,137
32	Revenues	670,447	685,233	601,693	1,957,373
33	**Safety Margin**	-36.46%	-27.25%	77.49%	1.80%
34					

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Interest Coverage and Debt Service
At Present and Proposed Rates

EXHIBIT
SCHEDULE D-4.18
PAGE 1
Witness: Bourassa

Present Rates

Line No.			Interest Coverage	Debt Service
1	Available for Interest Coverage:			
2	Operating Income	(a)	($132,727)	
3	Income Taxes		50	
4	Available for Interest Coverage:		($132,677)	
5	Interest Expense on Actual Debt		20,824	
6	Interest Coverage		(6.37)	
7				
8	Available for Debt Service:			
9	Operating Income	(a)		($132,727)
10	Add:			
11	Depreciation and Amortization Expense			35,496
12	Available for Debt Service			($97,231)
13	Debt Service (Interest and Principal			
14	Payments on Actual Debt)			71,900
15	Debt Service Coverage			(1.35)
16				

Company Proposed Rates

Line No.			Interest Coverage	Debt Service
17				
18			Interest	Debt
19			Coverage	Service
20	Available for Interest Coverage:			
21	Operating Income	(a)	$74,324	
22	Income Taxes		16,010	
23	Available for Interest Coverage:		$90,334	
24	Interest Expense on Actual Debt		20,824	
25	Interest Coverage		4.34	
26				
27	Available for Debt Service:			
28	Operating Income	(a)		$74,324
29	Add:			
30	Depreciation and Amortization Expense			35,496
31	Available for Debt Service			$109,820
32	Debt Service (Interest and Principal			
33	Payments on Actual Debt)			71,900
34	Debt Service Coverage			1.53

35 (a) Operating Income Not Reduced for Meter Deposits Refunds.

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Weighted Earnings Per Share Compound Growth
(Earnings and Number of Shares in 000's,
Earning Per Share in Dollars)

Exhibit
Schedule D-4.19
Page 1
Witness: Bourassa

Line No.	Company	2002	2001	2000	2000-2002 Compound Earnings Growth Per Share
1	American States Water Co.				
2	Net Income	20,310	21,372	19,945	
3	Number of Shares	15,181	15,119	13,437	
4	Earnings Per Share	$ 1.34	$ 1.41	$ 1.48	-4.90%
5	California Water Service				
6	Net Income	19,073	14,965	19,963	
7	Number of Shares	15,182	15,182	15,126	
8	Earnings Per Share	$ 1.26	$ 0.99	$ 1.32	-2.29%
9	Connecticut Water				
10	Net Income	8,742	8,401	7,858	
11	Number of Shares	7,940	7,649	7,605	
12	Earnings Per Share	$ 1.10	$ 1.10	$ 1.03	2.75%
13	Middlesex Water				
14	Net Income	$ 7,511	$ 6,701	$ 5,050	
15	Number of Shares	7,769	7,626	7,533	
16	Earnings Per Share	$ 0.97	$ 0.88	$ 0.67	21.53%
17	Philadelphia Suburban				
18	Net Income	67,155	60,005	52,784	
19	Number of Shares	70,068	69,300	64,759	
20	Earnings Per Share	$ 0.96	$ 0.87	$ 0.82	11.87%
21	SJW				
22	Net Income	14,232	14,017	10,665	
23	Number of Shares	3,045	3,045	3,045	
24	Earnings Per Share	$ 4.67	$ 4.60	$ 3.50	15.48%
25	Southwest Water				
26	Net Income	$ 5,975	$ 5,424	$ 4,812	
27	Number of Shares	9,759	9,183	8,534	
28	Earnings Per Share	$ 0.61	$ 0.59	$ 0.56	4.05%
29					
30	Simple Average of Earnings Per Share Growth Rate				
31					6.93%
32					
33	Sum of All Companies				
34	Total Net Income	142,998	130,885	121,077	
35	Total Number of Shares	128,944	127,105	120,039	
36	Weighted Earnings				
37	Per Share	$ 1.11	$ 1.03	$ 1.01	4.95%
38					
39	**Pine Water Company, Inc.**				
40		Earnings In Dollars and Actual Shares			
41	Total Earnings	$ (244,422)	$ (186,695)	$ 466,254	
42	Total Number of Shares	1,000	1,000	1,000	
43	Earnings Per Share	$ (244)	$ (187)	$ 466	-27.60%
44	Tom: You need to recompute Pine Water's Earnings per share Growth				
45					

Pine Water Company, Inc.
Test Year Ended December 31, 2002
COMPOUND GROWTH IN BOOK VALUE
(Total Equity and Number of Shares in
$ 000's, Book Value Per Share in Dollars)

Exhibit
Schedule D-4.20
Page 1
Witness: Bourassa

Line No.	Companies	2002	2001	2000	2000-2002 Compound Growth Rate
1	American States Water				
2	Total Equity	$ 213,279	$ 204,654	$ 196,386	
3	Number of Shares	15,181	15,119	15,119	
4	Book Value Per Share	$ 14.05	$ 13.54	$ 12.99	4.01%
5	**California Water Service**				
6	Total Equity	$ 199,217	$ 196,619	$ 198,834	
7	Number of Shares	15,182	15,182	15,126	
8	Book Value Per Share	$ 13.12	$ 12.95	$ 13.15	-0.10%
9	**Connecticut Water**				
10	Total Equity	$ 79,975	$ 70,783	$ 64,906	
11	Number of Shares	7,940	7,649	7,605	
12	Book Value Per Share	$ 10.07	$ 9.25	$ 8.54	8.63%
13	**Middlesex Water**				
14	Total Equity	$ 76,501	$ 72,290	$ 70,635	
15	Number of Shares	7,769	7,626	7,533	
16	Book Value Per Share	$ 9.85	$ 9.48	$ 9.38	3.65%
17	Philadelphia Suburban				
18	Total Equity	$ 493,097	$ 472,717	$ 430,587	
19	Number of Shares	70,068	69,300	64,759	
20	Book Value Per Share	$ 7.04	$ 6.82	$ 6.65	3.65%
21	**SJW**				
22	Total Equity	$ 153,499	$ 149,354	$ 144,325	
23	Number of Shares	3,045	3,045	3,045	
24	Book Value Per Share	$ 50.41	$ 49.05	$ 47.40	3.13%
25	**Southwest Water**				
26	Total Equity	$ 61,324	$ 55,205	$ 48,097	
27	Number of Shares	9,759	9,183	8,534	
28	Book Value Per Share	$ 6.28	$ 6.01	$ 5.64	3.49%
29					
30	**Simple Average of All**				
31	**Companies**	**$ 14.93**	**$ 14.44**	**$ 14.01**	2.90%
32					
33	**Sum of All Companies**				
34	Total Equity	$ 1,276,892	$ 1,221,622	$ 1,153,770	
35	Total Number of Shares	128,944	127,105	121,721	
36	Book Value Per Share	$ 110.82	$ 107.10	$ 103.73	3.36%
37					
38	**Pine Water Company, Inc.**				
39	Ending Equity	$ (153)	$ 91	$ 278	
40	Total Number of Shares	1	1	1	
41	Book Value Per Share	$ (153)	$ 91	$ 278	-173.42%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
PRICE / EARNING RATIO
(DOLLAR AMOUNTS IN 000'S)

Exhibit
Schedule D-4.21
Page 1
Witness: Bourassa

LINE NO.	Companies	2002	2001	2000	2000-2002 Average
1	AMERICAN STATES WATER COMPANY				
2	Net Income to Common Equity	$ 20,310	$ 21,372	$ 19,945	$ 61,627
3	Total Market Value	351,440	528,409	495,557	1,375,406
4	Price Earnings Ratio	17.30	24.72	24.85	22.32
5					
6	**California Water Service**				
7	Net Income to Common Equity	19,073	14,965	19,963	$ 54,001
8	Total Market Value	359,054	390,937	408,402	1,158,393
9	Price Earnings Ratio	18.83	26.12	20.46	21.45
10					
11	**Connecticut Water**				
12	Net Income to Common Equity	8,742	8,401	7,858	$ 25,001
13	Total Market Value	200,319	226,192	232,929	659,439
14	Price Earnings Ratio	22.91	26.92	29.64	26.38
15					
16	**Middlesex Water**				
17	Net Income to Common Equity	7,511	6,701	5,050	$ 19,262
18	Total Market Value	162,924	254,861	241,063	658,848
19	Price Earnings Ratio	21.69	38.03	47.74	34.20
20					
21	Philadelphia Suburban				
22	Net Income to Common Equity	67,155	60,005	52,784	$ 179,944
23	Total Market Value	1,443,396	1,562,723	1,586,596	4,592,715
24	Price Earnings Ratio	21.49	26.04	30.06	25.52
25					
26	SJW				
27	Net Income to Common Equity	14,232	14,017	10,665	$ 38,914
28	Total Market Value	237,674	259,721	310,605	807,999
29	Price Earnings Ratio	16.70	18.53	29.12	20.76
30					
31	Southwest Water				
32	Net Income to Common Equity	5,975	5,424	4,812	$ 16,211
33	Total Market Value	129,307	129,664	126,986	385,957
34	Price Earnings Ratio	21.64	23.91	26.39	23.81
35					
36	**Simple Average of All**				
37	**Companies**	20.08	26.33	29.75	24.92
38					
39					
40	All Companies Combined				
41	Net Income to Common Equity	142,998	130,885	121,077	394,960
42	Total Market Value	2,884,114	3,352,506	3,402,137	9,638,756
43	Price Earnings Ratio	20.17	25.61	28.10	24.40
44					
45					
46	**Pine Water Company, Inc.**				
47	Equity not publicly traded, thus no price to earnings ratio is computed.				
48					
49					

Pine Water Company, Inc.
Test Year Ended December 31, 2002
RETURN ON AVERAGE COMMON EQUITY
(AVERAGE EQUITY AND NET INCOME IN 000's)

Exhibit
Schedule D-4.22
Page 1
Witness: Bourassa

Line No.	Comparative Companies	2002	2001	2000	Three Year Totals and Averages
1	American States Water				
2	Average Equity	$ 208,967	$ 198,689	$ 175,785	$ 583,440
3	Net Income	20,310	21,372	19,945	61,627
4	Return on Average Equity	9.72%	10.76%	11.35%	10.56%
5					
6	**California Water Service**				
7	Average Equity	197,918	197,727	196,709	592,354
8	Net Income	19,073	14,965	19,963	54,001
9	Return on Average Equity	9.64%	7.57%	10.15%	9.12%
10					
11	**Connecticut Water**				
12	Average Equity	75,379	67,845	63,741	206,965
13	Net Income	8,742	8,401	7,858	25,001
14	Return on Average Equity	11.60%	12.38%	12.33%	12.08%
15					
16	**Middlesex Water**				
17	Average Equity	74,396	71,463	70,562	216,420
18	Net Income	7,511	6,701	5,050	19,262
19	Return on Average Equity	10.10%	9.38%	7.16%	8.90%
20					
21	Philadelphia Suburban				
22	Average Equity	482,907	451,652	398,864	1,333,423
23	Net Income	67,155	60,005	52,784	179,944
24	Return on Average Equity	13.91%	13.29%	13.23%	13.49%
25					
26	**SJW**				
27	Average Equity	151,427	146,840	144,110	442,376
28	Net Income	14,232	14,017	10,665	38,914
29	Return on Average Equity	9.40%	9.55%	7.40%	8.80%
30					
31	Southwest Water				
32	Average Equity	58,265	51,651	44,029	153,944
33	Net Income	5,975	5,424	4,812	16,211
34	Return on Average Equity	10.25%	10.50%	10.93%	10.53%
35					
36	**Simple Average of All Companies**	10.66%	10.49%	10.36%	10.50%
37					
38	**Sum of All Companies**				
39	Total Equity	$1,249,257	$ 1,185,865	$ 1,093,799	$ 3,528,920
40	Total Net Income	142,998	130,885	121,077	394,960
41	Return on Average Equity	11.45%	11.04%	11.07%	11.19%
42					
43					
44	**Pine Water Company, Inc.**				
45	Average Equity	(31)	185	$ 45	199
46	Net Income	(244)	(187)	$ 466	35
47	Return on Average Equity	793.99%	-101.04%	1036.25%	17.66%

Pine Water Company, Inc.
Test Year Ended December 31, 2002
Test of Financial Viability

Exhibit
Schedule D-4.23
Page 1
Witness: Bourassa

Line No.	Ratio Label	Ratio Computation	American States Water 2002	Calif. Water Service 2002	Con-necticut Water Service 2002	Middle-sex Water 2002	Phil. Surb. Water 2002	SJW 2002	Southwest Water 2002	Average of Ratioes of All Companies 2002	Pine Water Company, Inc. 2002	Proposed Pine Water Company, Inc. 2002
1	Profit-	Net Income + Depreciation	0.18	0.15	0.30	0.20	0.35	0.19	0.09	0.21	-0.29	0.10
2	ability	Annual Operating Revenues										
3											(a)	(a)
4	Liquid-	Current Assets	0.65	0.47	0.67	0.69	0.31	0.79	0.94	0.65	**0.06**	**0.33**
5	ity	Current Liabilities										
6												
7	Lever-	Common Stock Equity	0.30	0.25	0.30	0.31	0.29	0.34	0.23	0.29	-0.14	0.18
8	age	Total Assets										
9												
10	Profit	Retained Earnings	0.40	0.75	0.34	0.30	0.37	0.86	0.30	0.47	-6.93	-5.23
11	Trend	Common Stock Equity										
12												
13	Growth &											
14	Effic-	Annual Operating Revenue	0.30	0.33	0.17	0.25	0.19	0.32	0.49	0.29	0.63	0.80
15	iency	Total Assets										
16												
17	Effic-											
18	iency &	Annual Operating Revenue	1.22	1.13	1.35	1.25	1.44	1.16	1.06	1.23	0.74	1.09
19	Profit-	Annual Operating Expenses										
20	ability											
21												
22	Profit-	Net Income	0.10	0.07	0.19	0.12	0.21	0.10	0.05	0.12	-0.36	0.06
23	ability	Annual Operating Revenues										
24												
25		Totals	3.16	3.15	3.32	3.13	3.15	3.77	3.16	3.26	-6.30	-2.68
26			Weak to	Weak to	Weak to	Weak to	Weak to	Weak to	Weak to	Weak to	Distressed	Distressed
27			Marginal	Marginal	Marginal	Marginal	Marginal	Marginal	Marginal	Marginal		

28 Test of Financial Viability from:
29 **Viability Policies and Assessment Methods for Small Water Utilities,**
30 The National Regulatory Research Institute

(a) Results for applicant are being distorted by High Accounts Receivables

31
32 Distress Classification Model
33 If Distress Score is:
34 4.00 or more — Good to excellent
35 3.00 to 3.99 — Weak to marginal
36 3.00 or less — Distressed

Pine Water Company
Test Year Ended December 31, 2002
Comparative Balance Sheets

Exhibit
Schedule E-1
Page 1
Witness: Bourassa

Line No.		Test Year Ended 12/31/02	Prior Year Ended 12/31/01	Prior Year Ended 12/31/00
1	**ASSETS**			
2	Plant In Service	$ 1,891,594	$ 1,824,007	1,788,878
3				
4	Non-Utility Plant	-	-	
5	Construction Work in Progress	-	-	0
6	Less: Accumulated Depreciation	(1,228,209)	(1,180,752)	(1,134,640)
7	Net Plant	$ 663,385	$ 643,255	$ 654,238
8				
9	Debt Reserve Fund	$ -	$ -	$ -
10				
11	CURRENT ASSETS			
12	Cash and Equivalents	$ -	$ -	
13	Accounts Receivable, Net	18,111	19,774	15,071
14	Notes/Receivables from Associated Compani	-	-	-
15	Materials and Supplies	-	-	-
16	Prepayments	18,040	18,850	19,660
17	Other Current Assets	3,725	3,725	3,724
18	Total Current Assets	$ 39,876	$ 42,348	$ 38,455
19				
20	Deferred Debits	$ 369,000	$ 369,000	$ 369,000
21				
22	Other Investments & Special Funds	$ -	$ -	$ -
23				
24	TOTAL ASSETS	$ 1,072,261	$ 1,054,603	$ 1,061,693
25				
26				
27	**LIABILITIES AND STOCKHOLDERS' EQUITY**			
28				
29	Common Equity	$ (152,996)	$ 91,427	278,121
30				
31	Long-Term Debt	$ 55,353	$ 75,166	$ 93,080
32				
33	CURRENT LIABILITIES			
34	Accounts Payable	$ 59,388	$ 44,061	4,988
35	Current Portion of Long-Term Debt	-	-	
36	Payables to Associated Companies	533,599	277,182	96,400
37	Customer Deposits	21,356	20,410	15,708
38	Taxes Payable	-	-	0
39	Interest Payable	-	-	
40	Other Current Liabilities	40,096	21,796	21,140
41	Total Current Liabilities	$ 654,440	$ 363,450	$ 138,236
42	DEFERRED CREDITS			
43	Advances in Aid of Construction	$ 52,072	$ 36,964	$ 40,457
44	Accumulated Deferred Income Taxes	-	-	-
45	Contributions In Aid of Construction, Net	463,392	487,595	511,799
46	Accumulated Deferred Income Credits	-	-	-
47	Total Deferred Credits	$ 515,464	$ 524,559	$ 552,256
48				
49	Total Liabilities & Common Equity	$ 1,072,261	$ 1,054,603	$ 1,061,693
50				
51				
52	SUPPORTING SCHEDULES:		RECAP SCHEDULES:	
53	E-5			
54	A-3			
55				

Pine Water Company
Test Year Ended December 31, 2002
Comparative Income Statements

Exhibit
Schedule E-2
Page 1
Witness: Bourassa

Line No.		2002	2001	2000
1	**Revenues**			
2	Metered Water Revenues	$ 662,011	$ 675,199	$ 593,529
3	Unmetered Water Revenues	-	-	-
4	Other Water Revenues	8,436	10,034	8,164
5		$ 670,447	$ 685,233	$ 601,693
6	**Operating Expenses**			
7	Salaries and Wages	$ 125,296	$ 103,920	$ 100,771
8	Pension & Benefits	6,105	5,888	8,859
9	Purchased Water	103,532	85,556	39,183
10	Purchased Power	36,942	28,399	35,513
11	Chemicals	604	-	3,571
12	Materials & Supplies	59,423	4,447	11,202
13	Regulatory Water Testing	7,758	8,987	1,325
14	Contractual Services - Engineering	-	4,294	-
15	Contractual Services - Accounting	38,328	29,304	5,164
16	Contractual Services - Legal	104,161	87,682	7,448
17	Contractual Services - Other	19,368	7,797	8,000
18	Overhead Allocation - G&A	71,092	80,593	121,460
19	Rental of Equipment	-	582	7,025
20	Transportation Expenses	176,144	267,780	132,732
21	Worker's Comp	2,271	1,766	1,480
22	Insurances Medical/Dental	12,663	8,117	8,113
23	Telephone	2,631	3,870	4,656
24	Dues & Subscriptions	299	369	-
25	Bad Debt Expense	2,153	3,319	(978)
26	Misc Expenses	202	39	346
27	Office Supplies	-	152	197
28	Licenses & Permits	1,000	1,046	111
29	Repairs & Maintenance - Bldg	-	12	59
30	R&M Vehicles	-	20	
31	Sales Tax Expense	41,363	40,895	34,676
32	Utiltiy Reg. Assess. Fee	272	259	1,296
33	CAWCD Costs	21,501	22,386	23,926
34	Depreciation Expense	23,254	21,908	24,559
35	Other Taxes and Licenses	45	45	45
36	Property Taxes	51,177	43,592	42,282
37	Income Tax	-	-	-
38				
39	**Total Operating Expenses**	$ 907,584	$ 863,026	$ 623,020
40	**Operating Income**	$ (237,137)	$ (177,793)	$ (21,328)
41	**Other Income (Expense)**			
42	Interest Income	-	-	209
43	Other income	408	23	-
44	Income Tax Provision	-	-	494,500
45	Interest Expense	(7,694)	(8,925)	(7,127)
46	Other Expense	-	-	-
47	Gain/Loss Sale of Fixed Assets		-	-
48	**Total Other Income (Expense)**	$ (7,287)	$ (8,902)	$ 487,582
49	**Net Profit (Loss)**	$ (244,423)	$ (186,695)	$ 466,254
50				
51				
52	SUPPORTING SCHEDULES:		RECAP SCHEDULES:	
53				
54				

Pine Water Company
Test Year Ended December 31, 2002
Comparative Statements of Cash Flows

Exhibit
Schedule E-3
Page 1
Witness: Bourassa

Line No.		Test Year Ended 12/31/02	Prior Year Ended 12/31/01	Prior Year Ended 12/31/00
1				
2				
3	Cash Flows from Operating Activities			
4	Net Income	$ (244,424)	$ (186,695)	$ 466,254
5	Adjustments to reconcile net income to net cash			
6	provided by operating activities:			
7	Depreciation and Amortization	23,254	21,908	24,559
8	Deferred Income Taxes	-	-	-
9	Accumulated Deferred ITC	-	-	-
10	Changes in Certain Assets and Liabilities:			
11	Accounts Receivable	1,663	(4,703)	(1,944)
12	Materials and Supplies Inventory	-	-	-
13	Prepaid Expenses	810	810	9,530
14	Misc Current Assets and Deferred Expense	-	-	(498,225)
15	Accounts Payable and Accrued Liabilities	290,044	220,511	(270,406)
16	Accrued Taxes	-	-	-
17	Net Cash Flow provided by Operating Activities	$ 71,347	$ 51,831	$ (270,232)
18	Cash Flow From Investing Activities:			
19	Capital Expenditures	(67,587)	(35,129)	(20,701)
20	Plant Held for Future Use	-	-	-
21	Non-Utility Property	-	-	-
22	Net Cash Flows from Investing Activities	$ (67,587)	$ (35,129)	$ (20,701)
23	Cash Flow From Financing Activities			
24	(Decrease) Increase in Net Amounts due to Parent and			
25	Affiliates	-	-	-
26	Customer Deposits	946	4,702	625
27	Changes in Advances for Construction	15,108	(3,490)	28,364
28	Changes in Contributions for Construction	-	-	-
29	Net Proceeds from Long-Term Debt Borrowing	-	-	261,944
30	Repayments of Long-Term Debt	(19,814)	(17,914)	-
31	Dividends Paid	-	-	-
32	Deferred Financing Costs	-	-	-
33	Paid in Capital	-	-	-
34	Net Cash Flows Provided by Financing Activities	$ (3,760)	$ (16,702)	$ 290,933
35	Increase(decrease) in Cash and Cash Equivalents	-	-	-
36	Cash and Cash Equivalents at Beginning of Year	-	-	-
37	Cash and Cash Equivalents at End of Year	$ -	$ -	$ -
38				
39				
40	SUPPORTING SCHEDULES:		RECAP SCHEDULES:	
41				
42				
43				

Test Year Ended December 31, 2002
Statement of Changes in Stockholder's Equity

Schedule E-4
Page 1
Witness: Bourassa

Line No.		Common Stock	Additional Paid-In-Capital	Retained Earnings	Total
1					
2					
3					
4	Balance, December 31, 2000	321,823	584,935	(628,637)	278,121
5					
6	Net Income	-	-	(186,695)	(186,695)
7					
8	Balance, December 3, 2001	321,823	584,935	-	91,426
9					
10	Net Income	-	-	(244,423)	(244,423)
11					
12	Balance, December 31, 2002	$ 321,823	$ 584,935	$ (244,423)	$ (152,997)
13					
14	SUPPORTING SCHEDULES:			RECAP SCHEDULES:	
15					
16					
17					

Pine Water Company
Test Year Ended December 31, 2002
Detail of Plant in Service

Exhibit
Schedule E-5
Page 1
Witness: Bourassa

Line No.	Acct. No.	Plant Description	Plant Balance at 12/31/01	Plant Additions, Reclass-ications or or Retirements	Plant Balance at 12/31/02
1					
2	301	Organization	$ -	$ -	$ -
3	302	Franchises	-	-	-
4	303	Land and Land Rights	16,930	-	16,930
5	304	Structures and Improvements	160,067	-	160,067
6	305	Collecting and Impounding Rese	-	-	-
7	306	Lake, River and Other Intakes	-	-	-
8	307	Wells and Springs	65,994	-	65,994
9	308	Infiltration Galleries and Tun	-	-	-
10	309	Supply Mains	479	-	479
11	310	Power Generation Equipment	-	-	-
12	311	Pumping Equipment	123,060	8,233	131,293
13	320	Water Treatment Equipment	3,810	1,510	5,320
14	330	Distribution Reservoirs and St	247,073	-	247,073
15	331	Transmission and Distribution	988,892	1,399	990,291
16	333	Services	80,461	-	80,461
17	334	Meters and Meter Installations	137,242	56,446	193,687
18	335	Hydrants	-	-	-
19	336	Backflow Prevention Devices	-	-	-
20	339	Other Plant and Miscellaneous	-	-	-
21	340	Office Furniture and Equipment	-	-	-
22	341	Transportation Equipment	-	-	-
23	342	Stores Equipment	-	-	-
24	343	Tools, Shop and Garage Equipme	-	-	-
25	344	Laboratory Equipment	-	-	-
26	345	Power Operated Equipment	-	-	-
27	346	Communication Equipment	-	-	-
28	347	Miscellaneous Equipment	-	-	-
29	348	Other Tangible Plant	-	-	-
30	348	Other Tangible Plant	-	-	-
31					
32					
33					
34		TOTAL WATER PLANT	$ 1,824,007	$ 67,588	$ 1,891,594
35					
36		SUPPORTING SCHEDULES		RECAP SCHEDULES:	
37				A-4	
38				E-1	
39					

Pine Water Company
Test Year Ended December 31, 2002
Operating Statistics

Exhibit
Schedule E-7
Page 1
Witness: Bourassa

Line No.		Test Year Ended 12/31/02	Prior Year Ended 12/31/01	Prior Year Ended 12/31/00
1	WATER STATISTICS:			
2				
3				
4				
5	Total Gallons Sold (in Thousands)	52,006	52,256	42,344
6				
7				
8				
9	Water Revenues from Customer:	$ 662,011	$ 675,199	$ 593,529
10				
11				
12				
13				
14	Year End Number of Customers	1,887	1,839	1,833
15				
16				
17	Annual Gallons (in Thousands)			
18	Sold Per Year End Customer	27.56	28.42	23.10
19				
20				
21				
22	Annual Revenue per Year End Customer	$ 350.83	$ 367.16	$ 323.80
23				
24	Pumping Cost Per 1,000 Gallons	$ 0.7103	$ 0.5435	$ 0.8387
25	Purchased Water Cost per 1,000 Gallons	$ 1.9908	$ 1.6372	$ 0.9254
26				
27				
28				

Pine Water Company
Test Year Ended December 31, 2002
Taxes Charged to Operations

Exhibit
Schedule E-8
Page 1
Witness: Bourassa

Line No.	Description	Test Year Ended 12/31/02	Prior Year Ended 12/31/01	Prior Year Ended 12/31/00
1	Description			
2				
3	Federal Income Taxes *	$ -	$ -	$ -
4	State Income Taxes *	-	-	-
5	Payroll Taxes *	9,170	7,605	7,375
6	Property Taxes **	51,177	43,592	42,282
7				
8	Totals	$ 60,347	$ 51,197	$ 49,657
9				
10				
11	*Computed			
12	**Source: ACC Annual Reports			
13				
14				

Pine Water Company
Test Year Ended December 31, 2002
Notes To Financial Statements

Exhibit
Schedule E-9
Page 1
Witness: Bourassa

Line No.

1 **The Company does not prepare audited financial statements.**
2
3 1. The Company follows the NARUC system of accounts.
4 2. The Company uses the accrual method of accounting.
5 3. The Company uses the depreciation lives and methods as approved in
6 prior Commission order.
7 4. The Company follows the normalized method for accounting for
8 income taxes and uses the allowed tax depreciation lives and methods
9 for determining income taxes.
10
11
12
13
14
15
16
17
18

Pine Water Company
Test Year Ended December 31, 2002
Projected Income Statements - Present & Proposed Rates

Exhibit
Schedule F-1
Page 1
Witness: Bourassa

Line No.		Test Year Actual Results	At Present Rates Year Ended 12/31/03	At Proposed Rates Year Ended 12/31/03
1	**Revenues**			
2	Metered Water Revenues	$ 662,011	$ 645,612	$ 914,623
3	Unmetered Water Revenues	-	-	-
4	Other Water Revenues	8,436	8,436	8,436
5		$ 670,447	$ 654,048	$ 923,059
6	**Operating Expenses**			
7	Salaries and Wages	$ 125,296	$ 125,296	$ 125,296
8	Pension & Benefits	6,105	6,105	6,105
9	Purchased Water	103,532	64,262	64,262
10	Purchased Power	36,942	36,942	36,942
11	Chemicals	604	604	604
12	Materials & Supplies	59,423	42,923	42,923
13	Regulatory Water Testing	7,758	7,758	7,758
14	Contractual Services - Engineering	-	-	-
15	Contractual Services - Accounting	38,328	38,328	38,328
16	Contractual Services - Legal	104,161	66,430	66,430
17	Contractual Services - Other	19,368	19,368	19,368
18	Overhead Allocation - G&A	71,092	71,092	71,092
19	Rental of Equipment	-	-	-
20	Transportation Expenses	176,144	176,144	176,144
21	Worker's Comp	2,271	2,271	2,271
22	Insurances Medical/Dental	12,663	12,663	12,663
23	Telephone	2,631	2,631	2,631
24	Dues & Subscriptions	299	299	299
25	Bad Debt Expense	2,153	2,153	2,153
26	Misc Expenses	202	202	202
27	Office Supplies	-	4,080	4,080
28	Licenses & Permits	1,000	1,000	1,000
29	Repairs & Maintenance - Bldg	-	-	-
30	R&M Vehicles	-	-	-
31	Sales Tax Expense	41,363	(380)	(380)
32	Utiltiy Reg. Assess. Fee	272	272	272
33	CAWCD Costs	21,501	21,501	21,501
34	Rate Case Expense	-	50,000	50,000
35	Depreciation Expense	23,254	35,496	35,496
36	Other Taxes and Licenses	45	45	45
37	Property Taxes	51,177	45,239	45,239
38	Income Tax	-	(45,951)	16,010
39				
40				
41	**Total Operating Expenses**	$ 907,584	$ 786,774	$ 848,735
42	**Operating Income**	$ (237,137)	$ (132,727)	$ 74,324
43	**Other Income (Expense)**			
44	Interest Income	-	-	-
45	Other income	408	-	-
46	Interest Expense	(7,694)	(20,824)	(20,824)
47	Other Expense	-	-	-
48	Gain/Loss Sale of Fixed Assets	-	-	-
49	**Total Other Income (Expense)**	$ (7,287)	$ (20,824)	$ (20,824)
50	**Net Profit (Loss)**	$ (244,423)	$ (153,551)	$ 53,500
51				

Pine Water Company
Test Year Ended December 31, 2002
Projected Statements of Changes in Financial Position
Present and Proposed Rates

Exhibit
Schedule F-2
Page 1
Witness: Bourassa

Line No.		Test Year Ended 12/31/02	At Present Rates Year Ended 12/31/03	At Proposed Rates Year Ended 12/31/03
5	Cash Flows from Operating Activities			
6	Net Income	$ (244,424)	$ (153,551)	$ 53,500
7	Adjustments to reconcile net income to net cash			
8	provided by operating activities:			
9	Depreciation and Amortization	23,254	35,496	35,496
10	Deferred Income Taxes	-		
11	Accumulated Deferred ITC	-		
12	Changes in Certain Assests and Liabilities:	-		
13	Accounts Receivable	1,663		
14	Materials & Supplies	-		
15	Prepaid Expenses	810		
16	Misc Current Assets and Deferred Expense	-		
17	Accounts Payable and Accrued Liabilities	290,044	37,515	37,515
18	Accrued Taxes	-		
19	Net Cash Flow provided by Operating Activities	$ 71,347	$ (80,540)	$ 126,511
20	Cash Flow From Investing Activities:			
21	Capital Expenditures	(67,587)	(75,435)	(75,435)
22	Plant Held for Future Use	-		
23	Non-Utility Property	-		
24	Net Cash Flows from Investing Activities	$ (67,587)	$ (75,435)	$ (75,435)
25	Cash Flow From Financing Activities			
26	(Decrease) Increase in Net Amounts due to Parent and		(533,599)	(533,599)
27	Affiliates	-		
28	Customer Deposits	946		
29	Changes in Advances for Construction	15,108	-	-
30	Changes in Contributions for Construction	-		
31	Proceeds from Long-Term Debt Borrowing		178,000	178,000
32	Repayments of Long-Term Debt	(19,814)	(51,076)	(51,076)
33	Dividends Paid	-		
	Deferred Financing Costs			
34	Proceeds from Additional Paid-in-Capital	-	355,599	355,599
35	Net Cash Flows Provided by Financing Activities	$ (3,760)	$ (51,076)	$ (51,076)
36	Increase(decrease) in Cash and Cash Equivalents	$ -	$ (207,051)	$ (0)
37	Cash and Cash Equivalents at Beginning of Year	-	-	-
38	Cash and Cash Equivalents at End of Year	$ -	$ (207,051)	$ (0)
39				
40				
41	SUPPORTING SCHEDULES:			
42	E-3			
43	F-3			
44				
45				

Pine Water Company
Test Year Ended December 31, 2002
Projected Construction Requirements

Exhibit
Schedule F-3
Page 1
Witness: Bourassa

Line No.	Account Number	Plant Asset:	Thru 12/31/03	TO BE DETERMINED 2004	2005	2006
1						
2	Account		Thru	TO BE DETERMINED		
3	Number	Plant Asset:	12/31/03	2004	2005	2006
4	301	Organization Cost				
5	302	Franchise Cost				
6	303	Land and Land Rights				
7	304	Structures and Improvements				
8	305	Collecting & Impounding Resrvoirs				
9	306	Lake, River and Other Intakes				
10	307	Wells and Springs	17,100			
11	310	Power Generation Equipment				
12	311	Electric Pumping Equipment	20,335			
13	320	Water Treatment Equipment				
14	330	Distribution Reservoirs & Standpipe				
15	331	Transmission and Distribution Mains	8,000			
16	333	Services				
17	334	Meters	30,000			
18	335	Hydrants				
19	339	Plant Structures and Improvements				
20	340	Office Furniture and Fixtures				
21	341	Transportation Equipment				
22	343	Tools and Work Equipment				
23	344	Power Operated Equipment				
24	345	Communications Equipment				
25	346	Miscellaneous Equipment				
26	348	Other Tangible Plant				
27						
28	Total		$ 75,435	$ -	$ -	$ -
29						
30						
31						

Pine Water Company
Test Year Ended December 31, 2002
Assumptions Used in Rate Filing

Exhibit
Schedule F-4
Page 1
Witness: Bourassa

Line No.	
1	Property Taxes were computed using the method used by the Arizona Department
2	of Revenue
3	
4	Projected construction expenditures are shown on Schedule A-4.
5	
6	Expense adjustments are shown on Schedule C2, and are explained in the testimony.
7	
8	Accumulated depreciation and depreciation expense were computed at Arizona Corporation
9	Commission allowed rated in Prior Commission Decision. Adjusted test year depreciation
10	depreciation computed using proposed depreciation rates.
11	
12	Income taxes were computed using statutory state and federal income tax rates.
13	
14	
15	
16	

Pine Water Company
Revenue Summary
With Annualized Revenues to Year End Number of Customers
Test Year Ended December 31, 2002

Exhibit
Schedule H-1
Page 1
Witness: Bourassa

Line No.	Meter Size	Customer Classification	Present Revenues	Proposed Revenues	Dollar Change	Percent Change	Percent of Present Water Revenues	Percent of Proposed Water Revenues
1	5/8 Inch	Residential 14A	$ 507,049	$ 716,376	$ 209,327	41.28%	78.52%	78.33%
2	5/8 Inch	Residential 14B	119,446	164,623	45,177	37.82%	18.50%	18.00%
3								
4	3/4 Inch	Residential 14B	468	832	364	77.78%	0.07%	0.09%
5	1 Inch	Residential 14A	4,441	8,207	3,766	84.81%	0.69%	0.90%
6	2 Inch	Residential 14A	194	531	338	174.26%	0.03%	0.06%
7								
8								
9	5/8 Inch	Commercial 14A	2,003	3,698	1,695	84.64%	0.31%	0.40%
10	1 Inch	Commercial 14A	2,647	4,473	1,826	68.97%	0.41%	0.49%
11	2 Inch	Commercial 14A	5,977	11,347	5,370	89.84%	0.93%	1.24%
12								
13								
14								
15	**Total Water Revenues**		$ 642,224	$ 910,087	$ 267,863	41.71%	99.45%	99.51%
16								
17								
18	**Revenue Annualization (a)**							
19	5/8 Inch	Residential 14A	$ 3,539	$ 4,460	922	26.04%	0.55%	0.49%
20								
21								
22								
23								
24	**Total Revenue Annualization**		3,539	4,460	922	26.04%	0.55%	0.49%
25	**Total Water Revenues with**							
26	**Revenue Annualization**		$ 645,763	$ 914,548	$ 268,785		100.00%	100.00%
27								
28								
29	(a) Customer Growth Annualization is not calculated. Change in customers is not due to growth.							
30								
31								

Pine Water Company
Analysis of Revenue by Detailed Class
Test Year Ended December 31, 2002

Exhibit
Schedule H-2
Page 1
Witness: Bourassa

Line No.	Customer Classification and/or Meter Size		(a) Average Number of Customers at 12/31/02	Summer Average Consumption	Summer Revenues Present Rates	Summer Revenues Proposed Rates	Summer Proposed Increase Dollar Amount	Summer Proposed Increase Percent Amount	Winter Average Consumption	Winter Revenues Present Rates	Winter Revenues Proposed Rates	Winter Proposed Increase Dollar Amount	Winter Proposed Increase Percent Amount
1	5/8 Inch	Residential 14A	1,502	2,731	$ 27.74	$ 41.15	13.42	48.37%	1,998	$ 25.24	$ 30.70	5.46	21.61%
2	5/8 Inch	Residential 14B	360	2,614	29.50	39.96	10.46	35.47%	1,707	26.32	29.45	3.13	11.88%
3													
4	3/4 Inch	Residential 14B	1	4,901	38.37	74.23	35.86	93.45%	5,215	39.47	65.88	26.41	66.90%
5	1 Inch	Residential 14A	2	31,834	203.75	362.15	158.40	77.74%	28,836	185.91	254.74	68.83	37.02%
6	2 Inch	Residential 14A	0	-	64.58	177.12	112.54	174.26%	-	64.58	177.12	112.54	174.26%
7													
8													
9	5/8 Inch	Commercial 14A	2	14,750	96.02	190.09	94.07	97.97%	9,786	66.48	96.23	29.75	44.75%
10	1 Inch	Commercial 14A	1	44,901	281.50	546.98	265.48	94.31%	27,358	177.12	237.75	60.63	34.23%
11	2 Inch	Commercial 14A	2	38,801	285.24	582.47	297.22	104.20%	28,358	223.11	371.02	147.91	66.30%
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30		Totals	1,871										
31													
32		Actuall Year End Number											
33		of Customers:	1,884										
34													
35		**(a)** Average number of customers of less than one (1), indicates that less than 12 bills were issued during the year.											
36													
37													

Pine Water Company
Customer Count Summary
Test Year Ended December 31, 2002

Exhibit
Schedule H-2
Page 2
Witness: Bourassa

Size	Meter Classification	Month of Jan-02	Month of Feb-02	Month of Mar-02	Month of Apr-02	Month of May-02	Month of Jun-02	Month of Jul-02
5/8 Inch	Residential 14A	1,478	1,479	1,482	1,491	1,497	1,508	1,515
5/8 Inch	Residential 14B	360	359	358	358	357	359	361
3/4 Inch	Residential 14B	1	1	1	1	1	1	1
1 Inch	Residential 14A	1	1	1	1	1	2	2
2 Inch	Residential 14A	-	-	-	-	1	1	1
5/8 Inch	Commercial 14A	2	2	2	2	2	2	2
1 Inch	Commercial 14A	1	1	1	1	1	1	1
2 Inch	Commercial 14A	2	2	2	2	2	2	2
	Totals	1,845	1,845	1,847	1,856	1,862	1,876	1,885

Size	Meter Classification	Month of Aug-02	Month of Sep-02	Month of Oct-02	Month of Nov-02	Month of Dec-02	Change from Beginning of Year to	Revenues Annual-ized
5/8 Inch	Residential 14A	1,517	1,514	1,523	1,509	1,514	36	Yes
5/8 Inch	Residential 14B	362	360	364	361	361	1	No
3/4 Inch	Residential 14B	1	1	1	1	1	-	No
1 Inch	Residential 14A	3	3	3	3	3	2	No
2 Inch	Residential 14A	-	-	-	-	-	-	No
		-	-	-	-	-	-	
		-	-	-	-	-	-	
5/8 Inch	Commercial 14A	2	2	2	2	2	-	No
1 Inch	Commercial 14A	1	1	1	1	1	-	No
2 Inch	Commercial 14A	2	2	2	2	2	-	No
	Totals	1,888	1,883	1,896	1,879	1,884	39	

Pine Water Company
Gallons Sold Summary
Test Year Ended December 31, 2002

Exhibit
Schedule H-2
Page 3
Witness: Bourassa

Size	Meter Classification	Month of Jan-02	Month of Feb-02	Month of Mar-02	Month of Apr-02	Month of May-02	Month of Jun-02	Month of Jul-02
5/8 Inch	Residential 14A	2,680	2,706	2,530	3,064	4,123	4,923	3,867
5/8 Inch	Residential 14B	459	501	444	566	812	1,185	1,056
3/4 Inch	Residential 14B	5	7	5	7	5	6	5
1 Inch	Residential 14A	2	149	-	2	9	68	98
2 Inch	Residential 14A	-	-	-	-	-	-	-
5/8 Inch	Commercial 14A	9	16	25	22	1	56	29
1 Inch	Commercial 14A	19	30	24	39	35	37	52
2 Inch	Commercial 14A	68	60	58	36	55	68	77
	Actual Gallons Sold (1,000's)	3,241	3,467	3,085	3,734	5,037	6,342	5,183

Size	Meter Classification	Month of Aug-02	Month of Sep-02	Month of Oct-02	Month of Nov-02	Month of Dec-02	Total Year	Percent of Total Water Usage
5/8 Inch	Residential 14A	3,687	4,019	3,721	3,239	3,016	41,572	78.72%
5/8 Inch	Residential 14B	681	968	974	755	610	9,010	17.06%
0	0	-	-	-	-	-	-	0.00%
3/4 Inch	Residential 14B	5	6	5	6	5	61	0.12%
1 Inch	Residential 14A	98	106	66	48	38	680	1.29%
2 Inch	Residential 14A	-	-	-	-	-	-	0.00%
5/8 Inch	Commercial 14A	34	28	25	21	19	285	0.54%
1 Inch	Commercial 14A	49	54	30	38	15	416	0.79%
2 Inch	Commercial 14A	153	35	75	48	52	785	1.49%
	Actual Gallons Sold (1,000's)	4,706	5,214	4,894	4,153	3,753	52,808	100%

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Schedule H-3
Page 1
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Proposed Rates	Percent Change
1				
2				
3				
4	Rate Code Sheet 14A			
5	**Monthly Usage Charge for:**			
6	Residential,Commercial			
7	5/8 x 3/4 Inch	$ 18.45	$ 22.14	20.00%
8	3/4 Inch	21.22	33.21	56.50%
9	1 Inch	24.54	55.35	125.55%
10	1 1/2 Inch	36.90	110.70	200.00%
11	2 Inch	64.58	177.12	174.26%
12	3 Inch	92.25	354.24	284.00%
13	4 Inch	147.60	553.50	275.00%
14	6 Inch	-	1,107.00	0.00%
15	8 Inch	-	2,214.00	0.00%
16				
17	Rate Code Sheet 14B			
18	**Monthly Usage Charge for:**			
19	Residential,Commercial			
20	5/8 x 3/4 Inch	$ 20.35	$ 22.14	8.80%
21	3/4 Inch	30.53	33.21	8.78%
22	1 Inch	50.88	55.35	8.79%
23	1 1/2 Inch	101.75	110.70	8.80%
24	2 Inch	162.80	177.12	8.80%
25	3 Inch	305.25	354.24	16.05%
26	4 Inch	508.75	553.50	8.80%
27	6 Inch	1,017.50	1,107.00	8.80%
28	8 Inch	-	2,214.00	0.00%
29				
30				
31		**Present**	**Proposed**	
32		**Rates**	**Rates**	
33	Rate Code Sheet 14A			
34	Gallons In Minimum			
35	All	-	-	
36				
37				
38	Rate Code Sheet 14B			
39	Gallons In Minimum			
40	All	-	-	
41				
42				
43				
44	Rate Code Sheet 14A			
45	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
46	5/8 Inch Residential and Commercial	4,000	2,000	
47	1 Inch and Larger Residential and Commercial	4,000	10,000	
48				
49				
50	Rate Code Sheet 14B			
51	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
52	5/8 Inch Residential and Commercial	999,999,999	2,000	
53	1 Inch and Larger Residential and Commercial	999,999,999	10,000	
54				
55				

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Schedule H-3
Page 2
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Summer Proposed Rates
1			
2	Rate Code Sheet 14A		
3	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
4	5/8 Inch Residential and Commercial	999,999,999	8,000
5	1 Inch and Larger Residential and Commercial	999,999,999	25,000
6			
7			
8	Rate Code Sheet 14B		
9	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
10	5/8 Inch Residential and Commercial	999,999,999	8,000
11	1 Inch and Larger Residential and Commercial	999,999,999	25,000
12			
13			
14	Rate Code Sheet 14A		
15	**Tier 3:** (Gallon over)		
16	5/8 Inch Residential and Commercial	999,999,999	999,999,999
17	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
18			
19			
20	Rate Code Sheet 14B		
21	**Tier 3:** (Gallon over)		
22	5/8 Inch Residential and Commercial	999,999,999	999,999,999
23	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
24			
25			

			Present Rates	Summer* Proposed Rates	Winter* Proposed Rates
26					
27					
28					
29	Rate Code Sheet 14A				
30	Commodity Rates (per 1,000 gallons over minimum and per Tier) **(A)**				
31	All	Tier 1	$ 3.40	$ 5.80	$ 4.28
32	All	Tier 2	5.95	10.14	7.50
33	All	Tier 3	5.95	14.14	11.50
34	All	Tier 4	5.95	14.14	11.50
35					
36					
37	Rate Code Sheet 14B				
38	Commodity Rates (per 1,000 gallons over minimum and per Tier)				
39	All	Tier 1	$ 3.50	$ 5.80	$ 4.28
40	All	Tier 2	3.50	10.14	7.50
41	All	Tier 3	3.50	14.14	11.50
42	All	Tier 4	3.50	14.14	11.50
43					
44	* Summer Months (May, June, July, August, September)				
45	Winter Months (October, November, December, January, February, March, April)				
46					
47					
48					
49					
50					
51					
52					
53					
54					

Pine Water Company
Changes in Representative Rate Schedules
Test Year Ended December 31, 2002

Exhibit
Schedule H-3
Page 3
Witness: Bourassa

Line No.	Other Service Charges	Rate Code Sheet A Present Rates	Rate Code Sheet B Present Rates	Proposed Rates
1	Establishment	$ 25.00	$ 25.00	$ 25.00
2	Establishment (After Hours)	$ 35.00	$ 35.00	$ 35.00
3	Reconnection (Deliquent)	$ 20.00	$ 35.00	$ 50.00
4	Reconnection (After Hours)	$ 30.00	$ 45.00	$ 45.00
5	Meter Test	$ 25.00	$ 25.00	$ 25.00
6	Deposit	**	**	
7	Deposit Interest	6.00%	6.00%	6.00%
8	Re-Establishment (With-in 12 Months)	***		
9	NSF Check	$ 10.00	$ 10.00	$ 10.00
10	Deferred Payment, Per Month **(b)**			
11	Meter Re-Read	$ 15.00	$ 15.00	$ 15.00
12	Charge of Moving Customer Meter -			
13	Customer Requested	Cost	Cost	Cost
14	Late Payment Charge, greater of 1.50% or	$ 5.00	$ 10.00	(1)
15	Cut Lock Fee			$ 50.00
16	Meter Removal Fee			$ 150.00
17	Illegal Supply Fee			
18	First Offense			$ 500.00
19	Second Offense			$ 1,000.00
20	Third Offense			$ 2,000.00
21	Water Theft Fee			
22	First Offense			$ 250.00
23	Second Offense			$ 500.00
24	Third Offense			$ 750.00
25	Emmergency Conservation Response Fee			$ 100.00
26	Cross Connection Exposure Fee			$ 100.00
27				
28	Sprinklers			(a)

29 (1) Greater of 1.50% or $5.00 Present Rates or 1.5% or $10.00 Proposed Rates.
30 (2) $40.00 plus actual cost of making repairs.
31 ** PER COMMISSION RULES (R14-2-403.B)
32 *** MONTHS OFF SYSTEM TIMES MINIMUM (R14-2-403.D)
33
34 IN ADDITION TO THE COLLECTION OF REGULAR RATES, THE UTILITY WILL COLLECT FROM
35 ITS CUSTOMERS A PROPORTIONATE SHARE OF ANY PRIVILEGE, SALES, USE, AND FRANCHISE
36 TAX. PER COMMISSION RULE (14-2-409.D 5)
37 ALL ADVANCES AND/OR CONTRIBUTIONS ARE TO INCLUDE LABOR, MATERIALS, OVERHEADS,
38 AND ALL APPLICABLE TAXES, INCLUDING ALL GROSS-UP TAXES FOR INCOME TAXES.
39 (a) 1.50% of the monthly minimum for a comparable sized meter connection, but no less than $5 per month
40

41		Service Line and		
42		Meter Installation		Proposed
43		Rate Code	Rate Code	
44	Meter Size	Sheet A	Sheet B	Charges(*)
45	5/8 x 3/4 Inch	$430	$430	$430
46	3 / 4 Inch	$480	$480	$480
47	1 Inch	$550	$550	$550
48	1 1/2 Inch	$775	$775	$775
49	2 Inch	$1,305	$1,305	$1,305
50	3 Inch	$1,815	$1,815	$1,815
51	4 Inch	$2,860	$2,860	$2,860
52	6 Inch	N/A	$5,275	$5,275
53	8 Inch	Cost	Cost	Cost
54	Meters Larger than 8"	Cost	Cost	Cost

55
56 (*) For Compound Meters
57 Plus Actual Cost of Road Crossing Costs
58 As meters and service lines are now taxable income for income purposes, it shall be the at the
59 discrestion of the utility whether to collect income taxes on the meter and service line charges.
60 Any tax collected will be refunded each year that the meter deposit is refunded.
61

Pine Water Company
Changes in Representative Rate Schedules
Test Year Ended December 31, 2002

Exhibit
Schedule H-3
Page 4
Witness: Bourassa

Line No.		
1		
2	Water Exploration Surcharge, per month	$ 10.00
3		
4	Water Hauling Surcharge (1)	Cost
5		
6		
7		
8		
9		
10		
11		
12		
13	(1) Per gallon rate calculated by dividing actual hauling costs less curtailment	
14	penalty fees collected by the total gallons sold for te month.	
15	Customer bill amount will be calculated by multiplying the gallons used	
16	for the month times the per gallon rate. Customers will be billed	
17	in the month following actual costs incurred.	
18		

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 1
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 22.14	$ 3.69	20.00%
1,000	21.85	27.94	$ 6.09	27.86%
2,000	25.25	33.73	$ 8.48	33.60%
3,000	28.65	43.88	$ 15.23	53.15%
4,000	32.05	54.02	$ 21.97	68.56%
5,000	38.00	64.17	$ 26.17	68.86%
6,000	43.95	74.31	$ 30.36	69.09%
7,000	49.90	84.46	$ 34.56	69.25%
8,000	55.85	94.60	$ 38.75	69.39%
9,000	61.80	108.75	$ 46.95	75.97%
10,000	67.75	122.89	$ 55.14	81.39%
11,000	73.70	137.04	$ 63.34	85.94%
12,000	79.65	151.18	$ 71.53	89.81%
13,000	85.60	165.33	$ 79.73	93.14%
14,000	91.55	179.47	$ 87.92	96.04%
15,000	97.50	193.62	$ 96.12	98.58%
16,000	103.45	207.76	$ 104.31	100.83%
17,000	109.40	221.91	$ 112.51	102.84%
18,000	115.35	236.05	$ 120.70	104.64%
19,000	121.30	250.19	$ 128.89	106.26%
20,000	127.25	264.34	$ 137.09	107.73%
25,000	157.00	335.06	$ 178.06	113.42%
30,000	186.75	405.79	$ 219.04	117.29%
35,000	216.50	476.51	$ 260.01	120.10%
40,000	246.25	547.23	$ 300.98	122.23%
45,000	276.00	617.96	$ 341.96	123.90%
50,000	305.75	688.68	$ 382.93	125.24%
60,000	365.25	830.13	$ 464.88	127.28%
70,000	424.75	971.58	$ 546.83	128.74%
80,000	484.25	1,113.02	$ 628.77	129.85%
90,000	543.75	1,254.47	$ 710.72	130.71%
100,000	603.25	1,395.92	$ 792.67	131.40%
Average Usage				
2,731	$ 27.74	$ 41.15	$ 13.42	48.37%

Present Rates:

Monthly Minimum:		$ 18.45
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 22.14
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	2,000	$ 5.80
Up to	8,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 1a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 22.14	$ 3.69	20.00%
1,000	21.85	26.42	$ 4.57	20.93%
2,000	25.25	30.71	$ 5.46	21.62%
3,000	28.65	38.21	$ 9.56	33.35%
4,000	32.05	45.70	$ 13.65	42.60%
5,000	38.00	53.20	$ 15.20	40.00%
6,000	43.95	60.70	$ 16.75	38.10%
7,000	49.90	68.19	$ 18.29	36.66%
8,000	55.85	75.69	$ 19.84	35.52%
9,000	61.80	87.19	$ 25.39	41.08%
10,000	67.75	98.68	$ 30.93	45.66%
11,000	73.70	110.18	$ 36.48	49.50%
12,000	79.65	121.68	$ 42.03	52.77%
13,000	85.60	133.18	$ 47.58	55.58%
14,000	91.55	144.67	$ 53.12	58.03%
15,000	97.50	156.17	$ 58.67	60.17%
16,000	103.45	167.67	$ 64.22	62.07%
17,000	109.40	179.16	$ 69.76	63.77%
18,000	115.35	190.66	$ 75.31	65.29%
19,000	121.30	202.16	$ 80.86	66.66%
20,000	127.25	213.65	$ 86.40	67.90%
25,000	157.00	271.14	$ 114.14	72.70%
30,000	186.75	328.62	$ 141.87	75.97%
35,000	216.50	386.11	$ 169.61	78.34%
40,000	246.25	443.59	$ 197.34	80.14%
45,000	276.00	501.08	$ 225.08	81.55%
50,000	305.75	558.56	$ 252.81	82.69%
60,000	365.25	673.53	$ 308.28	84.40%
70,000	424.75	788.50	$ 363.75	85.64%
80,000	484.25	903.47	$ 419.22	86.57%
90,000	543.75	1,018.44	$ 474.69	87.30%
####	603.25	1,133.41	$ 530.16	87.88%
Average Usage				
1,998	$ 25.24	30.70	$ 5.46	21.61%

Present Rates:

Monthly Minimum:		$ 18.45
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		22.14
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	2,000	$ 4.28
Up to	8,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Schedule H-4
Page 2
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 22.14	$ 1.79	8.80%
1,000	23.85	27.94	$ 4.09	17.14%
2,000	27.35	33.73	$ 6.38	23.34%
3,000	30.85	43.88	$ 13.03	42.23%
4,000	34.35	54.02	$ 19.67	57.27%
5,000	37.85	64.17	$ 26.32	69.53%
6,000	41.35	74.31	$ 32.96	79.72%
7,000	44.85	84.46	$ 39.61	88.31%
8,000	48.35	94.60	$ 46.25	95.66%
9,000	51.85	108.75	$ 56.90	109.73%
10,000	55.35	122.89	$ 67.54	122.03%
11,000	58.85	137.04	$ 78.19	132.86%
12,000	62.35	151.18	$ 88.83	142.47%
13,000	65.85	165.33	$ 99.48	151.06%
14,000	69.35	179.47	$ 110.12	158.79%
15,000	72.85	193.62	$ 120.77	165.77%
16,000	76.35	207.76	$ 131.41	172.12%
17,000	79.85	221.91	$ 142.06	177.90%
18,000	83.35	236.05	$ 152.70	183.20%
19,000	86.85	250.19	$ 163.34	188.08%
20,000	90.35	264.34	$ 173.99	192.57%
25,000	107.85	335.06	$ 227.21	210.68%
30,000	125.35	405.79	$ 280.44	223.72%
35,000	142.85	476.51	$ 333.66	233.57%
40,000	160.35	547.23	$ 386.88	241.28%
45,000	177.85	617.96	$ 440.11	247.46%
50,000	195.35	688.68	$ 493.33	252.54%
60,000	230.35	830.13	$ 599.78	260.38%
70,000	265.35	971.58	$ 706.23	266.15%
80,000	300.35	1,113.02	$ 812.67	270.58%
90,000	335.35	1,254.47	$ 919.12	274.08%
100,000	370.35	1,395.92	$ 1,025.57	276.92%
Average Usage				
2,614	$ 29.50	$ 39.96	$ 10.46	35.47%

Present Rates:

Monthly Minimum:		$ 20.35
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Over	1,000,000,000	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 22.14
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	2,000	$ 5.80
Up to	8,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Schedule H-4
Page 2a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 22.14	$ 1.79	8.80%
1,000	23.85	26.42	$ 2.57	10.79%
2,000	27.35	30.71	$ 3.36	12.28%
3,000	30.85	38.21	$ 7.36	23.84%
4,000	34.35	45.70	$ 11.35	33.05%
5,000	37.85	53.20	$ 15.35	40.55%
6,000	41.35	60.70	$ 19.35	46.79%
7,000	44.85	68.19	$ 23.34	52.05%
8,000	48.35	75.69	$ 27.34	56.55%
9,000	51.85	87.19	$ 35.34	68.15%
10,000	55.35	98.68	$ 43.33	78.29%
11,000	58.85	110.18	$ 51.33	87.22%
12,000	62.35	121.68	$ 59.33	95.15%
13,000	65.85	133.18	$ 67.33	102.24%
14,000	69.35	144.67	$ 75.32	108.61%
15,000	72.85	156.17	$ 83.32	114.37%
16,000	76.35	167.67	$ 91.32	119.60%
17,000	79.85	179.16	$ 99.31	124.37%
18,000	83.35	190.66	$ 107.31	128.75%
19,000	86.85	202.16	$ 115.31	132.77%
20,000	90.35	213.65	$ 123.30	136.47%
25,000	107.85	271.14	$ 163.29	151.40%
30,000	125.35	328.62	$ 203.27	162.17%
35,000	142.85	386.11	$ 243.26	170.29%
40,000	160.35	443.59	$ 283.24	176.64%
45,000	177.85	501.08	$ 323.23	181.74%
50,000	195.35	558.56	$ 363.21	185.93%
60,000	230.35	673.53	$ 443.18	192.40%
70,000	265.35	788.50	$ 523.15	197.16%
80,000	300.35	903.47	$ 603.12	200.81%
90,000	335.35	1,018.44	$ 683.09	203.70%
100,000	370.35	1,133.41	$ 763.06	206.04%
Average Usage				
1,707	$ 26.32	29.45	$ 3.13	11.88%

Present Rates:

Monthly Minimum:		$ 20.35
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Over	1,000,000,000	$ 3.50

Proposed Rates:

Monthly Minimum:		22.14
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	2,000	$ 4.28
Up to	8,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Schedule H-4
Page 3
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 33.21	$ 11.99	56.50%
1,000	24.72	39.01	$ 14.29	57.80%
2,000	28.22	44.80	$ 16.58	58.77%
3,000	31.72	54.95	$ 23.23	73.23%
4,000	35.22	65.09	$ 29.87	84.82%
5,000	38.72	75.24	$ 36.52	94.31%
6,000	42.22	85.38	$ 43.16	102.23%
7,000	45.72	95.53	$ 49.81	108.94%
8,000	49.22	105.67	$ 56.45	114.69%
9,000	52.72	119.82	$ 67.10	127.27%
10,000	56.22	133.96	$ 77.74	138.28%
11,000	59.72	148.11	$ 88.39	148.00%
12,000	63.22	162.25	$ 99.03	156.65%
13,000	66.72	176.40	$ 109.68	164.38%
14,000	70.22	190.54	$ 120.32	171.35%
15,000	73.72	204.69	$ 130.97	177.65%
16,000	77.22	218.83	$ 141.61	183.39%
17,000	80.72	232.98	$ 152.26	188.62%
18,000	84.22	247.12	$ 162.90	193.42%
19,000	87.72	261.26	$ 173.54	197.84%
20,000	91.22	275.41	$ 184.19	201.92%
25,000	108.72	346.13	$ 237.41	218.37%
30,000	126.22	416.86	$ 290.64	230.26%
35,000	143.72	487.58	$ 343.86	239.26%
40,000	161.22	558.30	$ 397.08	246.30%
45,000	178.72	629.03	$ 450.31	251.96%
50,000	196.22	699.75	$ 503.53	256.62%
60,000	231.22	841.20	$ 609.98	263.81%
70,000	266.22	982.65	$ 716.43	269.11%
80,000	301.22	1,124.09	$ 822.87	273.18%
90,000	336.22	1,265.54	$ 929.32	276.40%
100,000	371.22	1,406.99	$ 1,035.77	279.02%

Average Usage

4,901	$ 38.37	$ 74.23	$ 35.86	93.45%

Present Rates:

Monthly Minimum:		$ 21.22
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Over	########	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 33.21
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	2,000	$ 5.80
Up to	8,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	########	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Schedule H-4
Page 3a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 33.21	$ 11.99	56.50%
1,000	24.72	37.49	$ 12.77	51.67%
2,000	28.22	41.78	$ 13.56	48.04%
3,000	31.72	49.28	$ 17.56	55.34%
4,000	35.22	56.77	$ 21.55	61.19%
5,000	38.72	64.27	$ 25.55	65.98%
6,000	42.22	71.77	$ 29.55	69.98%
7,000	45.72	79.26	$ 33.54	73.37%
8,000	49.22	86.76	$ 37.54	76.27%
9,000	52.72	98.26	$ 45.54	86.38%
10,000	56.22	109.75	$ 53.53	95.22%
11,000	59.72	121.25	$ 61.53	103.03%
12,000	63.22	132.75	$ 69.53	109.98%
13,000	66.72	144.25	$ 77.53	116.19%
14,000	70.22	155.74	$ 85.52	121.79%
15,000	73.72	167.24	$ 93.52	126.86%
16,000	77.22	178.74	$ 101.52	131.46%
17,000	80.72	190.23	$ 109.51	135.67%
18,000	84.22	201.73	$ 117.51	139.53%
19,000	87.72	213.23	$ 125.51	143.08%
20,000	91.22	224.72	$ 133.50	146.35%
25,000	108.72	282.21	$ 173.49	159.57%
30,000	126.22	339.69	$ 213.47	169.13%
35,000	143.72	397.18	$ 253.46	176.36%
40,000	161.22	454.66	$ 293.44	182.01%
45,000	178.72	512.15	$ 333.43	186.57%
50,000	196.22	569.63	$ 373.41	190.30%
60,000	231.22	684.60	$ 453.38	196.08%
70,000	266.22	799.57	$ 533.35	200.34%
80,000	301.22	914.54	$ 613.32	203.61%
90,000	336.22	1,029.51	$ 693.29	206.20%
100,000	371.22	1,144.48	$ 773.26	208.30%
-	21.22	33.21	$ 11.99	56.50%
Average Usage				
5,215	$ 39.47	65.88	$ 26.41	66.90%

Present Rates:

Monthly Minimum:		$ 21.22
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Up to	999,999,999	$ 3.50
Over	########	$ 3.50

Proposed Rates:

Monthly Minimum:		33.21
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	2,000	$ 4.28
Up to	8,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	########	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 4
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 55.35	$ 30.81	125.55%
1,000	27.94	61.15	$ 33.21	118.85%
2,000	31.34	66.94	$ 35.60	113.61%
3,000	34.74	72.74	$ 38.00	109.39%
4,000	38.14	78.54	$ 40.40	105.92%
5,000	44.09	84.34	$ 40.25	91.28%
6,000	50.04	90.13	$ 40.09	80.12%
7,000	55.99	95.93	$ 39.94	71.33%
8,000	61.94	101.73	$ 39.79	64.23%
9,000	67.89	107.52	$ 39.63	58.38%
10,000	73.84	113.32	$ 39.48	53.47%
11,000	79.79	123.46	$ 43.67	54.74%
12,000	85.74	133.61	$ 47.87	55.83%
13,000	91.69	143.75	$ 52.06	56.78%
14,000	97.64	153.90	$ 56.26	57.62%
15,000	103.59	164.04	$ 60.45	58.36%
16,000	109.54	174.19	$ 64.65	59.02%
17,000	115.49	184.33	$ 68.84	59.61%
18,000	121.44	194.48	$ 73.04	60.14%
19,000	127.39	204.62	$ 77.23	60.63%
20,000	133.34	214.77	$ 81.43	61.07%
25,000	163.09	265.49	$ 102.40	62.79%
30,000	192.84	336.22	$ 143.38	74.35%
35,000	222.59	406.94	$ 184.35	82.82%
40,000	252.34	477.66	$ 225.32	89.29%
45,000	282.09	548.39	$ 266.30	94.40%
50,000	311.84	619.11	$ 307.27	98.53%
60,000	371.34	760.56	$ 389.22	104.81%
70,000	430.84	902.01	$ 471.17	109.36%
80,000	490.34	1,043.45	$ 553.11	112.80%
90,000	549.84	1,184.90	$ 635.06	115.50%
100,000	609.34	1,326.35	$ 717.01	117.67%
Average Usage				
31,834	$ 203.75	$ 362.15	$ 158.40	77.74%

Present Rates:

Monthly Minimum:		$ 24.54
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 55.35
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	10,000	$ 5.80
Up to	25,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 4a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 55.35	$ 30.81	125.55%
1,000	27.94	59.63	$ 31.69	113.44%
2,000	31.34	63.92	$ 32.58	103.95%
3,000	34.74	68.20	$ 33.46	96.32%
4,000	38.14	72.49	$ 34.35	90.05%
5,000	44.09	76.77	$ 32.68	74.12%
6,000	50.04	81.05	$ 31.01	61.98%
7,000	55.99	85.34	$ 29.35	52.42%
8,000	61.94	89.62	$ 27.68	44.69%
9,000	67.89	93.91	$ 26.02	38.32%
10,000	73.84	98.19	$ 24.35	32.98%
11,000	79.79	105.69	$ 25.90	32.46%
12,000	85.74	113.18	$ 27.44	32.01%
13,000	91.69	120.68	$ 28.99	31.62%
14,000	97.64	128.18	$ 30.54	31.28%
15,000	103.59	135.68	$ 32.09	30.97%
16,000	109.54	143.17	$ 33.63	30.70%
17,000	115.49	150.67	$ 35.18	30.46%
18,000	121.44	158.17	$ 36.73	30.24%
19,000	127.39	165.66	$ 38.27	30.04%
20,000	133.34	173.16	$ 39.82	29.86%
25,000	163.09	210.65	$ 47.56	29.16%
30,000	192.84	268.13	$ 75.29	39.04%
35,000	222.59	325.62	$ 103.03	46.28%
40,000	252.34	383.10	$ 130.76	51.82%
45,000	282.09	440.59	$ 158.50	56.19%
50,000	311.84	498.07	$ 186.23	59.72%
60,000	371.34	613.04	$ 241.70	65.09%
70,000	430.84	728.01	$ 297.17	68.97%
80,000	490.34	842.98	$ 352.64	71.92%
90,000	549.84	957.95	$ 408.11	74.22%
100,000	609.34	1,072.92	$ 463.58	76.08%
-	24.54	55.35	$ 30.81	125.55%
Average Usage				
28,836	$ 185.91	254.74	$ 68.83	37.02%

Present Rates:

Monthly Minimum:		$ 24.54
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	10,000	$ 4.28
Up to	25,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification — 2 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 5
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 177.12	$ 112.54	174.26%
1,000	67.98	182.92	$ 114.94	169.07%
2,000	71.38	188.71	$ 117.33	164.38%
3,000	74.78	194.51	$ 119.73	160.11%
4,000	78.18	200.31	$ 122.13	156.21%
5,000	84.13	206.11	$ 121.98	144.98%
6,000	90.08	211.90	$ 121.82	135.24%
7,000	96.03	217.70	$ 121.67	126.70%
8,000	101.98	223.50	$ 121.52	119.16%
9,000	107.93	229.29	$ 121.36	112.45%
10,000	113.88	235.09	$ 121.21	106.44%
11,000	119.83	245.23	$ 125.40	104.65%
12,000	125.78	255.38	$ 129.60	103.04%
13,000	131.73	265.52	$ 133.79	101.57%
14,000	137.68	275.67	$ 137.99	100.22%
15,000	143.63	285.81	$ 142.18	98.99%
16,000	149.58	295.96	$ 146.38	97.86%
17,000	155.53	306.10	$ 150.57	96.81%
18,000	161.48	316.25	$ 154.77	95.84%
19,000	167.43	326.39	$ 158.96	94.94%
20,000	173.38	336.54	$ 163.16	94.10%
25,000	203.13	387.26	$ 184.13	90.65%
30,000	232.88	457.99	$ 225.11	96.66%
35,000	262.63	528.71	$ 266.08	101.31%
40,000	292.38	599.43	$ 307.05	105.02%
45,000	322.13	670.16	$ 348.03	108.04%
50,000	351.88	740.88	$ 389.00	110.55%
60,000	411.38	882.33	$ 470.95	114.48%
70,000	470.88	1,023.78	$ 552.90	117.42%
80,000	530.38	1,165.22	$ 634.84	119.70%
90,000	589.88	1,306.67	$ 716.79	121.51%
100,000	649.38	1,448.12	$ 798.74	123.00%
Average Usage				
-	$ 64.58	$ 177.12	$ 112.54	174.26%

Present Rates:

Monthly Minimum:		$ 64.58
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 177.12
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	10,000	$ 5.80
Up to	25,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 5a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 177.12	$ 112.54	174.26%
1,000	67.98	181.40	$ 113.42	166.85%
2,000	71.38	185.69	$ 114.31	160.14%
3,000	74.78	189.97	$ 115.19	154.04%
4,000	78.18	194.26	$ 116.08	148.47%
5,000	84.13	198.54	$ 114.41	135.99%
6,000	90.08	202.82	$ 112.74	125.16%
7,000	96.03	207.11	$ 111.08	115.67%
8,000	101.98	211.39	$ 109.41	107.29%
9,000	107.93	215.68	$ 107.75	99.83%
10,000	113.88	219.96	$ 106.08	93.15%
11,000	119.83	227.46	$ 107.63	89.82%
12,000	125.78	234.95	$ 109.17	86.80%
13,000	131.73	242.45	$ 110.72	84.05%
14,000	137.68	249.95	$ 112.27	81.54%
15,000	143.63	257.45	$ 113.82	79.24%
16,000	149.58	264.94	$ 115.36	77.12%
17,000	155.53	272.44	$ 116.91	75.17%
18,000	161.48	279.94	$ 118.46	73.36%
19,000	167.43	287.43	$ 120.00	71.67%
20,000	173.38	294.93	$ 121.55	70.11%
25,000	203.13	332.42	$ 129.29	63.65%
30,000	232.88	389.90	$ 157.02	67.43%
35,000	262.63	447.39	$ 184.76	70.35%
40,000	292.38	504.87	$ 212.49	72.68%
45,000	322.13	562.36	$ 240.23	74.57%
50,000	351.88	619.84	$ 267.96	76.15%
60,000	411.38	734.81	$ 323.43	78.62%
70,000	470.88	849.78	$ 378.90	80.47%
80,000	530.38	964.75	$ 434.37	81.90%
90,000	589.88	1,079.72	$ 489.84	83.04%
100,000	649.38	1,194.69	$ 545.31	83.97%
-	64.58	177.12	$ 112.54	174.26%
Average Usage				
-	$ 64.58	$ 177.12	177.12	274.26%

Present Rates:

Monthly Minimum:		$ 64.58
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		177.12
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	10,000	$ 4.28
Up to	25,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification — 5/8 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 6
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 22.14	$ 3.69	20.00%
1,000	21.85	27.94	$ 6.09	27.86%
2,000	25.25	33.73	$ 8.48	33.60%
3,000	28.65	43.88	$ 15.23	53.15%
4,000	32.05	54.02	$ 21.97	68.56%
5,000	38.00	64.17	$ 26.17	68.86%
6,000	43.95	74.31	$ 30.36	69.09%
7,000	49.90	84.46	$ 34.56	69.25%
8,000	55.85	94.60	$ 38.75	69.39%
9,000	61.80	108.75	$ 46.95	75.97%
10,000	67.75	122.89	$ 55.14	81.39%
11,000	73.70	137.04	$ 63.34	85.94%
12,000	79.65	151.18	$ 71.53	89.81%
13,000	85.60	165.33	$ 79.73	93.14%
14,000	91.55	179.47	$ 87.92	96.04%
15,000	97.50	193.62	$ 96.12	98.58%
16,000	103.45	207.76	$ 104.31	100.83%
17,000	109.40	221.91	$ 112.51	102.84%
18,000	115.35	236.05	$ 120.70	104.64%
19,000	121.30	250.19	$ 128.89	106.26%
20,000	127.25	264.34	$ 137.09	107.73%
25,000	157.00	335.06	$ 178.06	113.42%
30,000	186.75	405.79	$ 219.04	117.29%
35,000	216.50	476.51	$ 260.01	120.10%
40,000	246.25	547.23	$ 300.98	122.23%
45,000	276.00	617.96	$ 341.96	123.90%
50,000	305.75	688.68	$ 382.93	125.24%
60,000	365.25	830.13	$ 464.88	127.28%
70,000	424.75	971.58	$ 546.83	128.74%
80,000	484.25	1,113.02	$ 628.77	129.85%
90,000	543.75	1,254.47	$ 710.72	130.71%
100,000	603.25	1,395.92	$ 792.67	131.40%
Average Usage				
14,750	$ 96.02	$ 190.09	$ 94.07	97.97%

Present Rates:

Monthly Minimum:		$ 18.45
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 22.14
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	2,000	$ 5.80
Up to	8,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 6a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 22.14	$ 3.69	20.00%
1,000	21.85	26.42	$ 4.57	20.93%
2,000	25.25	30.71	$ 5.46	21.62%
3,000	28.65	38.21	$ 9.56	33.35%
4,000	32.05	45.70	$ 13.65	42.60%
5,000	38.00	53.20	$ 15.20	40.00%
6,000	43.95	60.70	$ 16.75	38.10%
7,000	49.90	68.19	$ 18.29	36.66%
8,000	55.85	75.69	$ 19.84	35.52%
9,000	61.80	87.19	$ 25.39	41.08%
10,000	67.75	98.68	$ 30.93	45.66%
11,000	73.70	110.18	$ 36.48	49.50%
12,000	79.65	121.68	$ 42.03	52.77%
13,000	85.60	133.18	$ 47.58	55.58%
14,000	91.55	144.67	$ 53.12	58.03%
15,000	97.50	156.17	$ 58.67	60.17%
16,000	103.45	167.67	$ 64.22	62.07%
17,000	109.40	179.16	$ 69.76	63.77%
18,000	115.35	190.66	$ 75.31	65.29%
19,000	121.30	202.16	$ 80.86	66.66%
20,000	127.25	213.65	$ 86.40	67.90%
25,000	157.00	271.14	$ 114.14	72.70%
30,000	186.75	328.62	$ 141.87	75.97%
35,000	216.50	386.11	$ 169.61	78.34%
40,000	246.25	443.59	$ 197.34	80.14%
45,000	276.00	501.08	$ 225.08	81.55%
50,000	305.75	558.56	$ 252.81	82.69%
60,000	365.25	673.53	$ 308.28	84.40%
70,000	424.75	788.50	$ 363.75	85.64%
80,000	484.25	903.47	$ 419.22	86.57%
90,000	543.75	1,018.44	$ 474.69	87.30%
100,000	603.25	1,133.41	$ 530.16	87.88%
Average Usage				
9,786	$ 66.48	96.23	$ 29.75	44.75%

Present Rates:

Monthly Minimum:		$ 18.45
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		22.14
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	2,000	$ 4.28
Up to	8,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification — 1 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 7
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 55.35	$ 30.81	125.55%
1,000	27.94	61.15	$ 33.21	118.85%
2,000	31.34	66.94	$ 35.60	113.61%
3,000	34.74	72.74	$ 38.00	109.39%
4,000	38.14	78.54	$ 40.40	105.92%
5,000	44.09	84.34	$ 40.25	91.28%
6,000	50.04	90.13	$ 40.09	80.12%
7,000	55.99	95.93	$ 39.94	71.33%
8,000	61.94	101.73	$ 39.79	64.23%
9,000	67.89	107.52	$ 39.63	58.38%
10,000	73.84	113.32	$ 39.48	53.47%
11,000	79.79	123.46	$ 43.67	54.74%
12,000	85.74	133.61	$ 47.87	55.83%
13,000	91.69	143.75	$ 52.06	56.78%
14,000	97.64	153.90	$ 56.26	57.62%
15,000	103.59	164.04	$ 60.45	58.36%
16,000	109.54	174.19	$ 64.65	59.02%
17,000	115.49	184.33	$ 68.84	59.61%
18,000	121.44	194.48	$ 73.04	60.14%
19,000	127.39	204.62	$ 77.23	60.63%
20,000	133.34	214.77	$ 81.43	61.07%
25,000	163.09	265.49	$ 102.40	62.79%
30,000	192.84	336.22	$ 143.38	74.35%
35,000	222.59	406.94	$ 184.35	82.82%
40,000	252.34	477.66	$ 225.32	89.29%
45,000	282.09	548.39	$ 266.30	94.40%
50,000	311.84	619.11	$ 307.27	98.53%
60,000	371.34	760.56	$ 389.22	104.81%
70,000	430.84	902.01	$ 471.17	109.36%
80,000	490.34	1,043.45	$ 553.11	112.80%
90,000	549.84	1,184.90	$ 635.06	115.50%
100,000	609.34	1,326.35	$ 717.01	117.67%
Average Usage				
44,901	$ 281.50	$ 546.98	$ 265.48	94.31%

Present Rates:

Monthly Minimum:		$ 24.54
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 55.35
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	10,000	$ 5.80
Up to	25,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 7a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 55.35	$ 30.81	125.55%
1,000	27.94	59.63	$ 31.69	113.44%
2,000	31.34	63.92	$ 32.58	103.95%
3,000	34.74	68.20	$ 33.46	96.32%
4,000	38.14	72.49	$ 34.35	90.05%
5,000	44.09	76.77	$ 32.68	74.12%
6,000	50.04	81.05	$ 31.01	61.98%
7,000	55.99	85.34	$ 29.35	52.42%
8,000	61.94	89.62	$ 27.68	44.69%
9,000	67.89	93.91	$ 26.02	38.32%
10,000	73.84	98.19	$ 24.35	32.98%
11,000	79.79	105.69	$ 25.90	32.46%
12,000	85.74	113.18	$ 27.44	32.01%
13,000	91.69	120.68	$ 28.99	31.62%
14,000	97.64	128.18	$ 30.54	31.28%
15,000	103.59	135.68	$ 32.09	30.97%
16,000	109.54	143.17	$ 33.63	30.70%
17,000	115.49	150.67	$ 35.18	30.46%
18,000	121.44	158.17	$ 36.73	30.24%
19,000	127.39	165.66	$ 38.27	30.04%
20,000	133.34	173.16	$ 39.82	29.86%
25,000	163.09	210.65	$ 47.56	29.16%
30,000	192.84	268.13	$ 75.29	39.04%
35,000	222.59	325.62	$ 103.03	46.28%
40,000	252.34	383.10	$ 130.76	51.82%
45,000	282.09	440.59	$ 158.50	56.19%
50,000	311.84	498.07	$ 186.23	59.72%
60,000	371.34	613.04	$ 241.70	65.09%
70,000	430.84	728.01	$ 297.17	68.97%
80,000	490.34	842.98	$ 352.64	71.92%
90,000	549.84	957.95	$ 408.11	74.22%
100,000	609.34	1,072.92	$ 463.58	76.08%
-	24.54	55.35	$ 30.81	125.55%
Average Usage				
27,358	$ 177.12	237.75	$ 60.63	34.23%

Present Rates:

Monthly Minimum:		$ 24.54
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		55.35
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	10,000	$ 4.28
Up to	25,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Bill Comparison
Customer Classification — 2 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Schedule H-4
Page 8
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 177.12	$ 112.54	174.26%
1,000	67.98	182.92	$ 114.94	169.07%
2,000	71.38	188.71	$ 117.33	164.38%
3,000	74.78	194.51	$ 119.73	160.11%
4,000	78.18	200.31	$ 122.13	156.21%
5,000	84.13	206.11	$ 121.98	144.98%
6,000	90.08	211.90	$ 121.82	135.24%
7,000	96.03	217.70	$ 121.67	126.70%
8,000	101.98	223.50	$ 121.52	119.16%
9,000	107.93	229.29	$ 121.36	112.45%
10,000	113.88	235.09	$ 121.21	106.44%
11,000	119.83	245.23	$ 125.40	104.65%
12,000	125.78	255.38	$ 129.60	103.04%
13,000	131.73	265.52	$ 133.79	101.57%
14,000	137.68	275.67	$ 137.99	100.22%
15,000	143.63	285.81	$ 142.18	98.99%
16,000	149.58	295.96	$ 146.38	97.86%
17,000	155.53	306.10	$ 150.57	96.81%
18,000	161.48	316.25	$ 154.77	95.84%
19,000	167.43	326.39	$ 158.96	94.94%
20,000	173.38	336.54	$ 163.16	94.10%
25,000	203.13	387.26	$ 184.13	90.65%
30,000	232.88	457.99	$ 225.11	96.66%
35,000	262.63	528.71	$ 266.08	101.31%
40,000	292.38	599.43	$ 307.05	105.02%
45,000	322.13	670.16	$ 348.03	108.04%
50,000	351.88	740.88	$ 389.00	110.55%
60,000	411.38	882.33	$ 470.95	114.48%
70,000	470.88	1,023.78	$ 552.90	117.42%
80,000	530.38	1,165.22	$ 634.84	119.70%
90,000	589.88	1,306.67	$ 716.79	121.51%
100,000	649.38	1,448.12	$ 798.74	123.00%
Average Usage				
38,801	$ 285.24	$ 582.47	$ 297.22	104.20%

Present Rates:

Monthly Minimum:		$ 64.58
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 177.12
Gallons in Minimum		-
Charge Per 1,000 Gallons		Summer
Up to	10,000	$ 5.80
Up to	25,000	$ 10.14
Up to	999,999,999	$ 14.14
Over	1,000,000,000	$ 14.14

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Schedule H-4
Page 8a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 177.12	$ 112.54	174.26%
1,000	67.98	181.40	$ 113.42	166.85%
2,000	71.38	185.69	$ 114.31	160.14%
3,000	74.78	189.97	$ 115.19	154.04%
4,000	78.18	194.26	$ 116.08	148.47%
5,000	84.13	198.54	$ 114.41	135.99%
6,000	90.08	202.82	$ 112.74	125.16%
7,000	96.03	207.11	$ 111.08	115.67%
8,000	101.98	211.39	$ 109.41	107.29%
9,000	107.93	215.68	$ 107.75	99.83%
10,000	113.88	219.96	$ 106.08	93.15%
11,000	119.83	227.46	$ 107.63	89.82%
12,000	125.78	234.95	$ 109.17	86.80%
13,000	131.73	242.45	$ 110.72	84.05%
14,000	137.68	249.95	$ 112.27	81.54%
15,000	143.63	257.45	$ 113.82	79.24%
16,000	149.58	264.94	$ 115.36	77.12%
17,000	155.53	272.44	$ 116.91	75.17%
18,000	161.48	279.94	$ 118.46	73.36%
19,000	167.43	287.43	$ 120.00	71.67%
20,000	173.38	294.93	$ 121.55	70.11%
25,000	203.13	332.42	$ 129.29	63.65%
30,000	232.88	389.90	$ 157.02	67.43%
35,000	262.63	447.39	$ 184.76	70.35%
40,000	292.38	504.87	$ 212.49	72.68%
45,000	322.13	562.36	$ 240.23	74.57%
50,000	351.88	619.84	$ 267.96	76.15%
60,000	411.38	734.81	$ 323.43	78.62%
70,000	470.88	849.78	$ 378.90	80.47%
80,000	530.38	964.75	$ 434.37	81.90%
90,000	589.88	1,079.72	$ 489.84	83.04%
100,000	649.38	1,194.69	$ 545.31	83.97%
Average Usage				
28,358	$ 223.11	371.02	$ 147.91	66.30%

Present Rates:

Monthly Minimum:		$ 64.58
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	4,000	$ 3.40
Up to	999,999,999	$ 5.95
Up to	999,999,999	$ 5.95
Over	1,000,000,000	$ 5.95

Proposed Rates:

Monthly Minimum:		177.12
Gallons in Minimum		
Charge Per 1,000 Gallons		Winter
Up to	10,000	$ 4.28
Up to	25,000	$ 7.50
Up to	999,999,999	$ 11.50
Over	1,000,000,000	$ 11.50

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Residential - 14A

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Schedcule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	520	433	422	367	287	198	225	206	214	295	323	422	3,912	3,912
1	1,000	360	442	448	441	449	379	447	493	461	450	452	415	5,237	9,149
1,001	2,000	185	146	177	191	181	244	244	251	248	212	182	166	2,427	11,576
2,001	3,000	129	145	146	121	144	167	167	166	175	181	167	167	1,875	13,451
3,001	4,000	87	115	84	111	105	120	128	127	121	110	125	101	1,334	14,785
4,001	5,000	57	59	75	75	74	99	78	80	83	71	75	84	910	15,695
5,001	6,000	48	38	51	50	76	62	64	52	62	51	58	46	658	16,353
6,001	7,000	25	28	27	43	42	57	44	38	39	35	37	36	451	16,804
7,001	8,000	21	25	17	28	29	32	25	34	25	24	26	22	308	17,112
8,001	9,000	12	11	11	19	16	32	24	11	30	20	23	17	226	17,338
9,001	10,000	8	10	7	13	14	26	20	12	10	11	5	6	142	17,480
10,001	11,000	5	2	3	8	11	19	6	10	2	6	11	5	88	17,568
11,001	12,000	4	5	2	6	13	9	5	7	8	7	4	6	76	17,644
12,001	13,000	1	4	1	6	8	14	6	4	5	11	4	5	69	17,713
13,001	14,000	2	3	1	3	8	9	5	0	7	8	2	3	51	17,764
14,001	15,000	1	0	1	3	7	6	5	6	5	3	2	3	42	17,806
15,001	16,000	3	3	0	1	4	4	2	2	1	7	4	2	33	17,839
16,001	17,000	2	1	0	0	2	8	4	0	0	3	1	1	22	17,861
17,001	18,000	1	1	3	1	3	2	5	2	1	1	0	2	22	17,883
18,001	19,000	0	1	2	0	3	4	1	0	2	1	1	0	15	17,898
19,001	20,000	0	2	0	1	3	2	0	3	3	5	1	1	21	17,919
20,001	21,000	0	1	1	0	4	2	0	1	1	1	0	1	12	17,931
21,001	22,000	1	0	1	1	3	0	1	0	1	0	0	0	8	17,939
22,001	23,000	0	0	0	0	1	2	0	0	0	1	3	0	7	17,946
23,001	24,000	0	0	0	0	0	1	1	3	0	1	0	0	6	17,952
24,001	25,000	0	1	0	0	3	1	1	0	0	3	1	0	10	17,962
25,001	26,000	2	0	0	0	1	1	2	0	0	0	1	0	7	17,969
26,001	27,000	0	0	0	0	0	0	1	2	0	1	0	0	4	17,973
27,001	28,000	0	0	0	0	0	1	0	1	2	0	0	0	4	17,977
28,001	29,000	0	1	0	0	0	2	0	0	0	0	0	0	3	17,980
29,001	30,000	0	0	1	0	0	1	1	0	2	1	0	0	6	17,986
30,001	31,000	0	0	0	0	1	0	0	1	0	0	0	0	2	17,988
31,001	32,000	0	0	0	0	0	0	0	0	0	1	0	0	1	17,989
32,001	33,000	0	0	0	0	1	0	0	0	1	0	0	0	2	17,991
33,001	34,000	0	0	0	0	1	0	0	2	1	0	0	0	4	17,995
34,001	35,000	0	1	0	0	0	0	1	0	0	1	0	1	4	17,999
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17,999
36,001	37,000	0	0	0	0	0	0	1	0	0	0	0	0	1	18,000
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,000
38,001	39,000	0	0	0	1	0	0	0	0	0	0	0	0	1	18,001
39,001	40,000	0	0	0	0	1	0	0	0	0	0	0	0	1	18,002
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,002
41,001	42,000	1	0	0	0	0	1	0	0	1	0	0	1	4	18,006
42,001	43,000	0	0	0	0	0	0	0	1	0	0	0	0	1	18,007
43,001	44,000	0	0	1	0	0	0	0	1	0	0	0	0	2	18,009
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,009
45,001	46,000	0	0	0	0	0	1	0	0	0	0	0	0	1	18,010
46,001	47,000	0	0	0	0	0	0	0	1	0	0	0	0	1	18,011
47,001	48,000	0	0	0	0	0	0	0	0	0	0	1	0	1	18,012
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,012
49,001	50,000	1	0	0	0	0	0	0	0	0	0	0	0	1	18,013

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Residential - 14A

Exhibit
Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,013
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,013
52,001	53,000	0	1	0	0	0	0	0	0	0	0	0	0	1	18,014
53,001	54,000	0	0	0	1	0	0	0	0	0	0	0	0	1	18,015
54,001	55,000	0	0	0	0	0	0	1	0	0	0	0	0	1	18,016
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,016
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,016
57,001	58,000	0	0	0	0	0	0	0	0	1	0	0	0	1	18,017
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,017
65,001	66,000	0	0	0	0	1	0	0	0	0	0	0	0	1	18,018
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,018
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,018
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,018
69,001	70,000	1	0	0	0	0	0	0	0	0	0	0	0	1	18,019
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,019
71,001	72,000	0	0	0	0	0	0	0	0	0	1	0	0	1	18,020
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,020
82,001	83,000	0	0	0	0	1	0	0	0	0	0	0	0	1	18,021
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,021
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,021
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,021
86,001	87,000	0	0	0	0	0	1	0	0	0	0	0	0	1	18,022
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,022
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,022
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	1	1	18,023
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,023
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,023
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,023
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,023
94,001	95,000	1	0	0	0	0	0	0	0	0	0	0	0	1	18,024
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,024
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,024
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,024
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,024
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18,024
137,883	137,883	0	0	0	0	0	1	0	0	0	0	0	0	1	18,025
128,440	128,440	0	0	0	0	0	0	0	0	1	0	0	0	1	18,026
128,440	128,440	0	0	0	0	0	0	0	0	1	0	0	0	1	18,027
	Totals	1,478	1,479	1,482	1,491	1,497	1,508	1,515	1,517	1,514	1,523	1,509	1,514	18,027	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Residential - 148

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	81	73	76	69	60	37	49	58	33	53	52	52	693	693
1	1,000	147	168	164	138	138	117	113	146	139	143	143	158	1,714	2,407
1,001	2,000	64	36	38	53	50	52	61	57	52	40	53	54	610	3,017
2,001	3,000	30	23	42	35	28	34	39	39	40	37	39	35	421	3,438
3,001	4,000	15	21	11	21	19	28	28	15	22	21	21	33	255	3,693
4,001	5,000	8	18	10	15	20	18	13	9	17	22	18	8	176	3,869
5,001	6,000	5	7	7	15	8	13	12	9	11	13	14	7	121	3,990
6,001	7,000	2	5	4	3	3	10	6	11	7	9	6	5	71	4,061
7,001	8,000	4	3	2	3	6	10	10	8	12	4	4	1	67	4,128
8,001	9,000	0	0	2	1	2	7	11	1	6	5	1	2	38	4,166
9,001	10,000	1	2	1	0	7	6	5	2	2	3	0	0	29	4,195
10,001	11,000	2	0	1	4	4	4	3	1	2	3	0	1	25	4,220
11,001	12,000	0	1	0	0	3	3	0	0	4	1	5	0	17	4,237
12,001	13,000	0	0	0	0	3	3	2	1	3	1	1	0	14	4,251
13,001	14,000	0	2	0	1	0	4	0	0	1	0	0	1	9	4,260
14,001	15,000	0	0	0	0	0	2	1	2	0	0	0	0	5	4,265
15,001	16,000	0	0	0	0	0	3	1	1	2	1	1	0	9	4,274
16,001	17,000	0	0	0	0	1	3	1	0	1	0	0	0	6	4,280
17,001	18,000	0	0	0	0	0	1	1	0	1	1	0	0	4	4,284
18,001	19,000	0	0	0	0	1	0	0	0	1	1	0	0	3	4,287
19,001	20,000	0	0	0	0	0	0	0	0	0	0	1	0	1	4,288
20,001	21,000	0	0	0	0	1	0	2	0	1	0	0	1	5	4,293
21,001	22,000	0	0	0	0	1	0	0	0	1	1	0	2	5	4,298
22,001	23,000	0	0	0	0	1	0	0	0	0	0	0	0	1	4,299
23,001	24,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,299
24,001	25,000	1	0	0	0	0	0	0	0	0	0	1	0	2	4,301
25,001	26,000	0	0	0	0	0	0	1	1	0	1	0	0	3	4,304
26,001	27,000	0	0	0	0	0	0	0	0	1	1	0	0	2	4,306
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	1	1	4,307
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,307
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,307
30,001	31,000	0	0	0	0	0	0	0	1	1	0	0	0	2	4,309
31,001	32,000	0	0	0	0	0	0	0	0	0	1	0	0	1	4,310
32,001	33,000	0	0	0	0	0	1	0	0	0	0	0	0	1	4,311
33,001	34,000	0	0	0	0	0	1	0	0	0	1	0	0	2	4,313
34,001	35,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,313
35,001	36,000	0	0	0	0	1	0	0	0	0	0	0	0	1	4,314
36,001	37,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,314
37,001	38,000	0	0	0	0	0	1	0	0	0	0	0	0	1	4,315
38,001	39,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,315
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,315
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,315
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,315
42,001	43,000	0	0	0	0	0	1	0	0	0	0	0	0	1	4,316
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Residential - 14B

Exhibit
Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
53,001	54,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,316
65,001	66,000	0	0	0	0	0	0	1	0	0	0	0	0	1	4,317
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,317
67,001	68,000	0	0	0	0	0	0	0	0	0	0	1	0	1	4,318
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,318
80,001	81,000	0	0	0	0	0	0	1	0	0	0	0	0	1	4,319
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4,319
100,820	100,820	0	0	0	0	0	0	0	0	0	1	0	0	1	4,320
	Totals	360	359	358	358	357	359	361	362	360	364	361	361	4,320	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 3/4 Inch Residential - 14B

Exhibit
Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1	1,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1,001	2,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
4,001	5,000	1	0	1	0	1	0	1	1	0	1	0	1	7	7
5,001	6,000	0	0	0	0	0	1	0	0	1	0	1	0	3	10
6,001	7,000	0	1	0	1	0	0	0	0	0	0	0	0	2	12
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
8,001	9,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
10,001	11,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
15,001	16,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
18,001	19,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
23,001	24,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
24,001	25,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
26,001	27,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
33,001	34,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
34,001	35,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
36,001	37,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
38,001	39,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 3/4 Inch Residential - 14B

Exhibit
Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
53,001	54,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
	Totals	1	1	1	1	1	1	1	1	1	1	1	1	12	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 1 Inch Residential - 14A

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Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	1	0	0	0	0	0	0	0	0	0	1	1
1	1,000	0	0	0	0	0	0	0	1	1	0	0	0	2	3
1,001	2,000	1	0	0	1	0	0	0	0	0	1	0	0	3	6
2,001	3,000	0	0	0	0	0	0	0	0	0	0	1	0	1	7
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	1	1	8
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	8
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	8
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	8
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	8
8,001	9,000	0	0	0	0	1	0	0	0	0	0	0	0	1	9
9,001	10,000	0	0	0	0	0	1	0	0	0	0	0	0	1	10
10,001	11,000	0	0	0	0	0	0	0	0	0	1	1	1	3	13
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
14,001	15,000	0	0	0	0	0	0	0	0	1	0	0	0	1	14
15,001	16,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
18,001	19,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
23,001	24,000	0	0	0	0	0	0	0	1	0	0	0	1	2	16
24,001	25,000	0	0	0	0	0	0	0	0	0	0	0	0	-	16
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	16
26,001	27,000	0	0	0	0	0	0	1	0	0	0	0	0	1	17
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
33,001	34,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
34,001	35,000	0	0	0	0	0	0	0	0	0	0	1	0	1	18
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
36,001	37,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
38,001	39,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 1 Inch Residential - 14A

Exhibit
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
53,001	54,000	0	0	0	0	0	0	0	0	0	1	0	0	1	19
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
58,001	59,000	0	0	0	0	0	1	0	0	0	0	0	0	1	20
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
71,001	72,000	0	0	0	0	0	0	1	0	0	0	0	0	1	21
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	21
73,001	74,000	0	0	0	0	0	0	0	1	0	0	0	0	1	22
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
90,001	91,000	0	0	0	0	0	0	0	0	1	0	0	0	1	23
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
148,680	148,680	0	1	0	0	0	0	0	0	0	0	0	0	1	24
	Totals	1	1	1	1	1	2	2	3	3	3	3	3	24	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 2 Inch Residential - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	1	1	1	0	0	0	0	0	3	3
1	1,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
1,001	2,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
8,001	9,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
10,001	11,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
15,001	16,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
18,001	19,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
23,001	24,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
24,001	25,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
26,001	27,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
33,001	34,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
34,001	35,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
36,001	37,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
38,001	39,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 2 Inch Residential - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	1	1	1	0	0	0	0	0	3	3
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
53,001	54,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
	Totals	-	-	-	-	1	1	1	-	-	-	-	-	3	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Commercial - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	1	0	0	0	0	0	0	0	1	1
1	1,000	1	1	1	1	1	1	0	1	0	1	1	1	10	11
1,001	2,000	0	0	0	0	0	0	1	0	1	0	0	0	2	13
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
8,001	9,000	1	0	0	0	0	0	0	0	0	0	0	0	1	14
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
10,001	11,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	0	-	14
15,001	16,000	0	1	0	0	0	0	0	0	0	0	0	0	1	15
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	15
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	15
18,001	19,000	0	0	0	0	0	0	0	0	0	0	0	1	1	16
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	16
20,001	21,000	0	0	0	0	0	0	0	0	0	0	1	0	1	17
21,001	22,000	0	0	0	1	0	0	0	0	0	0	0	0	1	18
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
23,001	24,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
24,001	25,000	0	0	1	0	0	0	0	0	0	1	0	0	2	20
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	20
26,001	27,000	0	0	0	0	0	0	0	0	1	0	0	0	1	21
27,001	28,000	0	0	0	0	0	0	1	0	0	0	0	0	1	22
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
33,001	34,000	0	0	0	0	0	0	0	1	0	0	0	0	1	23
34,001	35,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
36,001	37,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
38,001	39,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 5/8 Inch Commercial - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
53,001	54,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
55,001	56,000	0	0	0	0	0	1	0	0	0	0	0	0	1	24
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
	Totals	2	2	2	2	2	2	2	2	2	2	2	2	24	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 1 Inch Commercial - 14A

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Schedule H-5
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1	1,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1,001	2,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
8,001	9,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
10,001	11,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	1	1	1
15,001	16,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
18,001	19,000	1	0	0	0	0	0	0	0	0	0	0	0	1	2
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
23,001	24,000	0	0	1	0	0	0	0	0	0	0	0	0	1	3
24,001	25,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
26,001	27,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
29,001	30,000	0	1	0	0	0	0	0	0	0	1	0	0	2	5
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
33,001	34,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
34,001	35,000	0	0	0	0	1	0	0	0	0	0	0	0	1	6
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	6
36,001	37,000	0	0	0	0	0	1	0	0	0	0	0	0	1	7
37,001	38,000	0	0	0	0	0	0	0	0	0	0	1	0	1	8
38,001	39,000	0	0	0	1	0	0	0	0	0	0	0	0	1	9
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
48,001	49,000	0	0	0	0	0	0	0	1	0	0	0	0	1	10
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	10

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 1 Inch Commercial - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1	1,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1,001	2,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3,001	4,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
8,001	9,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
10,001	11,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
12,001	13,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	1	1	1
15,001	16,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
17,001	18,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
18,001	19,000	1	0	0	0	0	0	0	0	0	0	0	0	1	2
19,001	20,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
23,001	24,000	0	0	1	0	0	0	0	0	0	0	0	0	1	3
24,001	25,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
25,001	26,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
26,001	27,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
28,001	29,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
29,001	30,000	0	1	0	0	0	0	0	0	0	1	0	0	2	5
30,001	31,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
31,001	32,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
33,001	34,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
34,001	35,000	0	0	0	0	1	0	0	0	0	0	0	0	1	6
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	6
36,001	37,000	0	0	0	0	0	1	0	0	0	0	0	0	1	7
37,001	38,000	0	0	0	0	0	0	0	0	0	0	1	0	1	8
38,001	39,000	0	0	0	1	0	0	0	0	0	0	0	0	1	9
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
40,001	41,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
44,001	45,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
45,001	46,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
48,001	49,000	0	0	0	0	0	0	0	1	0	0	0	0	1	10
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	10

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 1 Inch Commercial - 14A

Exhibit
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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
50,001	51,000	0	0	0	0	0	0	0	0	0	0	0	0	-	10
51,001	52,000	0	0	0	0	0	0	1	0	0	0	0	0	1	11
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	11
53,001	54,000	0	0	0	0	0	0	0	0	1	0	0	0	1	12
54,001	55,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
98,001	99,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	12
	Totals	1	1	1	1	1	1	1	1	1	1	1	1	12	

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 2 Inch Commercial - 14A

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Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1	1,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1,001	2,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2,001	3,000	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3,001	4,000	0	0	0	0	0	0	0	0	1	0	0	0	1	1
4,001	5,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
5,001	6,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
6,001	7,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
7,001	8,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
8,001	9,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
9,001	10,000	0	0	0	0	0	0	0	0	0	0	0	0	-	1
10,001	11,000	0	0	0	1	0	0	0	0	0	0	0	0	1	2
11,001	12,000	0	0	0	0	0	0	0	0	0	0	0	0	-	2
12,001	13,000	0	0	1	0	0	0	0	0	0	0	0	0	1	3
13,001	14,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
14,001	15,000	0	0	0	0	0	0	0	0	0	0	0	0	-	3
15,001	16,000	0	1	0	0	0	0	0	0	0	0	0	0	1	4
16,001	17,000	0	0	0	0	0	0	0	0	0	0	0	0	-	4
17,001	18,000	1	0	0	0	0	0	0	0	0	0	0	0	1	5
18,001	19,000	0	0	0	0	0	0	0	0	0	0	0	0	-	5
19,001	20,000	0	0	0	0	0	0	0	0	0	0	1	0	1	6
20,001	21,000	0	0	0	0	0	0	0	0	0	0	0	0	-	6
21,001	22,000	0	0	0	0	0	0	0	0	0	0	0	1	1	7
22,001	23,000	0	0	0	0	0	0	0	0	0	0	0	0	-	7
23,001	24,000	0	0	0	0	0	0	0	0	0	0	0	0	-	7
24,001	25,000	0	0	0	0	1	0	0	0	0	0	0	0	1	8
25,001	26,000	0	0	0	1	0	0	0	0	0	0	0	0	1	9
26,001	27,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
27,001	28,000	0	0	0	0	0	0	0	0	0	0	0	0	-	9
28,001	29,000	0	0	0	0	0	0	0	0	0	0	1	0	1	10
29,001	30,000	0	0	0	0	0	0	0	0	0	0	0	0	-	10
30,001	31,000	0	0	0	0	1	0	0	0	0	0	0	1	2	12
31,001	32,000	0	0	0	0	0	0	0	0	1	0	0	0	1	13
32,001	33,000	0	0	0	0	0	0	0	0	0	0	0	0	-	13
33,001	34,000	0	0	0	0	0	1	0	0	0	0	0	0	1	14
34,001	35,000	0	0	0	0	0	1	0	0	0	0	0	0	1	15
35,001	36,000	0	0	0	0	0	0	0	0	0	0	0	0	-	15
36,001	37,000	0	0	0	0	0	0	1	0	0	1	0	0	2	17
37,001	38,000	0	0	0	0	0	0	0	0	0	0	0	0	-	17
38,001	39,000	0	0	0	0	0	0	0	0	0	1	0	0	1	18
39,001	40,000	0	0	0	0	0	0	0	0	0	0	0	0	-	18
40,001	41,000	0	0	0	0	0	0	1	0	0	0	0	0	1	19
41,001	42,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
42,001	43,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
43,001	44,000	0	0	0	0	0	0	0	0	0	0	0	0	-	19
44,001	45,000	0	1	0	0	0	0	0	0	0	0	0	0	1	20
45,001	46,000	0	0	1	0	0	0	0	0	0	0	0	0	1	21
46,001	47,000	0	0	0	0	0	0	0	0	0	0	0	0	-	21
47,001	48,000	0	0	0	0	0	0	0	0	0	0	0	0	-	21
48,001	49,000	0	0	0	0	0	0	0	0	0	0	0	0	-	21
49,001	50,000	0	0	0	0	0	0	0	0	0	0	0	0	-	21

Pine Water Company
Test Year Ended December 31, 2002
Customer Classification 2 Inch Commercial - 14A

Exhibit
Schedule H-5
Page 8a
Witness: Bourassa

Usage From:	Usage To:	Winter Month of Jan-02	Winter Month of Feb-02	Winter Month of Mar-02	Winter Month of Apr-02	Summer Month of May-02	Summer Month of Jun-02	Summer Month of Jul-02	Summer Month of Aug-02	Summer Month of Sep-02	Winter Month of Oct-02	Winter Month of Nov-02	Winter Month of Dec-02	Total Year	Cumul-ative Billing
50,001	51,000	1	0	0	0	0	0	0	0	0	0	0	0	1	22
51,001	52,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
52,001	53,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
53,001	54,000	0	0	0	0	0	0	0	0	0	0	0	0	-	22
54,001	55,000	0	0	0	0	0	0	0	1	0	0	0	0	1	23
55,001	56,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
56,001	57,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
57,001	58,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
58,001	59,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
59,001	60,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
60,001	61,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
61,001	62,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
62,001	63,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
63,001	64,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
64,001	65,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
65,001	66,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
66,001	67,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
67,001	68,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
68,001	69,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
69,001	70,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
70,001	71,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
71,001	72,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
72,001	73,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
73,001	74,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
74,001	75,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
75,001	76,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
76,001	77,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
77,001	78,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
78,001	79,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
79,001	80,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
80,001	81,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
81,001	82,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
82,001	83,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
83,001	84,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
84,001	85,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
85,001	86,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
86,001	87,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
87,001	88,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
88,001	89,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
89,001	90,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
90,001	91,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
91,001	92,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
92,001	93,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
93,001	94,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
94,001	95,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
95,001	96,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
96,001	97,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
97,001	98,000	0	0	0	0	0	0	0	0	0	0	0	0	-	23
98,001	99,000	0	0	0	0	0	0	0	1	0	0	0	0	1	24
99,001	100,000	0	0	0	0	0	0	0	0	0	0	0	0	-	24
	Totals	2	2	2	2	2	2	2	2	2	2	2	2	24	

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-0279

REBUTTAL TESTIMONY OF

THOMAS J. BOURASSA

EXHIBIT
A-5
admitted

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I. INTRODUCTION, PURPOSE AND SUMMARY OF REBUTTAL TESTIMONY.

Q. PLEASE STATE YOUR NAME AND ADDRESS?

A. Thomas J. Bourassa, 139 W. Wood Drive, Phoenix, Arizona 85029.

Q. ARE YOU THE SAME THOMAS J. BOURASSA THAT FILED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes, my direct testimony was filed with Pine Water Company's ("Pine Water" or "Company") application in this docket.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. I have reviewed the direct filing by Utilities Division Staff ("Staff") and the direct filings by Intervenors, Pine Strawberry Water Improvement District ("District") and John Breninger, and will provide testimony in rebuttal to these parties' positions on certain issues related to the revenue requirement, rate base and income statement, cost of capital and proposed return on rate base, rate design and proposed rates. In support of my rebuttal testimony, I have prepared Rebuttal Schedules A-1, B-1, B-2, B-5, C-1, C-2, D-1, D-2, H-1, H-2, H-3 and H-4, which schedules are attached hereto. I would note that to the extent we have not specifically addressed a particular issue raised by Staff or the Intervenors in this rebuttal filing, this omission is not intended to reflect the Company's agreement on that issue. Rather, where Pine Water accepts a recommendation of another party, we have specifically indicated that to be the case.

Q. WOULD YOU PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY, STARTING WITH THE COMPANY'S REBUTTAL RATE BASE?

A. Certainly. The Company's rebuttal fair value rate base ("FVRB") is approximately $665,500. This is approximately $14,500 lower than the direct filing due primarily to the Company's proposed adjustment to reduce post test year plant to reflect the

actual cost of revenue neutral plant additions constructed and in service as of October 31, 2003.

In contrast, Staff proposes a FVRB of $633,958, which at first glance appears close to the Company's proposed FVRB. However, there are significant differences in the rate base components. First, the Company proposes including approximately $61,000 of revenue neutral post test year plant, while Staff excludes all post test year plant.

Second, Staff proposes including approximately $450,000 of plant, at original cost less depreciation, pertaining to Project Magnolia, a pipeline connecting Pine Water and Strawberry Water. As Mr. Hardcastle explains in his rebuttal testimony, Staff's proposed inclusion of Project Magnolia in Pine Water's rate base is based on Staff's erroneous findings regarding ownership of the pipeline.

Third, Staff proposes to exclude $369,000 of deferred tax assets from rate base because the Company never sought approval to tax normalize. The Company disagrees with this Staff adjustment because it reflects a one-sided approach to ratemaking

Q. HAS THE COMPANY'S REQUESTED REVENUE REQUIREMENT CHANGED AS A RESULT OF THE CHANGE IN RATE BASE?

A. Yes, slightly due to the rate base adjustment mentioned above. The revenue requirement has also changed due to other adjustments to revenues and expenses reflected in the Company's rebuttal filing. For instance, the Company's has accepted Staff's purchased water adjustments as well as Staff's sales tax adjustment. In addition, while the Company does not accept Staff's use of revenues from historical years to determine the correct level of property taxes, Pine Water has made an adjustment in the rebuttal schedules to reflect changes to

proposed revenues as well as adoption of the same revenue components Staff recommends in the pending Arizona-American Water Company rate proceeding (Docket Nos. WS-01303a-02-0867, et al.).

Notably, however, there are several adjustments recommended by Staff that the Company does not accept, including Staff's proposal to remove all transportation expenses, reduce materials and supplies expense, and reduce rate case expense by lengthening the amortization period. Furthermore, Staff has increased depreciation expense for plant that is not owned by the Company (Project Magnolia) and Staff has eliminated depreciation expense on post test year plant in light of Staff's recommendation that no post test-year plant be included in rate base. The Company disagrees and includes an adjustment to reflect depreciation only on the post test year plant constructed and in service by October 31, 2003.

Q. WHAT IS THE COMPANY'S REBUTTAL REVENUE REQUIREMENT?

A. The Company's requested rebuttal revenue increase is approximately $266,000, a decrease of approximately $3,000 from the Company's direct filing. The rebuttal revenue increase represents a 40.8 percent increase over the adjusted test year revenues. In contrast, Staff's recommended revenue increase is approximately $46,724. This is an increase of approximately 7.14 percent over adjusted test year revenues. The District, as well as Intervenor John Breninger, are recommending no rate increase at this time.

Q. ARE THERE ANY OTHER CHANGES REFLECTED IN YOUR REBUTTAL AS COMPARED TO THE DIRECT FILING?

A. Yes, the Company has adjusted its recommended overall rate of return to 10.99 percent. The Company has not changed its recommended 12 percent cost of equity, however, because of a proposed change to long-term debt, the weighted cost of capital has changed.

Staff did not challenge the Company's recommended cost of capital. Instead, Staff's recommends an operating margin of 10%, which translates to an 11.05% rate of return on Staff's FVRB and further proposes to disallow the conversion on Pine Water's $533,000 inter-company payable. As a result, Staff's proposal results in a negative equity balance, a position that conflicts with Staff's proposal to include Project Magnolia in rate base, and threatens the Company's financial health.

II. RATE BASE.

A. Post Test Year Plant Additions.

Q. WOULD YOU PLEASE DISCUSS THE COMPANY'S PROPOSED ORIGINAL COST RATE BASE, AND IDENTIFY ANY ADJUSTMENTS YOU HAVE ACCEPTED FROM STAFF?

A. Yes. The Company's original cost rate base is shown on Schedule B-2. There is only one rebuttal adjustment to adjust post test year plant to actual expenditures through October 31, 2003. In the direct filing, the Company used estimates from its capital budget for 2003.

Q. WHAT POSITION HAS STAFF TAKEN ON THE INCLUSION OF POST TEST YEAR PLANT IN RATE BASE?

A. Staff is proposing to disallow all post test year plant because the proposed total amount was based on an estimate. *See* Direct testimony of Marlin Scott, Jr. ("Scott Dt.") at Exhibit MSJ, page 7 of 15. During Staff's plant audit in June 2003, Staff was provided information on actual plant addition for 2003 completed as of that time. *Id.* At that time, a mere month and a half after the application was filed, approximately $12,000 was expended for meter installations, although the Company informed Staff that these meter installations were "on-going". In addition, improvements to pumping equipment and transmission and distribution

mains were also listed as projects starting either later in 2003 or 2004.

Staff rejected the meter project costs because only 113 of the planned 300 installations were complete by the time of its audit, further referring to the small percentage of the planned total. *Id.* Staff also rejected the pumping equipment costs and transmission and distribution mains because these projects had not been completed at the time of their review. *Id.*

Q. WHAT IS THE TOTAL COST OF PINE WATER'S POST TEST YEAR PLANT ADDITIONS AS OF OCTOBER 31, 2003?

A. Approximately $52,000 for meter installations, $8000 for transmission and distribution mains improvements, and $1,000 for pumping equipment improvements. *See* Bourassa Rebuttal Exhibit 1. This is the amount, approximately $61,000 the Company proposes for inclusion in rate base.

Q. WHY HAS THE COMPANY SELECTED OCTOBER 31, 2003 AS THE CUT-OFF DATE?

A. Although this cut-off date is after Staff's audit, Staff's audit in this case took place almost immediately after the Company's application was deemed sufficient. However, the cut-off date is before the Company's rebuttal filing and well before Staff's surrebuttal, and well before the hearing in this matter. As a result, Staff's June 26, 2003 cut-off date is simply too far removed from the time new rates will be in effect. In addition, given the fact that the majority of the post test year plant additions are meters installed to replace poorly functioning meters, there is no reason Staff cannot update its audit in sufficient time.

B. Deferred Taxes.

Q. WOULD YOU PLEASE ADDRESS STAFF'S ADJUSTMENT TO RATE BASE TO REMOVE DEFERRED TAXES?

A. Yes, Staff proposes to reduce original cost rate base by $369,000 to eliminate a

deferred tax asset on the books of Pine Water. Fernandez Dt. at 9. First, Staff claims that the adjustment is necessary because the Company did not seek or receive prior approval from the Commission to tax normalize. Second, Staff claims that the customers of Pine Water have provided, through rates, cost recovery at a higher depreciation rate. *Id.* Third, Staff claims that the deferred tax asset should be eliminated from rate base because the Company failed to take the opportunity to provide ratepayers with zero cost capital. Fernandez Dt. at 10. None of Staff's reasons supports the proposed reduction to the Company's rate base.

Q. WOULD YOU PLEASE EXPLAIN THE DEFERRED TAX ASSET?

A. The deferred tax asset was booked at the time Brooke Utilities, the parent, reorganized several of its systems, including the creation of Pine Water from the former E&R Water Company and Williamson Waterworks, Inc. systems. *See* Decision No. 60972 (July 23, 1998). In accordance with Generally Accepted Accounting Principles ("GAAP"), the difference between the tax basis of assets and liabilities and their reported amounts in the financial statements was reflected in Pine Water's books and records. Guidance for recording deferred tax assets and liabilities is also given in FAS-109: Accounting for Income Taxes issued by the Financial Accounting Standards Board ("FASB").

Rebuttal Exhibit 2 shows the calculation of the deferred tax asset. The deferred tax asset consists of three primary book and tax timing differences. The first component is a deferred tax asset arising from contributions-in-aid of construction ("CIAC"). During the period 1986 to 1996, CIAC was treated as taxable income for tax purposes, but not for book purposes. The Tax Reform Act of 1986 repealed former Internal Revenue Code ("IRC") section 118(b) and the special provisions pertaining to CIAC's, effective for all amounts received after

December 31, 1986. IRS Notice 87-82, 1987 CB 389 provided that CIAC's received after December 31, 1986 were to be taxed as ordinary income. In 1996, IRC section 118 was amended via the Small Business Job Protection Act. This amendment reestablished the income tax exemption related to CIAC. Because CIAC received during the period 1986 to 1996 was recognized as income for tax purposes but not for book purposes, Pine Water paid the income taxes and a deferred tax asset was created.

The second component is a deferred tax liability arising from the difference in the tax depreciation rates and book depreciation rates. The Accelerated Cost Recovery System ("ACRS") in IRC Section 168 provides for greater tax depreciation deductions than are provided for book purposes. Accelerated depreciation was taken on Pine Water's existing plant, resulting in greater deductions for income tax purposes than for book purposes. As a consequence, a deferred tax liability must be recorded on the Company's books.

The third component is a deferred tax asset arising from net operating loss ("NOL") carry forwards. IRC Section 172 allows for NOL carry forwards to be carried over to each of the next 20 years following the taxable year of loss. Because of this tax deduction, a deferred tax asset is created.

Q. WOULD THE LACK OF A SPECIFIC FINDING OR ORDERING PARAGRAPH FROM THIS COMMISSION RELATING TO TAX NORMALIZATION MEAN THAT PINE WATER COULD NOT TAX NORMALIZE?

A. Not in my opinion. Few, if any, water utility companies receive a tax normalization order from the Commission. A good example is Paradise Valley Water Company. The first rate application filed by Paradise Valley Water Company, after more than a decade of no rate filings, used a test year ended

September 30, 1990 and, in that rate case, deferred income taxes were deducted from rate base. Decision No. 57834 (April 23, 1992) at 11. There was no question that the company could tax normalize, even though Paradise Valley Water had not received a rate order from this Commission authorizing tax normalization. In fact, Paradise Valley Water had to tax normalize consistent with the Tax Reform Act of 1969, which imposed tax normalization requirements under section 167 of the IRC, and the Economic Recovery Tax Act of 1981, which required full normalization of book-tax depreciation life and method differences required under IRC section 168 (e) for all public utility electing to use the new ACRS (for depreciation) set forth requirements for tax normalization. In the Paradise Valley Water case, the deferred taxes were deducted from rate base by the Company, due to higher tax depreciation compared to book depreciation, without a specific order from this Commission.

Numerous other water utility have never received a rate order from this Commission specifically setting forth tax normalization, prior to deferred income taxes appearing in their rate filing, yet they were considered tax normalized via the use of deferred income taxes or investment tax credits in then instant rate filing. Examples would include Big Park Water Company, Decision No. 57507, Chaparral City Water Company, Decision No. 57395, Rio Verde Utilities Inc., Decision No. 57168, and Bella Vista Water Company, Decision No. 57831. In short, Staff is apparently making up Commission policy on a case-by-case basis. As a result, this type of financing for all but the largest water utilities in this state will become next to impossible.

In summary, this is the first rate proceeding for Pine Water after the reorganization of E&R Water Company and Williamson Waterworks and therefore, the first place to address the matter. Moreover, there can be no question that the Commission has broad discretion here and Staff's assertion that treatment

of deferred taxes should be disallowed because it did not have prior approval is suspect. I think it can be safely assumed that had the Company sought specific approval for tax normalization prior to the instant case, Staff would have recommended that any decision on normalization be deferred until the next rate case, which is exactly where we are now.

Q. DID STAFF PROPOSE RATE BASE TREATMENT OF DEFERRED TAXES IN THE PRIOR E&R RATE PROCEEDING, DECISION 62400 (MARCH 31, 2000)?

A. Yes. Staff proposed a $91,000 reduction from rate base in the E&R water case. *See* Direct testimony of Darron W. Carlson (Docket No. W-01576A-99-0277) at 7. Staff also notes that Williamson's deferred taxes were excluded from rate base because Staff found insufficient substantiation of the deferred tax amount itself to include it in rate base. In neither instance did Staff assert that prior tax normalization approval by the Commission was needed. *Id.* Indeed, it would appear that the Company is tax normalized as a result of the Commission decision to include deferred taxes in the rate base determination in the last rate case.

Q. DO DEFERRED TAX ASSETS AND LIABILITIES HAVE THE SAME EFFECT ON RATE BASE?

A. No. Deferred tax assets increase rate base while deferred tax liabilities decrease rate base.

Q. DID PINE WATER'S RATEPAYERS PROVIDE COST RECOVERY AT A HIGHER DEPRECATION RATE? .

A. No. As I have testified above, there is a deferred tax liability arising from the differences in the tax and book depreciation rates (Component Two). Tax rates have been higher than book; otherwise, a deferred tax asset from the depreciation differences would have been created.

Q. DID THE COMPANY TAKE ACCELERATED DEPRECIATION?

A. Yes, and in doing so provided ratepayers the benefits of zero cost capital Staff refers to in its direct testimony. *See* Fernandez Dt. at 10. I am not sure why Mr. Fernandez claims otherwise.

Q. IS NORMALIZATION FOR RATEMAKING REQUIRED IF THE COMPANY CONTINUES TO EMPLOY ACCELERATED DEPRECIATION ON ITS EXISTING PLANT?

A. Yes, if the Commission disallows the deferred taxes, as Staff suggests, the Company will be precluded from using accelerated depreciation on its existing plant.

Q. WHAT ABOUT STAFF'S CLAIM THAT PINE WATER'S DEFERRED TAX ASSET SHOULD BE ELIMINATED BECAUSE THEY INCREASE RATE BASE?

A. This is not a valid reason to disallow inclusion of the deferred tax asset in rate base. If a utility company is afforded tax normalization and it reduces rate base in one rate proceeding, consistent treatment should be given to deferred taxes in future proceedings even if it increases rate base. This is a matter of fundamental fairness and the Commission should avoid adopting Staff recommendations that result in arbitrary decisions.

C. <u>Project Magnolia.</u>

Q. STAFF PROPOSES TO INCLUDE PROJECT MAGNOLIA IN PINE WATER'S RATE BASE. HAS STAFF PROPERLY ACCOUNTED FOR THIS ADJUSTMENT?

A. No. Mr. Hardcastle addresses Staff's erroneous conclusion that Pine Water owns Project Magnolia, the pipeline connecting the Pine Water and Strawberry Water Company systems, in his rebuttal testimony. Rebuttal Testimony of Robert T.

Hardcastle ("Hardcastle Rb.") at 20-24. For my part, though, I can testify that Staff failed to properly treat Project Magnolia as if Pine Water owned it because Staff did not account for the capitalization of the project and did not include all of the necessary operating expenses.

Q. PLEASE EXPLAIN THE SHORTCOMINGS IN STAFF'S RECOMMENDATION.

A. First, there is absolutely no evidence on the Company's books and records that Project Magnolia is included in Pine Water's plant balances. Therefore, in order to account for the project, the costs of the pipeline must be included in plant-in-service. If we were to use, hypothetically, original cost (which is inappropriate for the reasons identified in Mr. Hardcastle's rebuttal testimony at 29), the net effect would be to increase rate base by $420,120 ($449,568 of plant less $29,448 of accumulated depreciation). Although Staff made this adjustment, it incorrectly calculated accumulated depreciation. Perhaps though, Staff's error is due to the wrong in service date being given to Staff in data request responses. *See* Fernandez Dt. at 8. In any event, my calculation of accumulated depreciation is $13,487, if Project Magnolia were placed into service in February 2001, as Mr. Hardcastle correctly testified in the Company's direct presentation, and depreciated at a rate of 2 percent annually using a half-year convention ($449,568 times 1.5 times 2 percent).

Second, a corresponding amount needs to be added to the Company's capital structure, either additional debt, equity, or both. Nevertheless, Staff has failed to treat Project Magnolia as having been financed by debt or equity, despite asserting that Pine Water owns it. *Id.* Since Pine Water would need financing approval for debt, we would have to treat the project as having been financed with equity. Accounting properly for the financing of Project Magnolia would result in

positive equity. In addition, there would be further increases in the equity component of the capital structure if all transportation expenses (wheeling charges), from inception though the end of the test year, were deemed invalid, as required under Staff's recommended ratemaking treatment. These expenses would have to be added back to equity because net income for the test year and prior years would increase. Net income increases equity. The net effect of this failure to properly reflect Pine Water as being financed by equity is Staff's assertion that Pine Water's equity remains negative. Direct Testimony of John Thornton ("Thornton Dt.") at 5.

Third, if Project Magnolia were to be properly treated as owned by Pine Water, all of the operating costs associated with the project must be accounted for in operating expenses, including depreciation, pumping power, operations labor, payroll taxes, insurance, water treatment, and repairs and maintenance. Staff included only depreciation. *See* Staff Response to Pine Water Data Request 1.16, copy attached hereto as Bourassa Rebuttal Exhibit 3.

Q. WHAT ABOUT STAFF'S CLAIM THAT ALL OF THESE OTHER OPERATING EXPENSES ARE ACCOUNTED FOR IN AN ALLOCATION OF OVERHEAD?

A. Staff is wrong. Brooke Utilities does not allocate Project Magnolia operating expenses to Pine Water because Brooke Utilities' operating expenses are recovered through the wheeling charge paid by Pine Water.

Q. WHAT IS THE SIGNIFICANCE OF STAFF'S FAILURE TO PROPERLY TREAT PROJECT MAGNOLIA AS BEING OWNED BY PINE WATER?

A. Staff's inadequate accounting further undermines Staff's recommended treatment. Of course, the primary flaw in Staff's reasoning is that Project Magnolia was built and paid for and is owned and operated by Brooke Utilities. Hardcastle Rb. at 24-

25.

D. Working Capital Allowance.

Q. HAVE YOU ADJUSTED THE WORKING CAPITAL ALLOWANCE IN THE COMPANY'S REBUTTAL RATE BASE?

A. Yes. I have used the formula method and have accounted for rebuttal changes to operating expenses. The result is a working capital allowance that is slightly less than the amount requested in the direct filing.

III. <u>REVENUES AND EXPENSES</u>.

Q. PLEASE EXPLAIN THE REBUTTAL ADJUSTMENTS TO REVENUES AND EXPENSES AND THE ADJUSTMENTS ACCEPTED FROM STAFF.

A. There are 8 rebuttal adjustments to expenses.

The Company accepts Staff's proposed adjustment to sales tax expense. Rebuttal adjustment 1 removes the negative sales tax balance in sales tax expense.

Rebuttal adjustment number 2 decreases depreciation to reflect the lower amount of post test year plant the Company now proposes and to correct an error made in the direct filing. I inadvertently reduced rather than increased plant-in-service by $16,500 for materials and supplies expenses reclassified to plant. The proposed reclassification was unintentional.

Rebuttal adjustment number 3 adjusts property taxes to reflect the rebuttal proposed revenues and to reflect a change in the revenue components. I will discuss this later in my testimony.

The Company accepts Staff's proposed adjustments to purchased water. Purchased water was adjusted for reclassification materials and supplies expense and contractual services-other expense as well as for trucking or hauling costs that are now covered by an adjuster. Rebuttal adjustments 4, 5, and 6 reflect these adjustments. Rebuttal adjustments 4 and 5 have a net zero effect on operating

expenses because they simply reclassify expenses from one account to another. Rebuttal adjustment number 6 removes trucking costs that are now covered by an adjuster. The net effect is a $2,183 reduction to operating expenses from the direct filing.

Rebuttal adjustment 7 lowers interest expense to reflect a reduction in the proposed long-term debt from $178,000 to $164,000. I will discuss the Company's proposal for long-term debt in the next section of my rebuttal testimony.

Rebuttal adjustment 8 adjusts income taxes to reflect the changes to taxable income resulting from the adjustments described above.

A. <u>Transportation Expense.</u>

Q. HOW DOES THE COMPANY RESPOND TO STAFF'S ELIMINATION OF VIRTUALLY ALL OF THE WATER TRANSPORTATION EXPENSES?

A. The Company rejects Staff's proposal to eliminate transportation expenses from operating expenses because, contrary to Staff's claim, they are "applicable." Fernandez Dt. at 13. Transportation expenses represent the wheeling charges Pine Water incurs for delivery of water purchased from Strawberry Water through Project Magnolia. Because Staff has erroneously concluded that Pine Water owns Project Magnolia, Staff has improperly eliminated these necessary operating expenses.

Q. IS PINE WATER GOING TO CONTINUE INCURRING TRANSPORTATION EXPENSES?

A. Yes, unless the Commission denies recovery of this cost. For the foreseeable future, obtaining water from Strawberry Water for delivery through Project Magnolia is necessary if Pine Water is going to maintain its current water utility service levels. If the Commission denies recovery of this legitimate operating expense, Pine Water will no longer be able to purchase water from Strawberry

Water for delivery through Project Magnolia.

Q. WHAT ARE THE WHEELING FEES CHARGED TO PINE?

A. $15.00 per thousand gallons transported. *See* Hardcastle Rb. at 29 (discussing reasonableness of wheeling charge).

Q. DOES THE WHEELING CHARGE INCLUDE THE COST OF THE WATER FROM STRAWBERRY WATER?

A. No, Strawberry Water charges Pine Water for all water sold according to Strawberry Water's Commission approved tariff.

B. <u>Rate Case Expense.</u>

Q. HOW DOES THE COMPANY RESPOND TO STAFF'S RECOMMENDATION REGARDING RECOVERY OF RATE CASE EXPENSE?

A. Staff accepted the Company's total rate case expense. However, Staff proposes to amortize rate case expense over 4.5 years instead of 3 years as proposed by the Company. Fernandez Dt. at 13.

Q. WHAT IS THE BASIS FOR STAFF'S PROPOSED AMORTIZATION PERIOD?

A. Staff's basis for the 4.5 year amortization period is that this is the time period that elapsed between this case and the last rate case involving this system. *See* Fernandez Dt. at 13. Yet, Staff has not provided any explanation as to why it projects this will be the same interval between this rate proceeding and the next one. Moreover, given the Company's continuing need to address chronic water supply problems, and the potential for a massive infusion of capital to do so, plus the continuation of the water augmentation surcharge approved by the Commission in Decision No. 65914 (May 16, 2003), it is more likely than not that the next rate case will take place in less than 4.5 years.

Q. WHAT POSITION HAS THE DISTRICT TAKEN REGARDING THE COMPANY'S PROPOSED RATE CASE EXPENSE?

A. The District claims that Pine Water's "rate hearing costs are way out of line with what a firm this size should spend." *See* Jones Dt. at 11. The District provided no evidence in support of this allegation, however. Instead, the District has actually provided information supporting, at a minimum, the Company's requested level of rate case expense.

Q. WHAT INFORMATION HAS THE DISTRICT PROVIDED TO SUPPORT THE COMPANY'S REQUESTED LEVEL OF RATE CASE EXPENSES?

A. In response to Pine Water's data requests, the District provided copies of Mr. Jones' invoices for services rendered to the District in connection with this matter. *See* District Response to Pine Water Data Request 1.17, attached hereto as Exhibit 4. Between September 25, 2003 and October 31, 2003, Mr. Jones (and his assistant) spent nearly 150 hours in connection with this matter.

Clearly, Pine Water's outside consultant (me) and its attorneys charge higher rates than Mr. Jones, although I am aware of no claim that such rates are above market. Focusing therefore, on the number of hours spent by Mr. Jones on this matter in just 35 days, nearly 150, it should come as no surprise that the Company's consultant and attorneys have spent and will spend hundreds of hours in connection with this matter. It must be recalled that this matter began late last year with the preparation and then filing of the Company's interim rate case and will conclude some time next year following extensive discovery, multiple pre-hearing filings, several days of hearings, post hearing briefing and appearances before the Commission. Month-by-month, the Company's rate case expenses should reflect the tremendous efforts required of Pine Water to meet its burden of proof on every one of its recommendations as well as its need to defend against the

claims of all opposing parties, including the District.

Q. DID THE DISTRICT RECOMMEND WHAT THE RATE CASE EXPENSE SHOULD BE?

A. No.

Q. IS PINE WATER'S REQUESTED RATE CASE EXPENSE REASONABLE?

A. Yes, in my opinion it is. Staff also agrees, as it did not adjust the total amount of rate case expense. *See* Fernandez Dt. at 13. Rate case expense is directly related to not only to the general costs of preparing and prosecuting the application, but the number and nature of the Intervenors, the number, scope, and nature of the data requests, and the number and nature of the issues with respect to the parties in the case. As reflected throughout the Company's direct and rebuttal presentations, this Company faces a number of critical and unique issues. Moreover, the magnitude of the unsubstantiated accusations the District makes in its testimony, and the number and scope of the District's data requests, which the Company must respond to, contribute to a significant rate case expense.

Q. HAS THE COMPANY REVISED ITS REQUESTED LEVEL OF RATE CASE EXPENSE?

A. Not in this rebuttal filing. However, primarily due to the District's intervention, and its efforts to expand the scope of the issues in this proceeding, the Company has been required to expend substantial additional sums. Therefore, I anticipate a revised request for recovery of rate case expense in either the rejoinder presentation or during the hearings.

C. <u>Property Tax Expense.</u>

Q. DO YOU AGREE WITH STAFF ON THE REVENUE COMPONENTS USED IN THE PROPERTY TAX CALCULATION?

A. No. Staff improperly uses historical year revenues (2000, 2001, and 2002) in

computing property taxes. For ratemaking, where prospective rates are set, property taxes must be synchronized with prospective revenues to insure the Company recovers its property taxes on a going forward basis. In a recent Bella Vista Water rate case, Decision No. 65350 (Nov. 1, 2002), proposed revenues were included in the property tax calculation.

Q. IS THIS SYNCHRONIZATION OF PROPERTY TAX WITH REVENUES PROPER RATEMAKING?

A. Yes, it is certainly proper ratemaking to include all known changes to expenses. If income taxes can be adjusted based on adjusted revenues and expenses for ratemaking purposes, then property taxes can also be adjusted. Calculating property taxes based on data other than test year revenues at present and proposed rates is similar to using actual income tax expense in the test year

Q. IS STAFF'S POSITION IN THE INSTANT CASE CONSISTENT WITH ITS RECOMMENDATIONS IN OTHER RECENT RATE PROCEEDINGS?

A. No. For example, in the pending Arizona-American rate proceeding I referred to earlier, Staff is recommending use of two times adjusted teat year revenues plus proposed revenues. *See* Direct Testimony of Alexander Igwe at 3 (Docket Nos. WS-01303A-02-0867 et al.) This is exactly what the Company is recommending in this rebuttal filing.

D. <u>Other Revenue and Expense Items in Dispute with Staff.</u>

Q. WOULD YOU PLEASE CONTINUE WITH YOUR DISCUSSION OF REVENUES AND EXPENSES?

A. Sure. The Company also disagrees with Staff's recommended reduction to materials and supplies. Staff proposes to use an average of the past three years as its estimate of these expenses on a going forward basis. While I do not necessarily disagree with this approach, the result must be evaluated for reasonableness and

Pine Water's management expectations. Expenses for materials and supplies are expected to continue for the foreseeable future at the levels requested. In fact, the expenses through the ten months ending October 31, 2003 are over $28,400, greater than the level proposed by Staff for a full twelve months.

Finally, the Company disagrees with Staff's proposal to interest synchronize interest expense with rate base. Staff's proposal uses a proposed weighted cost of debt of 4.13 percent, which assumes a capital structure with positive equity. Yet, Mr. Thornton claims Staff could not do a cost of capital analysis because equity was negative. Thornton Dt. at 5. Thus, Staff's recommendation is contrary to its own determination of the Company's capital structure and weighted cost of debt. *See* Staff Response to Pine Water Data Request 1.23, attached hereto as Bourassa Rebuttal Exhibit 3. I do not know how Staff derived this capital structure.

Q. WHAT IMPACT DOES INTEREST SYNCHRONIZATION HAVE ON THE REVENUE REQUIREMENT?

A. In the instant case, interest synchronization increases interest expense and lowers income taxes. This has the effect of lowering the revenue requirement. Of course, all this is impossible if, as Staff claims, Pine Water's equity is negative. If equity is negative, a meaningful cost of debt cannot be determined. In the instant case, the unadjusted (before the proposed inter-company payable conversion) test year equity is a negative $153,000 and debt is a positive $59,000. Using this capital structure, the resulting weighted cost of debt is a negative 6.28 percent.

Q. DOES STAFF AGREE THAT INTEREST SHOULD NOT BE SYNCHRONIZED?

A. Yes. Staff was asked to explain why they are using interest synchronization if the requested debt and equity financings are proposed to cover operating expenses. Staff stated it should have used actual interest expense in its calculation of income

taxes rather than interest synchronization. *See* Staff Response to Pine Water Data Request 1.22, attached hereto as Bourassa Rebuttal Exhibit 3.

E. <u>District Testimony on Revenue and Expenses.</u>

Q. CAN YOU ADDRESS THE KEY INCOME STATEMENT ISSUES RAISED BY THE DISTRICT?

A. The District has charged that the Company "has excluded critical information that influences costs and rates has been left out, misstated or presented in a confusing manner in terms of (1) costs of purchasing water from third parties; (2) costs of (wheeling water) through the unregulated Project Magnolia pipeline connecting the Strawberry Water system to the Pine Water system; (3) costs of hauling water; (4) overstating property taxes; and (5) presenting massive outside service costs that are not clarified." *See* Jones Dt. at 2. In addition, the District's witness testifies that the Company is allocating costs and revenues in an "unjustified manipulative manner". *Id.* at 3. Finally, the District charges "there is a massive incentive to not disclose the details of transactions that could result in multiple mark-ups on water purchases, unjustified mark-ups between companies on wheeling costs, and excessive unexplained service fees." *See id.* at 3-4.

Q. DOES THE DISTRICT PROVIDE ANY EVIDENCE IN SUPPORT OF MR. JONES' TESTIMONY?

A. None whatsoever. In fact, the District could not produce such evidence when asked. *See* Hardcastle Rb. at Hardcastle Rebuttal Exhibit 2 (District response to Pine Water data request requesting supporting information for Mr. Jones' claims concerning misapplication of expenses and revenues directing Pine Water to Mr. Jones' direct testimony).

Q. WAS THE COMPANY'S APPLICATION PREPARED IN ACCORDANCE WITH COMMISSION RULES AND REGULATIONS?

A. Yes, as Staff found in its June 2, 2003 Letter of Sufficiency.

Q. IN DETERMINING THE REVENUE REQUIREMENT, DID YOU BECOME AWARE OF ANY COSTS THAT WERE MISSTATED, LEFT OUT, OR PRESENTED IN A CONFUSING MANNER?

A. Nothing material. I prepared the filing based on the books and records of the Company, in conformance with the rules and regulations of the Commission, and in a format prescribed by the Commission. For instance, the Company did propose adjustments to the test year operating expenses to make the test year in its view a normal or more realistic relationship between revenues, expenses and rate base as allowed consistent with the Commission's rules. *See* A.A.C. R14-2-103.A.3.i (defining pro forma adjustments to historical test year data).

Q. WHAT ABOUT THE DISTRICT'S ASSERTION THAT THE PROPERTY TAXES HAVE BEEN MATERIALLY MISSTATED?

A. I have adjusted the test year property taxes using the ADOR methodology and adjusted the test year accordingly. Any misstatements in actual expenses would be eliminated because property taxes were calculated using the ADOR formula. Any disagreement between the Company and Staff with respect to property taxes in the instant case is purely a function of a disagreement in the revenue components used in the ADOR model. This will be the expense level on a going forward basis, irrespective of any past reporting.

Nevertheless, in light of Mr. Jones' testimony, and in developing a response to a District data request, I have reviewed the 2002, 2001, and 2000 property taxes and have found amounts attributed to Strawberry Water in the reported amounts on Schedule E-2. In 2002, approximately $16,700 in property taxes were attributed to Strawberry Water, but incorrectly appeared on Pine Water's books. In 2001, approximately $14,550 in property taxes were attributed to Strawberry Water, but

incorrectly appeared on Pine Water's books. In 1999, there is insufficient information to determine the amount attributed to Strawberry Water in Pine Water's book.

I have learned that these were booking errors primarily caused by the fact that the property tax bills are addressed to Brooke Utilities and not specifically addressed to Pine Water or to Strawberry Water. The accounting clerk responsible did not realize the bills represented amounts for both entities and incorrectly booked them all to Pine Water.

Q. DOES THIS ERROR IMPACT THE REVENUE REQUIREMENT THE COMPANY IS SEEKING?

A. No. Again, the Company and Staff's proposed property tax expense levels are based on proposed rates using the ADOR methodology. Prior property tax payments are entirely irrelevant to the calculation.

Q. HAS PURCHASED WATER EXPENSE BEEN MATERIALLY MISSTATED?

A. No. As explained above, I removed trucking costs of $39,720 from the test year as these costs are now covered by an adjuster mechanism. During Staff's audit, Staff found additional invoices totaling approximately $2,183 relating to trucking costs and proposed an adjustment to further reduce purchased water expense. The Company has accepted this adjustment in rebuttal and has adjusted its proposed revenue requirement accordingly.

Q. HAVE THE WHEELING FEES IN TRANSPORTATION EXPENSES BEEN MATERIALLY MISSTATED?

A. No. During the test year, approximately 11,643,000 gallons of water were delivered to Pine Water through the pipeline. At a cost of $15.00 per thousand gallons, transportation expenses calculate to be $174,645. *See* Hardcastle Rb. at 29

(discussing reasonableness of wheeling charge). As reported on Schedule C-1 and on Schedule E-2, transportation expenses are $176,144. The difference is immaterial. In 2001, approximately 17,859,000 gallons were delivered. At a cost of $15.00 per thousand, transportation expenses calculate to be $267,865. As reported on Schedule E-2, transportation expenses are $267,780. Again, the difference is immaterial. In 2000, there were 0 gallons delivered though the pipeline. Schedule E-2 shows $132,732. In developing a response to a District data request, I discovered the 2000 expense was misclassified and should have been reported as contractual services.

Q. DOES THE 2000 MISREPORTING ERROR AFFECT THE REVENUE REQUIREMENT THE COMPANY IS REQUESTING OR ANY OF THE RECOMMENDATIONS THE COMPANY HAS MADE IN THE INSTANT CASE?

A. No on both counts. These errors occurred outside the test year.

Q. THE DISTRICT CLAIMS THAT TRANSPORTATION EXPENSES EQUAL TO 41 PERCENT OF REVENUE IS EXCESSIVE. HOW DOES THE COMPANY RESPOND?

A. The District's claim, that the wheeling charge resulting in costs equal to over 41 percent of the Company's revenues during the test year, is in error. *See* Jones Dt. at 3. During the test year, the transportation expense was equal to approximately 26 percent of revenues.

Q. PLEASE EXPLAIN.

A. In its calculation, the District includes purchased water expense, which includes costs of actual water purchases as well as the cost of trucking water, not wheeling fees. Wheeling fees (transportation expenses) were $176,144 in the test year. Test year revenues were $670,447. This translates to approximately 26 percent.

Thus, the District's calculation overstates the level of transportation expense. I cannot be certain whether this mistake is intentional or just a math error.

Q. HOW DO YOU RESPOND TO THE DISTRICT'S ASSERTION THAT PURCHASED WATER COSTS ARE $10.08 PER THOUSAND GALLONS?

A. The District also uses this calculation to support its allegations of massive mark-ups. *See* Jones Dt. at 10. Again, either the District does not understand the facts or it is intentionally overstating the cost in its effort to deprive Pine Water of needed rate relief.

For starters, the number for the purchased gallons is grossly understated. In 2002, Pine Water purchased 30,584,000 gallons, not 12,396,000 gallons as used by the District. *See* Jones Dt. at 10. Mr. Jones fails to include water purchased from water sources other than Strawberry Water and Starlight. Furthermore, the $125,033 cost he includes is for trucking expenses and CAWCD costs. Adjusted test year purchased water cost is actually $64,262 translating to a cost of $2.10 per thousand gallons.

Q. WHAT IS THE COST OF TRUCKING WATER COMPARED TO THE WHEELING FEE?

A. Trucking can cost up to 3 times more than the cost of water delivered through Project Magnolia. *See* Hardcastle Rb. at 29. Without Project Magnolia, ratepayers would be paying significantly higher rates.

Q. YOU MENTIONED THAT STAFF HAS AUDITED THE PURCHASED WATER EXPENSE. WHAT TESTIMONY DID STAFF PROVIDE WITH RESPECT TO THE PRICES THE COMPANY PAYS FOR PURCHASED WATER FROM PRIVATE WELL OWNERS OR TERMS AND CONDITIONS IN AGREEMENTS?

A. None, it appears Staff has not found reason to question these expense levels.

Q. DO YOU HAVE A RESPONSE TO THE DISTRICT'S ASSERTION THAT IT COULD NOT ASCERTAIN THE COSTS OF HAULED WATER DURING THE TEST YEAR COVERED BY THE ADJUSTER APPROVED IN EARLY 2003?

A. Yes. The District obviously did not review the Company's application. In my direct testimony, I specifically identify the adjustment for trucking costs ("water hauling costs") that I removed from the test year operating expenses. *See* Direct Testimony of Thomas J. Bourassa ("Bourassa Dt.") at 7. At best, this is another indication that the District does not have a full understanding of the facts.

Q. ARE THE COMPANY'S OUTSIDE SERVICE COSTS "MASSIVE" AS THE DISTRICT HAS CHARGED?

A. In my opinion, no. The Company does not have an operations and accounting staff. I would expect to see greater outside service costs as a result. Also, the Company has incurred and expects to incur significant legal costs in defending its CC&N as well as addressing its severe water supply problems. Also, as I explained in my direct presentation, the Company adjusted the test year expense levels downward by nearly $38,000 to reflect expected levels on a going forward basis. Bourassa Dt. at 9.

Q. HAS STAFF PROPOSED ANY ADJUSTMENTS TO CONTRACTUAL SERVICES OR TO THE OVERHEAD EXPENSES?

A. Again, no.

Q. HAS EVIDENCE BEEN PRESENTED THAT BROOKE UTILITIES ALLOCATES COSTS AND REVENUES BETWEEN PINE WATER, STRAWBERRY WATER AND ITSELF IN AN UNJUSTIFIED AND MANIPULATIVE MANNER?

A. None of which I am aware.

Q. ARE THERE ANY OPERATIONAL COSTS FROM PROJECT MAGNOLIA INCLUDED IN OPERATING EXPENSES?

A. No. As I testified to earlier, operating expenses are recovered in the wheeling fee Brooke Utilities charges.

Q. IS WATER PURCHASED BY BROOKE UTILITIES "MARKED-UP" AND THEN RESOLD TO PINE WATER?

A. No. The District makes this accusation, but frankly there is absolutely no evidence to support it. *See* Jones Dt. at 10. First, all invoices for purchased water are invoiced from the vendor, not Brooke Utilities. Second, neither Brooke Utilities nor any of its subsidiaries own or have an interest in the water suppliers (other than Strawberry Water) or in the trucking company, Pearson Trucking. Third, the cost of water purchased from Strawberry Water is covered by a tariff approved by the Commission. *See* Hardcastle Rb. at 27-28.

Q. DOES THE COMPANY PAY DIFFERENT AMOUNTS TO DIFFERENT WATER SUPPLIERS?

A. Yes, depending on the circumstances, purchased water costs do vary from supplier to supplier. For example, Pine Water pays Strawberry Water pursuant to a Commission approved tariff. In contrast, private well owners negotiate agreements and prices based on their own circumstances, including water quality, stand-by charges, electricity costs and water availability.

Q. CAN YOU ADDRESS THE DISTRICT'S CONCERN THAT REPAIRS AND MAINTENANCE EXPENSES WERE ZERO IN 1999 AND ZERO IN 2001?

A. Yes. In 1999 and 2001, repairs and maintenance expenses were reported in miscellaneous income on the Commission Annual Reports. *See* Bourassa Rebuttal Exhibit 5. The respective amounts were $16,325 and $4,447. Near as I can tell,

the individual preparing the Company's Annual Reports reported the repairs and maintenance amounts in miscellaneous expense because the internal general ledger account reported in repairs and maintenance for 2000 and 2002 was for the internal Company account, materials and supplies. Thus, there may have been some confusion as to where to report the amounts in the past. In my experience, this type of reporting problem is not unique to Pine Water, nor did this have any impact on the determination of the Company's revenue requirement.

Q. CAN YOU EXPLAIN THE $494,709 OF OTHER REVENUE IN 2000?

A. Yes. This was primarily related to the recording of income tax of $494,500 and the result of the recognition of deferred taxes, which I discussed earlier in this rebuttal testimony.

Q. DO YOU HAVE ANY OTHER COMMENTS?

A. Yes. The District asserts the Company's financial statements "appear to lack reasonable consistency and accuracy and should be used to prompt further questions as to the firm's real financial status." *See* Jones Dt. at 15. Thus, the District believes the Company is showing a poor financial condition in hopes of a large rate increase. *Id.*

Q. DO YOU BELIEVE THIS TO BE TRUE?

A. No. I believe my rebuttal testimony demonstrates the District does not have a full understanding of the facts. The Company's financial condition is poor, without any need to "enhance" the facts, due in large measure to the past (and on-going) water supply problems in Pine, Arizona and the increased operating costs incurred to meet the water demands of its customers. The net losses, as well as the insufficient cash flows in prior years, not creative accounting as Mr. Jones imagines, are the reasons Pine Water is in the shape it is in.

IV. COST OF CAPITAL.

Q. CAN YOU DISCUSS THE REBUTTAL COST OF CAPITAL SCHEDULES?

A. Yes. Rebuttal Schedule D-2 reflects a change in proposed long-term debt. As you will recall, the Company proposed converting $178,000 of inter-company payable to long-term debt. The Company now proposes a reduced debt amount of $164,000, as discussed below.

Rebuttal Schedule D-1, page 2, reflects a change in the proposed equity. In the direct filing, the Company proposed converting $355,599 of the inter-company payable to equity. The proposed change is to increase the amount of equity to $369,559, as further discussed below.

Rebuttal Schedule D-1, page 1, shows the rebuttal weighted cost of debt, equity, and capital. My recommendation on the cost of equity has not changed and remains at 12 percent.

Q. IS THERE A DISAGREEMENT BETWEEN STAFF AND THE COMPANY REGARDING THE COST OF CAPITAL?

A. Yes, although it is important to point out from the beginning that Staff has neither presented cost of capital testimony nor refuted my testimony on the appropriate cost of equity. *See, generally,* Thornton Dt. Still, the Company's has two primary issues with Staff's recommendations regarding Pine Water's capital structure and the cost of capital itself.

First, Staff recommends that the Commission deny the conversion on Pine Water's inter-company payable to long-term debt and equity. The Company continues to propose the conversion with the modification to the amount of long-term debt discussed herein. Second, in lieu of preparing cost of capital testimony, Staff recommends a 10 percent operating margin, which translates to an 11.05 percent return on Staff's FVRB for Pine Water. The Company disputes Staff's

approach primarily because its reasons for not preparing cost of capital testimony are erroneous, particularly given its proposals regarding rate base.

Q. WOULD YOU PLEASE SUMMARIZE THE COMPANY'S PROPOSAL TO CONVERT THE INTER-COMPANY PAYABLE TO LONG-TERM DEBT AND EQUITY?

A. Yes, as I discussed in my direct testimony, the Company proposed converting an inter-company payable of approximately $533,000 to $178,000 of long-term debt and $355,000 to equity. The $178,000 was related to financing of plant additions for 2000, 2001, 2002, and 2003, as Pine Water added approximately $103,000 of plant since 2000 and approximately $75,000 of plant additions were planned for 2003. *See* Bourassa Dt. at 11.

Q. WHAT IS THE REASON FOR THE ADJUSTMENT DOWNWARD TO $164,000?

A. In rebuttal, the 2003 amount has been adjusted downward to approximately $61,000 (2003 year to date actual plant expenditures). The Company now proposes approval of $164,000 of long-term debt and the balance of $369,000 converted to equity.

Q. WHY DOES STAFF RECOMMEND DENIAL OF THE COMPANY'S REQUESTED CONVERSION OF THE INTER-COMPANY PAYABLE TO DEBT AND EQUITY?

A. Staff asserts that the inter-company payable was for operating expenses and any amount converted to debt or equity is inappropriate and a violation of A.R.S. 40-302-(A). Thornton Dt. at 2. To begin with, I note that Staff's witness appears to be offering a legal opinion, something Staff recently criticized me for doing in the pending Arizona-American rate proceeding. *See* Staff's Statement of Objections to Arizona-American Water Company's Rebuttal Testimony (Docket Nos. WS-

01303a-02-0867, et al.).

In any event, Staff's position is incorrect for three reasons. One, as I have testified, the long-term debt is for plant. In my direct testimony, I stated that the financing was to be used for $103,000 of plant added since 2000 and $75,000 for plant to be added through the end of 2003. *See* Bourassa Dt. at 11.

Two, irrespective of the make-up of the inter-company payable, whatever money could have been paid to Brooke Utilities to reduce the inter-company payable was instead used to pay for plant. Cash is fungible. If plant was paid for, then some other operating expense or obligation was not. The flip side of this is if all wheeling charges were paid for, and then costs for new plant, property taxes, purchased water, and/or employee wages would not have been paid. Vendors, other than Brooke Utilities, demand payment on a timely basis or they would not continue to provide services to Pine Water. Employees have to be paid on time or they would sever their employment. Property taxes have to be paid. Therefore, while in my direct testimony I indicated that the inter-company payable was related to the wheeling charges, I went on to say that Pine Water had not been able to pay all if its operating expenses **as well as** to fund plant additions. *Id.*

Q. COULD ALL OF THE INTER-COMPANY PAYABLE BE ATTRIBUTED TO WHEELING CHARGES?

A. No, wheeling charges since 2000 were $443,924 (2001 was $267,780 and 2002 was $176,144). There is an error in Schedule E-2 for 2000. The transportation expenses of $132,732 are not wheeling charges, rather they are contractual services–other. This was a reporting error on the E-2 schedule but this error does not affect net income for 2000. In any case, the inter-company payable cannot be said to consist entirely of wheeling charges.

Q. THANK YOU. PLEASE CONTINUE.

A. Third, a utility company that cannot pay its obligations and continue to operate should have the ability to raise capital by increasing equity to maintain its financial health. The alternative is long-term debt or increasing short-term payables. Short-term liabilities should not finance long-term problems. I doubt Staff would have recommended Brooke Utilities discontinue funding Pine Water's cash needs and allow it to go bankrupt. Staff's position, based on their recommendations, is to place the financial burden on Brooke Utilities rather than help solve Pine Water's financial problems. If this happens, at some point, Brooke Utilities is going to have to stop infusing capital into Pine Water in one form or another, as it has done to keep the Company afloat.

Fourth, I note that in applications for CC&N's, equity additions are normally greater than funds needed for plant so that utilities can pay operating expenses during early years when there is not enough cash flow from revenues to fund all operating expenses. This is a similar situation.

Q. IS THE COMPANY STILL PROPOSING A TERM OF 5 YEARS AND 10 PERCENT INTEREST ON THE LONG-TERM DEBT?

A. Yes. Staff claims that a reasonable period would be 15 years and a reasonable rate would be 2 percentage points over prime or 6 percent. Thornton Dt. at 4. However, the term of the loan proposed by Pine Water is the same as that authorized in the prior rate case. Decision 62400 (March 31, 2000). Moreover, although the inter-company payable is short-term debt, payable within 12 months, none of the payable has been paid since 2000. Instead, it has increased from approximately $96,000 in 2000 to over $533,000 in 2002. In other words, Brooke Utilities has already waited as long as 3 years for payment without interest. In essence, Brooke Utilities will have to wait 8 to 9 years for full payment since inception of the original amounts giving rise to the inter-company payable. This is

because there will be insufficient cash flows, even under proposed rates, to retire this obligation timely. Increasing the term to 10 or 15 years places an unreasonable burden on Brooke Utilities.

It can also be argued that Pine Water has not been servicing its existing long-term debt. Theoretically, the Company has merely been transferring long-term debt (owed to Brooke Utilities) to interest-free short-term debt (inter-company payable owed to Brooke Utilities) rather than truly paying down debt. Again, cash is fungible. If Pine Water pays long-term debt, then it cannot pay the wheeling charges, or operating expenses, and visa-versa. No matter how you look at it, both obligations are due. Perhaps Pine Water should not pay the long-term debt. At least then Brooke Utilities could accrue interest.

Q. WHAT ABOUT STAFF'S PROPOSED INTEREST RATE?

A. Staff's proposed interest rate is unreasonable. As I have testified before, Pine Water is not creditworthy and would not likely be able to obtain third party financing at the interest rate proposed by Staff. For instance, I inquired of Mr. Kevin Lewis, Vice President of Merrill Lynch Financial Service ("MLFS") regarding the interest rates and parameters under which MLFS lends. He stated that high-risk loans would require 8.29 to 9.29 percent rates. *See* Bourassa Rebuttal Exhibit 6. Based on these parameters, I do not see how Pine Water would even be accepted by MLFS, even at the higher rates. This is because Pine Water has experienced negative cash flows in recent years and has a negative debt ratio. Two key parameters MLFS looks at in evaluating a borrower. *Id.*

In contrast, Staff has not provided any evidence that any of its supposed lenders at favorable rates would provide financing to Pine Water. *See* Staff Response to Pine Water Data Request 1.5, copy attached hereto as Bourassa Rebuttal Exhibit 3. For example, Staff claims WIFA would loan Pine Water

money but neglects to mention that WIFA only provides financing on new plant. *See* Staff Response to Pine Water Data Request 1.4, copy attached hereto as Bourassa Rebuttal Exhibit 3.

Q. HOW DOES STAFF JUSTIFY ITS RECOMMENDED LOWER INTEREST RATE ON DEBT THAT IT RECOMMENDS NOT BE APPROVED?

A. Staff cites two recent financings with low interest rates to support its interest rate recommendations: One for Community Water of Green Valley ("Community Water") from Bank One and one for Ashfork Water Service ("Ashfork Water") from the U.S. Department of Agriculture ("USDA"). Thornton Dt. at 3. Staff's support is seriously flawed. For one thing, Staff neglects to mention the financial conditions and legal forms of its two representative borrowers, which factors impact obtainable interest rates.

First, Community Water has a superior financial condition when compared to Pine Water. *See* Bourassa Rebuttal Exhibit 7 (excerpts from Community Waters Annual Report). Community Water had cash and cash equivalents of over $669,000 as of December 31, 2002, a current ratio of over 4 and had no long-term debt as of December 31, 2002. It also appears to have internally funded its plant additions for 2002 from internally generated funds, as plant increased by over $1,000,000 without a corresponding increase in debt, membership contributions and/or contributions-in-aid of construction.

Second, Staff references a financing source providing subsidized rates from which Pine Water could never obtain a loan. Ashfork Water is a non-profit co-operative and qualifies for the low subsidized interest rate from the USDA. Staff has not demonstrated that Pine Water, theoretically a for-profit entity, could qualify under the applicable USDA guidelines. In the end, Mr. Thornton's assessment of Pine Water's ability to obtain lower cost financing is unsupported fiction and

should be rejected.

Q. WHAT WOULD BE THE EFFECT OF THE COMMISSION DENYING THE PROPOSED CONVERSION OF THE INTER-COMPANY PAYABLE TO DEBT AND EQUITY?

A. First, Pine Water's financial situation would not be improved. It would still have a negative equity and poor liquidity ratios. This will impact both cash flow and the ability to borrow funds or attract capital in the future. Future cash flow will be needed to pay down the short-term inter-company payable rather than being available to help internally funded plant additions or to provide cash flow to service future long-term debt or to pay dividends. Risks to equity stakeholders will be much greater and I would have to advise the Company to request a much higher return on rate base to compensate for the added risks. Risks to potential debt holders will simply be too high to attract low interest rates or even obtain financing. Second, the inter-company payable would not be paid for several years, tying up Brooke Utilities' capital, providing no return, and placing a financial burden on the shareholder that will ultimately have trickle down implications to Pine Water's future financial health. In fact, it can be argued that denial of the conversion of the inter-company payable, at least to equity, is confiscatory because it deprives Brooke Utilities the recovery of funds that are now due, while simultaneously denying Brooke Utilities the opportunity to invest these funds in more profitable alternatives.

V. <u>RATES AND RATE DESIGN</u>.

Q. PLEASE DISCUSS YOUR REBUTTAL RATE SCHEDULES?

A. Rebuttal Schedule H-3 shows the rebuttal rates.

Q. HAS STAFF ADOPTED THE COMPANY'S PROPOSED DESIGN FOR WINTER AND SUMMER RATES?

A. Yes. *See* Fernandez Dt. at 15.

Q. WHAT IS THE PRIMARY DIFFERENCE IN STAFF'S RATE DESIGN WHEN COMPARED TO THE COMPANY'S PROPOSED RATE DESIGN?

A. The Company's design allows more gallons in each tier for 1 inch and larger meters while Staff's design applies the same number of gallons in each tier regardless of meter size. In Staff's opinion, inclusion of more gallons in the larger meter sizes does not promote conservation. *See* Fernandez Dt. at 15.

Q. DO YOU AGREE?

A. Yes and no. Both designs promote conservation. Customers who use more water pay more under both rate designs. However, the Company's proposed rate design takes into account the fact that larger meters serve customers with greater minimum water needs than those of smaller metered customers rather than the one size fits all approach of Staff. It also reflects, as do the minimum charges, that larger meters have higher capacity flows that are generally required to meet the minimum customer demands.

Allowing more gallons for larger meters is not necessarily counter to conservation. By considering the minimum water needs and capacity, the Company's designed its tiers to be more attainable for larger metered customers. In other words, there is an incentive for the larger metered customers to reduce their average usage below the higher cost tiers. For example, the second tier for 1 inch and larger meters is 25,000 for the Company and 6,000 gallons for Staff. The average usages for 1 inch meters, as shown on Schedule H-2, are approximately 31,800 gallons and 44,900 gallons, respectively. The Company's lower cost tier is more attainable than Staff's and there is an incentive to conserve.

Q. ARE THERE OTHER REBUTTAL SCHEDULES REGARDING RATE DESIGN?

A. Yes. Rebuttal Schedule H-1 shows the revenue summary for the rebuttal rates. Rebuttal Schedule H-2 shows the analysis of revenues by customer class.

Q. DOES THE COMPANY STILL PROPOSE A WATER EXPLORATION SURCHARGE?

A. No, Mr. Hardcastle explains the reasons for the Company's withdrawal for authorization to collect this surcharge in his rebuttal testimony. *See* Hardcastle Rb. at 19.

Q. ARE THE COMPANY AND STAFF IN AGREEMENT ON THE WATER HAULING ADJUSTER MECHANISM?

A. Yes, both Staff and the Company propose that this adjuster mechanism be continued to allow the Company to recover the costs of hauling water into the Pine Water system. *See* Fernandez Dt. at 11.

Q. DO ANY OF THE INTERVENORS OFFER A PROPOSED RATE DESIGN?

A. The District does not provide any testimony concerning rate design, except for its unwarranted criticism of the proposed Water Exploration Surcharge. Jones Dt. at 14. Mr. Breninger testifies that some sort of "tiered system of water rates" should be approved but provides no detail as to what he is recommending. Direct Testimony of John O. Breninger at 3, 5. Therefore, it is impossible for me to respond.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

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REBUTTAL EXHIBIT 1

Brooke Utilities and Affiliates
Capital Expenditures
For the Year of 2003

			BUI	Navajo	Payson	Pine	Strawberry	Tonto Basin	Total
January	106.00	Pine Reservoir	2,000.00						2,000.00
	311.00	Pumping Equipment			650.11		1,159.59		1,809.70
	331.00	Transmission & Dist. Mains			674.00	958.29	702.51		2,334.80
	334.00	Meter & Water Installation		181.82	996.84	5,782.07	1,222.05	335.68	8,518.46
		Total	2,000.00	181.82	2,320.95	6,740.36	3,084.15	335.68	14,662.96
February	331.00	Transmission & Dist. Mains			6,304.71	7,037.09	1,469.80	1,446.33	16,257.93
	334.00	Meter & Water Installation		674.62	2,128.70	14,333.97	468.91	225.42	17,831.62
		Total	-	674.62	8,433.41	21,371.06	1,938.71	1,671.75	34,089.55
March	311.00	Pumping Equipment					2,611.85	1,267.60	3,879.45
	334.00	Meter & Water Installation			1,508.80	9,696.16	548.27	771.94	12,525.17
		Total	-	-	1,508.80	9,696.16	3,160.12	2,039.54	16,404.62
April	311.00	Pumping Equipment			1,344.05				1,344.05
	334.00	Meter & Water Installation		168.53	2,666.38	2,422.07	1,665.65	179.63	7,102.26
		Total	-	168.53	4,010.43	2,422.07	1,665.65	179.63	8,446.31
May	311.00	Pumping Equipment					2,295.88		2,295.88
	334.00	Meter & Water Installation			2,680.85	2,925.99	587.91	902.09	7,096.84
		Total	-	-	2,680.85	2,925.99	2,883.79	902.09	9,392.72
June	334.00	Meter & Water Installation			3,670.64	7,218.78	216.45	986.28	12,092.15
		Total	-	-	3,670.64	7,218.78	216.45	986.28	12,092.15
July	311.00	Pumping Equipment						750.84	750.84
	334.00	Meter & Water Installation		327.57	427.29	3,393.67	892.82	1,659.70	6,701.05
	341.00	Transportation Equipment	59,552.22						59,552.22
		Total	59,552.22	327.57	427.29	3,393.67	892.82	2,410.54	67,004.11

Brooke Utilities and Affiliates
Capital Expenditures
For the Year of 2003

			BUI	Navajo	Payson	Pine	Strawberry	Tonto Basin	Total
August	311.00	Pumping Equipment		4,289.45	3,038.90		2,563.73	1,807.94	11,700.02
	331.00	Transmission & Dist. Mains						14,962.81	14,962.81
	334.00	Meter & Water Installation		440.29	3,638.63	2,535.70	434.24	875.98	7,924.84
		Total	-	4,729.74	6,677.53	2,535.70	2,997.97	17,646.73	34,587.67
September	334.00	Meter & Water Installation			1,115.66	3,762.39	74.81	647.32	5,600.18
		Total	-	-	1,115.66	3,762.39	74.81	647.32	5,600.18
October	311.00	Pumping Equipment				1,014.83			1,014.83
	334.00	Meter & Water Installation		127.16	1,436.75	56.81	260.43	56.81	1,937.96
		Total	-	127.16	1,436.75	1,071.64	260.43	56.81	2,952.79
		YTD Total	61,552.22	6,209.44	32,282.31	61,137.82	17,174.90	26,876.37	205,233.06

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REBUTTAL EXHIBIT 2

Brooke Utilities, Inc.
Deferred Tax Calculation
30-Apr-00

BUI & Subs April 30 2000

Temporary Book/Tax Differences	BUI	United Utilities	Strawberry	Tonto	Payson	Navajo	Pine Water	Total
1) Amortization of CIAC								
Books:								
Contributions in Aid of Construction	-	(966,725)	-	-	-	-	(958,323)	(1,925,048)
Less A/A of CIAC @ 4/30/00	-	280,671	-	-	-	-	430,388	711,059
Net liability to amortize	-	(686,054)	-	-	-	-	(527,935)	(1,213,989)
Tax:								
Contributions in Aid of Construction	-	-	-	-	-	-	-	-
Less A/A of CIAC	-	-	-	-	-	-	-	-
Net liability to amortize	-	-	-	-	-	-	-	-
Deferred (income) expense for tax	-	686,054	-	-	-	-	527,935	1,213,989
2) Bad Debt								
Books	-	-	-	-	-	-	-	-
Tax	-	-	-	-	-	-	-	-
Deferred (income) expense for tax	-	-	-	-	-	-	-	-
3) Depreciation								
Books:								
Fixed assets	377,300	2,836,910	1,175,456	-	123,789	314,408	1,772,204	6,600,067
Less undepreciable land	-	(25,566)	(2,375)	-	(300)	(10,050)	(16,930)	(55,221)
Accumulated depreciation @4/30/00	(126,341)	(1,237,496)	(701,103)	-	(71,977)	(175,983)	(1,104,609)	(3,417,509)
Net Book Value	250,959	1,573,848	471,978	-	51,512	128,375	650,665	3,127,337
Tax:								
Fixed assets	377,300	2,876,336	1,175,456	-	123,789	314,408	1,933,193	6,800,482
Less undepreciable land &equipment	-	(25,566)	(271,430)	-	(227)	(29,050)	(598,820)	(925,093)
Accumulated depreciation @4/30/00	(126,341)	(1,385,912)	(381,273)	-	(74,339)	(187,670)	(831,881)	(2,987,416)
Tax Basis	250,959	1,464,858	522,753	-	49,223	97,688	502,492	2,887,973
Deferred (income) expense for tax	-	(108,990)	50,775	-	(2,289)	(30,687)	(148,173)	(239,364)
4) Net Operating Losses								
BUI Net operating income c/f allocated		(121,379)	(69,510)		(6,736)	(16,790)	(57,291)	(271,705)
Income tax NOL not utilized @12/31/99	-	1,180,759	676,186	-	65,528	163,328	557,316	2,643,117
	-	1,059,380	606,676	-	58,792	146,538	500,026	2,371,412
Net deferred (income) expense for income tax	-	1,636,444	657,451	-	56,503	115,851	879,788	3,346,037
Federal deferred tax benefit (liability) based upon a tax rate of 34%	-	556,391	223,533	-	19,211	39,389	299,128	1,137,653
Arizona deferred tax benefit (liability) based upon a tax rate of 8%	-	130,916	52,596	-	4,520	9,268	70,383	267,683
Total deferred tax debit (credit)	-	687,307	276,129	-	23,731	48,658	369,511	1,405,336
Deferred Income Tax Asset (Liability) @ 4/30/2000(Rounded)	-	687,000	276,000	-	24,000	49,000	369,000	1,405,000
Deferred Income Tax Asset (Liability) @ 12/31/99 (Rounded)	-	(24,000)	(86,500)	-	10,000	11,000	(125,500)	(195,000)
Tax Provision (benefit) exp for Jan-Apr 2000	-	(711,000)	(342,500)	-	(14,000)	(38,000)	(494,500)	(1,600,000)

Payson's NOL is from C&S

E&R's R/E that went to:			%	NOL
3/31/00	Strawberry	617,084	62.65%	660,915
12/1/98	Pine	367,823	37.35%	393,949
				1,054,864

WWW's R/E that went to:				
12/1/98	Pine	689,087	87.50%	106,941
3/31/00	Strawberry	98,401	12.50%	15,271
				122,212

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REBUTTAL EXHIBIT 3

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.
TO ARIZONA CORPORATION COMMISSION STAFF
(Docket No. W-03412A-03-0279)

REQUEST:

1.4 Is Staff aware of any basis to conclude that the Water Infrastructure Finance Authority would provide financing to PWCo?

RESPONSE:

Yes. Staff believes that PWCo could qualify to submit an application for financing from the WIFA and that PWCo could qualify for such financing.

REQUEST:

1.5 Is Staff aware of any banks, including Bank One referenced in the Direct Testimony of John S. Thornton at page 3, ls. 22-23, would provide financing to PWCo?

RESPONSE:

Staff is not aware of what specific banks would or would not provide financing to PWCo.

REQUEST:

1.6 Is Staff aware of any basis to conclude that the U. S. Department of Agriculture would provide financing to PWCo?

RESPONSE:

Staff cannot conclude whether the U. S. Department of Agriculture would or would not provide financing to PWCo.

REQUEST:

1.16 Did Staff include operating and maintenance expenses associated with the operation of Project Magnolia in Staff's recommended level of operating expenses in light of Staff's recommended inclusion of the project in rate base? If Staff's answer is no to this Data Request, please explain why it is appropriate to include Project Magnolia in rate base but to not allow recovery of operating and maintenance expenses associated with Project Magnolia.

RESPONSE:

Staff included Depreciation Expense of $8,992 in its recommended rates. In addition Staff allowed the Company's proposed overhead allocation from Brooke Utilities to Pine Water of $71,092.

REQUEST:

1.22 If, as Staff asserts in its direct filing, the requested debt and equity financings proposed to recover operating expenses, please indicate why Mr. Fenandez is using interest synchronization on Schedule CMF-2 to compute income taxes, using weighted cost of debt of 4.13%?

RESPONSE:

Staff should have used the actual interest expense in its calculation of income taxes rather than the synchronized interest.

REQUEST:

1.23 Please identify Staff's proposed capital structure showing the calculation of the 4.13% weighted cost of debt.

RESPONSE:

See attached.

Pine Water Company
Capital Structure and
Rate of Return Calculation

Line No.	[A]	[B] Capital $	[C] Weight (%)	[D] Cost	[E] Weighted Cost	[F] Gross Rev. Conv. Factor	[G] Grossed-Up Cost
1	Long-term Debt	$ 205,332	58.34%	7.08%	4.13%	1.00	4.13%
2	Common Equity	$ 146,623	41.66%	8.7%	3.62%	1.63	5.91%
3		$ 351,955	100.0%		7.8%		10.04%
					Pre-Tax Interest Coverage		2.4

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REBUTTAL EXHIBIT 4

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.,
TO PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT
(Docket No. W-03412A-03-0279)

REQUEST:

1.17 Please state the number of hours spent in connection with this matter by Harry Jones, the cost billed to the District and provide copies of any invoices received by the District from or related to Harry Jones.

RESPONSE:

ANSWER; #1.17 During September 25.5 hours at a cost of $1,147.50 and during October 145.9 hours at a cost of $6,398.00.See Exhibit 1.17 for copies of bills.

1487701.1/75206.006

HDJ Management

HC8 Box 363
Payson, AZ 85541
(928) 474-2876
Cell (928) 595-1111
FAX (928) 474-2876

*** INVOICE ***

Terms: Net 10 days

To: John Nelson, Administrator, Pine/Strawberry Water Improvement District

From: Harry D. Jones, HDJ Management

Date: 9-30-03

For management services rendered 9-25-03 thru 9-30-03:

9-25-03	Review Economist.com report, Morrison Maierle report, and news articles to prepare for meeting with John, Marty, Dan, and Ron. Attend meeting at Marty's office. Start review of Pine Water Rate Hearing documents.	13.3 hours
9-26-03	Begin generating ideas for survey form. Meet with John to review prior days discussions, contract suggestions, and strategies.	1.9
9-28-03	Further review of Economist.com report to prepare for call to Dan. Review parts of rate hearing submittals and testimony that might affect Economist.com report.	4.3
9-29-03	Discuss suggested changes and questions on Econ.com report with Dan. Begin draft of letter to old board member related to recovery of assets. Go to Pine to meet with Mary Lou Myers about records. Complete letter to old board members.	6.0
	Total Hours	25.5
		@ 45.00/hr.
	Total Due:	$1,147.50

HDJ Management

HC8 Box 363
Payson, AZ 85541
(928) 474-2876
Cell (928) 595-1111
FAX (928) 474-2876

*** INVOICE ***

Terms: Net 10 days

To: John Nelson, Administrator, Pine/Strawberry Water Improvement District

From: Harry D. Jones, HDJ Management

Date: 10-31-03

11-5-03 pd. ck. # 1069 ALONG WITH EXPENSES OF #17233 AS ATT.

For management services rendered 10-1-03 thru 10-31-03:

10-1-03	Meet with John Nelson and leave suggested letter to former board members.	.6 hours
10-2-03	Telephone call with Loren Peterson with his suggestions about possible intervention in rate hearing and his ideas of community members to bring into a potential citizens communications group.	1.8
10-3-03	Call from John N. requesting I call Jon Breninger and to review Loren's comments. Go to Roundup newspaper office to review letter to editor from three weeks earlier by Estess. Call John B., make introduction, and set appointment for Sunday,10-5. Call from Loren Peterson about intervention deadline dates.	1.0
10-4-03	Prepare potential survey questions and file and organize documents.	2.2
10-5-03	Prepared agenda to discuss with John Breninger. Met with John B. to discuss his feelings and review his agenda for transition to Bd. of Supervisors. Reviewed records he will prepare to deliver next day.	6.9
10-6-03	Review CAP water rights of Pine Water Co. (none for Strawberry) with CAP offices. Go to bank to arrange to get new signatures on bank account. Lunch with Marty to update him on progress and to give him bank signature card to go to John N. Go to Pine and pick up records, unpaid bills, checks, keys, etc. and review them with John B.	3.8
10-7-03	To Pine to Post Office, storage building, and review and pick up some records to study. Called Mortensen and Goode about records and minutes of last board meeting. Made quick review of	4.6

	records picked up, sorted mail and bills, called John Liege about intervention, prepared for next day meeting with John N.	
10-8-03	Met with John N. to update on my activities and to review legal briefs, allocations of CAP water, etc. Filed documents, read reports, and began preparation for mailing of reports to citizens. Coordinated with Jo Johnson to handle M-M reports and CD-ROMs to be picked up by citizens.	5.8
10-9-03	Met with John N. to coordinate payment of bills and to arrange to have E-mail sent to John Liege. Prepared part of documents for John G., arranged notebooks, and prepared notes for Nancy to be able to do the telephone calls and mailings of the M-M reports and CD-ROMs.	2.7
10-10-03	Prepare copies of rate hearing documents and status for John G. Go to copy store, Jo Johnson's office, Payson Packaging, and Post Office.	1.3
10-11-03	Contact Pine library and John B. Set up mailing and call procedures for distribution of reports and CDs. Check Web sites for County link and PSWID links for internet access to report. Further review rate hearing application to save time of John G. (especially the financial sections).	5.5 Harry
10-11-03	Prepare invoice forms and mailing/pickup checklist for Jo Johnson to use. Make calls to citizens who requested reports two months ago, fill out invoices, and package items ready for pick up or mailing.	2.9 Nancy
10-12-03	Prepare to update John G. on significant details of rate hearing and procedural order of ACC. Further coordinate financial details in rate hearing application with Econ.com report. Complete M-M report review so I can discuss with Buzz Walker and Mike Ploughe when I hand deliver their copies.	6.8 Harry
10-12-03	Place calls to citizens and prepare invoices, mailings and pick up envelopes.	1.2 Nancy
10-13-03	Met with Ray Pugel and called Loren Peterson to get input for meeting with John Nelson	.6
10-14-03	Calls from Printing by George and John Gliege. To Payson P.O. and Printing by George. To Pine mailbox. To Payson Town Hall to meet with Buzz Walker. Pay bills and update mailing records.	3.7 Harry
10-14-03	Complete daily mailing preparation	. 5 Nancy
10-15-03	Met John N. to pay bills and set agenda for next days meeting. To Pine to go to storage unit and mail box and pick up new bills. Prepared written agenda for 10-16 meeting with attorney. Reviewed resumes and filed paid bills. Prepared CDs for mailing.	4.6
10-16-03	Make copies of resumes for meeting. Meet with John N. and John Gliege	3.0
10-17-03	Met with Bill McKnight to deliver report and discuss his well that supplies water to Brooke system. Met with Mike Ploughe to review study and arrange meeting with John N. To Post Office.	2.5
10-18-03	Update records and arrange meeting schedule with John N. Called Breninger, resume applicants, and other interested parties and interviewed them over phone. Began drafting interrogatory questions for John G.	5.2

10-19-03	Review E-mail from Loren. Prepare questions for John G. Call Ray Pugel for his e-mail. Make committee candidate calls. Prepare memo to attorney	10.2
10-20-03	Complete balance of mailing and prepare accounts receivable list	2.1 Nancy
10-20-03	Verify final mailing results. Handle E-mail from Pugel and prepare additional questions for Gliege.	3.6 Harry
10-21-03	Lunch with Gregrumph of SRP. To John N. office and post office to deliver mailings. Call from Glenn Brown. Start preparing written testimony.	5.7
10-22-03	Telephone review of draft testimony with Peterson. And Pugel. Review of testimony with Gliege and discuss extention request. To Pine P.O. for mail To nelson and Jo Johnson to review collections and status. Update of testimony and integrate Pugel and Peterson comments. Discuss additional background with Greg of SRP.	6.2
10-23-03	To J. Nelson office to review agenda. Long call from Gliege as to processes and facts. Integrate Gliege comments into agenda. Meet with Dan Jackson and Nelson and discussed legal issuesand testimony with Gliege.	4.0
10-24-03	Call from Komrumph to discuss data and review his explaination of M & M study. Obtain additional population info. From Nelson and discuss with Greg K.	1.0
10-25-03	Update written testimony with John. Calls with Jim Estess and Alan LaMagna.	7.9
10-26-03	Review and prepare testimony	8.5
10-27-03	Update testimony and re-arrange records. Prepare reply to Gliege and Nelson. Go to Pine to see Perry Schaal and Tom Weeks.	7.2
10-28-03	Review updates to testimony and seed to others. Calls to Jackson, Johnson, Nelson, and Gliege. Update testimony based on days conversations.	7.6
10-29-03	Print update of testimony and e-mail. Review Fed-Ex documents from Jackson. Call Gliege about the new info. To Pine for mail. Called Nelson on way to Laughlin to review status. Review exhibits and update testimony.	7.8
10-30-03	Call Gliege to review latest e-mail. To county offices to copy Exhibits. To P.O. to mail copies to Gliege. Make final adjustments to testimony .	5.6
10-31-03	To Pine P.O. to look for staff reports . See Perry Schaal at Knolls job site. Follow up at P.O. to track delivery to Gliege.	1.3

Total Hours – Nancy 6.7 @ $20.00 =	$ 134.00
Total Hours – Harry 139.2 @ $45.00 =	6,264.00
Total Due	$6,398.00

AGREEMENT NO. 03-GI-32-0010

BETWEEN THE

BUREAU OF RECLAMATION,
THE TOWN OF PAYSON, ARIZONA,
AND GILA COUNTY, ARIZONA

TO PROVIDE FUNDS AND IN-KIND SERVICES TO
SUPPLEMENT AVAILABLE APPROPRIATED FEDERAL FUNDS FOR
THE MOGOLLON RIM WATER RESOURCE MANAGEMENT STUDY

1. THIS AGREEMENT is made and entered into by and between the Town of Payson, Arizona, hereinafter referred to as "Payson," and Gila County, Arizona, hereinafter referred to as "the County", all of which at times are referred to as "Cooperating Partners" and the Bureau of Reclamation, hereinafter referred to as "Reclamation;" all of which are at times collectively referred to as "Parties," pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as Reclamation Law, and the Act of March 4, 1921, referred to as the Contributed Funds Act; and Public Law 108-7, which authorized the expenditure of fund to conduct the Mogollon Rim Water Resource Management Study.

WITNESSETH

2. EXPLANATORY RECITALS

2.1 WHEREAS, Reclamation in the above mentioned Acts has been authorized by Congress for said investigation; and

2.2 WHEREAS, investigation activities shall include, but are not limited to, those shown in the attached Plan of Study as Attachment A and incorporated herein by reference; and

2.3 WHEREAS, the problem of a growing population in the study area and limited water resources requires additional water sources; and

2.4 WHEREAS, Reclamation has programmed funds under the South/Central Arizona Investigations Program; and

2.5 WHEREAS, Reclamation seeks a minimum 50 percent match-of-study costs by the Cooperating Partners through direct funding or in-kind services; and

2.6 WHEREAS, the Cooperating Partners seek to support and participate in said investigation by providing direct funding and/or in-kind services,

2.7 WHEREAS, a "Project Management Team" (PMT), as described herein, will be formed to provide direction in the development of said Study.

NOW, THEREFORE, in consideration of the mutual covenants herein contained, Parties hereto agree as follows:

3. SERVICES TO BE PERFORMED

3.1 To the extent that funds are advanced or in-kind services are provided by or through the Cooperating Partners, and that Federal funds are appropriated for this purpose, Reclamation and the Cooperating Partners shall, with their staff or by contract, use said funds and in-kind services to complete the work program reflected in Attachment A (the Plan of Study) as set forth in this agreement, and as directed by the PMT herein described.

3.2 Upon completion, Reclamation shall transmit to the Cooperating Partners its report as scheduled in Attachment A.

4. TERM OF AGREEMENT

4.1 This agreement shall become effective upon the date of the last signature of this document and shall remain in effect until the completion of the Study, unless otherwise terminated pursuant to Article 14 herein. The Parties hereto anticipate that the Study will be completed by September 30, 2005.

5. COORDINATION AND PROGRESS REPORTS

5.1 Reclamation shall submit to the Cooperating Partners on a semi-annual basis, a report of actual expenditures on Study work. A separate account shall be maintained by Reclamation for all the work performed on the project Study, with costs identifiable by Study task. This account and related records shall be available for inspection, audit, and reproduction by the Cooperating Partners without charge during normal business hours. During the progress of the work, all operations of either Reclamation or the Cooperating Partners, pertaining to this Study, shall be open to inspection by authorized representatives of the Cooperating Partners or Reclamation, and if work is not being done in a mutually satisfactory manner, any Party may terminate this agreement as specified in Article 14.

6. STUDY MANAGER

6.1. The Parties hereby agree that Reclamation will provide a Study Manager to perform and carry out the duties and responsibilities required of the Study Manager under this agreement.

SAME AS ATTACHMENT A

Reclamation's Study Manager will pursue the work diligently, with an objective of meeting the schedule as found in the Plan of Study. The Study Manager supports the Chairman of the PMT as described in Article 7.

6.2. Subject only to the express limitations of this agreement, the Study Manager is authorized to incur costs, liabilities, and obligations up to the amounts approved and funded by the Parties to this agreement and to perform or arrange for the performance of Study investigations.

6.3 The Study Manager will organize and coordinate a multi-disciplinary team to conduct the Study activities as described in Attachment A.

7. PROJECT MANAGEMENT TEAM

7.1 As a means of guiding the performance of the Study Manager, securing effective cooperation and interchange of information, and providing consultation on a prompt and orderly basis among the Parties on various administrative and technical matters which may arise from time to time in connection with the Agreement, a Project Management Team or PMT is hereby established consisting of a representative from each of the Cooperating Partners and a representative from Reclamation. Other entities may be added to the PMT with approval of representatives from both Reclamation and each of the Cooperating Partners. The PMT will oversee the formulation of the project alternatives, level of detail of the Study, general format of documentation for the Study, and conformance with the Study goals, budget, and schedule.

The PMT shall act in accordance with the following provisions, as well as other provisions, which it may from time to time implement as long as such provisions are consistent with the terms of this Agreement:

7.1.1 Each of the Cooperating Partners shall have one duly authorized representative on the PMT. The representative must be vested with authority to make requisite decisions within the scope of this Agreement. Each of the Cooperating Partners may have an alternate act as temporary representative on the PMT in the absence of the regular member. Such alternate shall have all the authority granted to the authorized representative.

7.1.2 The Parties may invite representatives from agencies to attend PMT meetings to facilitate constructive input and exchange of information. Such invited representatives shall not, however, participate in the PMT decision-making process.

7.1.3 The Chairman of the PMT shall be Reclamation's representative. The Chairman shall be responsible for calling and presiding over meetings of the PMT. The Chairman shall promptly call a meeting of the PMT at the request of any member, but shall provide reasonable advance notice of the time and place of the meeting. The Chairman, with the assistance of the Study Manager shall prepare written notes of all meetings and distribute them to each PMT

representative within a reasonable time after each meeting. The Study Manager acts as the "executive secretary" for the PMT as well as the link with the technical disciplines.

7.1.4 Every reasonable attempt will be made to obtain consensus among all representative on issues that come before the PMT. However, in the event that consensus is not achieved, the Chairman shall consider the positions of each of the representatives in deciding an appropriate course of action.

7.1.5 Any decision may be made by the PMT in an assembled meeting or, upon consent of all PMT members, after the representatives have had an opportunity to consult with one another, by telephone/faxogram, telegraph, telex, letter, or by any combination thereof.

7.2 The PMT shall have the following duties and responsibilities, as well as other duties which it may from time to time agree to undertake, as long as such duties are consistent with the terms of this Agreement:

7.2.1 Monitor the progress of development and completion of the Study activities.

7.2.2 Review, discuss, and attempt to resolve any disputes among the Cooperating Partners arising under the Agreement.

7.2.3 Provide direction to the Study Manager as needed.

7.2.4 Review, and provide direction to the Study Manager, regarding changes to the schedule and scope of work.

7.2.5 Review and comment on drafts of documents developed as part of the Study. The Study Manager shall consider incorporating, as directed by the PMT, all comments in preparing the final documents. Drafts of documents shall be released to the public only after review by the PMT or as required by law.

8. STUDY FUNDING

8.1 Non-Federal funds provided to Reclamation, through direct funding or in-kind services by or through the Cooperating Partners will be a minimum of 50 percent of the actual costs of the work performed under this Agreement as provided in Articles 9. and 10. Reclamation will fund the balance of the study costs, except as discussed in Article 8.2.

8.2. Reclamation funding is subject to annual appropriation by the Congress of the United States, as described in Article 13. If funds available to Reclamation are interrupted, or if the Cooperating Partners wish to accelerate the pace of the Study where feasible, the Cooperating Partners may advance additional funds for Study purposes. Such additional funds may, at the

option of the Cooperating Partners, be counted as an increase in the Cooperating Partners' share of project costs.

8.3 The total estimated cost of the Study is approximately $600,000.00. Except for any changes described in Articles 11.1 and 11.2, the total payments and in-kind services by the Cooperating Partners under this agreement are not anticipated to exceed $300,000.00.

8.3.1 The total payments and in-kind services provided by Payson shall total 25% of the cost of the study, or approximately $150,000.00, which shall be paid or performed in accordance with the following schedule: No less than 8.33% of the total cost of the study, or $50,000.00, whichever is less, on or before September 30, 2003; no less than 8.33% of the total cost of the study or $50,000.00, whichever is less, on or before September 30, 2004; and the balance on or before September 30, 2005.

8.3.2 The total payments and in-kind services provided by the County shall total 25% of the cost of the study, or approximately $150,000.00, which shall be paid or performed in accordance with the following schedule: No less than 6.67% of the total cost of the study, or $40,000, whichever is less, on or before September 30, 2003; no less than 8.33% of the total cost of the study, or $50,000, whichever is less, on or before September 30, 2004; and the balance on or before September 30, 2005.

9. IN-KIND SERVICES

9.1 In-kind services provided by the Cooperating Partners will be comprised of tasks that would be otherwise performed by Reclamation in completing the Study. Allowability of these costs will be determined in accordance with the Office of Management and Budget (OMB) Circular A-87, revised August 29, 1997, "Cost Principles for State and Local Governments". Allowability of costs for in-kind services provided by others on behalf of Cooperating Partners will be determined by either OMB Circular A-21, "Cost Principles for Educational Institutions", revised August 8, 2000, OMB Circular A-87, "Cost Principles for State and Local Governments" revised August 29, 1997, or OMB Circular A-122, "Cost Principles for Non-Profit Organizations, " revised June 1, 1998, as appropriate.

Copies of OMB Circulars are available on the Internet at "http://www.whitehouse.gov/omb/grants/grants_circulars.html".

9.2 The value, as provided in Attachment A, of in-kind services provided by the Cooperating Partners, or others on behalf of the Cooperating Partners, shall be credited toward the Cooperating Partners' share of the Study costs, as documentation is received that said in-kind services have been accomplished. Such documentation is required on at least a semi-annual basis. The value of those services will generally be compared to what it would have cost Reclamation to provide the same service and be in accordance with the OMB cost principles.

9.3 Credit given for in-kind services performed prior to the date of enactment of this agreement will be limited to 1) those costs incurred after January 1, 2002 for preparation of the scope of this study and the resulting cost-share agreement or 2) those costs incurred after January 1, 2001 which focus on the availability of additional water supplies in the study area.

9.4 In-kind services not specifically detailed in Attachment A will be credited only if said service is approved in advance by Reclamation.

9.5 Source records supporting in-kind service credit will be retained for 3 years following completion of the Study.

10. ADVANCEMENT/REIMBURSEMENT OF FUNDS After the Study has begun, if projections of study expenses indicate that the combined available funds of the Parties will be exceeded, the Parties will be notified. Should the Cooperating Partners and Reclamation be unable to arrange for appropriate funding or in-kind services, the Study activities will be suspended until funding is available or other options are proposed which are acceptable to the Parties of this agreement.

11. CHANGES AND DISPUTES

11.1 It is recognized that the schedule of activities and costs of conducting this Study are estimates based on perceived requirements prior to initiation, and that changes are likely to occur. It is also anticipated that the plan of study (Attachment A) will be revised from time to time as changes occur in the Study. If and when the Cooperating Partners and Reclamation agree that a change in the activities or costs described in the plan of study is necessary and feasible, the plan of study may be modified in writing to reflect the change by having both parties sign as to the agreed upon changes.

11.2 Should disputes arise over the provisions of, or performance under this agreement, representatives of the Cooperating Partners and Reclamation will attempt to resolve the situation. Should the situation be unresolvable, termination of this agreement would follow procedures as described under Article 14.2.

12. LIABILITY

12.1 Reclamation shall perform its obligations under this Agreement in the capacity of a Federal agency. It is neither a co-venturer, agent, employee, nor representative of the Cooperating Partners. The Cooperating Partners assume no liability for claims or actions arising solely out of the performance of such work by Reclamation's employees or agents.

12.2 Liability of the United States resulting from the negligence of its employees shall be governed by the Federal Tort Claims Act (28 U.S.C. 2671, et seq.). The Cooperating Partners

recognizes that the Federal Tort Claims Act operates to provide liability coverage for the United States Government and its employees in lieu of ordinary insurance coverage.

12.3 Each Party to this Agreement shall be severally liable for loss, damage, or other expense caused by that Party's intentional or wrongful action, neglect, omission, or default in connection with this Agreement. No Party shall be liable for any loss, damage, or other expense caused by another Party's intentional or wrongful action, neglect, omission, or default in connection with this Agreement.

13. CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS The expenditure or advance of any money or the performance of any obligation by Reclamation under this agreement shall be contingent upon appropriation or allotment of funds by Congress. Absence of appropriation or allotment of funds shall relieve the Cooperating Partners from any obligation under this agreement. No liability shall accrue to Reclamation in case funds are not appropriated.

14. TERMINATION

14.1 Any of the Cooperating Partners or Reclamation may terminate work under this agreement by giving 90 days written notice of termination to the other Parties.

14.2 In the event of termination, Reclamation will prepare and make available to the Cooperating Partners and others interested Federal and State agencies a concluding report summarizing the Study accomplishments at the time of termination.

15. AVAILABILITY OF INFORMATION

15.1 All information and data obtained or developed by Reclamation, in connection with the Study (exclusive of intra-governmental communications) shall be available upon request, except where prohibited by law, to the Cooperating Partners without further charge. However, use of said reports, data, and information shall appropriately reference Reclamation as the source.

15.2 All information and data obtained or developed by the Cooperating Partners, in connection with the Study shall be available upon request, except where prohibited by law, to Reclamation without further charge. However, use of said reports, data, and information shall appropriately reference the appropriate Cooperating Partners as the source. Excluded from this paragraph and not required to be disclosed are internal communications.

15.3 Data compiled and results of studies performed under this agreement will become public domain upon the completion of the investigation and study report, or upon completion of a concluding report under the provisions of Article 14.2.

16. DELAYS

16.1 To the extent that performance of an obligation under this agreement is prevented or delayed by any cause which is beyond the reasonable control of either Party to this agreement, the non-performing Party shall not be deemed to be in default.

16.2 Should the non-performing Party be deemed to be in default, the Cooperating Partners and Reclamation will follow the procedures describe under Article 11.

17. JURISDICTION Federal and State laws govern this agreement. In case of conflict between Federal and State law, Federal law controls.

18. JUDICIAL REMEDIES NOT FORECLOSED Nothing herein shall be construed as: (a) depriving any Cooperating Partners from pursuing and prosecuting any remedy in any appropriate court of the United States or appropriate State which would otherwise be available to such Cooperating Partners, even though provisions herein may declare that determinations or decisions of Reclamation's authorized representative or other persons are conclusive, or (b) depriving any Cooperating Partners of any defense thereto which would otherwise be available.

19. NOTICES AND AUTHORIZED REPRESENTATIVES

19.1 Notice given pursuant to the provisions of this agreement, or which are necessary to carry out its provisions, must be in writing and delivered personally to whom the notice is to be given, or mailed, postage prepaid addressed to that authorized representative. The Parties' authorized representatives and their addresses for this purpose are as follows:

To Payson

Mr. Colin Walker
Town of Payson
303 North Beeline Highway
Payson, Arizona 85541

To Gila County

Supervisor Ron Christensen
Gila County
PO Box 2297
Payson, AZ 85547

To Reclamation

Ms. Leslie Meyers
Bureau of Reclamation
PO Box 81169
Phoenix, Arizona 85069-1169

19.2 Any Party may change its authorized representative in the future by letter to the other Party signed by the agency's responsible authority.

20. INTEGRATIONS No representations or promises are binding on Reclamation or the Cooperating Partners, except those representations and promises contained in this agreement or in some future written representations or promises signed by both Parties.

21. OFFICIALS NOT TO BENEFIT No member of or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit arising from it. However, this clause does not apply to this agreement to the extent that this agreement is made with a corporation for the corporation's general benefit.

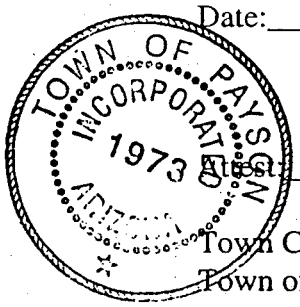
IN WITNESS WHEREOF, the Parties hereto have executed this agreement on the date and year written below.

Town of Payson

By: _____

Name: Kenneth P. Murphy
Title: Mayor
Town of Payson

Date: 6/23/03



Attest: _____

Town Clerk
Town of Payson

Date: 6/23/03

APPROVAL AS TO FORM

The Town of Payson Legal Department has reviewed this agreement and approved it as to form. When reviewing this agreement for form, the Legal Department considers whether the following situations have been addressed: 1) Identification of parties; 2) offer and acceptance; 3) existence of consideration (we do not review to determine if consideration is adequate); and 4) that certain provisions specifically required by statute are included are included (i.e., provisions concerning non-availaibility of funds and conflict of interest, A.R.S. § 38-511). We have not reviewed the agreement for other issues. Therefore, approval as to form should not be considered as approval of the appropriateness of the terms or conditions of the agreement or the underlying transaction. In addition, approval as to form should not be considered approval of the underlying policy considerations addressed by the agreement.

Dated 6/23, 2003.

By _____
Samuel I. Streichman, Town Attorney

Gila County

By: _____

Name: Ronald Christensen
Title: Chairman, Gila County Board of Supervisors
Gila County, Arizona

Date: 6-23-03

By: _____

Name: Jose M. Sanchez
Title: Vice-Chairman, Gila County Board of Supervisors
Gila County, Arizona

Date: 6-24-03

By: _____

Name: Cruz Salas
Title: Member, Gila County Board of Supervisors
Gila County, Arizona

Date: 6-24-03

Attest: _____

Name. John F. Nelson
Clerk of the Board of Supervisors
Gila County

Approved as to format:

_____
County Attorney

Bureau of Reclamation
United States Department of the Interior

By: _____
Carol Lynn Erwin
Area Manager
Phoenix Area Office

Date: 5/29/03

LESLIE MEYERS
STUDY MANAGER
(602) 216-3835
FAX (602) 216-4007
LMEYERS@LC.USBR.GOV

BOURASSA

REBUTTAL EXHIBIT 5

COMPANY NAME Pine Water Co., Inc. YEAR ENDING 12/31/99

COMPARATIVE STATEMENT OF INCOME AND EXPENSES

Acct. No.	OPERATING REVENUES	Prior Year	Current Year
461	Metered Water Sales*	$ 35628	$ 529,718
460	Unmetered Water Sales*		
46x	Water Sales to Other Customers		
47x	Other Operating Revenues	155	4909
	Total Operating Revenues	$ 35,783	$ 534,627

Acct. No.	OPERATING EXPENSES	Prior Year	Current Year
601	Salaries & Wages	$ 6,809	$ 79,856
610	Purchased Water	4,497	35,311
615	Purchased Pumping Power	3,012	31,371
618	Water Testing	90	14,090
619	Water Treatment		562
620	Repairs & Maintenance		
621	Office Supplies & Expense		
630	Outside Services	8,860	56,798
631	Rate Case Expense		
640	Rents		1,324
650	Transportation Expense		
655	General Insurance		
658	Health & Life Insurance		
675	Miscellaneous Operating Expense	10,808	122,928
680	Taxes Other than Property & Income	2,245	31,128
681	Property Tax	1,592	35,016
403	Depreciation / AMORTIZATION	(15,389)	36,268
409	Income Tax		
	Total Operating Expense	$ 22,524	$ 444,652
	OPERATING INCOME (LOSS)*	$ 13,259	$ 89,975

Acct. No.	OTHER INCOME/EXPENSE	Prior Year	Current Year
419	Interest Income	$	$
421	Other Income	862	267
426	Other Expense	390	48
427	Interest Expense	9,469	113,742
	TOTAL OTHER INCOME/EXPENSE*	$ (8,997)	$ (113,523)
	NET INCOME (LOSS)*	$ 4,262	$ (23,548)

ACC 2001

COMPANY NAME: PINE WATER COMPANY, INC

COMPARATIVE STATEMENT OF INCOME AND EXPENSE

Acct. No.	OPERATING REVENUES	PRIOR YEAR	CURRENT YEAR
461	Metered Water Revenue	$ 593,529	$ 675,199
460	Unmetered Water Revenue		
474	Other Water Revenues	8,164	10,034
	TOTAL REVENUES	**$ 601,693**	**$ 685,233**
	OPERATING EXPENSES		
601	Salaries and Wages	$ 109,630	$ 109,808
610	Purchased Water	- 39,183	107,942
615	Purchased Power	35,513	28,399
618	Chemicals	3,571	
620	Repairs & Maintenance	11,261	
621	Office Supplies and Expense		
630	Outside Services	153,343	129,077
635	Water Testing	1,325	8,987
641	Rents	7,025	583
650	Transportation Expenses		267,780
657	Insurance - General Liability		
659	Insurance - Health and Life	8,113	8,117
666	Regulatory Commission Expense - Rate Case		
675	Miscellaneous Expense	124,658	71,734
403	Depreciation Expense	52,440	46,112
408	Taxes Other Than Income	34,676	40,895
408.11	Property Taxes	42,282	43,592
409	Income Tax		
	TOTAL OPERATING EXPENSES	**$ 623,020**	**$ 863,026**
	OTHER INCOME/EXPENSE		
419	Interest and Dividend Income	$ -	$ -
421	Non-Utility Income	494,709	23
426	Miscellaneous Non-Utility Expenses		
427	Interest Expense	(7,128)	(8,925)
	TOTAL OTHER INCOME/EXPENSE	**$ 487,581**	**$ (8,902)**
	NET INCOME/(LOSS)	**$ 466,254**	**$ (186,695)**

BOURASSA

REBUTTAL EXHIBIT 6

Private Client Group

Merrill Lynch Business
Financial Services Inc.
2555 E. Camelback Road
Suite 900
Phoenix, AZ 85016
(602)954-5019
FAX (602)954-5815

Merrill Lynch

Kevin Lewis
Vice President
Regional Finance Manager

September 10, 2003

Mr. Thomas Bourassa, CPA
139 W. Wood Drive
Phoenix, Arizona 85029

Re: **CREDIT FACILITIES PROPOSAL**

Dear Mr. Bourassa,

Merrill Lynch uses a number of items to evaluate the pricing it provides clients on a deal by deal basis. These include profitability & cash flow trends, leverage, collateral, and industry risk. We typically like to see companies that have a positive cash flow over the last three years with a debt service coverage of 1.25:1, a debt to equity of 3:1 or better and fully collateralized. As noted we also assess industry risk in our model which is somewhat subjective based on the particular industry.

High risk companies which do not meet any of these would be assigned a higher risk using the FDIC's scale of 1 – 10. A "1" rating would be the least risk. Typically 7 – 10 would constitute high risk. Correspondingly, a high risk company would be assessed larger spread over the benchmark cost of funds when determining a fixed rate. Currently, I would price a fixed rate of 8.29% - 9.29% for a high risk deal usig a straight five year fully amortizing note. This pricing is based off of the five year treasury with a maturity in 8/08 and yield of 3.29%.

If you have any questions, please do not hesitate to call.

Very truly yours,

MERRILL LYNCH BUSINESS FINANCIAL SERVICES INC.

By: _____
Kevin Lewis
Vice President

BOURASSA

REBUTTAL EXHIBIT 7

STATE OF ARIZONA CORPORATION COMMISSION
CORPORATION ANNUAL REPORT & CERTIFICATE OF DISCLOSURE

AZ Corp. Commission
00672564

DUE ON OR BEFORE 04/15/2003 FY02-03 FILING FEE $10.00

The following information is required by A.R.S. §§10-1622 & 10-11622 for all corporations organized pursuant to Arizona Revised Statutes, Title 10. The Commission's authority to prescribe this form is A.R.S. §§10-121.A. & 10-3121.A. YOUR REPORT MUST BE SUBMITTED ON THIS ORIGINAL FORM. State changes or corrections where necessary. Information for the report should reflect the current status of the corporation. See instructions for proper format. REFER TO THE INSTRUCTIONS ON PAGE 4.

1. -0102411-7
COMMUNITY WATER COMPANY OF GREEN VALLEY
PO BOX 1078
GREEN VALLEY, AZ 85622-1078

RECEIVED
MAR 20 2003
ARIZONA CORP. COMMISSION
CORPORATIONS DIVISION

Business Phone: _____ (Business phone is optional)
State of Domicile: ARIZONA Type of Corporation: NON-PROFIT

2. Statutory Agent: WILLIAM D BAKER
Mailing Address: 7310 N 16TH STREET #320
City, State, Zip: PHOENIX, AZ 85020

Physical Address, If Different.
Physical Address:
City, State, Zip:

ACC USE ONLY
Fee $ 10
Penalty $
Reinstate $
Expedite $
Reinstatement $

MR 3-24-03

Use this box only if appointing a new Statutory Agent

If appointing a new statutory agent, the new agent MUST consent to their appointment by signing below.

I, (individual or We, (corporation or limited liability company) having been designated the new Statutory Agent, do hereby consent to the appointment until my removal or resignation pursuant to law.

Signature of new Statutory Agent

56/252

3. Secondary Address:
(Foreign Corporations are REQUIRED to complete this section.)

4. Check the one category below which best describes the CHARACTER OF BUSINESS of your corporation.

BUSINESS CORPORATIONS

__ 1. Accounting
__ 2. Advertising
__ 3. Aerospace
__ 4. Agriculture
__ 5. Architecture
__ 6. Banking/Finance
__ 7. Barbers/Cosmetology
__ 8. Construction
__ 9. Contractor
__ 10. Credit/Collection
__ 11. Education
__ 12. Engineering
__ 13. Entertainment
__ 14. General Consulting
__ 15. Health Care
__ 16. Hotel/Motel
__ 17. Import/Export
__ 18. Insurance
__ 19. Legal Services
__ 20. Manufacturing
__ 21. Mining
__ 22. News Media
__ 23. Pharmaceutical
__ 24. Publishing/Printing
__ 25. Ranching/Livestock
__ 26. Real Estate
__ 27. Restaurant/Bar
__ 28. Retail Sales
__ 29. Science/Research
__ 30. Sports/Sporting Events
__ 31. Technology/Computer
__ 32. Technology/General
__ 33. Television/Radio
__ 34. Tourism/Convention Services
__ 35. Transportation
__ 36. Utilities
__ 37. Veterinary Medicine/Animal Care
__ 38. Other _____

NON-PROFIT CORPORATIONS

1. __ Charitable
2. __ Benevolent
3. __ Educational
4. __ Civic
5. __ Political
6. __ Religious
7. __ Social
8. __ Literary
9. __ Cultural
10. __ Athletic
11. __ Science/Research
12. __ Hospital/Health Care
13. __ Agricultural
14. __ Animal Husbandry
15. __ Homeowner's Association
16. __ Professional, commercial, industrial or trade association
17. X Other WATER UTILITY

5. CAPITALIZATION: (Business Corporations and Business Trusts are REQUIRED to complete this section.) Business trusts must indicate the number of transferable certificates held by trustees evidencing their beneficial interest in the trust estate. Please examine the corporation's original Articles of Incorporation for the amount of shares authorized. Review all corporation amendments to determine if the original number of shares has changed. Examine the corporation's minutes for the number of shares issued. Please Print or Type Clearly.

Number of Shares/Certificates Authorized	Class	Series Within Class (if any)
None		

Number of Shares/Certificates Issued	Class	Series Within Class (if any)
None		

6. SHAREHOLDERS: (Business Corporations and Business Trusts are REQUIRED to complete this section.) List shareholders holding more than 20% of any class of shares issued by the corporation, or having more than a 20%

beneficial interest in the corporation. **Please Type or Print Clearly.**

Name: _____ Name: _____

NONE ☑

Name: _____ Name: _____

7. OFFICERS **Please Type or Print Clearly. You Must List at Least One.**

Name: Raymond L Smith
Title: Chairman
Address: 545 Paseo Potrerro
Green Valley, AZ 85614
Date taking office: 4/28/98

Name: Robert W Liddell
Title: Secretary
Address: 20 Calle Lecho
Green Valley, AZ 85614
Date taking office: 6/28/99

Name: John R (Dick) McCandless
Title: Treasurer
Address: 917 W Camino Guarina
Green Valley, AZ 85614
Date taking office: 02/26/03

Name:
Title:
Address:
Date taking office:

8. DIRECTORS **Please Type or Print Clearly. You Must List at Least One.**

Name: George H Fielder
Address: 911 Camino Guarina
Green Valley, AZ 85614
Date taking office: 4/24/95

Name: Roy H Erickson
Address: 913 W Camino Guarina
Green Valley, AZ 85614
Date taking office: 12/18/95

Name: Roger L Roggee
Address: 651 N Avenida Ciprea
Green Valley, AZ 85614
Date taking office: 11/23/98

Name: Grant E McMartin
Address: 963 S Vuelta de Transicion
Green Valley, AZ 85614
Date taking office: 2/28/00

0102411-7

Balance Sheets

Assets

	2002	2001
Utility plant:		
Plant in service, at cost	$16,059,274	$14,974,931
Construction work-in-progress	598,553	427,704
	16,657,827	15,402,635
Less accumulated depreciation	5,433,096	5,114,108
Total utility plant	11,224,731	10,288,527
Current assets:		
Cash and cash equivalents	669,270	1,209,915
Securities available-for-sale, at market	119,847	416,375
Accounts receivable, less allowance for doubtful accounts of $3,200 in 2002 and 2001	179,397	169,592
Materials and supplies	38,166	50,774
Prepayments and special deposit	19,389	19,197

Total current assets	1,025,179	1,865,853
Deferred charges:		
Central Arizona Project Capital Charges	336,256	278,765
Other	64,184	67,602
Total deferred charges	400,440	346,367
	$12,650,350	$12,500,747

0102411-7

As of December 31, 2002 and 2001

Membership Interest and Liabilities

	2002	2001
Membership interest:		
Memberships and contributions	$ 48,010	$ 48,010
Accumulated surplus	7,127,766	6,859,149
Accumulated other comprehensive income	14,436	6,939
Total membership interest	7,190,212	6,914,098
Current liabilities:		
Accounts payable	98,920	347,528
Accrued taxes	67,917	85,502
Other liabilities	71,502	69,878
Total current liabilities	238,339	502,908
Deferred credits:		
Refundable advances for construction	4,019,985	3,901,510
Other	101,948	90,805
Total deferred credits	4,121,933	3,992,315
Contributions in-aid-of construction, net	1,099,866	1,091,426
	$12,650,350	$12,500,747

Pine Water Company
Test Year Ended December 31, 2002
Computation of Increase in Gross Revenue
Requirements As Adjusted

Exhibit
Rebuttal Schedule A-1
Page
Witness: Bourassa

Line No.		
1	Fair Value Rate base	$ 665,509
2		
3	Adjusted Operating Income	(132,139)
4		
5	Current Rate of Return	-19.86%
6		
7	Required Operating Income	$ 73,164
8		
9	Required Rate of Return on Fair Value Rate Base	10.99%
10		
11	Operating Income Deficiency	$ 205,303
12		
13	Gross Revenue Conversion Factor	1.2985
14		
15	Increase in Gross Revenue	
16	Requirement	$ 266,589
17		

18		Present	Proposed	Dollar	Percent
19	Customer	Rates	Rates	Increase	Increase
20	Classification				
21	5/8 Inch Meter - Residential	$626,494	$878,138	$ 251,644	40.17%
22	3/4 Inch Meter - Residential	468	833	365	77.91%
23	1 Inch Meter - Residential	4,441	8,263	3,822	86.07%
24	2 Inch Meter - Residential	194	523	329	169.69%
25	5/8 Inch Meter - Commercial	2,003	3,725	1,722	85.98%
26	1 Inch Meter - Commercial	2,647	4,509	1,862	70.32%
27	2 Inch Meter - Commercial	5,977	11,368	5,390	90.18%
28					
29	Revenues from Annualization	3,539	4,434	895	25.30%
30				-	0.00%
31				-	0.00%
32	Miscellaneous Revenues	8,436	8,436	-	0.00%
33				-	0.00%
34	Total of Water Revenues	$654,199	$920,228	$ 266,029	40.66%
35					
36					
37					
38	SUPPORTING SCHEDULES:				
39	Rebuttal B-1				
40	Rebuttal C-1				
41	Rebuttal C-3				
42	Rebuttal H-1				
43					
44					

Pine Water Company
Test Year Ended December 31, 2002
Summary of Fair Value Rate Base

Exhibit
Rebuttal Schedule B-1
Page 1
Witness: Bourassa

Line No.		Original Cost Rate base
1		
2	Gross Utility Plant in Service	$ 1,952,732
3	Less: Accumulated Depreciation	1,228,209
4		
5	Net Utility Plant in Service	$ 724,523
6		
7	Less:	
8	Advances in Aid of	
9	Construction	52,072
10	Contributions in Aid of	
11	Construction - Net of amortization	463,392
12	Customer Meter Deposits	21,356
13	Deferred Income Taxes & Credits	-
14	Investment tax Credits	-
15	Plus:	
16	Unamortized Finance	
17	Charges	-
18	Deferred Tax Assets	369,000
19	Allowance for Working Capital	108,806
20	Citizens Acquisition Adjustment	-
21		
22	Total Rate Base	$ 665,509
23		
24		
25		
26	SUPPORTING SCHEDULES:	
27	Rebuttal B-2	
28		
29		
30		
31		

RECAP SCHEDULES:
Rebuttal A-1

Pine Water Company
Test Year Ended December 31, 2002
Original Cost Rate Base Proforma Adjustments

Exhibit
Rebuttal Schedule B-2
Page 1
Witness: Bourassa

Line No.		Direct Adjusted End of Test Year	Proforma Adjustment Label	Proforma Adjustment Amount	Rebuttal Adjusted End of Test Year
1	Gross Utility				
2	Plant in Service	$ 1,967,029	(1)	(14,297)	$ 1,952,732
3					
4	**Less:**				
5					
6	Accumulated				
7	Depreciation	1,228,209			1,228,209
8					
9	Net Utility Plant				
10	in Service	$ 738,820			$ 724,523
11					
12	**Less:**				
13	Advances in Aid of				
14	Construction	$ 52,072			$ 52,072
15	Contributions in Aid of				
16	Construction - Net	463,392			463,392
17					
18	Customer Meter Deposits	21,356			21,356
19	Deferred Income Taxes	-			-
20	Investment Tax Credits	-			-
21	**Plus:**				
22					
23	Deferred Tax Assets	369,000			369,000
24					
25	Working capital	109,032	(2)	(225)	108,806
26					
27					
28	Total	$ 680,032			$ 665,509
29					
30					
31	ADJUSTMENTS:				
32	(1) Adjust proforma plant to actual YTD expenditures				
33	(2) Change in working capital allowance.				
34					
35					
36					
37					
38					
39					
40	SUPPORTING SCHEDULES:				RECAP SCHEDULES:
41					Rebuttal B-1
42					

Pine Water Company
Test Year Ended December 31, 2002
Computation of Working Capital

Exhibit
Rebuttal Schedule B-5
Page 1
Witness: Bourassa

Line No.			
1	Cash Working Capital (1/8 of Allowance		
2	Operation and Maintenance Expense)	$	89,156
3	Pumping Power (1/24 of Pumping Power)		1,539
4	Material and Supplies Inventories		-
5	Prepayments		18,111
6			
7			
8	Total Working Capital Allowance	$	108,806
9			
10			
11	Working Capital Requested	$	108,806
12			
13			
14	SUPPORTING SCHEDULES:	RECAP SCHEDULES:	
15	Rebuttal C-1	Rebuttal B-1	
16			

Pine Water Company
Test Year Ended December 31, 2002
Income Statement

Exhibit
Rebuttal Schedule C-1
Page 1
Witness: Bourassa

Line No.		Direct Adjusted Test Year	Label	Adjustment	Rebuttal Test Year Adjusted Results	Proposed Rate Increase	Rebuttal Adjusted with Rate Increase
1	**Revenues**						
2	Metered Water Revenues	$ 645,612			$ 645,612	266,029	$ 911,640
3	Unmetered Water Revenues	-			-		-
4	Other Water Revenues	8,436			8,436		8,436
5		$ 654,048		$ -	$ 654,048	$ 266,029	$ 920,076
6	**Operating Expenses**						
7	Salaries and Wages	$ 125,296			$ 125,296		$ 125,296
8	Pension & Benefits	6,105			6,105		6,105
9	Purchased Water	64,262	(4a)(5a)(6)	(6,427)	57,835		57,835
10	Purchased Power	36,942			36,942		36,942
11	Chemicals	604			604		604
12	Materials & Supplies	42,923	(5b)	807	43,730		43,730
13	Regulatory Water Testing	7,758			7,758		7,758
14	Contractual Services - Engineering	-			-		-
15	Contractual Services - Accounting	38,328			38,328		38,328
16	Contractual Services - Legal	66,430			66,430		66,430
17	Contractual Services - Other	19,368	(4b)	3,437	22,805		22,805
18	Overhead Allocation - G&A	71,092			71,092		71,092
19	Rental of Equipment	-			-		-
20	Transportation Expenses	176,144			176,144		176,144
21	Worker's Comp	2,271			2,271		2,271
22	Insurances Medical/Dental	12,663			12,663		12,663
23	Telephone	2,631			2,631		2,631
24	Dues & Subscriptions	299			299		299
25	Bad Debt Expense	2,153			2,153		2,153
26	Misc Expenses	202			202		202
27	Office Supplies	4,080			4,080		4,080
28	Licenses & Permits	1,000			1,000		1,000
29	Repairs & Maintenance - Bldg	-			-		-
30	R&M Vehicles	-			-		-
31	Sales Tax Expense	(380)	(1)	380	0		0
32	Utiltiy Reg. Assess. Fee	272			272		272
33	CAWCD Costs	21,501			21,501		21,501
34	Rate Case Expense	50,000			50,000		50,000
34	Depreciation Expense	35,496	(2)	80	35,576		35,576
35	Other Taxes and Licenses	45			45		45
36	Property Taxes	45,239	(3)	459	45,698		45,698
37	Income Tax	(45,951)	(8)	676	(45,274)	61,157	15,883
38					-		-
39	**Total Operating Expenses**	$ 786,774		$ (588)	$ 786,186	$ 61,157	$ 847,344
40	**Operating Income**	$ (132,727)		$ 588	$ (132,139)	$ 204,871	$ 72,733
41	**Other Income (Expense)**						
42	Interest Income	-			-		-
43	Other income	-			-		-
44	Income Tax Provision	-			-		
45	Interest Expense	(20,824)	(7)	1,298	(19,526)		(19,526)
46	Other Expense	-			-		-
47	Gain/Loss Sale of Fixed Assets	-			-		-
48	**Total Other Income (Expense)**	$ (20,824)		$ 1,298	$ (19,526)	$ -	$ (19,526)
49	**Net Profit (Loss)**	$ (153,551)		$ 1,886	$ (151,665)	$ 204,871	$ 53,206
50							
51	SUPPORTING SCHEDULES:					RECAP SCHEDULES:	
52	Rebuttal C-2					Rebuttal A-1	
53							
54							

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses

Exhibit
Rebuttal Schedule C-2
Page 1
Witness: Bourassa

Adjustments to Revenues and Expenses

Line No.		1 Remove Sales Tax Expen	2 Depreciation Expense	3 Property Taxes	4 Reclassify Purchased Water Expense	5 eclassify Purchase Water Expense	6 eclassify Purchased Water Expense	Subtotal
1								
2								
3	Revenues							-
4								
5	Expenses	380	80	459	-	-	(2,183)	(1,264)
6								
7	Operating							
8	Income	(380)	(80)	(459)	-	-	2,183	1,264
9								
10	Interest							
11	Expense							-
12	Other							
13	Income /							
14	Expense							
15								
16	Net Income	(380)	(80)	(459)	-	-	2,183	1,264
17								
18								

Adjustments to Revenues and Expenses

19								
20		7	8	9	10	11	12	Subtotal
21		Interest	Income	Intentionally	Intentionally	Intentionally	Intentionally	
22		Expense	Taxes	Left Blank	Left Blank	Left Blank	Left Blank	
23	Revenues						-	-
24								
25	Expenses		676		-	-		(588)
26								
27	Operating							
28	Income	-	(676)	-	-	-	-	588
29								
30	Interest							
31	Expense	1,298		-				1,298
32	Other							
33	Income /		-					-
34	Expense							
35								
36	Net Income	1,298	(676)	-	-	-	-	1,886
37								
38								

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 1

Exhibit
Rebuttal Schedule C-2
Page 2
Witness: Bourassa

Line No.		
1	Remove Negative Sales Taxes Recorded in Revenues	
2		
3		
4	Direct Sales Tax Amount	(380)
5	Rebuttal Test Year Sales Tax Amount	-
6		
7	Total Adjustments	$ (380)
8		
9	Adjustment to Revenues and/or Expenses	$ 380
10		
11		
12		
13		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 2

Exhibit
Rebuttal Schedule C-2
Page 3
Witness: Bourassa

Line No.

1 Depreciation Expense

Account No.	Description	Original Cost	Rate	Depreciation Expense
301	Organization	$ -	0.00%	$ -
302	Franchises	-	0.00%	-
303	Land and Land Rights	16,930	0.00%	-
304	Structures and Improvements	160,067	3.33%	5,330
305	Collecting and Impounding Rese	-	2.50%	-
306	Lake, River and Other Intakes	-	2.50%	-
307	Wells and Springs	65,994	3.33%	2,198
308	Infiltration Galleries and Tun	-	6.67%	-
309	Supply Mains	479	2.00%	10
310	Power Generation Equipment	-	5.00%	-
311	Pumping Equipment	131,293	12.50%	16,412
320	Water Treatment Equipment	5,320	3.33%	177
330	Distribution Reservoirs and St	247,073	2.22%	5,485
331	Transmission and Distribution	990,291	2.00%	19,806
333	Services	80,461	3.33%	2,679
334	Meters and Meter Installations	193,687	8.33%	16,134
335	Hydrants	-	2.00%	-
336	Backflow Prevention Devices	-	6.67%	-
339	Other Plant and Miscellaneous	-	6.67%	-
340	Office Furniture and Equipment	-	6.67%	-
341	Transportation Equipment	-	20.00%	-
342	Stores Equipment	-	4.00%	-
343	Tools, Shop and Garage Equipment	-	5.00%	-
344	Laboratory Equipment	-	10.00%	-
345	Power Operated Equipment	-	5.00%	-
346	Communication Equipment	-	10.00%	-
347	Miscellaneous Equipment	-	10.00%	-
348	Other Tangible Plant	-	0.00%	-
	TOTALS	$ 1,891,594		$ 68,230

Proforma Plant (to be completed by 12/31/2003)	$ 61,138	3.6396%	2,225
Less: Amortization of Contributions	$ 958,323	3.6396%	(34,879)
Total Depreciation Expense			$ 35,576
Test Year Depreciation Expense			35,496
Increase (decrease) in Depreciation Expense			80
Adjustment to Revenues and/or Expenses			$ 80

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 3

Exhibit
Rebuttal Schedule C-2
Page 4
Witness: Bourassa

Line No.		
1	Property Taxes	
2		
3	Adjusted Revenues in year ended 12/31/02	$ 654,048
4	Adjusted Revenues in year ended 12/31/02	654,048
5	Proposed Revenues	920,076
6	Average of three year's of revenue	$742,724
7	Average of three year's of revenue, times 2	$1,485,448
8	Add:	
9	Construction Work in Progess at 10%	
10	Deduct:	
11	Book Value of Transportation Equipment	-
12		
13	Total Book Value of Transportation Equipment	$ -
14		
15	Full Cash Value	$ 1,485,448
16	Assessment Ratio	25%
17	Assessed Value	371,362
18	Property Tax Rate	12.31%
19		
20	Property Tax	45,698
21	Tax on Parcels	-
22		
23	Total Property Tax at Proposed Rates	$ 45,698
24	Property Taxes in the test year	45,239
25	Change in Property Taxes	$ 459
26		
27		
28	Adjustment to Revenues and/or Expenses	$ 459
29		
30		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 4

Exhibit
Rebuttal Schedule C-2
Page 5
Witness: Bourassa

Line No.		Label	
1	Transfer Amounts from Purchased Water to Contractal Services -Other (per Staff)		
2			
3	Decrease Purchased Water for Meter Reading Charges	4a	(3,437)
4	Increase Contractual Services - Other for Meter Reading Charges	4b	3,437
5			
6			
7			
8	Adjustment to Revenues and/or Expenses		$ -
9			
10			
11			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 5

Exhibit
Rebuttal Schedule C-2
Page 6
Witness: Bourassa

Line No.		Label	
1	Transfer Amounts from Purchased Water to Materials and Supplies (per Staff)		
2			
3	Decrease Purchased Water for Meter Reading Charges	5a	(807)
4	Increase Contractual Services - Other for Meter Reading Charges	5b	807
5			
6			
7			
8	Adjustment to Revenues and/or Expenses		$ -
9			
10			
11			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 6

Exhibit
Rebuttal Schedule C-2
Page 7
Witness: Bourassa

Line No.		
1	Remove Starlight Hauling Costs from Purchased Water (per Staff)	
2		
3	Decrease Purchased Water for Starlight Water Trucking Charges	(2,183)
4		
5		
6		
7		
8	Adjustment to Revenues and/or Expenses	$ (2,183)
9		
10		
11		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 7

Exhibit
Rebuttal Schedule C-2
Page 8
Witness: Bourassa

Line No.			
1	Projected 2003 Interest Expense		
2			
3	Projected 2003 Interest Expense	$	19,526
4			
5	Direct Adjusted Test year Interest Expense		20,824
6			
7	Increase (decrease) in Revenues/ Expenses	$	(1,298)
8			
9			
10			
11			
12	Adjustment to Revenue and/or Expense	$	1,298
13			
14	SUPPORTING SCHEDULES:		
15	Rebuttal C-2, Page 8a		
16			
17			
18			

Pine Water Company
Test Year Ended December 31, 2002
Computation of Gross Revenue Conversion Factor

Exhibit
Rebuttal Schedule C-3
Page 1
Witness: Bourassa

Line No.	Description	Percentage of Incremental Gross Revenues
1	Federal Income Taxes	16.02%
2		
3	State Income Taxes	6.97%
4		
5	Other Taxes and Expenses	0.00%
6		
7		
8	Total Tax Percentage	22.99%
9		
10	Operating Income % = 100% - Tax Percentage	77.01%
11		
12		
13		
14		
15	1 = Gross Revenue Conversion Factor	
16	Operating Income %	1.2985
17		
18	SUPPORTING SCHEDULES:	RECAP SCHEDULES:
19		Rebuttal A-1
20		

Pine Water Company
Test Year Ended December 31, 2002
Summary of Cost of Capital

Exhibit
Rebuttal Schedule D-1
Page 2
Witness: Bourassa

Line No.		Actual End of Test Year Dollar Amount	Label	Adjustment	Adjusted End of Test Year Dollar Amount
1					
2	Stockholder's Equity	(152,996)	(a)	369,599	216,604
3					
4	Totals	(152,996)			216,604
5					
6					
7	(a) Propose converting $369,599 of $533,599 inter-company payable to equity.				
8					
9	SUPPORTING SCHEDULES:				
10	E-1				
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					

Pine Water Company
Test Year Ended December 31, 2002
Cost of Long Term Debt

Exhibit
Rebuttal Schedule D-2
Page 1
Witness: Bourassa

Line No.	Description of Debt	Adjusted End of Test Year Amount Outstanding	Percent	Interest Rate	Composite Cost	End of Projected Year Amount Outstanding	Percent	Interest Rate	Composite Cost
1									
2	Long-Term Debt	55,353	25.23%	10.00%	2.52%	32,971	15.03%	10.00%	1.50%
3	Long-Term Debt (a)	164,000	74.77%	10.00%	7.48%	137,388	62.63%	8.00%	5.01%
4									
5									
6									
7									
8									
9									
10	Totals	219,353	100.00%		10.00%	170,359	77.66%		6.51%
11									
12	(a) Propose converting $164,000 of the $533,599 inter-company payable to long-term debt.								
13									
14									
15	Supporting Schdules:								
16									
17									
18									

Pine Water Company
Amortization Schedule

Exhibit
Rebuttal Schedule C2
Page 8a
Witness: Bourassa

Line No.			
1	Principal		$ 104,000.00
2	No. of Months		60
3	Annual Interest Rate		10.00%
4	Monthly Payment		$ 2,209.69
5			

6	Date	Pay No.	Principal	Interest	Payment	Balance
7	May-00	1	$ 1,343.03	$ 866.67	$2,209.69	$ 104,000.00
8	Jun-00	2	1,354.22	855.47	2,209.69	102,656.97
9	Jul-00	3	1,365.50	844.19	2,209.69	101,302.76
10	Aug-00	4	1,376.88	832.81	2,209.69	99,937.25
11	Sep-00	5	1,388.36	821.34	2,209.69	98,560.37
12	Oct-00	6	1,399.93	809.77	2,209.69	97,172.01
13	Nov-00	7	1,411.59	798.10	2,209.69	95,772.09
14	Dec-00	8	1,423.36	786.34	2,209.69	94,360.50
15	Jan-01	9	1,435.22	774.48	2,209.69	92,937.14
16	Feb-01	10	1,447.18	762.52	2,209.69	91,501.93
17	Mar-01	11	1,459.24	750.46	2,209.69	90,054.75
18	Apr-01	12	1,471.40	738.30	2,209.69	88,595.51
19	May-01	13	1,483.66	726.03	2,209.69	87,124.12
20	Jun-01	14	1,496.02	713.67	2,209.69	85,640.46
21	Jul-01	15	1,508.49	701.20	2,209.69	84,144.44
22	Aug-01	16	1,521.06	688.63	2,209.69	82,635.95
23	Sep-01	17	1,533.74	675.96	2,209.69	81,114.89
24	Oct-01	18	1,546.52	663.18	2,209.69	79,581.15
25	Nov-01	19	1,559.40	650.29	2,209.69	78,034.63
26	Dec-01	20	1,572.40	637.29	2,209.69	76,475.23
27	Jan-02	21	1,585.50	624.19	2,209.69	74,902.83
28	Feb-02	22	1,598.71	610.98	2,209.69	73,317.33
29	Mar-02	23	1,612.04	597.66	2,209.69	71,718.61
30	Apr-02	24	1,625.47	584.22	2,209.69	70,106.58
31	May-02	25	1,639.02	570.68	2,209.69	68,481.11
32	Jun-02	26	1,652.68	557.02	2,209.69	66,842.09
33	Jul-02	27	1,666.45	543.25	2,209.69	65,189.41
34	Aug-02	28	1,680.33	529.36	2,209.69	63,522.97
35	Sep-02	29	1,694.34	515.36	2,209.69	61,842.63
36	Oct-02	30	1,708.46	501.24	2,209.69	60,148.29
37	Nov-02	31	1,722.69	487.00	2,209.69	58,439.84
38	Dec-02	32	1,737.05	472.64	2,209.69	56,717.14
39	Jan-03	33	1,751.53	458.17	2,209.69	54,980.09
40	Feb-03	34	1,766.12	443.57	2,209.69	53,228.57
41	Mar-03	35	1,780.84	428.85	2,209.69	51,462.45
42	Apr-03	36	1,795.68	414.01	2,209.69	49,681.61
43	May-03	37	1,810.64	399.05	2,209.69	47,885.93

2003	
Current Portion	22,192.32
Interest Expense	4,323.99
Total Debt Service	26,516.31

Pine Water Company
Revenue Summary
With Annualized Revenues to Year End Number of Customers
Test Year Ended December 31, 2002

Exhibit
Rebuttal Schedule H-1
Page 1
Witness: Bourassa

Line No.	Meter Size	Customer Classification	Present Revenues	Proposed Revenues	Dollar Change	Percent Change	Percent of Present Water Revenues	Percent of Proposed Water Revenues
1	5/8 Inch	Residential 14A	$ 507,049	$ 714,179	$ 207,130	40.85%	78.52%	78.33%
2	5/8 Inch	Residential 14B	119,446	163,959	44,514	37.27%	18.50%	17.98%
3								
4	3/4 Inch	Residential 14B	468	833	365	77.91%	0.07%	0.09%
5	1 Inch	Residential 14A	4,441	8,263	3,822	86.07%	0.69%	0.91%
6	2 Inch	Residential 14A	194	523	329	169.69%	0.03%	0.06%
7								
8								
9	5/8 Inch	Commercial 14A	2,003	3,725	1,722	85.98%	0.31%	0.41%
10	1 Inch	Commercial 14A	2,647	4,509	1,862	70.32%	0.41%	0.49%
11	2 Inch	Commercial 14A	5,977	11,368	5,390	90.18%	0.93%	1.25%
12								
13								
14								
15	**Total Water Revenues**		$ 642,224	$ 907,358	$ 265,134	41.28%	99.45%	99.51%
16								
17								
18	**Revenue Annualization (a)**							
19	5/8 Inch	Residential 14A	$ 3,539	$ 4,434	895	25.30%	0.55%	0.49%
20								
21								
22								
23								
24	**Total Revenue Annualization**		3,539	4,434	895	25.30%	0.55%	0.49%
25	**Total Water Revenues with**							
26	**Revenue Annualization**		$ 645,763	$ 911,792	$ 266,029		100.00%	100.00%
27								
28								
29	(a) Customer Growth Annualization is not calculated. Change in customers is not due to growth.							
30								
31								

Pine Water Company
Analysis of Revenue by Detailed Class
Test Year Ended December 31, 2002

Exhibit
Rebuttal Schedule H-2
Page 1
Witness: Bourassa

Line No.	Customer Classification and/or Meter Size		(a) Average Number of Customers at 12/31/2002	Summer Average Consumption	Summer Revenues Present Rates	Summer Revenues Proposed Rates	Summer Proposed Increase Dollar Amount	Summer Proposed Increase Percent Amount	Winter Average Consumption	Winter Revenues Present Rates	Winter Revenues Proposed Rates	Winter Proposed Increase Dollar Amount	Winter Proposed Increase Percent Amount
1	5/8 Inch	Residential 14A	1,502	2,731	$ 27.74	$ 40.95	13.21	47.64%	1,998	$ 25.24	$ 30.53	5.29	20.96%
2	5/8 Inch	Residential 14B	360	2,614	29.50	39.75	10.25	34.75%	1,707	26.32	29.26	2.93	11.14%
3													
4	3/4 Inch	Residential 14B	1	4,901	38.37	74.04	35.66	92.94%	5,215	39.47	66.10	26.63	67.47%
5	1 Inch	Residential 14A	2	31,834	203.75	363.69	159.94	78.50%	28,836	185.91	258.20	72.29	38.88%
6	2 Inch	Residential 14A	0	-	64.58	174.17	109.59	169.69%	-	64.58	174.17	109.59	169.69%
7													
8													
9	5/8 Inch	Commercial 14A	2	14,750	96.02	190.96	94.94	98.88%	9,786	66.48	97.45	30.97	46.59%
10	1 Inch	Commercial 14A	1	44,901	281.50	549.68	268.18	95.27%	27,358	177.12	240.95	63.83	36.04%
11	2 Inch	Commercial 14A	2	38,801	285.24	582.59	297.35	104.24%	28,358	223.11	372.36	149.25	66.90%
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30		Totals	1,871										
31													
32		Actuall Year End Number											
33		of Customers:	1,884										
34													
35		**(a)** Average number of customers of less than one (1), indicates that less than 12 bills were issued during the year.											
36													
37													

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Rebuttal Schedule H-3
Page 1
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Proposed Rates	Percent Change
1				
2				
3				
4	Rate Code Sheet 14A			
5	**Monthly Usage Charge for:**			
6	Residential,Commercial			
7	5/8 x 3/4 Inch	$ 18.45	$ 21.77	18.00%
8	3/4 Inch	21.22	32.66	53.89%
9	1 Inch	24.54	54.43	121.79%
10	1 1/2 Inch	36.90	108.86	195.00%
11	2 Inch	64.58	174.17	169.69%
12	3 Inch	92.25	348.34	277.60%
13	4 Inch	147.60	544.28	268.75%
14	6 Inch	-	1,088.55	0.00%
15	8 Inch	-	2,177.10	0.00%
16				
17	Rate Code Sheet 14B			
18	**Monthly Usage Charge for:**			
19	Residential,Commercial			
20	5/8 x 3/4 Inch	$ 20.35	$ 21.77	6.98%
21	3/4 Inch	30.53	32.66	6.97%
22	1 Inch	50.88	54.43	6.97%
23	1 1/2 Inch	101.75	108.86	6.98%
24	2 Inch	162.80	174.17	6.98%
25	3 Inch	305.25	348.34	14.11%
26	4 Inch	508.75	544.28	6.98%
27	6 Inch	1,017.50	1,088.55	6.98%
28	8 Inch	-	2,177.10	0.00%
29				
30				
31		**Present**	**Proposed**	
32		**Rates**	**Rates**	
33	Rate Code Sheet 14A			
34	Gallons In Minimum			
35	All	-	-	
36				
37				
38	Rate Code Sheet 14B			
39	Gallons In Minimum			
40	All	-	-	
41				
42				
43				
44	Rate Code Sheet 14A			
45	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
46	5/8 Inch Residential and Commercial	4,000	2,000	
47	1 Inch and Larger Residential and Commercial	4,000	10,000	
48				
49				
50	Rate Code Sheet 14B			
51	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
52	5/8 Inch Residential and Commercial	999,999,999	2,000	
53	1 Inch and Larger Residential and Commercial	999,999,999	10,000	
54				
55				

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Schedule H-3
Page 2
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Summer Proposed Rates
1			
2	Rate Code Sheet 14A		
3	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
4	5/8 Inch Residential and Commercial	999,999,999	8,000
5	1 Inch and Larger Residential and Commercial	999,999,999	25,000
6			
7			
8	Rate Code Sheet 14B		
9	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
10	5/8 Inch Residential and Commercial	999,999,999	8,000
11	1 Inch and Larger Residential and Commercial	999,999,999	25,000
12			
13			
14	Rate Code Sheet 14A		
15	**Tier 3:** (Gallon over)		
16	5/8 Inch Residential and Commercial	999,999,999	999,999,999
17	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
18			
19			
20	Rate Code Sheet 14B		
21	**Tier 3:** (Gallon over)		
22	5/8 Inch Residential and Commercial	999,999,999	999,999,999
23	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
24			
25			
26			
27			
28			
29	Rate Code Sheet 14A		
30	Commodity Rates (per 1,000 gallons over minimum and per Tier) **(A)**		
31	All	Tier 1	$ 3.40	$ 5.85	$ 4.39
32	All	Tier 2	5.95	10.23	7.68
33	All	Tier 3	5.95	14.23	11.68
34	All	Tier 4	5.95	14.23	11.68
35			
36			
37	Rate Code Sheet 14B		
38	Commodity Rates (per 1,000 gallons over minimum and per Tier)		
39	All	Tier 1	$ 3.50	$ 5.85	$ 4.39
40	All	Tier 2	3.50	10.23	7.68
41	All	Tier 3	3.50	14.23	11.68
42	All	Tier 4	3.50	14.23	11.68
43			
44	* Summer Months (May, June, July, August, September)		
45	Winter Months (October, November, December, January, February, March, April)		
46			
47			
48			
49			
50			
51			
52			
53			
54			

	Present Rates	Summer* Proposed Rates	Winter* Proposed Rates
Tier 1	$ 3.40	$ 5.85	$ 4.39
Tier 2	5.95	10.23	7.68
Tier 3	5.95	14.23	11.68
Tier 4	5.95	14.23	11.68
Tier 1	$ 3.50	$ 5.85	$ 4.39
Tier 2	3.50	10.23	7.68
Tier 3	3.50	14.23	11.68
Tier 4	3.50	14.23	11.68

Pine Water Company
Changes in Representative Rate Schedules
Test Year Ended December 31, 2002

Exhibit
Rebuttal Schedule H-3
Page 3
Witness: Bourassa

Line No.	Other Service Charges	Rate Code Sheet A Present Rates	Rate Code Sheet B Present Rates	Proposed Rates
1	Establishment	$ 25.00	$ 25.00	$ 25.00
2	Establishment (After Hours)	$ 35.00	$ 35.00	$ 35.00
3	Reconnection (Deliquent)	$ 20.00	$ 35.00	$ 50.00
4	Reconnection (After Hours)	$ 30.00	$ 45.00	$ 45.00
5	Meter Test	$ 25.00	$ 25.00	$ 25.00
6	Deposit	**	**	
7	Deposit Interest	6.00%	6.00%	6.00%
8	Re-Establishment (With-in 12 Months)	***		
9	NSF Check	$ 10.00	$ 10.00	$ 10.00
10	Deferred Payment, Per Month **(b)**			
11	Meter Re-Read	$ 15.00	$ 15.00	$ 15.00
12	Charge of Moving Customer Meter -			
13	Customer Requested	Cost	Cost	Cost
14	Late Payment Charge, greater of 1.50% or	$ 5.00	$ 10.00	(1)
15	Cut Lock Fee			$ 50.00
16	Meter Removal Fee			$ 150.00
17	Illegal Supply Fee			
18	First Offense			$ 500.00
19	Second Offense			$ 1,000.00
20	Third Offense			$ 2,000.00
21	Water Theft Fee			
22	First Offense			$ 250.00
23	Second Offense			$ 500.00
24	Third Offense			$ 750.00
25	Emmergency Conservation Response Fee			$ 100.00
26	Cross Connection Exposure Fee			$ 100.00
27	Damages to Meter Locks, Valves, Seals	Cost	$ 40.00	(2)
28	Sprinklers			(a)

29 (1) Greater of 1.50% or $5.00 Present Rates or 1.5% or $10.00 Proposed Rates.
30 (2) $40.00 plus actual cost of making repairs.
31 ** PER COMMISSION RULES (R14-2-403.B)
32 *** MONTHS OFF SYSTEM TIMES MINIMUM (R14-2-403.D)
33
34 IN ADDITION TO THE COLLECTION OF REGULAR RATES, THE UTILITY WILL COLLECT FROM
35 ITS CUSTOMERS A PROPORTIONATE SHARE OF ANY PRIVILEGE, SALES, USE, AND FRANCHISE
36 TAX. PER COMMISSION RULE (14-2-409.D 5)
37 ALL ADVANCES AND/OR CONTRIBUTIONS ARE TO INCLUDE LABOR, MATERIALS, OVERHEADS,
38 AND ALL APPLICABLE TAXES, INCLUDING ALL GROSS-UP TAXES FOR INCOME TAXES.
39 (a) 1.50% of the monthly minimum for a comparable sized meter connection, but no less than $5 per month
40

41		Service Line and			
42		Meter Installation			
43		Rate Code	Rate Code	Proposed	Proposed
44	Meter Size	Sheet A	Sheet B	Charges(*)	Charges(**)
45	5/8 x 3/4 Inch	$430	$430	$500	$500
46	3 / 4 Inch	$480	$480	$575	$575
47	1 Inch	$550	$550	$660	$660
48	1 1/2 Inch	$775	$775	$900	$900
49	2 Inch	$1,305	$1,305	$2,200	$1,500
50	3 Inch	$1,815	$1,815	$2,900	$2,100
51	4 Inch	$2,860	$2,860	$4,200	$3,200
52	6 Inch	N/A	$5,275	$7,700	$6,000
53	8 Inch	Cost	Cost	Cost	Cost
54	Meters Larger than 8	Cost	Cost	Cost	Cost

55
56 (*) For Compound Meters
57 (**) For Turbine Meters
58 Plus Actual Cost of Road Crossing Costs
59 As meters and service lines are now taxable income for income purposes, it shall be the at the
60 discrestion of the utility whether to collect income taxes on the meter and service line charges.
61 Any tax collected will be refunded each year that the meter deposit is refunded.
62

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 1a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 21.77	$ 3.32	18.00%
1,000	21.85	27.62	5.77	26.40%
2,000	25.25	33.47	8.22	32.54%
3,000	28.65	43.70	15.05	52.53%
4,000	32.05	53.94	21.89	68.28%
5,000	38.00	64.17	26.17	68.87%
6,000	43.95	74.40	30.45	69.29%
7,000	49.90	84.64	34.74	69.61%
8,000	55.85	94.87	39.02	69.87%
9,000	61.80	109.11	47.31	76.55%
10,000	67.75	123.34	55.59	82.05%
11,000	73.70	137.57	63.87	86.67%
12,000	79.65	151.81	72.16	90.59%
13,000	85.60	166.04	80.44	93.97%
14,000	91.55	180.28	88.73	96.91%
15,000	97.50	194.51	97.01	99.50%
16,000	103.45	208.74	105.29	101.78%
17,000	109.40	222.98	113.58	103.82%
18,000	115.35	237.21	121.86	105.64%
19,000	121.30	251.45	130.15	107.29%
20,000	127.25	265.68	138.43	108.79%
25,000	157.00	336.85	179.85	114.55%
30,000	186.75	408.02	221.27	118.48%
35,000	216.50	479.19	262.69	121.33%
40,000	246.25	550.36	304.11	123.50%
45,000	276.00	621.53	345.53	125.19%
50,000	305.75	692.70	386.95	126.56%
60,000	365.25	835.04	469.79	128.62%
70,000	424.75	977.38	552.63	130.11%
80,000	484.25	1,119.72	635.47	131.23%
90,000	543.75	1,262.06	718.31	132.10%
100,000	603.25	1,404.40	801.15	132.81%
Average Usage				
2,731	$ 27.74	$ 40.95	$ 13.21	47.64%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 1b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 21.77	$ 3.32	18.00%
1,000	21.85	26.16	4.31	19.71%
2,000	25.25	30.54	5.29	20.96%
3,000	28.65	38.22	9.57	33.40%
4,000	32.05	45.89	13.84	43.20%
5,000	38.00	53.57	15.57	40.97%
6,000	43.95	61.25	17.30	39.35%
7,000	49.90	68.92	19.02	38.12%
8,000	55.85	76.60	20.75	37.15%
9,000	61.80	88.27	26.47	42.83%
10,000	67.75	99.95	32.20	47.52%
11,000	73.70	111.62	37.92	51.46%
12,000	79.65	123.30	43.65	54.80%
13,000	85.60	134.97	49.37	57.68%
14,000	91.55	146.65	55.10	60.18%
15,000	97.50	158.32	60.82	62.38%
16,000	103.45	170.00	66.55	64.33%
17,000	109.40	181.68	72.28	66.07%
18,000	115.35	193.35	78.00	67.62%
19,000	121.30	205.03	83.73	69.02%
20,000	127.25	216.70	89.45	70.30%
25,000	157.00	275.08	118.08	75.21%
30,000	186.75	333.46	146.71	78.56%
35,000	216.50	391.83	175.33	80.99%
40,000	246.25	450.21	203.96	82.83%
45,000	276.00	508.59	232.59	84.27%
50,000	305.75	566.97	261.22	85.43%
60,000	365.25	683.72	318.47	87.19%
70,000	424.75	800.48	375.73	88.46%
80,000	484.25	917.23	432.98	89.41%
90,000	543.75	1,033.99	490.24	90.16%
####	603.25	1,150.74	547.49	90.76%
Average Usage				
1,998	$ 25.24	30.53	$ 5.29	20.96%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification — 5/8 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 2a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 21.77	$ 1.42	6.98%
1,000	23.85	27.62	3.77	15.80%
2,000	27.35	33.47	6.12	22.37%
3,000	30.85	43.70	12.85	41.66%
4,000	34.35	53.94	19.59	57.02%
5,000	37.85	64.17	26.32	69.54%
6,000	41.35	74.40	33.05	79.93%
7,000	44.85	84.64	39.79	88.71%
8,000	48.35	94.87	46.52	96.22%
9,000	51.85	109.11	57.26	110.42%
10,000	55.35	123.34	67.99	122.83%
11,000	58.85	137.57	78.72	133.77%
12,000	62.35	151.81	89.46	143.48%
13,000	65.85	166.04	100.19	152.15%
14,000	69.35	180.28	110.93	159.95%
15,000	72.85	194.51	121.66	167.00%
16,000	76.35	208.74	132.39	173.40%
17,000	79.85	222.98	143.13	179.24%
18,000	83.35	237.21	153.86	184.60%
19,000	86.85	251.45	164.60	189.52%
20,000	90.35	265.68	175.33	194.06%
25,000	107.85	336.85	229.00	212.33%
30,000	125.35	408.02	282.67	225.50%
35,000	142.85	479.19	336.34	235.45%
40,000	160.35	550.36	390.01	243.22%
45,000	177.85	621.53	443.68	249.47%
50,000	195.35	692.70	497.35	254.59%
60,000	230.35	835.04	604.69	262.51%
70,000	265.35	977.38	712.03	268.34%
80,000	300.35	1,119.72	819.37	272.80%
90,000	335.35	1,262.06	926.71	276.34%
100,000	370.35	1,404.40	1,034.05	279.21%
Average Usage				
2,614	$ 29.50	$ 39.75	$ 10.25	34.75%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 2a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 21.77	$ 1.42	6.98%
1,000	23.85	26.16	2.31	9.67%
2,000	27.35	30.54	3.19	11.67%
3,000	30.85	38.22	7.37	23.88%
4,000	34.35	45.89	11.54	33.61%
5,000	37.85	53.57	15.72	41.53%
6,000	41.35	61.25	19.90	48.11%
7,000	44.85	68.92	24.07	53.67%
8,000	48.35	76.60	28.25	58.42%
9,000	51.85	88.27	36.42	70.24%
10,000	55.35	99.95	44.60	80.57%
11,000	58.85	111.62	52.77	89.67%
12,000	62.35	123.30	60.95	97.75%
13,000	65.85	134.97	69.12	104.97%
14,000	69.35	146.65	77.30	111.46%
15,000	72.85	158.32	85.47	117.33%
16,000	76.35	170.00	93.65	122.66%
17,000	79.85	181.68	101.83	127.52%
18,000	83.35	193.35	110.00	131.97%
19,000	86.85	205.03	118.18	136.07%
20,000	90.35	216.70	126.35	139.85%
25,000	107.85	275.08	167.23	155.06%
30,000	125.35	333.46	208.11	166.02%
35,000	142.85	391.83	248.98	174.30%
40,000	160.35	450.21	289.86	180.77%
45,000	177.85	508.59	330.74	185.97%
50,000	195.35	566.97	371.62	190.23%
60,000	230.35	683.72	453.37	196.82%
70,000	265.35	800.48	535.13	201.67%
80,000	300.35	917.23	616.88	205.39%
90,000	335.35	1,033.99	698.64	208.33%
100,000	370.35	1,150.74	780.39	210.72%
Average Usage				
1,707	$ 26.32	29.26	$ 2.93	11.14%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification — 3/4 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 3a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 32.66	$ 11.44	53.89%
1,000	24.72	38.50	13.78	55.76%
2,000	28.22	44.35	16.13	57.17%
3,000	31.72	54.59	22.87	72.09%
4,000	35.22	64.82	29.60	84.04%
5,000	38.72	75.05	36.33	93.84%
6,000	42.22	85.29	43.07	102.01%
7,000	45.72	95.52	49.80	108.93%
8,000	49.22	105.76	56.54	114.86%
9,000	52.72	119.99	67.27	127.60%
10,000	56.22	134.22	78.00	138.75%
11,000	59.72	148.46	88.74	148.59%
12,000	63.22	162.69	99.47	157.34%
13,000	66.72	176.93	110.21	165.18%
14,000	70.22	191.16	120.94	172.23%
15,000	73.72	205.39	131.67	178.61%
16,000	77.22	219.63	142.41	184.42%
17,000	80.72	233.86	153.14	189.72%
18,000	84.22	248.10	163.88	194.58%
19,000	87.72	262.33	174.61	199.05%
20,000	91.22	276.56	185.34	203.18%
25,000	108.72	347.73	239.01	219.84%
30,000	126.22	418.90	292.68	231.88%
35,000	143.72	490.07	346.35	240.99%
40,000	161.22	561.24	400.02	248.12%
45,000	178.72	632.41	453.69	253.86%
50,000	196.22	703.58	507.36	258.57%
60,000	231.22	845.92	614.70	265.85%
70,000	266.22	988.26	722.04	271.22%
80,000	301.22	1,130.60	829.38	275.34%
90,000	336.22	1,272.94	936.72	278.60%
100,000	371.22	1,415.28	1,044.06	281.25%
Average Usage				
4,901	$ 38.37	$ 74.04	$ 35.66	92.94%

Present Rates:

Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 32.66	32.6565
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 3b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 32.66	$ 11.44	53.89%
1,000	24.72	37.04	$ 12.32	49.85%
2,000	28.22	41.43	$ 13.21	46.81%
3,000	31.72	49.10	$ 17.38	54.80%
4,000	35.22	56.78	$ 21.56	61.21%
5,000	38.72	64.46	$ 25.74	66.46%
6,000	42.22	72.13	$ 29.91	70.84%
7,000	45.72	79.81	$ 34.09	74.55%
8,000	49.22	87.48	$ 38.26	77.74%
9,000	52.72	99.16	$ 46.44	88.08%
10,000	56.22	110.83	$ 54.61	97.14%
11,000	59.72	122.51	$ 62.79	105.14%
12,000	63.22	134.18	$ 70.96	112.25%
13,000	66.72	145.86	$ 79.14	118.61%
14,000	70.22	157.53	$ 87.31	124.34%
15,000	73.72	169.21	$ 95.49	129.53%
16,000	77.22	180.89	$ 103.67	134.25%
17,000	80.72	192.56	$ 111.84	138.55%
18,000	84.22	204.24	$ 120.02	142.50%
19,000	87.72	215.91	$ 128.19	146.14%
20,000	91.22	227.59	$ 136.37	149.49%
25,000	108.72	285.97	$ 177.25	163.03%
30,000	126.22	344.34	$ 218.12	172.81%
35,000	143.72	402.72	$ 259.00	180.21%
40,000	161.22	461.10	$ 299.88	186.01%
45,000	178.72	519.48	$ 340.76	190.66%
50,000	196.22	577.85	$ 381.63	194.49%
60,000	231.22	694.61	$ 463.39	200.41%
70,000	266.22	811.36	$ 545.14	204.77%
80,000	301.22	928.12	$ 626.90	208.12%
90,000	336.22	1,044.87	$ 708.65	210.77%
100,000	371.22	1,161.63	$ 790.41	212.92%
Average Usage				
5,215	$ 39.47	66.10	$ 26.63	67.47%

Present Rates:

Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 32.66	32.6565
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification — 1 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 4a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 54.43	$ 29.89	121.79%
1,000	27.94	60.28	32.34	115.73%
2,000	31.34	66.12	34.78	110.99%
3,000	34.74	71.97	37.23	107.17%
4,000	38.14	77.82	39.68	104.04%
5,000	44.09	83.67	39.58	89.77%
6,000	50.04	89.52	39.48	78.89%
7,000	55.99	95.36	39.37	70.32%
8,000	61.94	101.21	39.27	63.40%
9,000	67.89	107.06	39.17	57.70%
10,000	73.84	112.91	39.07	52.91%
11,000	79.79	123.14	43.35	54.33%
12,000	85.74	133.38	47.64	55.56%
13,000	91.69	143.61	51.92	56.63%
14,000	97.64	153.84	56.20	57.56%
15,000	103.59	164.08	60.49	58.39%
16,000	109.54	174.31	64.77	59.13%
17,000	115.49	184.55	69.06	59.79%
18,000	121.44	194.78	73.34	60.39%
19,000	127.39	205.01	77.62	60.93%
20,000	133.34	215.25	81.91	61.43%
25,000	163.09	266.42	103.33	63.36%
30,000	192.84	337.59	144.75	75.06%
35,000	222.59	408.76	186.17	83.64%
40,000	252.34	479.93	227.59	90.19%
45,000	282.09	551.10	269.01	95.36%
50,000	311.84	622.27	310.43	99.55%
60,000	371.34	764.61	393.27	105.90%
70,000	430.84	906.95	476.11	110.51%
80,000	490.34	1,049.29	558.95	113.99%
90,000	549.84	1,191.63	641.79	116.72%
100,000	609.34	1,333.97	724.63	118.92%
Average Usage				
31,834	$ 203.75	$ 363.69	$ 159.94	78.50%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 54.43	
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 4a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 54.43	$ 29.89	121.79%
1,000	27.94	58.81	30.87	110.50%
2,000	31.34	63.20	31.86	101.66%
3,000	34.74	67.59	32.85	94.55%
4,000	38.14	71.97	33.83	88.70%
5,000	44.09	76.36	32.27	73.19%
6,000	50.04	80.74	30.70	61.36%
7,000	55.99	85.13	29.14	52.04%
8,000	61.94	89.52	27.58	44.52%
9,000	67.89	93.90	26.01	38.31%
10,000	73.84	98.29	24.45	33.11%
11,000	79.79	105.96	26.17	32.80%
12,000	85.74	113.64	27.90	32.54%
13,000	91.69	121.31	29.62	32.31%
14,000	97.64	128.99	31.35	32.11%
15,000	103.59	136.67	33.08	31.93%
16,000	109.54	144.34	34.80	31.77%
17,000	115.49	152.02	36.53	31.63%
18,000	121.44	159.69	38.25	31.50%
19,000	127.39	167.37	39.98	31.38%
20,000	133.34	175.04	41.70	31.28%
25,000	163.09	213.42	50.33	30.86%
30,000	192.84	271.80	78.96	40.94%
35,000	222.59	330.18	107.59	48.33%
40,000	252.34	388.55	136.21	53.98%
45,000	282.09	446.93	164.84	58.44%
50,000	311.84	505.31	193.47	62.04%
60,000	371.34	622.06	250.72	67.52%
70,000	430.84	738.82	307.98	71.48%
80,000	490.34	855.57	365.23	74.49%
90,000	549.84	972.33	422.49	76.84%
100,000	609.34	1,089.08	479.74	78.73%
Average Usage				
28,836	$ 185.91	258.20	$ 72.29	38.88%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 54.43	
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification — 2 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 5a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 174.17	$ 109.59	169.69%
1,000	67.98	180.02	112.04	164.81%
2,000	71.38	185.86	114.48	160.39%
3,000	74.78	191.71	116.93	156.37%
4,000	78.18	197.56	119.38	152.70%
5,000	84.13	203.41	119.28	141.78%
6,000	90.08	209.26	119.18	132.30%
7,000	96.03	215.10	119.07	124.00%
8,000	101.98	220.95	118.97	116.66%
9,000	107.93	226.80	118.87	110.14%
10,000	113.88	232.65	118.77	104.29%
11,000	119.83	242.88	123.05	102.69%
12,000	125.78	253.12	127.34	101.24%
13,000	131.73	263.35	131.62	99.92%
14,000	137.68	273.58	135.90	98.71%
15,000	143.63	283.82	140.19	97.60%
16,000	149.58	294.05	144.47	96.59%
17,000	155.53	304.29	148.76	95.64%
18,000	161.48	314.52	153.04	94.77%
19,000	167.43	324.75	157.32	93.96%
20,000	173.38	334.99	161.61	93.21%
25,000	203.13	386.16	183.03	90.10%
30,000	232.88	457.33	224.45	96.38%
35,000	262.63	528.50	265.87	101.23%
40,000	292.38	599.67	307.29	105.10%
45,000	322.13	670.84	348.71	108.25%
50,000	351.88	742.01	390.13	110.87%
60,000	411.38	884.35	472.97	114.97%
70,000	470.88	1,026.69	555.81	118.04%
80,000	530.38	1,169.03	638.65	120.41%
90,000	589.88	1,311.37	721.49	122.31%
100,000	649.38	1,453.71	804.33	123.86%
Average Usage				
-	$ 64.58	$ 174.17	$ 109.59	169.69%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 174.17	174.168
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 5b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 174.17	$ 109.59	169.69%
1,000	67.98	178.55	110.57	162.66%
2,000	71.38	182.94	111.56	156.29%
3,000	74.78	187.33	112.55	150.50%
4,000	78.18	191.71	113.53	145.22%
5,000	84.13	196.10	111.97	133.09%
6,000	90.08	200.48	110.40	122.56%
7,000	96.03	204.87	108.84	113.34%
8,000	101.98	209.26	107.28	105.19%
9,000	107.93	213.64	105.71	97.94%
10,000	113.88	218.03	104.15	91.45%
11,000	119.83	225.70	105.87	88.35%
12,000	125.78	233.38	107.60	85.55%
13,000	131.73	241.05	109.32	82.99%
14,000	137.68	248.73	111.05	80.66%
15,000	143.63	256.41	112.78	78.52%
16,000	149.58	264.08	114.50	76.55%
17,000	155.53	271.76	116.23	74.73%
18,000	161.48	279.43	117.95	73.04%
19,000	167.43	287.11	119.68	71.48%
20,000	173.38	294.78	121.40	70.02%
25,000	203.13	333.16	130.03	64.01%
30,000	232.88	391.54	158.66	68.13%
35,000	262.63	449.92	187.29	71.31%
40,000	292.38	508.29	215.91	73.85%
45,000	322.13	566.67	244.54	75.91%
50,000	351.88	625.05	273.17	77.63%
60,000	411.38	741.80	330.42	80.32%
70,000	470.88	858.56	387.68	82.33%
80,000	530.38	975.31	444.93	83.89%
90,000	589.88	1,092.07	502.19	85.13%
100,000	649.38	1,208.82	559.44	86.15%
Average Usage				
-	$ 64.58	$ 174.17	174.17	269.69%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 174.17	174.168
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 6a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 21.77	$ 3.32	18.00%
1,000	21.85	27.62	5.77	26.40%
2,000	25.25	33.47	8.22	32.54%
3,000	28.65	43.70	15.05	52.53%
4,000	32.05	53.94	21.89	68.28%
5,000	38.00	64.17	26.17	68.87%
6,000	43.95	74.40	30.45	69.29%
7,000	49.90	84.64	34.74	69.61%
8,000	55.85	94.87	39.02	69.87%
9,000	61.80	109.11	47.31	76.55%
10,000	67.75	123.34	55.59	82.05%
11,000	73.70	137.57	63.87	86.67%
12,000	79.65	151.81	72.16	90.59%
13,000	85.60	166.04	80.44	93.97%
14,000	91.55	180.28	88.73	96.91%
15,000	97.50	194.51	97.01	99.50%
16,000	103.45	208.74	105.29	101.78%
17,000	109.40	222.98	113.58	103.82%
18,000	115.35	237.21	121.86	105.64%
19,000	121.30	251.45	130.15	107.29%
20,000	127.25	265.68	138.43	108.79%
25,000	157.00	336.85	179.85	114.55%
30,000	186.75	408.02	221.27	118.48%
35,000	216.50	479.19	262.69	121.33%
40,000	246.25	550.36	304.11	123.50%
45,000	276.00	621.53	345.53	125.19%
50,000	305.75	692.70	386.95	126.56%
60,000	365.25	835.04	469.79	128.62%
70,000	424.75	977.38	552.63	130.11%
80,000	484.25	1,119.72	635.47	131.23%
90,000	543.75	1,262.06	718.31	132.10%
100,000	603.25	1,404.40	801.15	132.81%
Average Usage				
14,750	$ 96.02	$ 190.96	$ 94.94	98.88%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
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Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 21.77	$ 3.32	18.00%
1,000	21.85	26.16	4.31	19.71%
2,000	25.25	30.54	5.29	20.96%
3,000	28.65	38.22	9.57	33.40%
4,000	32.05	45.89	13.84	43.20%
5,000	38.00	53.57	15.57	40.97%
6,000	43.95	61.25	17.30	39.35%
7,000	49.90	68.92	19.02	38.12%
8,000	55.85	76.60	20.75	37.15%
9,000	61.80	88.27	26.47	42.83%
10,000	67.75	99.95	32.20	47.52%
11,000	73.70	111.62	37.92	51.46%
12,000	79.65	123.30	43.65	54.80%
13,000	85.60	134.97	49.37	57.68%
14,000	91.55	146.65	55.10	60.18%
15,000	97.50	158.32	60.82	62.38%
16,000	103.45	170.00	66.55	64.33%
17,000	109.40	181.68	72.28	66.07%
18,000	115.35	193.35	78.00	67.62%
19,000	121.30	205.03	83.73	69.02%
20,000	127.25	216.70	89.45	70.30%
25,000	157.00	275.08	118.08	75.21%
30,000	186.75	333.46	146.71	78.56%
35,000	216.50	391.83	175.33	80.99%
40,000	246.25	450.21	203.96	82.83%
45,000	276.00	508.59	232.59	84.27%
50,000	305.75	566.97	261.22	85.43%
60,000	365.25	683.72	318.47	87.19%
70,000	424.75	800.48	375.73	88.46%
80,000	484.25	917.23	432.98	89.41%
90,000	543.75	1,033.99	490.24	90.16%
100,000	603.25	1,150.74	547.49	90.76%
Average Usage				
9,786	$ 66.48	97.45	$ 30.97	46.59%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 21.77	21.771
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 5.85	$ 4.39
Up to	8,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 7a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 54.43	$ 29.89	121.79%
1,000	27.94	60.28	32.34	115.73%
2,000	31.34	66.12	34.78	110.99%
3,000	34.74	71.97	37.23	107.17%
4,000	38.14	77.82	39.68	104.04%
5,000	44.09	83.67	39.58	89.77%
6,000	50.04	89.52	39.48	78.89%
7,000	55.99	95.36	39.37	70.32%
8,000	61.94	101.21	39.27	63.40%
9,000	67.89	107.06	39.17	57.70%
10,000	73.84	112.91	39.07	52.91%
11,000	79.79	123.14	43.35	54.33%
12,000	85.74	133.38	47.64	55.56%
13,000	91.69	143.61	51.92	56.63%
14,000	97.64	153.84	56.20	57.56%
15,000	103.59	164.08	60.49	58.39%
16,000	109.54	174.31	64.77	59.13%
17,000	115.49	184.55	69.06	59.79%
18,000	121.44	194.78	73.34	60.39%
19,000	127.39	205.01	77.62	60.93%
20,000	133.34	215.25	81.91	61.43%
25,000	163.09	266.42	103.33	63.36%
30,000	192.84	337.59	144.75	75.06%
35,000	222.59	408.76	186.17	83.64%
40,000	252.34	479.93	227.59	90.19%
45,000	282.09	551.10	269.01	95.36%
50,000	311.84	622.27	310.43	99.55%
60,000	371.34	764.61	393.27	105.90%
70,000	430.84	906.95	476.11	110.51%
80,000	490.34	1,049.29	558.95	113.99%
90,000	549.84	1,191.63	641.79	116.72%
100,000	609.34	1,333.97	724.63	118.92%
Average Usage				
44,901	$ 281.50	$ 549.68	$ 268.18	95.27%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 54.43	54.4275
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 7b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 54.43	$ 29.89	121.79%
1,000	27.94	58.81	30.87	110.50%
2,000	31.34	63.20	31.86	101.66%
3,000	34.74	67.59	32.85	94.55%
4,000	38.14	71.97	33.83	88.70%
5,000	44.09	76.36	32.27	73.19%
6,000	50.04	80.74	30.70	61.36%
7,000	55.99	85.13	29.14	52.04%
8,000	61.94	89.52	27.58	44.52%
9,000	67.89	93.90	26.01	38.31%
10,000	73.84	98.29	24.45	33.11%
11,000	79.79	105.96	26.17	32.80%
12,000	85.74	113.64	27.90	32.54%
13,000	91.69	121.31	29.62	32.31%
14,000	97.64	128.99	31.35	32.11%
15,000	103.59	136.67	33.08	31.93%
16,000	109.54	144.34	34.80	31.77%
17,000	115.49	152.02	36.53	31.63%
18,000	121.44	159.69	38.25	31.50%
19,000	127.39	167.37	39.98	31.38%
20,000	133.34	175.04	41.70	31.28%
25,000	163.09	213.42	50.33	30.86%
30,000	192.84	271.80	78.96	40.94%
35,000	222.59	330.18	107.59	48.33%
40,000	252.34	388.55	136.21	53.98%
45,000	282.09	446.93	164.84	58.44%
50,000	311.84	505.31	193.47	62.04%
60,000	371.34	622.06	250.72	67.52%
70,000	430.84	738.82	307.98	71.48%
80,000	490.34	855.57	365.23	74.49%
90,000	549.84	972.33	422.49	76.84%
100,000	609.34	1,089.08	479.74	78.73%
Average Usage				
27,358	$ 177.12	240.95	$ 63.83	36.04%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 54.43	54.4275
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification — 2 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 8a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 174.17	$ 109.59	169.69%
1,000	67.98	180.02	112.04	164.81%
2,000	71.38	185.86	114.48	160.39%
3,000	74.78	191.71	116.93	156.37%
4,000	78.18	197.56	119.38	152.70%
5,000	84.13	203.41	119.28	141.78%
6,000	90.08	209.26	119.18	132.30%
7,000	96.03	215.10	119.07	124.00%
8,000	101.98	220.95	118.97	116.66%
9,000	107.93	226.80	118.87	110.14%
10,000	113.88	232.65	118.77	104.29%
11,000	119.83	242.88	123.05	102.69%
12,000	125.78	253.12	127.34	101.24%
13,000	131.73	263.35	131.62	99.92%
14,000	137.68	273.58	135.90	98.71%
15,000	143.63	283.82	140.19	97.60%
16,000	149.58	294.05	144.47	96.59%
17,000	155.53	304.29	148.76	95.64%
18,000	161.48	314.52	153.04	94.77%
19,000	167.43	324.75	157.32	93.96%
20,000	173.38	334.99	161.61	93.21%
25,000	203.13	386.16	183.03	90.10%
30,000	232.88	457.33	224.45	96.38%
35,000	262.63	528.50	265.87	101.23%
40,000	292.38	599.67	307.29	105.10%
45,000	322.13	670.84	348.71	108.25%
50,000	351.88	742.01	390.13	110.87%
60,000	411.38	884.35	472.97	114.97%
70,000	470.88	1,026.69	555.81	118.04%
80,000	530.38	1,169.03	638.65	120.41%
90,000	589.88	1,311.37	721.49	122.31%
100,000	649.38	1,453.71	804.33	123.86%
Average Usage				
38,801	$ 285.24	$ 582.59	$ 297.35	104.24%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 174.17	174.168
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rebuttal Schedule H-4
Page 8b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 174.17	$ 109.59	169.69%
1,000	67.98	178.55	110.57	162.66%
2,000	71.38	182.94	111.56	156.29%
3,000	74.78	187.33	112.55	150.50%
4,000	78.18	191.71	113.53	145.22%
5,000	84.13	196.10	111.97	133.09%
6,000	90.08	200.48	110.40	122.56%
7,000	96.03	204.87	108.84	113.34%
8,000	101.98	209.26	107.28	105.19%
9,000	107.93	213.64	105.71	97.94%
10,000	113.88	218.03	104.15	91.45%
11,000	119.83	225.70	105.87	88.35%
12,000	125.78	233.38	107.60	85.55%
13,000	131.73	241.05	109.32	82.99%
14,000	137.68	248.73	111.05	80.66%
15,000	143.63	256.41	112.78	78.52%
16,000	149.58	264.08	114.50	76.55%
17,000	155.53	271.76	116.23	74.73%
18,000	161.48	279.43	117.95	73.04%
19,000	167.43	287.11	119.68	71.48%
20,000	173.38	294.78	121.40	70.02%
25,000	203.13	333.16	130.03	64.01%
30,000	232.88	391.54	158.66	68.13%
35,000	262.63	449.92	187.29	71.31%
40,000	292.38	508.29	215.91	73.85%
45,000	322.13	566.67	244.54	75.91%
50,000	351.88	625.05	273.17	77.63%
60,000	411.38	741.80	330.42	80.32%
70,000	470.88	858.56	387.68	82.33%
80,000	530.38	975.31	444.93	83.89%
90,000	589.88	1,092.07	502.19	85.13%
100,000	649.38	1,208.82	559.44	86.15%
Average Usage				
28,358	$ 223.11	372.36	$ 149.25	66.90%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 174.17	174.168
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 5.85	$ 4.39
Up to	25,000	$ 10.23	$ 7.68
Up to	999,999,999	$ 14.23	$ 11.68
Over	1,000,000,000	$ 14.23	$ 11.68

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PINE WATER COMPANY 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 AND FOR APPROVAL TO INCUR LONG-TERM DEBT	DOCKET NO: W-03512A-03-0279

REJOINDER TESTIMONY OF

THOMAS J. BOURASSA

EXHIBIT
A-6

I. INTRODUCTION AND PURPOSE OF REJOINDER TESTIMONY

Q. PLEASE STATE YOUR NAME AND ADDRESS?

A. Thomas Bourassa, 139 W. Wood Drive, Phoenix, Arizona 85029.

Q. ARE YOU THE SAME THOMAS BOURASSA WHO FILED DIRECT AND REBUTTAL TESTIMONY IN THIS MATTER?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REJOINDER TESTIMONY?

A. I will provide rejoinder testimony on the general topics of rate base, revenues and expenses, cost of capital, and rate design in response to the surrebuttal testimony of the Commission Utilities Division Staff ("Staff"), the Pine Strawberry Water Improvement District ("PSWID" or the "District"), and Mr. Breninger ("Breninger") concerning the rate application filed by Pine Water Company ('Pine Water" or the "Company"'). I am also testifying in support of Rejoinder Schedules A-1, B-1, B-2, B-5, C-1, C-2, D-1, D-2, D-4, H-1, H-2, H-3, and H-4.

Q. HOW WILL YOUR TESTIMONY BE ORGANIZED?

A. I will provide a summary of the issues I address and then describe the Company's rejoinder positions on these issues. If I do not respond to a specific proposal, adjustment argument or other assertion of Staff, the District or any other party, it does not mean that the Company accepts that position.

II. SUMMARY OF REJOINDER TESTIMONY

Q. HAS THE COMPANY CHANGED ITS REQUESTED REVENUE INCREASE FROM ITS REBUTTAL FILING?

A. Yes. The Company's requested increase is reduced to approximately $87,900, or 13.5%, from $267,000, or 41%, at the time of the Company's rebuttal filing. The main reason is that the Company has removed test year Project Magnolia transportation expenses, also known as wheeling fees, in the amount of $174,645

from operating expenses. Instead, the Company proposes to amend the existing Water Augmentation Surcharge Tariff ("Surcharge Tariff") to include, on a permanent basis, recovery of the actual costs of the water purchased from Strawberry Water and delivered through Brooke Utilities' Project Magnolia, in addition to the water hauling costs that are already covered under the Surcharge Tariff.

Q. WILL CHANGING THE MANNER OF RECOVERY FOR THESE PROJECT MAGNOLIA COSTS IMPACT RATEPAYERS?

A. Not really. Customers will still pay for the costs of buying water and having it delivered through the pipeline owned by Brooke Utilities, Inc. ("BUI"). Now, however, they will pay the costs in the same manner that other water augmentation costs are recovered.

Q. ARE THERE ANY OTHER REASONS THAT THE REQUESTED REVENUE REQUIREMENT HAS CHANGED SINCE THE REBUTTAL FILING?

A. Yes. The Company has accepted Staff adjustments to plant in service (post-test year plant), which has lowered the Company's proposed rate base The Company has also proposed an increase in rate case expense. The combined effect of the Company's adjustments to rate base and to operating expenses, including treatment of Project Magnolia costs, is to reduce the revenue requirement to approximately $742,000 from $920,000 contained in the Company's rebuttal filing.

Q. WHAT IS THE DIFFERENCE BETWEEN THE COMPANY'S REVENUE INCREASE REQUEST AND THE RECOMMENDATIONS OF THE OTHER PARTIES?

A. Staff recommends a revenue increase of approximately $46,900 or approximately 7.2 percent under Staff's adjusted test year revenues. The amount has changed

slightly from Staff's direct filing. The District and Mr. Breninger have not recommended a revenue increase or revenue requirement.

Q. WHAT IS THE FAIR VALUE RATE BASE THE COMPANY IS NOW PROPOSING?

A. The Company's proposed fair value rate base is approximately $590,700.

Q. WHAT IS THE FAIR VALUE RATE BASE STAFF IS PROPOSING?

A. Staff's proposed fair value rate base is approximately $637,500.

Q. WHAT ARE THE MAJOR DIFFERENCES IN THE COMPANY'S AND THE OTHER PARTIES PROPOSED FAIR VALUE RATE BASES?

A. There are two factors that explain much of the difference. Staff includes Project Magnolia in rate base based on original cost plant less accumulated depreciation, whereas the Company does not. This is based on Staff's mistaken belief that the pipeline is owned by Pine Water and not BUI. The Company also disagrees with Staff on the treatment of deferred taxes in rate base. Staff excludes deferred taxes of $369,000 from rate base, whereas, the Company includes deferred taxes.

The District did not provide schedules and/or specific adjustments in its surrebuttal testimony. The District has generally taken the positions proposed by Staff. The District believes post test year plant should not be allowed in rate base and Project Magnolia should be included in rate base. *See* Surrebuttal Testimony of Harry Jones ("Jones Sb.") at 3 and 4.

Q. HAS THE COMPANY CHANGED ITS RECOMMENDATION ON THE REQUIRED RATE OF RETURN?

A. No. The Company still seeks a 10.99 percent rate of return on fair value rate base.

Q. HAS STAFF CHANGED ITS RECOMMENDATION THAT THE REVENUE REQUIREMENT BE BASED ON A 10 PERCENT OPERATING MARGIN?

A. No. Staff continues to recommend a revenue requirement based on a 10 percent operating margin. This translates to an 11 percent rate of return on Staff's recommended rate base. However, Staff has prepared new cost of capital testimony providing for an 8.7 percent rate of return as an alternative, but has not provided a revenue requirement based on this alternate recommendation.

Q. WHAT ARE THE MAJOR DISAGREEMENTS IN OPERATING EXPENSES IN THIS CASE?

A. Several disagreements between the Company and Staff remain, in addition to the dispute over ownership of Project Magnolia, which impacts operating expenses in several ways. The Company also disagrees with Staff on the proper level of materials and supplies expense, the computation of property taxes and the amortization period of rate case expense.

The District claims the Company's requested rate case expense is too high. Staff supported the Company's initial request for rate case expense of $150,000 and recognized the Company's intention to evaluate that request and possible increase it due to the intervention of the District. Staff has not yet had the opportunity to comment on the Company's rejoinder request for $200,000 in rate case expense.

Q. WHAT ARE THE DIFFERENCES BETWEEN THE PARTIES WITH RESPECT TO RATE DESIGN?

A. Staff continues to propose a single rate tier structure regardless of meter size, whereas the Company proposes a rate tier structure based on meter size. Neither the District nor Mr. Breninger has proposed a rate design.

III. <u>RATE BASE</u>

Q. WHAT ADJUSTMENTS YOU HAVE ACCEPTED FROM STAFF, THE DISTRICT AND/OR BRENINGER?

A. The Company has accepted Staff's proposed post test year plant of $1,597. The number consists of post test year pumping equipment of $1,015 with a retirement amount of $988, and meter installations of $5,050, with a retirement amount of $3,480. *See* Surrebuttal Testimony of Marlin Scott, Jr. ("Scott Sb.") at 2-3. The District testified that no post test year plant should be allowed in rate base. *See* Jones Sb. at 3.

A. <u>Project Magnolia</u>

Q. DOES STAFF CONTINUE TO RECOMMEND PROJECT MAGNOLIA BE INCLUDED IN PINE WATER'S RATE BASE?

A. Yes. Both Staff and the District take this position. The District does not provide a rationale, other than it is in agreement with Staff. *Id.* at 4

Staff asserts the Company owns Project Magnolia. According to Staff, ownership is based on their claim Project Magnolia was included in construction work-in-progress ('CWIP') in Pine Water's predecessor, E&R Water Company ('E&R' or 'E&R Water'), prior rate case and that at least 75 percent of the costs of Project Magnolia were on the books of E&R up to the time of the last filing. *See* Surrebuttal Testimony of Claudio Fernandez ("Fernandez Sb.") at 4.

As support for Staff's position, Staff testified that the B-1 schedule (rate base) in the E&R Water prior rate application included CWIP of $334,242 which represented the cost of Project Magnolia. *Id.* at 4.

Q. IS THE BASIS OF STAFF'S ASSERTION CORRECT?

A. No. The CWIP balance listed ob the B-1 schedule in the prior case was merely based on a capital expenditures ('CAPX') budget. *See* Rebuttal Testimony of Robert T. Hardcastle ("Hardcastle Rb.") at 20-24. As support for its assertion and in response to a data request from the Company, Staff provided a copy of the CAPX budget filed in the prior case. *Id.* at Exhibit 5.

Staff also provided an E-5 schedule filed in the prior case showing approximately $17,000 of 'Project Magnolia' costs. *Id.*

Q. IS THE CAPX BUDGET EVIDENCE THAN THE COSTS OF PROJECT MAGNOLIA WERE ON THE BOOKS OF E&R WATER COMPANY UP TO THE TIME E&R FILED ITS RATE APPLICATION?

A. No. This schedule is clearly identified as a CAPX budget. This is not evidence that the approximately $334,000 of CAPX budgeted amounts were expended or recorded on the books of E&R Water at the time the prior rate case was filed. Mr. Hardcastle also provided a copy of an agreement with ASL Consulting showing that work to perfect a right of way permit to construct Project Magnolia wasn't even signed by BUI until May 24, 2000. *See* Hardcastle Rb. at Exhibit 3. The right of way permit work request from ASL Consulting is nearly two months after the E&R Water decision was issued. *See* ACC Decision 62400, March 31, 2000.

Q. WHAT IS THE $17,000 SHOWN ON THE E-5 SCHEDULE?

A. As explained by Mr. Hardcastle, this was not used and useful plant in service in the last case. *See* Rejoinder Testimony of Robert T. Hardcastle ("Hardcastle Rj.") at 8. These costs are preliminary consulting and engineering services contracted for by BUI and paid for, at least in part, by E&R. *Id.* According to Mr. Hardcastle, it appears that E&R paid for some of these costs in 1998 and were picked up and listed as plant in service by E&R's accounting witness. *Id.* Ultimately, both the $334,272 and the $17,040 were identified as CWIP and removed from plant in service by Staff in the prior case. *See* Staff Engineering Direct Testimony at 6, 7, Docket No. W-01576A-99-0277.

Q. IF CWIP IN THE PRIOR CASE WAS BASED UPON A CONSTRUCTION BUDGET, WHY IS STAFF CONTINUING TO CLAIM THE PINE WATER OWNS PROJECT MAGNOLIA?

A. Frankly, I do not know.

Q. WAS CWIP APPROVED AS A RATE BASE ITEM IN E&R'S PRIOR CASE?

A. No.

Q. HAS THE COMPANY OBTAINED ADDITIONAL EVIDENCE SURROUNDING THIS ISSUE?

A. Yes. Supporting general ledger (GL) detail is attached at Exhibit 1.

Two clearly ascertainable facts can be discerned from a review of the GL detail supporting the $449,568 cost of Project Magnolia. First, the evidence shows that Project Magnolia costs of $334,000 could have only been a capital budget amount and not a recorded CWIP cost when E&R Water filed its rate application. The earliest of these costs were recorded on April 25, 2000. Further, the bulk of the costs for Project Magnolia were incurred in the second half of 2000 through early 2001. E&R Water filed its prior case in February 1999 (June 1998 test year) and the final decision issued on March 31, 2000 (ACC Decision No. 62400). Mr. Fernandez's claim that the 75 percent of the costs of Project Magnolia were on the books of E&R Water when it filed its rate application is incorrect. *See* Fernandez Sb. at 5.

Second, the Project Magnolia costs of $449,598, with the exception of two invoices totaling approximately $1,500, were recorded on the books of BUI, since the last rate case, not E&R Water, or Pine Water for that matter. Project Magnolia was not constructed, recorded on the books of E&R, placed into service, and then later transferred to BUI.

Q. DOES THE $17,040 APPEAR TO HAVE BEEN RECLASSIFIED FROM E&R TO BUI AND INCLUDED IN THE FINAL COST OF PROJECT MAGNOLIA OF $449,598?

A. No, it does not appear that this is the case based on the GL detail I reviewed.

Q. IS THE $17,040 IN THE PLANT BALANCE OF PINE WATER AT THE END OF THE TEST YEAR?

A. No. It appears the $17,040 was ultimately expensed, not capitalized, on the books of E&R.

Q. SO, THE $17,040 AND THE $334,000 OF CWIP FROM THE PRIOR CASE HAVE NEVER BEEN GIVEN RATE BASE TREATMENT NOR HAVE THESE AMOUNTS BEEN INCLUDED IN OPERATING EXPENSES FOR RATE MAKING PURPOSES?

A. No. E&R, now Pine Water, has never recovered any portion of the $17,040 or the $334,000 through rates.

Q. ON THE GL DETAIL, I SEE ENTRIES STARTING IN SEPTEMBER 2000, WHY DO YOU CLAIM THE EARLIEST COST WAS RECORDED IN APRIL 2000?

A. The first six entries on the Brooke Project Magnolia CWIP account are reclassification entries. I requested support for these entries to find when the original entry upon which the reclassification was made.

Q. CAN YOU EXPLAIN THE SEPTEMBER 2000 RECLASS ENTRIES LISTED ON THE GL LISTING?

A. Yes.

The first entry of $1,808.42 is a reclassification of two invoices from the Brooke contractual services expense account to the Brooke Project Magnolia CWIP account. The earliest recorded cost was July 24, 2000.

The second entry of $53.44 is a reclassification of expense from the Brooke licenses and permits expense account to the Brooke Project Magnolia CWIP account. The original entry is dated September 12, 2000.

The third entry of $455.00 is a reclassification of expense from the Brooke supplies expense account to Brooke Project Magnolia CWIP account. The original entry date is September 30, 2000.

The fourth entry of 749.25 is a reclassification of expense from the Pine contractual services expense account to the Brooke Project Magnolia CWIP account. The original entry is dated April 24, 2000.

The fifth entry of 749.25 is a reclassification of expense from the Strawberry Water contractual services expense account to the Brooke Project Magnolia CWIP account. The original entry date is May 25, 2000.

The sixth entry of $16,351.89 is a reclassification of amount from Brooke plant in service accounts, pumping equipment and transmission mains to Brooke Project Magnolia CWIP. The earliest recorded entry date is October 23, 2000.

B. <u>Deferred Income Taxes</u>

Q. WHY DOES STAFF EXCLUDE DEFERRED TAXES FROM RATE BASE?

A. Staff makes several arguments. First, because Pine Water did not exist from 1986 to 1996 it did not pay the taxes on contributions-in-aid of construction (CIAC) during this time period. *See* Fernandez Sb. at 7-8. Second, Staff asserts that the tax liability attributed to the timing differences between book and tax depreciation should be a reduction from rate base. Third, net operating losses, NOLs, are not recognized by the Commission. *Id.*

Q. HOW DO YOU RESPOND TO THESE ARGUMENTS BY STAFF?

A. With respect to the first argument, although Pine Water did not exist from 1986 to 1996, it's predecessors, E&R Water and Williamson Waterworks did. Pine Water was the result of a geographic re-organization approved by the Commission. *See* Decision No. 60972 (June 19, 1998). The Commission authorized Brooke to re-organize Desert Utilities, Inc., High Country Water Co., Inc., Pine-Oak Water Co.,

Inc., E&R Water, Williamson Waterworks, and C&S Water Co., Inc. into new entities based on more appropriate geographical locations. Pine Water was the result of combining parts of E&R Water and Williamson Waterworks. All of the underlying assets, liabilities, and equity balances, as well as the CC&N's were transferred to the new entities in accordance with this decision. The tax timing differences did not disappear as a result of the re-organizations. Commission policy directive allows for self-paid income taxes on advances and contributions as a rate base item. *See* Decision 55774 (October 21, 1987) at 3.

It is disingenuous of Staff to make the argument that because Pine Water did not exist from 1986 to 1996, it is not entitled (or required to per generally accepted accounting principles) to record deferred taxes attributed to E&R Water and Williamson Waterworks. For one thing, to the extent the deferred taxes related to CIAC, that CIAC was brought over to Pine Water's books as a deduction to rate base. Staff should not be allowed to bring over the reductions to rate base while leaving behind the additions. It also illustrates the inconsistency in Staff's position regarding Project Magnolia. On the one hand, Staff asserts that Pine Water owns Project Magnolia because it was in CWIP during E&R Water's prior case, while on the other hand denying Pine Water deferred taxes attributed to E&R Water.

Q. WHAT ABOUT STAFF'S SECOND REASON FOR ELIMINATING DEFERRED TAXES FROM RATE BASE?

A. As shown by Bourassa Rebuttal Exhibit 2 detailing the deferred tax calculation, contrary to Mr. Fernandez, there is a deferred tax liability component arises from tax depreciation timing differences which is a reduction to rate base. However, as I explained in my rebuttal testimony, it is the net effect of all three components (CIAC, depreciation, and NOL) that results in a net deferred tax asset. *See* Bourassa Rb. at 5-10.

Q. WHAT ABOUT STAFF'S THIRD REASON FOR ELIMINATING DEFERRED TAXES FROM RATE BASE?

A. With respect to the NOLs, if a company is tax normalized, then deferred taxes, whether positive (deferred tax liability) or negative (deferred tax asset) should be included in rate base. Under full tax normalization, negative deferred taxes are a true, paid up, asset on the company's books. Negative deferred taxes under IRC Section 263A provides that in the case of any property "produced" by the taxpayer should be capitalized. An asset is "produced" and/or "paid up" by the taxpayer (shareholder), by the reduction to the taxpayer's (shareholder) equity due to past losses.

Q. WHAT ARE THE THREE INDIVIDUAL TAX COMPONENT AMOUNTS?

A. The first component amount, attributed to taxable CIAC from 1986 to 1996, is approximately $221,700. This is a negative deferred tax or deferred tax asset. The second component amount, attributed to depreciation book and tax timing differences is approximately $62,200. This is a positive deferred tax or deferred tax liability. The third component amount, attributed to NOL carry forwards, is approximately $210,000. This is a negative deferred tax or deferred tax asset. The net of all three components is approximately $369,000, a net negative deferred tax or net deferred tax asset. (negative 221,700 plus 62,000 plus negative 210,000).

IV. INCOME STATEMENT.

Q. WOULD YOU PLEASE SUMMARIZE THE COMPANY'S PROPOSED ADJUSTMENTS TO REVENUES AND EXPENSES AND WHAT ADDITIONAL ADJUSTMENTS, IF ANY, YOU HAVE ACCEPTED FROM STAFF, THE DISTRICT, AND/OR MR. BRENINGER?

A. Yes. Rejoinder adjustments to operating expenses are shown in Rejoinder Schedules C-1 and C-2. My Rejoinder Schedules are attached hereto as Exhibit 2.

No additional adjustments recommended by the other parties have been accepted by the Company. There are, however, five rejoinder adjustments proposed by the Company.

Adjustment number 1 removes depreciation expense related to acceptance of Staff's level of post test year plant and corresponding retirements.

Adjustment number 2 lowers property taxes reflecting the reduction to property taxes caused by a lower proposed revenue amount – the third revenue component of the property tax calculation.

Adjustment number 3 increases rate case expense. The Company now requests rate case expense of $200,000 amortized over three years, increased from its original request of $150,000.

Adjustment number 4, removes Project Magnolia wheeling fees of $174,645 from transportation expenses. The Company now proposes to recover these expenses through the Company's proposed water hauling adjuster. I will discuss this later in my testimony.

Adjustment number 5 adjusts interest expense to a level which reflects an interest expense synchronized with the Company's rate base. The synchronization has resulted in a higher interest expense than the Company proposed in its direct or rebuttal filings. The higher interest expense has the effect of lowering income taxes that are included in rates. The Company has proposed this because rate base and capitalization are significantly different due in part to deferred taxes. Also, if the Company is to include deferred taxes in the rate base, it would be proper to allow rate payers the benefit of lower income taxes.

A. <u>Property Tax Expense</u>

Q. DOES THERE REMAIN A DISAGREEMENT WITH STAFF CONCERNING THE REVENUE COMPONENTS USED IN THE

PROPERTY TAX CALCULATION?

A. Yes. Staff uses historical years 2000, 2001, and 2002 plus Staff's recommended revenue increase, whereas the Company uses two times the 2002 historical revenues plus the Company's proposed revenues. As I have testified, the Company based its recommendation, in part, on Staff's proposal in the pending Arizona-American rate proceeding (Docket Nos. WS-01303A-02-0867 et al.). *See* Bourassa Rb. at 18. The Company believes that its recommendation better synchronizes property taxes with revenues than does Staff's in the instant case. Staff, in response, refers to the recent docket for Arizona Water Company's Eastern Group rate case. *See* Fernandez Sb. at 10. In short, Staff is being inconsistent and revisiting this issue from case to case only serves to add to rate case expense.

Q. WHAT POSITION DOES THE DISTRICT TAKE REGARDING PROPERTY TAXES?

A. The District has claimed that the Company made errors in reporting property tax expense for 2001 and 2002. *See* Jones Sb. at 5. The District asserts that this reporting error has caused property taxes to be overstated by $16,617 and would result in excess recovery by the Company through rates. *See* District Response to Company Data Request 4.1 (2), a copy attached hereto as Bourassa Rejoinder Exhibit 3. This is false.

The Company has readily admitted this error, identified during the discovery process. *See* Bourassa Rb. at 21. As I explained in my rebuttal testimony, these unintentional recoding errors have absolutely no bearing on the level of property tax expense the Company has requested to be included in operating expenses. Proposed property taxes are based on the Arizona Department of Revenue ("ADOR") formula, which formula uses the utility's revenues. The

amount of property taxes previously paid is totally immaterial. While Staff and the Company may disagree on which revenue years to use, they clearly agree that prior tax payments are irrelevant by employing ADOR formula for property taxes. *See* Fernandez Sb. at 10.

Q. DOES THE DISTRICT EXPLAIN WHY IT PERSIST IN ITS POSITION DESPITE YOUR EXPLANATION?

A. Not really. Clearly, the District misunderstands how the Company determined its recommended property tax expense and how the expense impacts rates. For example, the District seems to think the Company is requesting an unjustified return on accrued property taxes. In the Districts own words, "This excessive accrual would allow rate base to be excessively high . . ., allowing for an unjustified recovery of return of return on assets employed." *See* District Response to Company Data Request 4.1 (3), copy attached hereto as Bourassa Rejoinder Exhibit 4. There is no component of rate base for accrued property taxes. Further, accrued property taxes are a liability, not an asset. Therefore, I simply do not understand what the District is trying to convey and can only assume they do not understand the process.

Q. WHAT ABOUT MR. JONES' CLAIM THAT THE HISTORICAL AMOUNTS NEED TO BE ADJUSTED?.

A. Mr. Jones testifies that "the historical figures need to be adjusted to determine the real costs of property taxes for in 2000, 2001, and 2002." *See* Jones Sb. at 5. If the District wishes to make a recommendation for property taxes based on these any one or more of these historical year figures, I agree and adjustment is needed and the District has this information, provided during discovery, if it wishes to make such a recommendation. However, property taxes allowed in Commission decisions have, for many years, been based upon the ADOR formula making any

adjustment unnecessary from my perspective. Again, and notwithstanding Mr. Jones' apparent belief that the historical costs are used as the basis for Staff's recommended property tax expense (*Id.* at 5), Staff agrees with the Company and uses the same ADOR formula, which is based entirely on revenue. *See* Fernandez Sb. at 10.

B. <u>Rate Case Expense</u>

Q. WHY HAS THE COMPANY INCREASED ITS REQUESTED RATE CASE EXPENSE FROM $150,000 TO $200,000?

A. To reflect increased costs to prosecute the instant case that were not foreseeable at the time of the Company's original estimate. The intervention of the District has caused rate case expense to increase significantly. Frankly, the Company will now incur more than the amount requested but believes $200,000 is reasonable in this case.

Q. WHAT RECOMMENDATIONS HAS STAFF MADE REGARDING RATE CASE EXPENSE?

A. The Company and Staff accepted the Company's initial estimate and agreed that $150,000 was a reasonable amount of rate case expense before the District even moved to intervene, although Staff sought a longer amortization period. In surrebuttal, Staff testified it is willing to review any changes to the Company's proposed amount. *Id.* Surely, Staff will recognize that the District's intervention has had a substantial impact on rate case expense and support the Company's revised request. The record in this case reflects the extraordinary amount of work required to prosecute the instant case, especially since the District intervened.

Q. WHAT HAS THE DISTRICT PROPOSED REGARDING RATE CASE EXPENSE?

A. The District has not provided a specific rate case expense amount. However, the

District claims that the requested rate case expense is "unrealistically high due to the fact that the Application is full of incorrect and misleading information that the Staff and the District must ferret out." Jones Sb. at 5. Moreover, Mr. Jones testifies that "the level of allowable rate case expense to include should be based on the average percent of sales the Commission typically allows utility firms similar in size to PWCo." *Id.*

Q. HAS THE COMMISSION PRESCRIBED SUCH A FORMULA FOR DETERMINING ALLOWABLE RATE CASE EXPENSE?

A. In my experience, there is no set formula, nor should there be. Each case is different. A one size fits all approach would be arbitrary. Allowable rate case expense reflects the Commission's view as to the appropriate and reasonable level based the size, complexity, number, extent, and nature of the issues between the parties, and number and nature of the intervenors.

Q. IS PINE WATER'S REQUESTED RATE CASE EXPENSE "UNREALISTICALLY HIGH"?

A. No, not given the amount of time and resources spent defending the Company's rate filing. I have been working on the interim and permanent rate filing since January 2003, approximately 13 months and it will likely be an 18 month process before all is said and done. The total number of hours I spent through the end of January 2004 was just under 300 hours.

While this might seem like a lot of time at first blush, it really isn't when one considers such factors as the nature of the intervenors' claims as well as the number the data requests, in addition to the substantial work that is part of every rate case. There is also the nature and extent of the issues in this case and I assume there is no dispute that Pine Water has faced some very significant issues in this case including the issue of water shortages and what can be done to combat them.

Moreover, it must be recognized that my time, and that of counsel as well, covers preparation of two rate filings (the interim and permanent) including schedules, testimony, and responding to data requests from the parties, and attending procedural conferences.

Q. EXCUSE ME FOR INTERRUPTING, BUT WHY DOES THE COMPANY'S REQUESTED RATE CASE EXPENSE INCLUDE COSTS FROM THE COMPANY'S INTERIM RATE REQUEST?

A. For the same reason the Company is allowed to recover rate case expense in this case, it must go through Commission proceedings to adjust its rates. The Commission agreed that interim rate relief was necessary but the Company had no way of recovering the expense from the interim proceeding in the relief the Commission issued. Therefore, it has been included here.

Q. HAS THE COMMISSION ALLOWED COSTS FROM AN INTERIM RATE FILING TO BE INCLUDED IN RATE CASE EXPENSE IN A PERMANENT RATE FILING?

A. Yes. In the Far West Water Company rate case. *See* Decision No. 62649 (June 13, 2000). In that case, Far West had filed for interim rates during the period of time it constructed new water treatment facilities. The costs of the interim rate filing were included in rate case expense in the subsequent permanent rate case and allowed in the recovery of rate case expense by the Commission.

Q. CAN YOU PROVIDE SOME SORT OF COMPARISON TO SUPPORT YOUR VIEW THAT THE AMOUNT OF TIME SPENT BY YOU AND COUNSEL IS REASONABLE?

A. Yes, by comparison to the 300 hours I had spent through January 31, 2004, the District's witness Harry Jones has worked on this case since October of 2003, and has billed the District over 425 hours through December 2003. *See* District

Response to Company Data Request 1.1, a copy attached hereto as Bourassa Rejoinder Exhibit 5. Therefore, in 3 months, the District's witness has compiled more hours than I have in over a year, without even debating whether the District's efforts have helped ratepayers. It is a fact, though, that the District's accounting witness has produced no schedules or specific recommendations on the level of revenues, expenses, rate base, and/or cost of capital, the typical time consuming endeavors in a rate case. Instead, the District essentially relies on Staff's schedules and analysis, at least when it is convenient. Similarly, the District's legal counsel had spent approximately 175 hours on this rate case through January 2004. Again, that is only 4 months, a lot less time than the Company's lawyers have been involved.

Now, I am not criticizing the amount of time the District's lawyer and consultants have spent on this case. I am instead pointing out just how time consuming these cases are, even for intervenors like the District that do not have the burden of proof, do not need to review and respond to all other parties and do not prepare schedules and other evidence to support their position. If the District's consultants and lawyers can spend nearly 600 hours on this case in just 3-4 months at a cost of approximately $50,000, is it so unrealistic that over the course of some 18 months, two applications, multiple rounds of prefiled testimony, substantial discovery, two hearings, post-hearing briefing and exceptions and multiple appearances before the Commission the Company would incur $200,000 of expense? I think the answer is obvious.

Q. WHAT ABOUT THE DISTRICT'S CLAIM THAT THE RATE CASE EXPENSE IS HIGH DUE TO INCORRECT AND MISLEADING INFORMATION IT HAD TO FERRET OUT?

A. The District, particularly its witness Mr. Jones, has challenged virtually every

accounting entry made by Pine Water and BUI for the past several years. *See* Direct Testimony of Harry Jones ("Jones Dt.") at 5-15 and Jones Sb. at 3-8. Further, the District demanded 5 or more years of historical data and records of the Company, BUI, and Strawberry Water Company. In the end, though, while there have been some accounting and reporting errors in the prior years annual reports and the application, the District has not identified a single error that has materially changed the Company or Staff's conclusions and recommendations in this case.

Q. IS REQUESTING 3-5 YEARS OR MORE OF RECORDS UNUSUAL?

A. Not with respect to plant. If for example, if it has been 5 or more years since a utility filed a rate case, audits of plant would be conducted by Staff to verify plant balances. Plant is the largest component of rate base and warrants scrutiny. In the case of revenue and expenses, in my experience, the test year is always audited, and in some cases where a specific issue needs be resolved relating to the test year, maybe one or two years prior to the test year will suffice. Even then, the scope is limited and is first based upon a review of general ledger information and some clear indication that the issue will have a material impact on ratemaking. Subsequently, analytical procedures, inquiries and a sampling of transactions are performed to achieve audit objectives. In the instant case, however, the District has taken a "shot gun" approach and challenged every thing for five, and in some cases as long as seven years. Ultimately, the District was limited to three years worth of expense data, which still had the impact of increasing rate case expense.

Q. IN YOUR VIEW, MR. BOURASSA, WHAT IS THE PURPOSE OF DISCOVERY?

A. One primary purpose of discovery is for each party to gain an understanding of the rate base, revenues, and expenses upon which rates will be based. Every utility filing a rate case expects a reasonable amount of discovery. What is unusual in this

case is not only the scope of discovery, which for the District went far beyond the test year and to other entities not before the Commission in this docket, but the accusations made on the part of the District. In short, the District's zeal to cast aspersions regarding our competence, credibility and integrity has obfuscated the real issues in this case. As I stated, despite the District questioning everything the Company has done, it has not pointed to anything that has had a material adverse impact on rates or ratepayers. The process, however, has increased rate case expense which the Company should be allowed to recover in rates.

Q. IS IT UNUSUAL IN RATE CASES FOR PARTIES TO BASE THEIR RECOMMENDATIONS ON INFORMATION FOUND DURING THE DISCOVERY PHASE?

A. No. Nonetheless, the District points to Staff's proposed adjustments to either plant in service or expenses in order to bolster its claim that there can be no confidence in the accuracy and reliability of the records in this case. *See, e.g.*, District Response to Data Request 4.1 (17), a copy attached hereto at Bourassa Rejoinder Exhibit 6.

Typically, during the discovery phase of rate proceedings, Staff and other parties find errors or other information upon which they make their recommendations concerning rate base, revenue, and expenses as well as appropriate pro forma adjustments. For my part, I have never been involved in a case where one or more parties have not found the need for expenses to be adjusted or where plant was not properly recorded and needed to be reclassified. The errors are the result of audits, and frankly, part of the intended result at the end as all parties have a clean slate from which to go forward with the specific utility. Any reasonable person that has been involved in Commission rate proceedings would consider this to be common and the errors that do not impact rates minor.

Q. CAN YOU IDENTIFY THE ADJUSTMENTS STAFF PROPOSED THAT THE DISTRICT RELIES ON TO BOLSTER ITS POSITION?

A. Yes, and none of them have a significant impact on rates, nor do they reflect some sort of larger problem lying below the surface, as Mr. Jones implies. *See* Jones Dt. at 4, Jones Sb. at 3, District Response to Data Request 4.1, a copy attached hereto at Bourassa Rejoinder Exhibit 7.

The first Staff adjustment was to sales tax and was a small adjustment of $266. The Company accepted this adjustment.

Second, I believe the plant in service adjustment made by Staff to which the District refers was for post test year plant. There has always been controversy over post test year plant and post test year plant has been allowed in prior rate proceedings. *See* Bella Vista Water, Decision, 65350 (Nov. 1, 2002); Paradise Valley Water Company, Decision 61831 (July 20, 1999). Now, however, the Company has accepted Staff's post test year plant amount.

Third, Staff's proposed an adjustment to materials and supplies expense. This adjustment is not a result of an error in record keeping. It is the result of Staff's belief that the going forward amount of materials and supplies should be an average of the prior three years. The Company and Staff are in disagreement on this issue, but again, it has nothing to with the accuracy of the amount recorded during the test year.

Finally, during Staff's audit, they found additional invoices for purchased water that were hauling invoices. The amount was for less than $2,200 and the Company accepted this adjustment.

Q. WOULD YOU PLEASE CONTINUE WITH YOUR DISCUSSION OF HOW THE DISTRICT HAS EXACERBATED RATE CASE EXPENSE DUE TO THE EXTENT OF ITS CLAIMS AND DISCOVERY CONDUCT?

A. Sure. As another example, the District has claimed that the Company continues to present misleading information related to what the words "transportation costs" mean. *See* Jones Sb. at 4. Mr. Jones' argument is based on his concern over the recording of the wheeling fees charged by Brooke (but never paid by Pine Water) in the incorrect NARUC account. According to Mr. Jones "'this improper use of the required system of accounting is misleading and confusing and adds greatly to the mistrust of [the Company]." *Id.*

While I do not disagree with Mr. Jones that wheeling charges should be recorded in the proper NARUC account, I disagree that the Company has mislead anyone or that any of the parties misunderstand what expenses have been included in transportation expense. As stated above, one of the purposes of discovery is ask questions regarding test year expenses. The real question is not what account this expense was recorded in, it is the level of wheeling charges incurred during the test year. All relevant information concerning this operating expense, like every other operating expense upon which the Company's proposed revenue requirement is based, was provided to all parties when requested. Further, there is absolutely no evidence that the Company attempted to hide, misdirect, or mislead Staff or any other of the party at anytime.

Q. HAS STAFF CLAIMED THE COMPANY WAS MISLEADING WITH RESPECT TO THE WHEELING FEES?

A. No.

Q. PLEASE CONTINUE.

A. Mr. Jones claims water hauling costs were misstated and misleading. *See* Jones Sb. at 6. First, Mr. Jones is actually referring to transportation expense, not water hauling costs. Second, in my rebuttal, I admitted to my error in misclassifying 2000 contractual services as transportation expenses on the E-2 schedule. *See*

Bourassa Rb. at 23. Besides ignoring my rebuttal, Mr. Jones never explains how this three year old expense amount is relevant to the current test year amount. It does not. As I testified, this classification error has no bearing on the level of transportation expenses included in operating expenses during the test year and upon which the Company's direct and rebuttal revenue requirement is based.

In yet another example, Mr. Jones claims that because the Company reduced test year outside services expense for ratemaking by $38,000, that somehow the unadjusted test year amount was "massive." *See* Jones Sb. at 6. What Mr. Jones doesn't understand is that the Company's adjustment was based on a forward looking approach and it is based on what the Company has determined to be the appropriate level of this expense on a going forward basis. It could just as well not have adjusted outside services, a valid test year expense. In any case, as I explained, adjustments are typically proposed, and are allowed by rule, by one or more of the parties to a rate case. *See* A.A.C. R14-2-103(i) (definition of pro forma adjustments). Actual expenses in future year may be much higher and it is merely the District's unsupported speculation that unadjusted contractual services expense during the test year was "massive."

Q. HAS THE DISTRICT MADE A SPECIFIC RECOMMENDATION AS TO THE LEVEL OF OUTSIDE SERVICE EXPENSE?

A. No, apparently the District will support any number it does not deem "massive."

Q. DOES STAFF PROPOSE A DIFFERENT AMOUNT THAN THE COMPANY FOR OUTSIDE SERVICES?

A. No.

Q. ANY OTHER EXAMPLES?

A. Yes, Mr. Jones claims I made "massive" corrections to materials and supplies (repairs and maintenance) for 1999 ($16,325) and 2001 ($4,447). *See* Jones Sb. at

6. Year 1999 was not shown on the E-2 schedule. For the year 2000, the E-2 schedule reflects $4,447 in repairs and maintenance.

The corrections to which Mr. Jones refers are to the annual reports and occurred outside the test year. During discovery, it was determined that in 1999 and 2001 repairs and maintenance was reported in miscellaneous expense on the annual reports. Yet, these errors have no bearing on either actual test year expense or adjusted test year expense proposed by the Company. Nevertheless, according to the District, the Company has admitted the test year was overstated by $17,000. *See* District Response to Data Request 4.1 (4), copy attached hereto at Bourassa Rejoinder Exhibit 8.

I am not aware of any evidence of an overstatement. Staff did not find actual test year expenses to be overstated. The proposed adjustments to lower the expense by both the Company and Staff is simply based on what each of the parties believe is the most appropriate level of these expenses on a going forward basis. Again, the reporting errors have no impact on the determination of revenue requirement by either the Company, or Staff for that matter.

Q. BUT STAFF DOES PROPOSE A DIFFERENT AMOUNT THAN THE COMPANY FOR MATERIALS AND SUPPLIES?

A. Yes, but it has nothing to do with a reporting error that occurred in 1999 or 2000 annual reports. Staff proposes using an estimate based on three year average (2000, 2001, and 2002). Staff asserts its estimate is better than the Company's estimate, yet Staff ignores my testimony that 2003 materials and supplies expense through October 2003 (10 months) was $28,400, which is greater than Staff's proposed level of $25,293 for an entire year. *See* Bourassa Rb. at 19. As of December 2003, the materials and supplies expense is $46,600. This amount is approximately $3,000 higher than the amount proposed by the Company and

approximately $21,000 greater than the amount proposed by Staff. Therefore, the Company believes it proposed materials and supply expense is a far superior reflection of the proper amount for materials and supplies on a going forward basis.

Q. ARE THERE FURTHER EXAMPLES?

A. Yes, many, but I think those I have discussed above present a clear picture of how the District has misunderstood the process, expanded the issues, made baseless accusations and inflated the Company's rate case expense.

C. <u>Project Magnolia</u>

Q. YOU ALSO MENTIONED EXPENSE ADJUSTMENTS RELATED TO PROJECT MAGNOLIA. WOULD YOU PLEASE DISCUSS THOSE ADJUSTMENTS?

A. As I said, I have removed the Project Magnolia wheeling fees of $174,645 from transportation expenses because the Company now proposes to recover these expenses through the Surcharge Tariff.

Q. HAVE YOU REMOVED ANY OTHER EXPENSES RELATED TO PROJECT MAGNOLIA?

A. No. BUI recovers its Project Magnolia operating expenses through the wheeling fee, which is contrary to Staff's assertion that the operating costs for the pipeline are included in the Company's operating expenses. *See* Fernandez Sb. at 8. Specifically, Mr. Fernandez relies on the Company's response to data request CF 9-2 but that schedule shows the BUI costs attributed to Project Magnolia and does not show amounts allocated to Pine Water. *See* Company Response to Data Request CF 9-2, copy attached hereto at Bourassa Rejoinder <u>Exhibit</u> 9.

V. <u>COST OF CAPITAL.</u>

A. <u>The Company's Position and Staff's Operating Margin Approach.</u>

Q. HAVE YOU PREPARED COST OF CAPITAL SCHEDULES IN

CONJUNCTION WITH YOUR REJOINDER TESTIMONY?

A. Yes. Rebuttal Schedule D-1, page 1, shows the weighted cost of debt, equity, and capital at the rebuttal stage. My recommendation on the cost of equity has not changed and remains at 12 percent. The required fair value return or weighted cost of capital remains at 10.99 percent as contained in the Company's rebuttal filing.

Rejoinder Schedule D-2 reflects the Company's proposed long-term debt. Rejoinder Schedule D-1, page 2, reflects the Company proposed equity. The Company has not modified its proposed conversion of the $533,000 inter-company debt to $164,000 long-term debt and $369,599 equity. Nor has the Company changed its proposed interest rate of 10 percent on the long-term debt.

Q. HAVE YOU UPDATED YOUR COST OF CAPITAL SCHEDULES?

A. No. Frankly, we didn't have sufficient time after Staff presented entirely new cost of capital testimony in its surrebuttal, as an alternative position. Instead of updating my own analysis, I had to assess and prepare a response to Staff's.

Q. DO YOU BELIEVE YOUR RECOMMENDATIONS ON THE COST OF CAPITAL WOULD HAVE CHANGED IF YOU HAD UPDATED YOUR SCHEDULES?

A. Not materially, although if anything it would have led to a higher cost of equity. Certainly the record in this case now reflects a greater degree of risk than was present when I conducted my initial analysis and we had no indication Staff would recommend confiscating Project Magnolia from BUI or that the District would aggressively seek to obtain Pine Water's CC&N and other assets. Therefore, while I did not prepare a specific update using the same formula used in my initial recommendation, I still conclude the cost of equity for Pine Water should be at least 12 percent. This is the minimum required to ensure confidence in the financial integrity of Pine Water, maintain and support its credit, enable the

Company to attract capital and earn a fair rate of return.

Further, I do not believe an equity or debt investor in Pine Water would accept the 9% return on equity now deemed reasonable by Staff. Staff has completely ignored the risks faced by Pine Water and failed to account in any way for the Company's operating characteristics that impact the relative risk compared to the nationally traded water companies listed in Value Line. My analysis does not ignore these risks and is therefore superior to Mr. Reiker's because these risks are certain to be considered the investor. *See* Direct Testimony of Thomas J. Bourassa ("Bourassa Dt.") at 33-42.

Q. YOU STATED THAT PINE WATER'S RISKS ARE GREATER NOW THAN WHEN YOU PREPARED YOUR DIRECT TESTIMONY. WOULD YOU PLEASE ELABORATE ON THAT TESTIMONY?

A. Sure, we do not have to look beyond the recommendations of Staff and Mr. Breninger and the actions and recommendations of the District in this case. Here are just a few examples of what I mean:

- The District has done everything possible, at the very least, to delay rate increases. The District has even gone so far as to file a motion to have the Company's CC&N deleted.
- The District, in my opinion, is out to discredit the Company and hamper its financial condition in order to acquire its assets at the lowest possible price.
- The District's own witnesses have conflicting views about the water supply in Pine. District member Breninger also offers recommendations questioned by the District. Staff is silent on water supply issues and the water supply limitations Pine Water faces are not getting any better.
- Staff has recommended denial of Pine Water's proposal to improve its financial health by converting a current liability (the inter-company payable) to some debt and mostly equity.
- Staff has recommended Pine Water purchase Project Magnolia with financing that includes debt without addressing the debt Pine Water

already has on the books.

- Staff's recommended financing on Project Magnolia does not allow for timely repayment of the inter-company payable.
- The Commission has denied the Company's proposal for an interim surcharge to cover wheeling fees until the matter can be decided at the conclusion of the instant case leaving Pine Water's financial condition to deteriorate further.

Q. JUST TO BE CLEAR, THOUGH, STAFF'S PRIMARY POSITION STILL RESULTS IN AN 11 PERCENT RETURN ON FAIR VALUE RATE BASE?

A. Yes.

Q. DOES THIS MEAN THERE IS NO REAL DISAGREEMENT BETWEEN STAFF AND THE COMPANY REGARDING THE FAIR VALUE RETURN?

A. Yes, and no. It depends on what portions of Staff's testimony we are assessing. It is true that Staff continues to recommend an operating margin of 10 percent, which translates to an 11 percent return on fair value rate base. The Company recommends a 10.99 percent return on fair value rate base. Therefore, with Staff's so-called primary position, the difference between Staff and the Company is very small.

However, as I mentioned, Staff has offered a new alternative return on fair value rate base of 8.7 percent. *See* Surrebuttal Testimony of Joel M. Reiker ("Reiker Sb.") at 37. Under this approach, the Company and Staff are over 229 basis points a part. Of course, the end result of Staff's so-called primary position is also 229 basis points is higher than its alternative position.

Q. WHAT COST OF EQUITY DOES STAFF RECOMMEND BY USING THE OPERATING MARGIN METHOD?

A. The operating margin method translates to a 14.45 percent cost of equity under Staff's proposed capital structure.

Q. WHAT COST OF EQUITY DOES STAFF RECOMMEND UNDER THE NEW ALTERNATIVE COST OF CAPITAL TESTIMONY?

A. 9 percent.

Q. WHAT COST OF EQUITY DO YOU RECOMMEND?

A. 12 percent.

Q. HAS STAFF CHANGED ITS RECOMMENDATION WITH RESPECT TO THE COMPANY'S PROPOSED CONVERSION OF THE INTER-COMPANY PAYABLE OF $533,000?

A. No, even though I explained that the portion of the inter-company payable to be converted to long-term debt is for plant and that the balance was to be converted to equity. *See* Bourassa Dt. at 11, Bourassa Rb. at 29. However, while Staff ignored this testimony in its surrebuttal testimony, in a response to a Company data request regarding the disposition of the $533,000 inter-company payable, Staff responded as follows:

> Staff is not recognizing the inter-company payable in its recommended rates. However, Staff believes that the Company is in a better position to make a determination as to the proposed treatment of the payable. ***The Company's choices could include writing-off the payable, issue equity or payback the inter-company payable.*** (Staff Response to Company Data Request 2.2, copy attached hereto at Bourassa Rejoinder Exhibit 10.) *(Emphasis added).*

Q. HAS STAFF MADE A FINANCING RECOMMENDATION?

A. Yes. Staff's recommends that Pine Water be authorized to issue debt and equity to finance Project Magnolia in the amount of $449,598. *See* Reiker Sb. at 4. Staff proposes 33 percent debt and 66 percent equity for financing Project Magnolia, which translates to $149,979 in long-term debt and $299,619 in paid-in-capital or equity. *See id.*; *see also* Fernandez Sb. at 1.

This is astonishing. First, Staff is proposing financing to purchase an asset

that is not for sale. Second, Staff's proposed debt and equity allocations are based on the Company's proposal to convert the inter-company payable. Why not some other ratio of debt to equity? Why should Staff assume that BUI is willing to sell Project Magnolia for a capital asset to be recorded in roughly the same proportions as it sought to treat the inter-company payable? I assume BUI would not be willing to agree to this, especially given that BUI would be lending additional funds to Pine Water when it is already owed $588,000 by Pine Water ($533,000 payable plus $55,000 long-term debt) – amounts it does not appear Pine Water can ever repay.

Third, Staff recommends an interest rate of only 8.0 percent over a 15 year term. There is no credible evidence that any creditor would be willing to lend additional funds to Pine Water for that rate or for that period of time. *See* Reiker Sb. at 4. Considering Pine Water's current financial condition, including the $588,000 of debt yet to be paid to BUI, an 8.0 percent interest rate would be unconscionable. Staff has yet to provide a name of a credible third party lender willing to lend money to Pine Water at all, never mind the interest rate they would charge.

Q. WHY DOES STAFF PROPOSE FINANCING FOR PROJECT MAGNOLIA?

A. For the same reason Staff now offers cost of capital testimony after previously claiming it could not be done. *See* Direct Testimony of John S. Thornton ("Thornton Dt.") at 3. Staff has now realized that when it asserted Project Magnolia was owned by Pine Water and included it in the proposed rate base, no cost of the pipeline was reflected in the capital structure. *See* Reiker Sb. at 3.

Q. ARE YOU SAYING STAFF HAS ADMITTED THAT PROJECT MAGNOLIA IS NOT REFLECTED ON THE BOOKS OF PINE WATER?

A. Yes.

Q. WHAT IS STAFF'S PROPOSED CAPITAL STRUCTURE UNDER EITHER OF STAFF'S RECOMMENDATIONS ON THE FAIR VALUE RETURN?

A. Staff's proposed debt is $205,332 and proposed equity is $299,619. Staff's capital structure results in approximately 60 percent debt and 40 percent equity.

Q. CAN YOU EXPLAIN HOW THE DEBT AND EQUITY AMOUNTS ARE DERIVED?

A. As you will recall, the Company's debt was approximately $55,353 and equity was approximately negative 152,996 at the end of the test year. With $149,979 additional debt and $299,619 of additional equity, Staff's proposed debt becomes $205,332 (55,353 plus 149,979) and proposed equity becomes $146,623 (negative 152,996 plus 229,619).

Q. HOW DOES STAFF RECONCILE CONTINUING TO RECOMMEND AN 11 PERCENT RETURN ON FAIR VALUE RATE BASE EVEN THOUGH ITS FINANCING RECOMMENDATION RESULTS IN POSITIVE EQUITY?

A. Staff recommends an operating margin method due to the Company's small rate base. *See* Direct Testimony of Claudio M. Fernandez at 2. Frankly, I suspect Mr. Reiker was simply stuck with Mr. Thornton's position and although he preserved it as the "primary" approach, he firmly believes his cost of capital recommendations should prevail.

Q. DO YOU AGREE WITH STAFF'S OPERATING MARGIN APPROACH IN THIS CASE?

A. Yes, if the operating margin approach results in a return sufficient to maintain the financial integrity of Pine Water, maintain and support the Company's credit, attract capital, and is comparable to other firms with corresponding risks. Simply

looking at the resulting return on rate base of 11%, I can live with it. However, Staff's recommended financing of Project Magnolia with $149,979 of new long-term debt and $229,610 of new equity is not acceptable or appropriate while the existing debt of $55,353 and existing $533,000 inter-company payable remain unpaid.

Q. WOULD YOU PLEASE ELABORATE?

A. Yes. Under Staff's recommendations, the available cash flows will be insufficient to service the debt and to repay the inter-company payable. I have prepared a schedule, attached at Bourassa Rejoinder Exhibit 11 to illustrate. Under Staff's 10 percent operating margin approach, there would be insufficient cash flows for Staff's proposed new debt of $149,979, existing debt of $55,353, and assuming the inter-company payable was supposed to be paid back in 5 years. In fact, cash flow will be negative by over 30,000 per year.

Furthermore, the analysis assumes BUI is willing to wait an additional 5 years to be repaid and without receiving any interest. It also assumes no dividends will be paid. Under this scenario, there will be no cash available for plant additions in the next five years, which of course conflicts with Breninger and the District's recommendations and the realities of providing water service in Pine, Arizona.

Q. DOES STAFF'S RECOMMENDED RETURN OF 8.7 PERCENT PROVIDE SUFFICIENT CASH FLOWS?

A. No. It is worse. The schedule shows that cash flow will be negative by over $45,000 per year.

B. Staff's Cost of Capital Recommendations.

Q. DO YOU ACCEPT MR. REIKER'S CORRECTIONS TO YOUR DCF COMPUTATIONS?

A. Yes.

Q. DO THE CORRECTIONS CHANGE YOUR RECOMMENDATIONS ON THE COST OF EQUITY FOR PINE WATER?

A. No.

Q. PLEASE SUMMARIZE YOUR CRITICISMS OF STAFF'S ALTERNATIVE COST OF CAPITAL TESTIMONY?

A. Staff's equity recommendation omits the risks this Company faces. The only risk Staff recognized in its equity recommendation is the amount of equity, as a percentage of capitalization, which totally disregards operating characteristics. In fact, Staff's cost of capital recommendation is generic and determined without any examination or independent consideration of this Company. The fact that Staff totally disregards the operating characteristics of the Company makes Staff's alternative cost of equity and capital recommendation meaningless.

Q. WHAT DO YOU MEAN STAFF'S TESTIMONY IS GENERIC?

A. This testimony can be applied to any water utility, such as Arizona Water Company or Arizona-American Water Company. In fact, Staff admits the cost of capital computations are for an investment in the water industry. *See* Reiker Sb. at 36. There is no consideration of the risks the Company faces. According to Staff, the cost of capital for Pine Water is the same at that for any of the nationally traded Value Line water utilities. It is also the same as Staff recently recommended for Arizona Water Company, Arizona American Water Company and for Arizona Public Service.

Q. IS PINE WATER COMPARABLE TO THE NATIONALLY TRADED WATER COMPANIES?

A. Only to the extent it is a regulated utility company. Beyond that, there is no comparison. Pine Water is a high risk company deserving of a significant adjustment in its allowed equity return. Although Mr. Reiker's recommendations

rely on the premise that he is comparing Pine Water with other companies of comparable risks and on the notion that his recommendation provides for a return which is sufficient to maintain the financial integrity of Pine Water, maintain and support Pine Water's credit, attract capital, and is comparable to other firms with corresponding risks, in reality his recommendations do none of these things.

Q. ARE THE RISKS FACED BY PINE WATER COMPARABLE TO ARIZONA WATER, ARIZONA-AMERICAN OR ARIZONA PUBLIC SERVICE?

A. No, although in the pending Arizona-American rate proceeding, for example, Mr. Reiker recommends the same cost of equity of 9.0 percent. (Docket Nos. WS-01303A-02-8867 et. al), Surrebuttal Testimony of Joel Reiker at 38. Arizona-American has a capitalization of over 276 million dollars. The smallest company is my sample Value Line water utilities has a market capitalization of $129 million (Southwest Water). Compared to Pine Water, which has a rate base of approximately $700,000, Southwest Water is 129 times the size.

Q. WOULD AN INVESTOR IGNORE THE RISKS OF PINE WATER IF HE/SHE WERE CONSIDERING INVESTING IN PINE WATER?

A. No. An investor in Pine Water would most certainly look at the Company's specific risks, as Mr. Hardcastle, a shareholder in BUI has made clear. Hardcastle Rj. at 12-13. The investor would most certainly consider operating characteristics of Pine Water as compared to the nationally traded companies. *See* Bourassa Dt. at 34-35. Nevertheless, Mr. Reiker dismisses my testimony on the specific risks Pine Water faces because they are unique to the Company and, according to Mr. Reiker, are diversifiable and investors do not expect to be rewarded for them.

Although Mr. Reiker has repeatedly made this assertion elsewhere, no where is it more far-fetched than this case. Just take the fact that an investor in

Pine Water would not be (and has not been) paid a dividend, has no publicly available market to sell his/her stock when his/her investment horizon has been reached, would be investing in a company with high financial risk that translates to a higher likelihood that he/she would lose some or all of his/her investment (no earnings growth). The current financial condition and past financial history validate these facts. Shareholder equity is negative and no dividend has ever been paid. And I have not even mentioned substantial operating losses requiring shareholder subsidy, or delayed rate increases, confiscation of assets or the District's attempt to take away the Company's CC&N. Would Mr. Reiker really ignore these risks because some college finance textbook says he would if he owned this Company? I don't believe so and the Commission should not believe Pine Water's investors will ignore these specific risks because they have a diversified portfolio.

Indeed, BUI is the sole investor in Pine Water. Mr. Reiker is actually assuming that BUI is able to hold a diversified portfolio, so that when BUI commits an additional $359,000 in Pine equity, as proposed by the Company, BUI has sufficient funds to invest in other investments to diversify away from Pine Water's risks. This is an incredible and outlandish assumption upon which to rest his recommendations.

Q. ARE THERE INCONSISTENCIES CONTAINED IN MR. REIKER'S TESTIMONY?

A. Yes. Mr. Reiker states that opportunity cost is forward looking, yet he uses a combination of historic and projected measures of dividend growth, earnings per share growth, and intrinsic growth to derive dividend growth in Schedule JMR-4, coupled with spot prices for stock to compute dividend yield. *See* Reiker Sb. at 14. Then, he cities another source which states that analysts' projections of future

earning are generally high, but proceeds to use the projected earning projections. *Id.* at 23. Mr. Reiker's citation to the problem with analyst's projections apparently don't seem matter when he estimates the one and five year dividend growth rates. *Id.* at 32.

Mr. Reiker's Schedule JMR-1 assumes that utilities do not have to continually invest in new plant. That assumption is obviously absurd.

Mr. Reiker testifies that having water stocks sell at 2.3 times book value is a problem. When stocks are selling at or below book value, that stock is considered to in major trouble.

To make matters really inconsistent, he testifies over and over that the cost of capital can only be computed based on market forces, then recommends that his market equity return should be applied to a book based rate base.

Q. DIDN'T YOU COMPUTE THE COST OF CAPITAL IN THE SAME MANNER?

A. Yes, in fact my cost of capital computations I tried to replicate the methods Staff has used of late in other cases. However, the more I read Mr. Reiker's testimony, the more I realize that I should not have attempted to replicate his methods. Mr. Reiker obviously did not look very closely at my schedules that compared Pine Water to the nationally traded water companies. The major difference is that my cost of capital recognizes Company specific risks, whereas Mr. Reiker only recognizes financial risk arising from the ratio of debt to equity in the capital structure.

Q. MR. REIKER SIDE STEPS THE ISSUE THAT SMALLER WATER UTILITIES IN YOUR SAMPLE MAY BE TARGETED FOR ACQUISITION. WOULD YOU PLEASE ADDRESS THAT TOPIC?

A. One only needs to look at the price earnings multiples (Market Price divided by the

earnings per share) to determine if the smaller companies are possible acquisition candidates or not. Middlesex, Connecticut, and Southwest Water had above average price earnings multiples at December 31, 2002. Aqua America, Inc. (formerly Philadelphia Suburban) had a high price earnings ratio due to the return on book equity.

Q. HOW DO YOU PROPOSE THAT THE COST OF CAPITAL BE COMPUTED?

A. Comparable earnings should be used as the floor of what Pine Water is entitled to earn on equity. *See* Bourassa Rejoinder Schedule D-4-1 showing the current and authorized rates of return on equity as reported in C.A. Turner Utility Reports for the nationally traded companies. The simple averages of these figures are 9.54 percent and 10.31 percent, respectively. The actual returns exceed Mr. Reiker's recommended equity return in the instant case by .54 percent to 1.31 percent, respectively.

Value Line projects equity returns for 2004 and for 2006-2008 to be 10.5 and 12 percent, respectively. *See* Bourassa Rejoinder Schedule D-4-2. The estimated returns projected by Value Line exceed Mr. Reiker's recommended equity return in the instant case by 1.5 percent to 3.0 percent.

Q. DOES MR. REIKER HAVE A PROBLEM WITH PROJECTED EARNINGS?

A. Yes, he is of the opinion that projected earnings are usually too high. *See* Reiker Sb. at 10. He cites Jeremy J. Siegel, Stocks for the Long Run, as the basis for this opinion.

Q. DOES MR. REIKER HAVE A PROBLEM WITH USING COMPARABLE EARNINGS?

A. Yes, he is of the opinion that the approach is circular. *Id.* at 15. Additionally, he

opines that comparable earnings cannot be used due to the market to book ratio being above 1; that DCF and CAPM have supplemented modern corporate finance, and comparable earnings approach does not rest easily on the concept of opportunity cost, which the cost of equity represents. *Id.*

Q. BUT ISN'T MR. REIKER'S COST OF CAPITAL PREMISED ON RETURNS BASED ON WATER UTILITIES?

A. Yes. Both Mr. Reiker's cost of capital study and my cost of capital study are premised on returns from water utilities. I guess what he means is that circular reasoning is contained throughout the studies.

Q. WHAT ARE THE ADVANTAGES OF THE COMPARABLE EARNINGS METHOD, AS COMPARED TO THE DCF AND CAPM METHODS OF DETERMINING AN EQUITY RETURN?

A. The following quote is from Roger Morin's *Utilities Cost of Capital*, Public Utilities Reports, 1984, at 229:

> "The comparable earnings standard is easy to calculate, and the amount of subjective judgment required is minimal. The method avoids several of the subjective factors involved in other cost of capital methodologies. For example, the DCF approach requires the determination of the growth rate contemplated by investors, which is a subjective factor. This method avoids several of the subjective factors. The CAPM requires the specification of several expectational variables, such as market return and beta. In contrast, the comparable earnings approach makes use of simple readily available accounting data; return on book equity data is widely available on computerized data bases for most public companies and for a wide variety of market indices."
>
> * * * *
>
> "The method is easily understood, and is firmly anchored in regulatory tradition. The method is not influenced by the regulatory process to the same extent as market-based methods such as the DCF and CAPM. The base to which the comparable earnings standard is applicable is the utility's book common equity, which is much less vulnerable to regulatory influences than stock price which is the base to

which the market-based standards are applied. Stock price can be influenced by the actions of regulators."

(Emphasis added).

Q. WHAT ARE THE DISADVANTAGES OF THE COMPARABLE EARNINGS METHOD?

A. Again quoting from Dr. Morin: "The apparent simplicity of the method is overshadowed by several practical difficulties encountered in executing the method, some which are more illusory than real." *Id.* at 230. (Emphasis added). These practical difficulties include risk comparability, circularity, time period, measurement error, and conceptual shortcomings. Dr. Morin lists the criteria for selecting comparable companies comparable in risk to a specified utility might be screened from a computer base using the following:

(1) They should have a standard deviation of market return and/or beta as close as possible to the subject utility;

(2) They should be publicly traded companies to ensure data availability;

(3) The should have a given Value Line rating indicating a degree of safety similar to the subject utility;

(4) They should have a given Standard & Poor's quality rating comparable to the subject utility; and

(5) The companies should be non-regulated industries so as to avoid circularity problems.

Id. As Pine Water Company's stock is not publicly traded, meeting these criteria is very difficult.

Q. DOES DR. MORIN PROVIDE ANY GUIDANCE ON MR. REIKER'S CIRCULARITY ARGUMENT?

A. As to the problem of circularity, Dr. Morin states the "care must be taken not to include other utilities in the sample, since the rate of return on other utilities depend on the allowed rate of return." *Id.* This is an obvious problem, as there are

few, if any industrials that meet the above 5 criteria when applied to the water industry. Both Staff and I used these same water companies to derive their recommended rates of return. However, use of the actual and projected returns on water companies is simple, and non-subjective

Similarly, as to time period, Dr. Morin writes that "Historical returns on equity vary from year to year, responding to the cyclical forces of recession and expansion and to economic, industry-specific marked and company specific trends." *Id.* at 231. In the instant case, I showed the actual returns earned by companies in the water industry from 2000 to 2002, and the returns were increasing. *See* Bourassa Dt. at Schedule D-4.22. I listed the returns of these water companies through April 2003, via inclusion of the C.A. Turner returns. *Id.* at Schedule D-2, Page 1. Finally, I listed the projected or expected returns from Value Line. *Id.* at Schedule D-4.4, Page 1.

Q. ANYTHING ELSE FROM DR. MORIN THAT CONTRADICTS MR. REIKER'S ANALYSIS?

A. Dr. Morin's concern with measurement error deals with the various options available under generally acceptable accounting principles, which could lead to differences in inter-company accounting, which would make the financial statements misleading. All the sample companies I used are required to follow the National Association of Regulatory Utility Commissioners' Uniform System of Accounts. Thus, this disadvantage should not occur.

Dr. Morin summarizes the disadvantages as follows:

> All of the conceptual flaws in the comparable earning standard discussed in this section boil down to a repudiation of the core assumptions that accounting rates of return are valid proxies for opportunity costs. The Comparable Earnings test does not rest well with economic theory. But, if the basic purpose of Comparable Earnings is not to determine the true economic return, then all the arguments of this

> section evaporate. If regulation considers a fair return as one which is equal to the book rates of return earned by comparable risk firms rather than one which is equal to the cost of capital of such firms, the Comparable Earning test is relevant. This narrow definition of fairness, rooted in the traditional legalistic interpretation of the Hope language, validates the Comparable Earning test." *Id.* at 235.

Q. AGAIN, WHAT RETURN ON COMMON EQUITY ARE YOU RECOMMENDING?

A. The minimum return on common equity should be the 12.00% cited in Value Line. This rate of return is premised on book valued equity, which the Commission will apply in the instant case.

VI. <u>RATES AND RATE DESIGN.</u>

Q. PLEASE DISCUSS YOU REBUTTAL RATE SCHEDULES?

A. Rejoinder Schedule H-3 shows the Company's proposed rejoinder rates.

Q. DOES STAFF CONTINUE TO PROPOSE AN INCREASING BLOCK TIER RATE STRUCTURE REGARDLESS OF METER SIZE?

A. Yes. Staff continues to advocate a one "size fits all" approach. In Staff's opinion, "...the rate structure should be uniform and non-discriminatory regardless of the meter size, especially when you consider Pine's water shortage situation." *See* Fernandez Sb. at 12.

Q. DOES STAFF PROVIDE ANY SUPPORT OR EVIDENCE TO WHY THE TIER STRUCTURE SHOULD BE UNIFORM AND NON-DISCRIMINATORY?

A. No.

Q. IS STAFF'S "ONE SIZE FITS ALL" TIER STRUCTURE MORE APPROPRIATE THAN THE COMPANY'S DESIGN?

A. No. Under the Company's rate design approach, rates are better designed to encourage large-volume customers with larger meters to reduce their water usage.

The Company's design provides a better conservation price signal to large metered customers. As I testified in my direct testimony, the Company's tiers are more attainable for larger metered customers. That is, there is more incentive for larger metered customers to reduce their average consumption below the higher cost tiers primarily because the lower cost tiers for larger meters are more attainable. *See* Bourassa Dt. at 35

Q. ARE THERE OTHER REJOINDER SCHEDULES REGARDING RATE DESIGN?

A. Yes. Rejoinder Schedule H-1 shows the revenue summary for the rebuttal rates. Rejoinder Schedule H-2 shows the analysis of revenues by customer class.

Q. IS THE COMPANY PROPOSING TO AMEND ITS WATER HAULING ADJUSTER MECHANISM?

A. Yes. As I explained above, the Company now proposes an adjustment to remove test year transportation expense, i.e., the Project Magnolia wheeling fees from test year operating expenses. Instead, the Company proposes to recover the wheeling fees in addition to water hauling costs via the Surcharge Tariff.

Q. WHAT ADVANTAGES DOES THIS HAVE FOR THE COMPANY AND ITS RATEPAYERS?

A. The primary benefit is this is now actual cost recovery of only the actual costs of water purchased for and delivered through Project Magnolia. This means the Company benefits by not under collecting its costs through rates when the wheeling fees are greater than the test year amount and the rate payer benefits by not over paying costs through rates when wheeling fees are less than the test year amount, all of which is a function of water supply. For example, if $174,000 of wheeling fees are included in base rates on a going forward basis and the Company incurs $250,000 in wheeling fees, the Company will under collect its costs through

rates. On the other hand, if the Company only incurs $100,000 of wheeling fees, the Company will over collect its costs from ratepayers through rates.

Q. WHAT ABOUT BUI?

A. BUI has the investment and financial risks associated with Project Magnolia regardless of whether wheeling costs are included in base rates or are collected under the Surcharge Tariff. BUI's investment risk is that the revenues and return on its investment will continue to be entirely dependent upon the amount of water delivered through Project Magnolia, either from Strawberry to Pine or from Pine to Strawberry. If zero gallons are delivered through Project Magnolia in either direction, BUI collects nothing, earns nothing, and continues to bear the operating and maintenance costs. BUI bears the risks encompassed by the volatility in water volume delivered via the pipeline. On the other hand, BUI should be entitled to the rewards associated with this risk.

Q. WHAT IS THE CURRENT CONTRACTUAL RATE FOR WATER DELIVERED THROUGH PROJECT MAGNOLIA?

A. Pine Water currently pays $15 per thousand gallons. This will not change.

Q. IS THIS FEE REASONABLE?

A. The Company has already provided substantial evidence supporting the $15 wheeling fee. *See* Hardcastle Rb. at 28-29. In short, and in light of the fact that the market rate for trucking water is $38 to $43 per thousand, $15 is very reasonable.

Q. DOES STAFF CALCULATE A WHEELING CHARGE?

A. Yes, Staff calculated a required fee of $7.02 per thousand gallons based on the test year gallons delivered of 11,643,000 gallons and a rate of return of 10.62 percent. *See* Fernandez Sb. at 7. However, Staff's calculation does not include a gross-up for income taxes nor does it reflect a rate of return commensurate with the investment risk BUI has in Project Magnolia. The already low return of 10.62

percent suggested by Staff, actually results in a 7.58 percent return when income taxes are included. When income taxes (using a 40% tax rate) are included in Staff's computation, the 10.62 percent return produces a required fee of $8.60 per thousand.

However, as I testified, a return of 10.62 percent, given the risks is low. Rates of 15 percent and 20 percent produce a required fee of $10.87 per thousand gallons and $13.47 per thousand gallons, respectively. While 15 or 20 percent returns seem high, in my opinion, they are not out of line, and are possibly even low, given that BUI's return on investment is not guaranteed and is volatile. For example, at half the gallons delivered through the pipeline in 2002, the required fee becomes $21.75 per thousand and $26.93 per thousand, at 15 and 20 percent, respectively. BUI's return on investment drops to 8.51 percent at half the gallons delivered when the fee is fixed at $15 per thousand. On the other hand, at 1.5 times the gallons delivered in 2002, the required fee becomes $7.25 per thousand and $8.98 per thousand, respectively. BUI's return on investment increases to 37.39 percent at 1.5 times the water delivered when the fee is fixed at $15 per thousand.

The contract rate is $15 per thousand regardless of the number of gallons delivered. The fee is not charged on a sliding scale based on water volume delivered. In addition, there is no standby charge to cover BUI's minimum costs of operating the pipeline or earning a return. The ratepayers of Pine Water do not have the investment risk of BUI. They will only pay for the water delivered to them.

Q. HAS BUI RECOVERED ANY OF ITS INVESTMENT IN PROJECT MAGNOLIA SINCE IT WENT OPERATIONAL IN FEBRUARY 2001?

A. No, unless we count increasing inter-company payable accounts, which will not likely be repaid. Nor has Pine water been able to pay for the water itself, which is

purchased from Strawberry Water and paid for by BUI. Notably, Staff suggests that BUI transfer the inter-company payable to Pine Water's equity or even forgive the debt. *See* Bourassa Rejoinder Exhibit 10

Q. WHAT CLAIMS HAS THE DISTRICT MADE REGARDING THE COST OF WATER DELIVERED THROUGH PROJECT MAGNOLIA?

A. The District claims the mark-up on this water supply is 6.81 times its cost. *See* Jones Sb. at 6. My calculations, however, show a mark-up of approximately 4.87 times cost. I calculate this as follows: Annual operating costs of $35,884 divided by 11,643 gallons (in 1,000's) equals $3.08 per thousand gallons. Dividing $15 per thousand gallons by $3.08 per thousand gallons equals 4.87 time mark-up. The District implies that the mark-up is exorbitant. Of course, it should be obvious that Mr. Jones' methodology does not include anything but cost recovery, return on the investment and taxes have been eliminated.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

1513413.1/75206.006

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EXHIBIT

1

General Ledger Listing as of Dec 31 00

G/L listing for account [105.00] to [105.00],
for department [ ] to [zzzzzz],
for fiscal period [1] to [12],
sorted by (Account),
(Exclude) accounts with no activity.
Printed in (Standard) format.

Last posting sequence number: 31

Acct.	Pd	Dept. Srce	Date	Description	Reference	Debits	Credits	Net Change	Balance
105.00				CIP - Project Magnolia					0.00
	9	GL-01	Sep 30 00	Reclass Expenses Keyed in BUI	AJE #000925	1,808.42			
	9	GL-01	Sep 30 00	Reclass Expenses Keyed in BUI	AJE #000925	53.44			
	9	GL 01	Sep 30 00	Reclass Expenses Keyed in BUI	AJE #000925	455.00			
	9	GL-01	Sep 30 00	Record Interco Rec & Payable	AJE #000926	749.25			
	9	GL-01	Sep 30 00	Record Interco Rec & Payable	AJE #000926	749.25		3,815.36	3,815.36
	10	GL-01	Oct 31 00	Reclass Capital Exp.-Magnolia	AJE #001012	16,351.89		16,351.89	20,167.25
	11	AP-CN	Nov 09 00	322- 364- 25 174778	HUGHES SUPPL		36,193.80		
	11	AP-IN	Nov 01 00	321- 363- 19 10/00	INTERMOUNTAI	1,711.00			
	11	AP-IN	Nov 01 00	321- 363- 20 173-0319465	GRAYBAR ELEC	139.01			
	11	AP-IN	Nov 01 00	322- 364- 1 173-0327484	GRAYBAR ELEC	5,395.36			
	11	AP-IN	Nov 01 00	322- 364 28 157781	HUGHES SUPPL	55,505.12			
	11	AP IN	Nov 07 00	321- 363- 8 167454	HUGHES SUPPL	209.55			
	11	AP-IN	Nov 07 00	322- 364- 20 171443	HUGHES SUPPL	792.52			
	11	AP-IN	Nov 08 00	321- 363- 14 38576201	CENTRAL ARIZ	22.03			
	11	AP-IN	Nov 08 00	322- 364- 24 174777	HUGHES SUPPL	33.75			
	11	AP-IN	Nov 09 00	319- 361- 4 5239851	FOXWORTH-GAL	21.86			
	11	AP-IN	Nov 09 00	320- 362- 1 686728	BUD'S PLUMBI	108.75			
	11	AP-IN	Nov 10 00	322- 364- 21 175681	HUGHES SUPPI	122.47			
	11	AP-IN	Nov 10 00	322- 364- 22 175679	HUGHES SUPPL	672.57			
	11	AP-IN	Nov 10 00	322- 364- 23 175678	HUGHES SUPPL	61.53			
	11	AP-IN	Nov 10 00	322- 364- 26 175680	HUGHES SUPPL	31.10			
	11	AP-IN	Nov 10 00	322- 364- 27 175677	HUGHES SUPPI	31.10			
	11	AP-IN	Nov 13 00	321 363- 6 5240303	FOXWORTH GAL	35.38			
	11	AP-IN	Nov 14 00	321- 363- 3 PD CK #1531.	BROOKE UTILI	143.30			
	11	AP-IN	Nov 14 00	322- 364- 17 ZZ10019106	INVENSYS MET	1,502.72			
	11	AP-IN	Nov 16 00	321- 363- 9 412	GLENN HALE	2,590.00			
	11	AP-IN	Nov 17 00	322- 364- 19 691203	ABLE/BUDS PI	47.74			
	11	AP-IN	Nov 20 00	324- 366- 2 39261301	CENTRAL ARIZ	27.56			
	11	AP IN	Nov 21 00	322- 364- 18 692805	ABLE/BUDS PL	43.44			
	11	AP-IN	Nov 22 00	326- 368- 3 120484	ENGINEERED S	2,099.93			
	11	AP-IN	Nov 27 00	324- 366- 7 693982	ABLE/BUDS PL	21.99			
	11	GL-01	Nov 30 00	Reclass Cap Exp. to CIP	AJE #001119	128.09			
	11	GL-01	Nov 30 00	Reclass Exp.	AJE #001122	260.00			
	11	GL 01	Nov 30 00	Reclass Exp.	AJE #001122	350.00		35,914.07	56,081.32
	12	AP-CN	Dec 15 00	334- 377- 25 11010281	EDSON ELECTR		182.17		
	12	AP-CN	Dec 22 00	332- 375- 19 217787	HUGHES SUPPL		1,060.00		
	12	AP-IN	Dec 01 00	325- 367- 6 413	GLENN HALE	2,555.00			
	12	AP-IN	Dec 01 00	327- 369 10 11/00	INTERMOUNTAI	16,295.00			
	12	AP-IN	Dec 01 00	327- 369- 18 70051	TETRA TECH A	2,546.25			
	12	AP-IN	Dec 01 00	330- 373- 33 39900201	CENTRAL ARIZ	48.91			
	12	AP-IN	Dec 04 00	327- 369- 14 697365	ABLE/BUDS PI	126.74			

General Ledger Listing as of Dec 31 00

Acct.	Pd	Srce	Date	Dept.	Description		Reference	Debits	Credits	Net Change	Balance
105.00					CIP - Project Magnolia		(continued)				
	12	AP-IN	Dec 04 00	330- 373	23	200308	HUGHES SUPPL	108.94			
	12	AP-IN	Dec 05 00	330- 373-	20	198425	HUGHES SUPPL	1,253.17			
	12	AP-IN	Dec 05 00	330- 373-	21	198426	HUGHES SUPPL	216.07			
	12	AP-IN	Dec 05 00	330- 373-	22	198427	HUGHES SUPPL	56.60			
	12	AP-IN	Dec 06 00	327- 369	15	699051	ABLE/BUDS PL	27.49			
	12	AP-IN	Dec 07 00	327- 369-	1	34070	B & M RENTAL	35.00			
	12	AP-IN	Dec 07 00	330- 373-	19	200982	HUGHES SUPPL	35,469.92			
	12	AP-IN	Dec 07 00	334- 377-	21	11009920	EDSON ELECTR	191.76			
	12	AP-IN	Dec 08 00	334 377-	4	202467	HUGHES SUPPL	787.06			
	12	AP-IN	Dec 11 00	330- 373	45	138854	GILA COUNTY	32.93			
	12	AP-IN	Dec 11 00	330- 373-	46	138846	GILA COUNTY	43.29			
	12	AP-IN	Dec 12 00	332- 375-	6	1952664-001	SUNSTATE EQU	1,080.59			
	12	AP-IN	Dec 12 00	334- 377-	5	205186	HUGHES SUPPL	437.51			
	12	AP-IN	Dec 12 00	334- 377-	6	205187	HUGHES SUPPL	68.97			
	12	AP-IN	Dec 13 00	328- 370-	1	12/13/00	LUMBERMAN'S	1,368.57			
	12	AP-IN	Dec 13 00	330- 373-	32	40528101	CENTRAL ARIZ	27.85			
	12	AP-IN	Dec 14 00	332- 375-	17	302633	PAYSON CONCR	85.79			
	12	AP-IN	Dec 15 00	330- 373	9	302619	PAYSON CONCR	129.57			
	12	AP-IN	Dec 15 00	330- 373-	16	414	GLENN HALE	3,000.00			
	12	AP-IN	Dec 15 00	330- 373-	34	209134	HUGHES SUPPL	15.48			
	12	AP-IN	Dec 15 00	332- 375-	13	210297	HUGHES SUPPL	1,076.35			
	12	AP-IN	Dec 15 00	332- 375-	15	29828	B & M RENTAL	36.41			
	12	AP-IN	Dec 15 00	334- 377-	7	210296	HUGHES SUPPL	289.30			
	12	AP-IN	Dec 15 00	334- 377-	24	11010283	EDSON ELECTR	20.11			
	12	AP-IN	Dec 18 00	330- 373-	8	302630	PAYSON CONCR	122.88			
	12	AP-IN	Dec 18 00	334- 377-	8	210358	HUGHES SUPPL	964.88			
	12	AP-IN	Dec 18 00	334- 377-	22	11010342	EDSON ELECTR	4.60			
	12	AP-IN	Dec 18 00	334- 377-	23	11010341	EDSON ELECTR	164.47			
	12	AP-IN	Dec 19 00	330- 373-	7	29823	B & M RENTAL	34.34			
	12	AP-IN	Dec 19 00	330- 373-	35	76358	ACE HARDWARE	23.30			
	12	AP-IN	Dec 19 00	334 377-	9	211978	HUGHES SUPPL	29.91			
	12	AP-IN	Dec 19 00	334- 377-	10	211914	HUGHES SUPPL	180.55			
	12	AP-IN	Dec 20 00	332- 375-	3	706210	ABLE/BUDS PL	55.83			
	12	AP-IN	Dec 21 00	332- 375-	7	1959855-001	SUNSTATE EQU	346.36			
	12	AP-IN	Dec 21 00	334 377-	3	70440	TETRA TECH A	707.22			
	12	AP-IN	Dec 22 00	334- 377-	11	12/22/00	INTERMOUNTAI	498.47			
	12	AP-IN	Dec 26 00	332- 375-	16	302654	PAYSON CONCR	85.73			
	12	AP-IN	Dec 28 00	334- 377-	13	41312901	CENTRAL ARIZ	23.03			
	12	AP-IN	Dec 30 00	332- 375-	5	D26594	CARQUEST OF	14.87			
	12	AP-IN	Dec 30 00	334- 377-	17	5245659	FOXWORTH GAL	32.77			
	12	AP-IN	Dec 31 00	332- 375-	20	12/00	INTERMOUNTAI	202,871.00		272,348.67	328,429.99 *
								365,865.96	37,435.97		328,429.99

82 transactions printed.
1 account printed.

General Ledger Listing as of Dec 31 01

G/L listing for account [105.00] to [105.00],
for department [ ] to [zzzzzz],
for fiscal period [1] to [12].
sorted by (Account).
(Exclude) accounts with no activity.
Printed in (Standard) format.

Last posting sequence number: 17

Acct.	Pd	Srce	Date	Dept.	Description		Reference	Debits	Credits	Net Change	Balance
105.00					CIP - Project Magnolia						328,429.99
	1	AP-CN	Jan 17 01	336- 379-	2	718153	ABLE/BUDS PL		3.20		
	1	AP-CN	Jan 23 01	337- 380-	33	721284	ARLE/BUDS PL		35.96		
	1	AP-IN	Jan 01 01	337- 380-	20	222029	HUGHES SUPPL	166.05			
	1	AP-IN	Jan 01 01	337 380-	21	222066	HUGHES SUPPI	539.72			
	1	AP-IN	Jan 01 01	337- 380-	26	222030	HUGHES SUPPL	61.97			
	1	AP-IN	Jan 01 01	336- 379-	17	2099	NASH ELECTRI	873.46			
	1	AP-IN	Jan 03 01	333- 376-	3	416	GLENN HALE	3,067.20			
	1	AP-IN	Jan 03 01	336 379-	1	711662	ABLE/BUDS PI	93.03			
	1	AP-IN	Jan 04 01	333- 376	4	711668	ABLE/BUDS PL	299.87			
	1	AP IN	Jan 05 01	337- 380-	22	226955	HUGHES SUPPL	743.60			
	1	AP-IN	Jan 05 01	337- 380-	23	226958	HUGHES SUPPL	108.13			
	1	AP-IN	Jan 05 01	337- 380-	24	226957	HUGHES SUPPI	451.36			
	1	AP-IN	Jan 05 01	337- 380	25	226956	HUGHES SUPPL	639.43			
	1	AP IN	Jan 06 01	335- 378-	7	5246769	FOXWORTH-GAL	30.34			
	1	AP-IN	Jan 08 01	337- 380-	39	713100	ARI F/BUDS PL	229.24			
	1	AP-IN	Jan 08 01	335- 378-	12	713096	ABLE/BUDS PL	94.65			
	1	AP-IN	Jan 09 01	337 380-	19	229717	HUGHES SUPPL	185.57			
	1	AP-IN	Jan 09 01	335- 378	2	714014	ABLE/BUDS PL	53.17			
	1	AP-IN	Jan 09 01	335- 378-	14	PD CK #1541A	BROOKE UTILI	6.89			
	1	AP-IN	Jan 09 01	336- 379-	27	41895601	CENTRAL ARIZ	285.80			
	1	AP-IN	Jan 10 01	335- 378-	3	714980	ABLE/BUDS PI	8.01			
	1	AP-IN	Jan 10 01	335 378-	10	5246662	FOXWORTH GAL	78.81			
	1	AP-IN	Jan 11 01	336- 379-	5	11011782	EDSON ELECTR	71.27			
	1	AP IN	Jan 11 01	336- 379-	6	5246785	FOXWORTH-GAL	10.66			
	1	AP-IN	Jan 17 01	336- 379-	3	718152	ABLE/BUDS PL	35.15			
	1	AP-IN	Jan 17 01	336 379-	8	5247255	FOXWORTH-GAL	15.24			
	1	AP-IN	Jan 18 01	336- 379	7	5247407	FOXWORTH-GAL	20.14			
	1	AP-IN	Jan 18 01	336- 379-	10	77191	ACE HARDWARE	19.42			
	1	AP-IN	Jan 18 01	336- 379-	18	417	GLENN HALE	3,000.00			
	1	AP-IN	Jan 19 01	337- 380-	14	70699	TETRA TECH A	3,279.24			
	1	AP-IN	Jan 22 01	337 380-	18	5247676	FOXWORTH GAL	31.69			
	1	AP-IN	Jan 22 01	337- 380-	32	720294	ABLE/BUDS PL	5.30			
	1	AP IN	Jan 22 01	337- 380-	37	720296	ARI F/BUDS PL	32.07			
	1	AP-IN	Jan 22 01	337- 380-	38	720288	ABLE/BUDS PI	34.92			
	1	AP-IN	Jan 22 01	337- 380-	40	42606801	CENTRAL ARIZ	44.72			
	1	AP-IN	Jan 23 01	337- 380-	36	721281	ABLE/BUDS PL	40.08			
	1	AP-IN	Jan 25 01	337- 380	17	5248168	FOXWORTH-GAL	23.58			
	1	AP-IN	Jan 25 01	337- 380-	35	722610	ABLE/BUDS PL	43.78			
	1	AP IN	Jan 30 01	337- 380-	41	326	SEVERN TRENT	1,615.00			
	1	AP-IN	Jan 31 01	337- 380-	34	725466	ABLE/BUDS PL	27.53			
	1	GL-01	Jan 31 01		Record Exp. in Imprest Account	AJE #010114		71.00		16,397.93	344,827.92

General Ledger Listing as of Dec 31 01

Acct.	Pd	Srce	Date	Dept.	Description			Reference	Debits	Credits	Net Change	Balance
105.00					CIP - Project Magnolia			(continued)				
	2	AP-IN	Feb 01 01	340- 383-	3	302752		PAYSON CONCR	296.97			
	2	AP-IN	Feb 01 01	340- 383-	9	5246126		FOXWORTH-GAL	378.00			
	2	AP-IN	Feb 01 01	340- 383-	10	5247029		FOXWORTH-GAL	433.51			
	2	AP-IN	Feb 01 01	340- 383-	11	5247040		FOXWORTH-GAL	35.60			
	2	AP-IN	Feb 01 01	340- 383-	12	5248049		FOXWORTH-GAL	482.39			
	2	AP-IN	Feb 01 01	340- 383-	13	5248280		FOXWORTH-GAI		36.24		
	2	AP-IN	Feb 01 01	340- 383-	14	5248222		FOXWORTH GAL	44.65			
	2	AP-IN	Feb 01 01	340- 383-	15	5248967		FOXWORTH-GAL	794.79			
	2	AP-IN	Feb 01 01	340- 383-	16	5248898		FOXWORTH-GAL	14.47			
	2	AP-IN	Feb 01 01	340- 383	17	302772		PAYSON CONCR	624.01			
	2	AP-IN	Feb 01 01	340- 383-	18	34638		B & N RENTAL	45.79			
	2	AP-IN	Feb 01 01	340- 383-	26	243324		HUGHES SUPPL	21.24			
	2	AP-IN	Feb 01 01	340- 383-	27	243325		HUGHES SUPPL	35.20			
	2	AP-IN	Feb 01 01	340- 383-	28	252113		HUGHES SUPPL	41.06			
	2	AP-IN	Feb 01 01	340- 383	29	239441		HUGHES SUPPL	21.74			
	2	AP IN	Feb 01 01	340- 383-	30	246899		HUGHES SUPPL	53.94			
	2	AP-IN	Feb 01 01	340- 383-	31	246900		HUGHES SUPPL	70.76			
	2	AP-IN	Feb 01 01	340- 383-	32	246901		HUGHES SUPPL	105.40			
	2	AP-IN	Feb 01 01	340- 383-	33	246902		HUGHES SUPPL	124.13			
	2	AP-IN	Feb 01 01	340- 383-	34	246903		HUGHES SUPPL	308.27			
	2	AP IN	Feb 01 01	340- 383-	35	1/01		INTERMOUNTAI	29,643.00			
	2	AP-IN	Feb 01 01	342- 386-	3	7137		AERO DRILLIN	3,769.15			
	2	AP-IN	Feb 02 01	341- 384-	7	43312601		CENTRAL ARIZ	31.37			
	2	AP-IN	Feb 03 01	342- 386-	26	OOP124.000		TERRANE ENGI	370.00			
	2	AP-IN	Feb 05 01	340- 383	38	726863		ABLE/BUDS PL	1.31			
	2	AP IN	Feb 07 01	340- 383-	43	2170		CANYON RIM C	8,374.34			
	2	AP-IN	Feb 08 01	340- 383-	2	11012402		EDSON ELECTR	9.14			
	2	AP-IN	Feb 08 01	341- 384-	6	729753		ABLE/BUDS PL	165.64			
	2	AP-IN	Feb 11 01	342- 386-	25	534747		PHIPPS PAINT	210.00			
	2	AP-IN	Feb 13 01	343- 387-	7	731825		ABLE/BUDS PL	43.75			
	2	AP IN	Feb 15 01	342- 386-	2	77998		ACE HARDWARE	38.87			
	2	AP-IN	Feb 15 01	342- 386-	23	420		GLENN HALE	1,500.00			
	2	AP-IN	Feb 20 01	342- 386-	5	5250853		FOXWORTH-GAL	14.39			
	2	AP-IN	Feb 20 01	342 386-	6	5250855		FOXWORTH-GAL	26.27			
	2	AP IN	Feb 20 01	342- 386-	9	735006		ABLE/BUDS PL	481.80			
	2	AP-IN	Feb 21 01	343- 387-	6	44438201		CENTRAL ARIZ	33.53			
	2	AP-IN	Feb 24 01	343- 387-	11	5251450		FOXWORTH-GAL	27.00			
	2	AP-IN	Feb 27 01	343 387-	8	735726		ABLE/BUDS PL	61.23			
	2	AP-IN	Feb 27 01	343- 387-	10	5251664		FOXWORTH GAL	6.46			
	2	AP-IN	Feb 28 01	342- 386-	27	801		BROOKE UTILI	54.11			
	2	AP-IN	Feb 28 01	342- 386-	27	801		BROOKE UTILI	166.50			
	2	AP-IN	Feb 28 01	343- 387-	9	5251863		FOXWORTH-GAL	5.83			
	2	AP-IN	Feb 28 01	343- 387-	20	421		GLENN HALE	3,750.00			
	2	AP-IN	Feb 28 01	343- 387	22	2/01		INTERMOUNTAI	27,836.00			
	2	GL-01	Feb 28 01	Record AJE #010208							80,515.37	425,343.29
	3	AP CN	Mar 01 01	348- 392-	2	260919		HUGHES SUPPL		242.10		
	3	AP-CN	Mar 01 01	348- 392-	3	260920		HUGHES SUPPL		70.99		
	3	AP-CN	Mar 01 01	348- 392-	4	260921		HUGHES SUPPL		22.18		
	3	AP-IN	Mar 01 01	346 390-	1	302805		PAYSON CONCR	147.02			
	3	AP-IN	Mar 01 01	346- 390	2	44733601		CENTRAL ARIZ	45.43			

General Ledger Listing as of Dec 31 01

Acct.	Pd	Srce	Date	Dept.	Description		Reference	Debits	Credits	Net Change	Balance
105.00					CIP - Project Magnolia		(continued)				
	3	AP-IN	Mar 01 01	346- 390-	3	739887	ABLE/BUDS PL	16.09			
	3	AP-IN	Mar 01 01	346- 390-	7	689-728236-1	W.W. GRAINGE	114.44			
	3	AP-IN	Mar 01 01	348 392-	12	418	GLENN HALE	3,000.00			
	3	AP-IN	Mar 08 01	348- 392-	14	45279001	CENTRAL ARIZ	264.41			
	3	AP-IN	Mar 12 01	348- 392-	8	5253125	FOXWORTH-GAL	32.40			
	3	AP-IN	Mar 15 01	348- 392-	7	5253583	FOXWORTH-GAL	51.52			
	3	AP-IN	Mar 15 01	349- 393-	6	424	GLENN HALE	420.00			
	3	AP-IN	Mar 15 01	349- 393-	8	423	GLENN HALE	420.00			
	3	AP-IN	Mar 15 01	349- 393-	9	12578	ABLE/BUDS PL		53.13		
	3	AP IN	Mar 19 01	349- 393	1	748513	ABLE/BUDS PI	55.99			
	3	AP-IN	Mar 20 01	349- 393-	10	12555	ABLE/BUDS PL		233.16		
	3	AP-IN	Mar 23 01	350- 394-	2	304627	HUGHES SUPPL	54.00			
	3	AP-IN	Mar 26 01	350- 394-	12	5254879	FOXWORTH-GAL	22.68			
	3	AP-IN	Mar 31 01	349- 393-	7	425	GLENN HALE	1,495.00		5,017.42	430,360.71
	4	AP-IN	Apr 01 01	355- 399-	1	1695849	TETRA TECH A	6,013.33			
	4	AP-IN	Apr 01 01	356- 400-	16	2073	NASH ELECTRI	723.61			
	4	AP-IN	Apr 01 01	356- 400-	17	2074	NASH ELECTRI	1,420.89			
	4	AP-IN	Apr 01 01	356 400-	18	2086	NASH ELECTRI	3,459.66			
	4	AP-IN	Apr 10 01	355- 399-	17	4/10/01	INTERMOUNTAT	1,122.12			
	4	AP IN	Apr 18 01	357- 401-	12	17134879	TETRA TECH A	1,308.00			
	4	AP-IN	Apr 18 01	357- 401-	13	17134589	TETRA TECH A	717.75			
	4	AP-IN	Apr 20 01	357- 401-	8	332941	HUGHES SUPPL		49.10	14,716.26	445,076.97
	5	AP-IN	May 23 01	370- 415-	13	17668976	TETRA TECH A	637.00			
	5	AP-IN	May 24 01	370- 415	18	5554	NASH ELECTRI	1,220.90			
	5	AP IN	May 24 01	370- 415-	19	5555	NASH ELECTRI	1,463.73			
	5	AP-IN	May 31 01	370- 415-	11	5/31/01	BRENINGER, J	60.75		3,382.38	448,459.35
	6	AP-IN	Jun 01 01	375- 421-	2	731825 01	ABLE/BUDS PL	44.58			
	6	AP-IN	Jun 01 01	377 423-	7	17668977	TETRA TECH A	619.50		664.08	449,123.43
	7	AP-IN	Jul 21 01	392- 438	8	14368	TETRA TECH A	153.50		153.50	449,276.93
	11	AP-IN	Nov 30 01	439- 491-	1	1/02-12/02	USDA, FOREST	56.86		56.86	449,333.79
	12	AP-IN	Dec 01 01	443- 497-	7	2002 FEES	USDA, FOREST	56.86		56.86	449,390.65 *
								122,206.72	1246.06		449,390.65

122 transactions printed.
1 account printed.

General Ledger Listing as of Dec 31 02

G/L listing for account [105.00] to [105.00],
for department [ ] to [zzzzzz],
for fiscal period [1] to [12],
sorted by (Account).
(Exclude) accounts with no activity.
Printed in (Standard) format.

Last posting sequence number: 13

Acct.	Dept.	Pd	Srce	Date	Description	Reference	Debits	Credits	Net Change	Balance	
105.00					CIP - Project Magnolia					449,390.65	
		3	AP IN	Mar 01 02	482- 536- 1	INV 10726 TETRA TECH A	208.00		208.00	449,598.65	
		11	GL-01	Nov 30 02	Reclass CIP to FA	AJE #021114		449,598.65	449,598.65-	0.00	*
							208.00	449,598.65		0.00	

2 transactions printed.
1 account printed.

EXHIBIT

2

Pine Water Company
Test Year Ended December 31, 2002
Computation of Increase in Gross Revenue
Requirements As Adjusted

Exhibit
Rejoinder Schedule A-1
Page
Witness: Bourassa

Line No.			
1	Fair Value Rate base	$	590,689
2			
3	Adjusted Operating Income		(4,548)
4			
5	Current Rate of Return		-0.77%
6			
7	Required Operating Income	$	64,939
8			
9	Required Rate of Return on Fair Value Rate Base		10.99%
10			
11	Operating Income Deficiency	$	69,486
12			
13	Gross Revenue Conversion Factor		1.2646
14			
15	Increase in Gross Revenue		
16	Requirement	$	87,871
17			

18		Present	Proposed		Dollar	Percent
19	Customer	Rates	Rates		Increase	Increase
20	Classification					
21	5/8 Inch Meter - Residential	$626,494	$707,036	$	80,542	12.86%
22	3/4 Inch Meter - Residential	468	658		190	40.53%
23	1 Inch Meter - Residential	4,441	6,306		1,865	42.00%
24	2 Inch Meter - Residential	194	463		269	138.84%
25	5/8 Inch Meter - Commercial	2,003	2,882		879	43.86%
26	1 Inch Meter - Commercial	2,647	3,351		703	26.57%
27	2 Inch Meter - Commercial	5,977	8,939		2,962	49.56%
28						
29	Revenues from Annualization	3,539	3,726		187	5.28%
30					-	0.00%
31					-	0.00%
32	Miscellaneous Revenues	8,436	8,436		-	0.00%
33					-	0.00%
34	Total of Water Revenues	$654,199	$741,796	$	87,597	13.39%

35
36
37
38 SUPPORTING SCHEDULES:
39 Rejoinder B-1
40 Rejoinder C-1
41 Rejoinder C-3
42 Rejoinder H-1
43
44

Pine Water Company
Test Year Ended December 31, 2002
Summary of Fair Value Rate Base

Exhibit
Rejoinder Schedule B-1
Page 1
Witness: Bourassa

Line No.		Original Cost Rate base
1		
2	Gross Utility Plant in Service	$ 1,893,191
3	Less: Accumulated Depreciation	1,223,741
4		
5	Net Utility Plant in Service	$ 669,450
6		
7	Less:	
8	Advances in Aid of	
9	Construction	52,072
10	Contributions in Aid of	
11	Construction - Net of amortization	463,392
12	Customer Meter Deposits	21,356
13	Deferred Income Taxes & Credits	-
14	Investment tax Credits	-
15	Plus:	
16	Unamortized Finance	
17	Charges	-
18	Deferred Tax Assets	369,000
19	Allowance for Working Capital	89,059
20	Citizens Acquisition Adjustment	-
21		
22	Total Rate Base	$ 590,689
23		
24		
25		
26	SUPPORTING SCHEDULES:	RECAP SCHEDULES:
27	Rejoinder B-2	Rejoinder A-1
28		
29		
30		
31		

Pine Water Company
Test Year Ended December 31, 2002
Original Cost Rate Base Proforma Adjustments

Exhibit
Rejoinder Schedule B-2
Page 1
Witness: Bourassa

Line No.		Rebuttal Adjusted End of Test Year	Proforma Adjustment Label	Proforma Adjustment Amount	Rejoinder Adjusted End of Test Year
1	Gross Utility				
2	Plant in Service	$ 1,952,732	(1)	(59,541)	$ 1,893,191
3					
4	**Less:**				
5					
6	Accumulated				
7	Depreciation	1,228,209	(2)	(4,468)	1,223,741
8					
9	Net Utility Plant				
10	in Service	$ 724,523			$ 669,450
11					
12	**Less:**				
13	Advances in Aid of				
14	Construction	$ 52,072			$ 52,072
15	Contributions in Aid of				
16	Construction - Net	463,392			463,392
17					
18	Customer Meter Deposits	21,356			21,356
19	Deferred Income Taxes	-			-
20	Investment Tax Credits	-			-
21	**Plus:**				
22					
23	Deferred Tax Assets	369,000			369,000
24					
25	Working capital	108,806	(3)	(19,747)	89,059
26					
27					
28	Total	$ 665,509			$ 590,689
29					
30					
31	ADJUSTMENTS:				
32	(1) Post test year plant	Rebuttal Filing Amount		$ 61,138	
33		Rejoinder Amount*		1,597	
34		Adjustment		$ (59,541)	
35	* Pumping Equipment $1,015 less retirement of $988.				
36	Meters of $5,050 less retirement of $3,480.				
37					
38	(2) Retirements - Pumping Equip of $988, Meters $3,480.				
39	(3) Change in working capital allowance.				
40					
41					
42					
43					
44					
45	SUPPORTING SCHEDULES:				RECAP SCHEDULES:
46					Rejoinder B-1
47					

Pine Water Company
Test Year Ended December 31, 2002
Computation of Working Capital

Exhibit
Rejoinder Schedule B-5
Page 1
Witness: Bourassa

Line No.			
1	Cash Working Capital (1/8 of Allowance		
2	Operation and Maintenance Expense)	$	69,408
3	Pumping Power (1/24 of Pumping Power)		1,539
4	Material and Supplies Inventories		-
5	Prepayments		18,111
6			
7			
8	Total Working Capital Allowance	$	89,059
9			
10			
11	Working Capital Requested	$	89,059
12			
13			
14	SUPPORTING SCHEDULES:	RECAP SCHEDULES:	
15	Rejoinder C-1	Rejoinder B-1	
16			

Pine Water Company
Test Year Ended December 31, 2002
Income Statement

Exhibit
Rejoinder Schedule C-1
Page 1
Witness: Bourassa

Line No.		Rebuttal Adjusted Test Year	Label	Rejoinder Adjustment	Rejoinder Test Year Adjusted Results	Proposed Rate Increase	Rejoinder Adjusted with Rate Increase
1	**Revenues**						
2	Metered Water Revenues	$ 645,612			$ 645,612	87,871	$ 733,483
3	Unmetered Water Revenues	-			-		-
4	Other Water Revenues	8,436			8,436		8,436
5		$ 654,048		$ -	$ 654,048	$ 87,871	$ 741,919
6	**Operating Expenses**						
7	Salaries and Wages	$ 125,296			$ 125,296		$ 125,296
8	Pension & Benefits	6,105			6,105		6,105
9	Purchased Water	57,835			57,835		57,835
10	Purchased Power	36,942			36,942		36,942
11	Chemicals	604			604		604
12	Materials & Supplies	43,730			43,730		43,730
13	Regulatory Water Testing	7,758			7,758		7,758
14	Contractual Services - Engineering	-			-		-
15	Contractual Services - Accounting	38,328			38,328		38,328
16	Contractual Services - Legal	66,430			66,430		66,430
17	Contractual Services - Other	22,805			22,805		22,805
18	Overhead Allocation - G&A	71,092			71,092		71,092
19	Rental of Equipment	-			-		-
20	Transportation Expenses	176,144	4	(174,645)	1,499		1,499
21	Worker's Comp	2,271			2,271		2,271
22	Insurances Medical/Dental	12,663			12,663		12,663
23	Telephone	2,631			2,631		2,631
24	Dues & Subscriptions	299			299		299
25	Bad Debt Expense	2,153			2,153		2,153
26	Misc Expenses	202			202		202
27	Office Supplies	4,080			4,080		4,080
28	Licenses & Permits	1,000			1,000		1,000
29	Repairs & Maintenance - Bldg	-			-		-
30	R&M Vehicles	-			-		-
31	Sales Tax Expense	0			0		0
32	Utiltiy Reg. Assess. Fee	272			272		272
33	CAWCD Costs	21,501			21,501		21,501
34	Rate Case Expense	50,000	3	16,667	66,667		66,667
34	Depreciation Expense	35,576	1	(2,167)	33,409		33,409
35	Other Taxes and Licenses	45			45		45
36	Property Taxes	45,698	2	(3,654)	42,044		42,044
37	Income Tax	(45,274)			(9,067)	18,385	9,318
38					-		-
39	**Total Operating Expenses**	$ 786,186		$ (163,799)	$ 658,595	$ 18,385	$ 676,980
40	**Operating Income**	$ (132,139)		$ 163,799	$ (4,548)	$ 69,486	$ 64,939
41	**Other Income (Expense)**						
42	Interest Income	-			-		-
43	Other Income	-			-		-
44	Income Tax Provision	-			-		
45	Interest Expense	(19,526)	5	(10,194)	(29,721)		(29,721)
46	Other Expense	-			-		-
47	Gain/Loss Sale of Fixed Assets	-			-		-
48	**Total Other Income (Expense)**	$ (19,526)		$ (10,194)	$ (29,721)	$ -	$ (29,721)
49	**Net Profit (Loss)**	$ (151,665)		$ 153,604	$ (34,268)	$ 69,486	$ 35,218
50							
51	SUPPORTING SCHEDULES:					RECAP SCHEDULES:	
52	Rejoinder C-2					Rejoinder A-1	
53							
54							

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses

Exhibit
Rejoinder Schedule C-2
Page 1
Witness: Bourassa

Adjustments to Revenues and Expenses

Line No.		1 Depreciation Expense	2 Property Taxes	3 Rate Case Expense	4 Remove PM Wheeling Fees	5 Interest Expense	6 Reclassify Purchased Water Expense	Subtotal
1								
2								
3	Revenues							-
4								
5	Expenses	(2,167)	(3,654)	16,667	(174,645)		-	(163,799)
6								
7	Operating							
8	Income	2,167	3,654	(16,667)	174,645	-	-	163,799
9								
10	Interest							
11	Expense					(10,194)		(10,194)
12	Other							
13	Income /							
14	Expense							
15								
16	Net Income	2,167	3,654	(16,667)	174,645	(10,194)	-	153,604
17								
18								

Adjustments to Revenues and Expenses

19								
20		7 Interest Expense	8 Income Taxes	9 Intentionally Left Blank	10 Intentionally Left Blank	11 Intentionally Left Blank	12 Intentionally Left Blank	Subtotal
21								
22								
23	Revenues						-	-
24								
25	Expenses		-			-		(163,799)
26								
27	Operating							
28	Income	-	-	-	-	-	-	163,799
29								
30	Interest							
31	Expense	-		-				(10,194)
32	Other							
33	Income /		-					-
34	Expense							
35								
36	Net Income	-	-	-	-	-	-	153,604
37								
38								

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 1

Exhibit
Rejoinder Schedule C-2
Page 2
Witness: Bourassa

Line No.

1 Depreciation Expense

Account No.	Description	Original Cost	Rate	Depreciation Expense
301	Organization	$ -	0.00%	$ -
302	Franchises	-	0.00%	-
303	Land and Land Rights	16,930	0.00%	-
304	Structures and Improvements	160,067	3.33%	5,330
305	Collecting and Impounding Rese	-	2.50%	-
306	Lake, River and Other Intakes	-	2.50%	-
307	Wells and Springs	65,994	3.33%	2,198
308	Infiltration Galleries and Tun	-	6.67%	-
309	Supply Mains	479	2.00%	10
310	Power Generation Equipment	-	5.00%	-
311	Pumping Equipment	131,293	12.50%	16,412
320	Water Treatment Equipment	5,320	3.33%	177
330	Distribution Reservoirs and St	247,073	2.22%	5,485
331	Transmission and Distribution	990,291	2.00%	19,806
333	Services	80,461	3.33%	2,679
334	Meters and Meter Installations	193,687	8.33%	16,134
335	Hydrants	-	2.00%	-
336	Backflow Prevention Devices	-	6.67%	-
339	Other Plant and Miscellaneous	-	6.67%	-
340	Office Furniture and Equipment	-	6.67%	-
341	Transportation Equipment	-	20.00%	-
342	Stores Equipment	-	4.00%	-
343	Tools, Shop and Garage Equipment	-	5.00%	-
344	Laboratory Equipment	-	10.00%	-
345	Power Operated Equipment	-	5.00%	-
346	Communication Equipment	-	10.00%	-
347	Miscellaneous Equipment	-	10.00%	-
348	Other Tangible Plant	-	0.00%	-
	TOTALS	$ 1,891,594		$ 68,230

Proforma Plant (to be completed by 12/31/2003)	$ 1,594	3.6396%	58
Less: Amortization of Contributions	$ 958,323	3.6396%	(34,879)
Total Depreciation Expense			$ 33,409
Test Year Depreciation Expense			35,576
Increase (decrease) in Depreciation Expense			(2,167)
Adjustment to Revenues and/or Expenses			$ (2,167)

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 2

Exhibit
Rejoinder Schedule C-2
Page 3
Witness: Bourassa

Line No.		
1	Property Taxes	
2		
3	Adjusted Revenues in year ended 12/31/02	$ 654,048
4	Adjusted Revenues in year ended 12/31/02	654,048
5	Proposed Revenues	741,919
6	Average of three year's of revenue	$683,338
7	Average of three year's of revenue, times 2	$1,366,676
8	Add:	
9	Construction Work in Progess at 10%	
10	Deduct:	
11	Book Value of Transportation Equipment	-
12		
13	Total Book Value of Transportation Equipment	$ -
14		
15	Full Cash Value	$ 1,366,676
16	Assessment Ratio	25%
17	Assessed Value	341,669
18	Property Tax Rate	12.31%
19		
20	Property Tax	42,044
21	Tax on Parcels	-
22		
23	Total Property Tax at Proposed Rates	$ 42,044
24	Property Taxes in the test year	45,698
25	Change in Property Taxes	$ (3,654)
26		
27		
28	Adjustment to Revenues and/or Expenses	$ (3,654)
29		
30		

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 5

Exhibit
Rejoinder Schedule C-2
Page 6
Witness: Bourassa

Line No.			
1	Synchronize Interest Expense with Rate Base		
2			
	Proposed Rate Base per B-1		590,689
	Weighted Cost of Debt		5.03%
3	Syncrhonized Interest Expense	$	29,721
4			
5	Rebuttal Adjusted Test year Interest Expense		19,526
6			
7	Increase (decrease) in Revenues/ Expenses	$	10,194
8			
9			
10			
11			
12	Adjustment to Revenue and/or Expense	$	(10,194)
13			
14	SUPPORTING SCHEDULES:		
15	Rejoinder Schedule B-1		
16	Rejoinder Schedule D-1		
17			
18			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 3

Exhibit
RejoinderSchedule C-2
Page 4
Witness: Bourassa

Line No.			
1	Rate Case Expense		
2			
3	Rate Case Expense	$	200,000
4	Amortization Period (Years)		3
5	Annual Amortization Expense	$	66,667
6			
7	Rebuttal Rate Case Expense		50,000
8			
9	Increase (Decrease) Expense	$	16,667
10			
11			
12	Adjustment to Revenues and/or Expense	$	16,667
13			
14			

Pine Water Company
Test Year Ended December 31, 2002
Adjustments to Revenues and Expenses
Adjustment Number 4

Exhibit
RejoinderSchedule C-2
Page 5
Witness: Bourassa

Line No.			
1	Remove Test Year Project Magnolia Wheeling Fees from Transportation Expenses		
2			
3	Test Year Transportation Expenses	$	176,144
4			
5	Test Year Exclusive of PM Wheeling Fees		1,499
6			
7			
8	Increase (Decrease) Expense	$	(174,645)
9			
10			
11	Adjustment to Revenues and/or Expense	$	(174,645)
12			
13			

Pine Water Company
Test Year Ended December 31, 2002
Computation of Gross Revenue Conversion Factor

Exhibit
Rejoinder Schedule C-3
Page 1
Witness: Bourassa

Line No.	Description	Percentage of Incremental Gross Revenues
1	Federal Income Taxes	13.95%
2		
3	State Income Taxes	6.97%
4		
5	Other Taxes and Expenses	0.00%
6		
7		
8	Total Tax Percentage	20.92%
9		
10	Operating Income % = 100% - Tax Percentage	79.08%
11		
12		
13		
14		
15	1 = Gross Revenue Conversion Factor	
16	Operating Income %	1.2646
17		
18	SUPPORTING SCHEDULES:	RECAP SCHEDULES:
19		Rebuttal A-1
20		

Pine Water Company
Test Year Ended December 31, 2002
Summary of Cost of Capital

Exhibit
Rejoinder Schedule D-1
Page 1
Witness: Bourassa

Line No.	Item of Capital	Proposed End of Test Year: Dollar Amount	Percent of Total	Cost Rate	Weighted Cost	End of Projected Year: Dollar Amount	Percent of Total	Cost Rate	Weighted Cost
1	Long-Term Debt (a)	219,353	50.32%	10.00%	5.03%	170,359	40.35%	10.00%	4.04%
2									
3	Stockholder's Equity (a)	216,604	49.68%	12.00%	5.96%	251,822	59.65%	12.00%	7.16%
4									
5	Totals	435,956	100.00%		10.99%	422,181	100.00%		11.19%
6									
7	(a) Adjusted for proposed conversion of inter-company payable to debt and equity.								
8									
9	SUPPORTING SCHEDULES:								
10	Rejoinder D-1, page 2								
11	Rejoinder D-2								
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									

Pine Water Company
Test Year Ended December 31, 2002
Summary of Cost of Capital

Exhibit
Rejoinder Schedule D-1
Page 2
Witness: Bourassa

Line No.		Actual End of Test Year Dollar Amount	Label	Adjustment	Adjusted End of Test Year Dollar Amount
1					
2	Stockholder's Equity	(152,996)	(a)	369,599	216,604
3					
4	Totals	(152,996)			216,604
5					
6					
7	(a) Propose converting $369,599 of $533,599 inter-company payable to equity.				
8					
9	SUPPORTING SCHEDULES:				
10	E-1				
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					

Pine Water Company
Test Year Ended December 31, 2002
Cost of Long Term Debt

Exhibit
Rejoinder Schedule D-2
Page 1
Witness: Bourassa

Line No.	Description of Debt	Adjusted End of Test Year Amount Outstanding	Percent	Interest Rate	Composite Cost	End of Projected Year Amount Outstanding	Percent	Interest Rate	Composite Cost
1									
2	Long-Term Debt	55,353	25.23%	10.00%	2.52%	32,971	19.35%	10.00%	1.94%
3	Long-Term Debt (a)	164,000	74.77%	10.00%	7.48%	137,388	80.65%	10.00%	8.06%
4									
5									
6									
7									
8									
9									
10	Totals	219,353	100.00%		10.00%	170,359	100.00%		10.00%
11									
12	(a) Propose converting $164,000 of the $533,599 inter-company payable to long-term debt.								
13									
14									
15	Supporting Schdules:								
16									
17									
18									

Pine Water Company
Test Year Ended December 31, 2002
Returns on Equity of Nationally Traded Water
Utilities as Reported in C.A. Turner Utility Reports **(a)**
at January 2004

Exhibit
RESPONDER Schedule D-4
Page 1
Witness: Bourassa

Line No.		Authorize Rate of Return	Current Rate of Return
1	American States Water Co.	10.00%	8.10%
2	Aqua America **(b)**	10.15%	12.50%
2	Artesian Resources Corp.	10.50%	8.10%
3	California	8.90%	6.80%
4	Connecticut Water Service	12.70%	11.10%
5	Middlesex Water Co.	10.38%	9.30%
6	Pennichuck Corporation	10.33%	8.60%
7	SJW Corp.	9.95%	9.60%
8	Southwest Water	9.84%	10.20%
9	York Water		11.10%
10			
11	Simple Averages	10.31%	9.54%
12			
13			
14			
15			
16	**(a)** Data reported in C. A. Turner Utility Reports (January 2004).		
17			
18	**(b)** Formerly Philadelphia Suburan		
19			
20			

Pine Water Company
Revenue Summary
With Annualized Revenues to Year End Number of Customers
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-1
Page 1
Witness: Bourassa

Line No.	Meter Size	Customer Classification	Present Revenues	Proposed Revenues	Dollar Change	Percent Change	Percent of Present Water Revenues	Percent of Proposed Water Revenues
1	5/8 Inch	Residential 14A	$ 507,049	$ 574,698	$ 67,650	13.34%	78.52%	78.37%
2	5/8 Inch	Residential 14B	119,446	132,338	12,892	10.79%	18.50%	18.05%
3								
4	3/4 Inch	Residential 14B	468	658	190	40.53%	0.07%	0.09%
5	1 Inch	Residential 14A	4,441	6,306	1,865	42.00%	0.69%	0.86%
6	2 Inch	Residential 14A	194	463	269	138.84%	0.03%	0.06%
7								
8								
9	5/8 Inch	Commercial 14A	2,003	2,882	879	43.86%	0.31%	0.39%
10	1 Inch	Commercial 14A	2,647	3,351	703	26.57%	0.41%	0.46%
11	2 Inch	Commercial 14A	5,977	8,939	2,962	49.56%	0.93%	1.22%
12								
13								
14								
15	**Total Water Revenues**		$ 642,224	$ 729,635	$ 87,410	13.61%	99.45%	99.49%
16								
17								
18	**Revenue Annualization (a)**							
19	5/8 Inch	Residential 14A	$ 3,539	$ 3,726	187	5.28%	0.55%	0.51%
20								
21								
22								
23								
24	**Total Revenue Annualization**		3,539	3,726	187	5.28%	0.55%	0.51%
25	**Total Water Revenues with**							
26	**Revenue Annualization**		$ 645,763	$ 733,360	$ 87,597		100.00%	100.00%
27								
28								
29	(a) Customer Growth Annualization is not calculated. Change in customers is not due to growth.							
30								
31								

Pine Water Company
Analysis of Revenue by Detailed Class
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-2
Page 1
Witness: Bourassa

Line No.	Customer Classification and/or Meter Size	(a) Average Number of Customers at 12/31/2002	Summer Average Consumption	Summer Revenues Present Rates	Summer Revenues Proposed Rates	Summer Proposed Increase Dollar Amount	Summer Proposed Increase Percent Amount	Winter Average Consumption	Winter Revenues Present Rates	Winter Revenues Proposed Rates	Winter Proposed Increase Dollar Amount	Winter Proposed Increase Percent Amount
1	5/8 Inch Residential 14A	1,502	2,731	$ 27.74	$ 30.76	3.03	10.92%	1,998	$ 25.24	$ 26.28	1.03	4.10%
2	5/8 Inch Residential 14B	360	2,614	29.50	30.05	0.55	1.86%	1,707	26.32	25.26	(1.07)	-4.05%
3												
4	3/4 Inch Residential 14B	1	4,901	38.37	53.70	15.33	39.95%	5,215	39.47	55.63	16.15	40.93%
5	1 Inch Residential 14A	2	31,834	203.75	244.36	40.61	19.93%	28,836	185.91	214.00	28.09	15.11%
6	2 Inch Residential 14A	0	-	64.58	154.24	89.66	138.84%	-	64.58	154.24	89.66	138.84%
7												
8												
9	5/8 Inch Commercial 14A	2	14,750	96.02	131.43	35.41	36.88%	9,786	66.48	81.15	14.67	22.07%
10	1 Inch Commercial 14A	1	44,901	281.50	376.71	95.21	33.82%	27,358	177.12	199.03	21.91	12.37%
11	2 Inch Commercial 14A	2	38,801	285.24	420.97	135.72	47.58%	28,358	223.11	315.20	92.09	41.28%
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30	Totals	1,871										
31												
32	Actuall Year End Number											
33	of Customers:	1,884										
34												
35	**(a)** Average number of customers of less than one (1), indicates that less than 12 bills were issued during the year.											
36												
37												

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-3
Page 1
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Proposed Rates	Percent Change
1				
2				
3				
4	Rate Code Sheet 14A			
5	**Monthly Usage Charge for:**			
6	Residential,Commercial			
7	5/8 x 3/4 Inch	$ 18.45	$ 19.28	4.50%
8	3/4 Inch	21.22	28.92	36.29%
9	1 Inch	24.54	48.20	96.42%
10	1 1/2 Inch	36.90	96.40	161.25%
11	2 Inch	64.58	154.24	138.84%
12	3 Inch	92.25	308.48	234.40%
13	4 Inch	147.60	482.01	226.56%
14	6 Inch	-	964.01	0.00%
15	8 Inch	-	1,928.03	0.00%
16				
17	Rate Code Sheet 14B			
18	**Monthly Usage Charge for:**			
19	Residential,Commercial			
20	5/8 x 3/4 Inch	$ 20.35	$ 19.28	-5.26%
21	3/4 Inch	30.53	28.92	-5.27%
22	1 Inch	50.88	48.20	-5.27%
23	1 1/2 Inch	101.75	96.40	-5.26%
24	2 Inch	162.80	154.24	-5.26%
25	3 Inch	305.25	308.48	1.06%
26	4 Inch	508.75	482.01	-5.26%
27	6 Inch	1,017.50	964.01	-5.26%
28	8 Inch	-	1,928.03	0.00%
29				
30				
31		**Present**	**Proposed**	
32		**Rates**	**Rates**	
33	Rate Code Sheet 14A			
34	Gallons In Minimum			
35	All	-	-	
36				
37				
38	Rate Code Sheet 14B			
39	Gallons In Minimum			
40	All	-	-	
41				
42				
43				
44	Rate Code Sheet 14A			
45	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
46	5/8 Inch Residential and Commercial	4,000	2,000	
47	1 Inch and Larger Residential and Commercial	4,000	10,000	
48				
49				
50	Rate Code Sheet 14B			
51	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
52	5/8 Inch Residential and Commercial	999,999,999	2,000	
53	1 Inch and Larger Residential and Commercial	999,999,999	10,000	
54				
55				

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-3
Page 2
Witness: Bourassa

Line No.	Customer Classification and Meter Size	Present Rates	Summer Proposed Rates
1			
2	Rate Code Sheet 14A		
3	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
4	5/8 Inch Residential and Commercial	999,999,999	8,000
5	1 Inch and Larger Residential and Commercial	999,999,999	25,000
6			
7			
8	Rate Code Sheet 14B		
9	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
10	5/8 Inch Residential and Commercial	999,999,999	8,000
11	1 Inch and Larger Residential and Commercial	999,999,999	25,000
12			
13			
14	Rate Code Sheet 14A		
15	**Tier 3:** (Gallon over)		
16	5/8 Inch Residential and Commercial	999,999,999	999,999,999
17	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
18			
19			
20	Rate Code Sheet 14B		
21	**Tier 3:** (Gallon over)		
22	5/8 Inch Residential and Commercial	999,999,999	999,999,999
23	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
24			
25			

			Present Rates	Summer* Proposed Rates	Winter* Proposed Rates
26					
27					
28					
29	Rate Code Sheet 14A				
30	Commodity Rates (per 1,000 gallons over minimum and per Tier) **(A)**				
31	All	Tier 1	$ 3.40	$ 3.50	$ 3.50
32	All	Tier 2	5.95	6.13	6.13
33	All	Tier 3	5.95	10.13	10.13
34	All	Tier 4	5.95	10.13	10.13
35					
36					
37	Rate Code Sheet 14B				
38	Commodity Rates (per 1,000 gallons over minimum and per Tier)				
39	All	Tier 1	$ 3.50	$ 3.50	$ 3.50
40	All	Tier 2	3.50	6.13	6.13
41	All	Tier 3	3.50	10.13	10.13
42	All	Tier 4	3.50	10.13	10.13
43					
44	* Summer Months (May, June, July, August, September)				
45	Winter Months (October, November, December, January, February, March, April)				
46					
47					
48					
49					
50					
51					
52					
53					
54					

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 1a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.78	0.93	4.27%
2,000	25.25	26.28	1.03	4.10%
3,000	28.65	32.41	3.76	13.13%
4,000	32.05	38.54	6.49	20.25%
5,000	38.00	44.67	6.67	17.55%
6,000	43.95	50.80	6.85	15.58%
7,000	49.90	56.93	7.03	14.08%
8,000	55.85	63.06	7.21	12.90%
9,000	61.80	73.18	11.38	18.42%
10,000	67.75	83.31	15.56	22.97%
11,000	73.70	93.44	19.74	26.79%
12,000	79.65	103.57	23.92	30.03%
13,000	85.60	113.70	28.10	32.82%
14,000	91.55	123.83	32.28	35.26%
15,000	97.50	133.95	36.45	37.39%
16,000	103.45	144.08	40.63	39.28%
17,000	109.40	154.21	44.81	40.96%
18,000	115.35	164.34	48.99	42.47%
19,000	121.30	174.47	53.17	43.83%
20,000	127.25	184.60	57.35	45.07%
25,000	157.00	235.24	78.24	49.83%
30,000	186.75	285.88	99.13	53.08%
35,000	216.50	336.52	120.02	55.44%
40,000	246.25	387.17	140.92	57.23%
45,000	276.00	437.81	161.81	58.63%
50,000	305.75	488.45	182.70	59.76%
60,000	365.25	589.74	224.49	61.46%
70,000	424.75	691.02	266.27	62.69%
80,000	484.25	792.31	308.06	63.62%
90,000	543.75	893.59	349.84	64.34%
100,000	603.25	994.88	391.63	64.92%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	19.28025
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 1b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.78	0.93	4.27%
2,000	25.25	26.28	1.03	4.10%
3,000	28.65	32.41	3.76	13.13%
4,000	32.05	38.54	6.49	20.25%
5,000	38.00	44.67	6.67	17.55%
6,000	43.95	50.80	6.85	15.58%
7,000	49.90	56.93	7.03	14.08%
8,000	55.85	63.06	7.21	12.90%
9,000	61.80	73.18	11.38	18.42%
10,000	67.75	83.31	15.56	22.97%
11,000	73.70	93.44	19.74	26.79%
12,000	79.65	103.57	23.92	30.03%
13,000	85.60	113.70	28.10	32.82%
14,000	91.55	123.83	32.28	35.26%
15,000	97.50	133.95	36.45	37.39%
16,000	103.45	144.08	40.63	39.28%
17,000	109.40	154.21	44.81	40.96%
18,000	115.35	164.34	48.99	42.47%
19,000	121.30	174.47	53.17	43.83%
20,000	127.25	184.60	57.35	45.07%
25,000	157.00	235.24	78.24	49.83%
30,000	186.75	285.88	99.13	53.08%
35,000	216.50	336.52	120.02	55.44%
40,000	246.25	387.17	140.92	57.23%
45,000	276.00	437.81	161.81	58.63%
50,000	305.75	488.45	182.70	59.76%
60,000	365.25	589.74	224.49	61.46%
70,000	424.75	691.02	266.27	62.69%
80,000	484.25	792.31	308.06	63.62%
90,000	543.75	893.59	349.84	64.34%
####	603.25	994.88	391.63	64.92%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 2a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 19.28	$ (1.07)	-5.26%
1,000	23.85	22.78	(1.07)	-4.48%
2,000	27.35	26.28	(1.07)	-3.90%
3,000	30.85	32.41	1.56	5.07%
4,000	34.35	38.54	4.19	12.20%
5,000	37.85	44.67	6.82	18.02%
6,000	41.35	50.80	9.45	22.85%
7,000	44.85	56.93	12.08	26.93%
8,000	48.35	63.06	14.71	30.41%
9,000	51.85	73.18	21.33	41.15%
10,000	55.35	83.31	27.96	50.52%
11,000	58.85	93.44	34.59	58.78%
12,000	62.35	103.57	41.22	66.11%
13,000	65.85	113.70	47.85	72.66%
14,000	69.35	123.83	54.48	78.55%
15,000	72.85	133.95	61.10	83.88%
16,000	76.35	144.08	67.73	88.71%
17,000	79.85	154.21	74.36	93.13%
18,000	83.35	164.34	80.99	97.17%
19,000	86.85	174.47	87.62	100.89%
20,000	90.35	184.60	94.25	104.31%
25,000	107.85	235.24	127.39	118.12%
30,000	125.35	285.88	160.53	128.07%
35,000	142.85	336.52	193.67	135.58%
40,000	160.35	387.17	226.82	141.45%
45,000	177.85	437.81	259.96	146.17%
50,000	195.35	488.45	293.10	150.04%
60,000	230.35	589.74	359.39	156.02%
70,000	265.35	691.02	425.67	160.42%
80,000	300.35	792.31	491.96	163.79%
90,000	335.35	893.59	558.24	166.47%
100,000	370.35	994.88	624.53	168.63%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 19.28	19.28025
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 2b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 19.28	$ (1.07)	-5.26%
1,000	23.85	22.78	(1.07)	-4.48%
2,000	27.35	26.28	(1.07)	-3.90%
3,000	30.85	32.41	1.56	5.07%
4,000	34.35	38.54	4.19	12.20%
5,000	37.85	44.67	6.82	18.02%
6,000	41.35	50.80	9.45	22.85%
7,000	44.85	56.93	12.08	26.93%
8,000	48.35	63.06	14.71	30.41%
9,000	51.85	73.18	21.33	41.15%
10,000	55.35	83.31	27.96	50.52%
11,000	58.85	93.44	34.59	58.78%
12,000	62.35	103.57	41.22	66.11%
13,000	65.85	113.70	47.85	72.66%
14,000	69.35	123.83	54.48	78.55%
15,000	72.85	133.95	61.10	83.88%
16,000	76.35	144.08	67.73	88.71%
17,000	79.85	154.21	74.36	93.13%
18,000	83.35	164.34	80.99	97.17%
19,000	86.85	174.47	87.62	100.89%
20,000	90.35	184.60	94.25	104.31%
25,000	107.85	235.24	127.39	118.12%
30,000	125.35	285.88	160.53	128.07%
35,000	142.85	336.52	193.67	135.58%
40,000	160.35	387.17	226.82	141.45%
45,000	177.85	437.81	259.96	146.17%
50,000	195.35	488.45	293.10	150.04%
60,000	230.35	589.74	359.39	156.02%
70,000	265.35	691.02	425.67	160.42%
80,000	300.35	792.31	491.96	163.79%
90,000	335.35	893.59	558.24	166.47%
100,000	370.35	994.88	624.53	168.63%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 3a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 28.92	$ 7.70	36.29%
1,000	24.72	32.42	7.70	31.16%
2,000	28.22	35.92	7.70	27.30%
3,000	31.72	42.05	10.33	32.58%
4,000	35.22	48.18	12.96	36.80%
5,000	38.72	54.31	15.59	40.26%
6,000	42.22	60.44	18.22	43.15%
7,000	45.72	66.57	20.85	45.60%
8,000	49.22	72.70	23.48	47.69%
9,000	52.72	82.82	30.10	57.10%
10,000	56.22	92.95	36.73	65.34%
11,000	59.72	103.08	43.36	72.61%
12,000	63.22	113.21	49.99	79.07%
13,000	66.72	123.34	56.62	84.86%
14,000	70.22	133.47	63.25	90.07%
15,000	73.72	143.59	69.87	94.78%
16,000	77.22	153.72	76.50	99.07%
17,000	80.72	163.85	83.13	102.99%
18,000	84.22	173.98	89.76	106.58%
19,000	87.72	184.11	96.39	109.88%
20,000	91.22	194.24	103.02	112.93%
25,000	108.72	244.88	136.16	125.24%
30,000	126.22	295.52	169.30	134.13%
35,000	143.72	346.16	202.44	140.86%
40,000	161.22	396.81	235.59	146.13%
45,000	178.72	447.45	268.73	150.36%
50,000	196.22	498.09	301.87	153.84%
60,000	231.22	599.38	368.16	159.22%
70,000	266.22	700.66	434.44	163.19%
80,000	301.22	801.95	500.73	166.23%
90,000	336.22	903.23	567.01	168.64%
100,000	371.22	1,004.52	633.30	170.60%

Present Rates:

Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 28.92	$ 28.92
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 3b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 28.92	$ 7.70	36.29%
1,000	24.72	32.42	$ 7.70	31.16%
2,000	28.22	35.92	$ 7.70	27.30%
3,000	31.72	42.05	$ 10.33	32.58%
4,000	35.22	48.18	$ 12.96	36.80%
5,000	38.72	54.31	$ 15.59	40.26%
6,000	42.22	60.44	$ 18.22	43.15%
7,000	45.72	66.57	$ 20.85	45.60%
8,000	49.22	72.70	$ 23.48	47.69%
9,000	52.72	82.82	$ 30.10	57.10%
10,000	56.22	92.95	$ 36.73	65.34%
11,000	59.72	103.08	$ 43.36	72.61%
12,000	63.22	113.21	$ 49.99	79.07%
13,000	66.72	123.34	$ 56.62	84.86%
14,000	70.22	133.47	$ 63.25	90.07%
15,000	73.72	143.59	$ 69.87	94.78%
16,000	77.22	153.72	$ 76.50	99.07%
17,000	80.72	163.85	$ 83.13	102.99%
18,000	84.22	173.98	$ 89.76	106.58%
19,000	87.72	184.11	$ 96.39	109.88%
20,000	91.22	194.24	$ 103.02	112.93%
25,000	108.72	244.88	$ 136.16	125.24%
30,000	126.22	295.52	$ 169.30	134.13%
35,000	143.72	346.16	$ 202.44	140.86%
40,000	161.22	396.81	$ 235.59	146.13%
45,000	178.72	447.45	$ 268.73	150.36%
50,000	196.22	498.09	$ 301.87	153.84%
60,000	231.22	599.38	$ 368.16	159.22%
70,000	266.22	700.66	$ 434.44	163.19%
80,000	301.22	801.95	$ 500.73	166.23%
90,000	336.22	903.23	$ 567.01	168.64%
100,000	371.22	1,004.52	$ 633.30	170.60%

Present Rates:

Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 28.92	$ 28.92
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 4a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.70	23.76	85.05%
2,000	31.34	55.20	23.86	76.15%
3,000	34.74	58.71	23.97	68.99%
4,000	38.14	62.21	24.07	63.11%
5,000	44.09	65.71	21.62	49.04%
6,000	50.04	69.21	19.17	38.31%
7,000	55.99	72.71	16.72	29.87%
8,000	61.94	76.22	14.28	23.05%
9,000	67.89	79.72	11.83	17.42%
10,000	73.84	83.22	9.38	12.70%
11,000	79.79	89.35	9.56	11.98%
12,000	85.74	95.48	9.74	11.36%
13,000	91.69	101.61	9.92	10.81%
14,000	97.64	107.73	10.09	10.34%
15,000	103.59	113.86	10.27	9.92%
16,000	109.54	119.99	10.45	9.54%
17,000	115.49	126.12	10.63	9.20%
18,000	121.44	132.25	10.81	8.90%
19,000	127.39	138.38	10.99	8.62%
20,000	133.34	144.51	11.17	8.37%
25,000	163.09	175.15	12.06	7.39%
30,000	192.84	225.79	32.95	17.09%
35,000	222.59	276.43	53.84	24.19%
40,000	252.34	327.08	74.74	29.62%
45,000	282.09	377.72	95.63	33.90%
50,000	311.84	428.36	116.52	37.37%
60,000	371.34	529.65	158.31	42.63%
70,000	430.84	630.93	200.09	46.44%
80,000	490.34	732.22	241.88	49.33%
90,000	549.84	833.50	283.66	51.59%
100,000	609.34	934.79	325.45	53.41%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 4b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.70	23.76	85.05%
2,000	31.34	55.20	23.86	76.15%
3,000	34.74	58.71	23.97	68.99%
4,000	38.14	62.21	24.07	63.11%
5,000	44.09	65.71	21.62	49.04%
6,000	50.04	69.21	19.17	38.31%
7,000	55.99	72.71	16.72	29.87%
8,000	61.94	76.22	14.28	23.05%
9,000	67.89	79.72	11.83	17.42%
10,000	73.84	83.22	9.38	12.70%
11,000	79.79	89.35	9.56	11.98%
12,000	85.74	95.48	9.74	11.36%
13,000	91.69	101.61	9.92	10.81%
14,000	97.64	107.73	10.09	10.34%
15,000	103.59	113.86	10.27	9.92%
16,000	109.54	119.99	10.45	9.54%
17,000	115.49	126.12	10.63	9.20%
18,000	121.44	132.25	10.81	8.90%
19,000	127.39	138.38	10.99	8.62%
20,000	133.34	144.51	11.17	8.37%
25,000	163.09	175.15	12.06	7.39%
30,000	192.84	225.79	32.95	17.09%
35,000	222.59	276.43	53.84	24.19%
40,000	252.34	327.08	74.74	29.62%
45,000	282.09	377.72	95.63	33.90%
50,000	311.84	428.36	116.52	37.37%
60,000	371.34	529.65	158.31	42.63%
70,000	430.84	630.93	200.09	46.44%
80,000	490.34	732.22	241.88	49.33%
90,000	549.84	833.50	283.66	51.59%
100,000	609.34	934.79	325.45	53.41%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 5a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	157.74	89.76	132.04%
2,000	71.38	161.25	89.87	125.90%
3,000	74.78	164.75	89.97	120.31%
4,000	78.18	168.25	90.07	115.21%
5,000	84.13	171.75	87.62	104.15%
6,000	90.08	175.25	85.17	94.55%
7,000	96.03	178.76	82.73	86.15%
8,000	101.98	182.26	80.28	78.72%
9,000	107.93	185.76	77.83	72.11%
10,000	113.88	189.26	75.38	66.19%
11,000	119.83	195.39	75.56	63.06%
12,000	125.78	201.52	75.74	60.22%
13,000	131.73	207.65	75.92	57.63%
14,000	137.68	213.78	76.10	55.27%
15,000	143.63	219.90	76.27	53.10%
16,000	149.58	226.03	76.45	51.11%
17,000	155.53	232.16	76.63	49.27%
18,000	161.48	238.29	76.81	47.57%
19,000	167.43	244.42	76.99	45.98%
20,000	173.38	250.55	77.17	44.51%
25,000	203.13	281.19	78.06	38.43%
30,000	232.88	331.83	98.95	42.49%
35,000	262.63	382.47	119.84	45.63%
40,000	292.38	433.12	140.74	48.13%
45,000	322.13	483.76	161.63	50.18%
50,000	351.88	534.40	182.52	51.87%
60,000	411.38	635.69	224.31	54.53%
70,000	470.88	736.97	266.09	56.51%
80,000	530.38	838.26	307.88	58.05%
90,000	589.88	939.54	349.66	59.28%
100,000	649.38	1,040.83	391.45	60.28%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 5b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	157.74	89.76	132.04%
2,000	71.38	161.25	89.87	125.90%
3,000	74.78	164.75	89.97	120.31%
4,000	78.18	168.25	90.07	115.21%
5,000	84.13	171.75	87.62	104.15%
6,000	90.08	175.25	85.17	94.55%
7,000	96.03	178.76	82.73	86.15%
8,000	101.98	182.26	80.28	78.72%
9,000	107.93	185.76	77.83	72.11%
10,000	113.88	189.26	75.38	66.19%
11,000	119.83	195.39	75.56	63.06%
12,000	125.78	201.52	75.74	60.22%
13,000	131.73	207.65	75.92	57.63%
14,000	137.68	213.78	76.10	55.27%
15,000	143.63	219.90	76.27	53.10%
16,000	149.58	226.03	76.45	51.11%
17,000	155.53	232.16	76.63	49.27%
18,000	161.48	238.29	76.81	47.57%
19,000	167.43	244.42	76.99	45.98%
20,000	173.38	250.55	77.17	44.51%
25,000	203.13	281.19	78.06	38.43%
30,000	232.88	331.83	98.95	42.49%
35,000	262.63	382.47	119.84	45.63%
40,000	292.38	433.12	140.74	48.13%
45,000	322.13	483.76	161.63	50.18%
50,000	351.88	534.40	182.52	51.87%
60,000	411.38	635.69	224.31	54.53%
70,000	470.88	736.97	266.09	56.51%
80,000	530.38	838.26	307.88	58.05%
90,000	589.88	939.54	349.66	59.28%
100,000	649.38	1,040.83	391.45	60.28%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 6a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.78	0.93	4.27%
2,000	25.25	26.28	1.03	4.10%
3,000	28.65	32.41	3.76	13.13%
4,000	32.05	38.54	6.49	20.25%
5,000	38.00	44.67	6.67	17.55%
6,000	43.95	50.80	6.85	15.58%
7,000	49.90	56.93	7.03	14.08%
8,000	55.85	63.06	7.21	12.90%
9,000	61.80	73.18	11.38	18.42%
10,000	67.75	83.31	15.56	22.97%
11,000	73.70	93.44	19.74	26.79%
12,000	79.65	103.57	23.92	30.03%
13,000	85.60	113.70	28.10	32.82%
14,000	91.55	123.83	32.28	35.26%
15,000	97.50	133.95	36.45	37.39%
16,000	103.45	144.08	40.63	39.28%
17,000	109.40	154.21	44.81	40.96%
18,000	115.35	164.34	48.99	42.47%
19,000	121.30	174.47	53.17	43.83%
20,000	127.25	184.60	57.35	45.07%
25,000	157.00	235.24	78.24	49.83%
30,000	186.75	285.88	99.13	53.08%
35,000	216.50	336.52	120.02	55.44%
40,000	246.25	387.17	140.92	57.23%
45,000	276.00	437.81	161.81	58.63%
50,000	305.75	488.45	182.70	59.76%
60,000	365.25	589.74	224.49	61.46%
70,000	424.75	691.02	266.27	62.69%
80,000	484.25	792.31	308.06	63.62%
90,000	543.75	893.59	349.84	64.34%
100,000	603.25	994.88	391.63	64.92%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 6b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.78	0.93	4.27%
2,000	25.25	26.28	1.03	4.10%
3,000	28.65	32.41	3.76	13.13%
4,000	32.05	38.54	6.49	20.25%
5,000	38.00	44.67	6.67	17.55%
6,000	43.95	50.80	6.85	15.58%
7,000	49.90	56.93	7.03	14.08%
8,000	55.85	63.06	7.21	12.90%
9,000	61.80	73.18	11.38	18.42%
10,000	67.75	83.31	15.56	22.97%
11,000	73.70	93.44	19.74	26.79%
12,000	79.65	103.57	23.92	30.03%
13,000	85.60	113.70	28.10	32.82%
14,000	91.55	123.83	32.28	35.26%
15,000	97.50	133.95	36.45	37.39%
16,000	103.45	144.08	40.63	39.28%
17,000	109.40	154.21	44.81	40.96%
18,000	115.35	164.34	48.99	42.47%
19,000	121.30	174.47	53.17	43.83%
20,000	127.25	184.60	57.35	45.07%
25,000	157.00	235.24	78.24	49.83%
30,000	186.75	285.88	99.13	53.08%
35,000	216.50	336.52	120.02	55.44%
40,000	246.25	387.17	140.92	57.23%
45,000	276.00	437.81	161.81	58.63%
50,000	305.75	488.45	182.70	59.76%
60,000	365.25	589.74	224.49	61.46%
70,000	424.75	691.02	266.27	62.69%
80,000	484.25	792.31	308.06	63.62%
90,000	543.75	893.59	349.84	64.34%
100,000	603.25	994.88	391.63	64.92%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.50	$ 3.50
Up to	8,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification — 1 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 7a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.70	23.76	85.05%
2,000	31.34	55.20	23.86	76.15%
3,000	34.74	58.71	23.97	68.99%
4,000	38.14	62.21	24.07	63.11%
5,000	44.09	65.71	21.62	49.04%
6,000	50.04	69.21	19.17	38.31%
7,000	55.99	72.71	16.72	29.87%
8,000	61.94	76.22	14.28	23.05%
9,000	67.89	79.72	11.83	17.42%
10,000	73.84	83.22	9.38	12.70%
11,000	79.79	89.35	9.56	11.98%
12,000	85.74	95.48	9.74	11.36%
13,000	91.69	101.61	9.92	10.81%
14,000	97.64	107.73	10.09	10.34%
15,000	103.59	113.86	10.27	9.92%
16,000	109.54	119.99	10.45	9.54%
17,000	115.49	126.12	10.63	9.20%
18,000	121.44	132.25	10.81	8.90%
19,000	127.39	138.38	10.99	8.62%
20,000	133.34	144.51	11.17	8.37%
25,000	163.09	175.15	12.06	7.39%
30,000	192.84	225.79	32.95	17.09%
35,000	222.59	276.43	53.84	24.19%
40,000	252.34	327.08	74.74	29.62%
45,000	282.09	377.72	95.63	33.90%
50,000	311.84	428.36	116.52	37.37%
60,000	371.34	529.65	158.31	42.63%
70,000	430.84	630.93	200.09	46.44%
80,000	490.34	732.22	241.88	49.33%
90,000	549.84	833.50	283.66	51.59%
100,000	609.34	934.79	325.45	53.41%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 7b
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.70	23.76	85.05%
2,000	31.34	55.20	23.86	76.15%
3,000	34.74	58.71	23.97	68.99%
4,000	38.14	62.21	24.07	63.11%
5,000	44.09	65.71	21.62	49.04%
6,000	50.04	69.21	19.17	38.31%
7,000	55.99	72.71	16.72	29.87%
8,000	61.94	76.22	14.28	23.05%
9,000	67.89	79.72	11.83	17.42%
10,000	73.84	83.22	9.38	12.70%
11,000	79.79	89.35	9.56	11.98%
12,000	85.74	95.48	9.74	11.36%
13,000	91.69	101.61	9.92	10.81%
14,000	97.64	107.73	10.09	10.34%
15,000	103.59	113.86	10.27	9.92%
16,000	109.54	119.99	10.45	9.54%
17,000	115.49	126.12	10.63	9.20%
18,000	121.44	132.25	10.81	8.90%
19,000	127.39	138.38	10.99	8.62%
20,000	133.34	144.51	11.17	8.37%
25,000	163.09	175.15	12.06	7.39%
30,000	192.84	225.79	32.95	17.09%
35,000	222.59	276.43	53.84	24.19%
40,000	252.34	327.08	74.74	29.62%
45,000	282.09	377.72	95.63	33.90%
50,000	311.84	428.36	116.52	37.37%
60,000	371.34	529.65	158.31	42.63%
70,000	430.84	630.93	200.09	46.44%
80,000	490.34	732.22	241.88	49.33%
90,000	549.84	833.50	283.66	51.59%
100,000	609.34	934.79	325.45	53.41%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.50	$ 3.50
Up to	25,000	$ 6.13	$ 6.13
Up to	999,999,999	$ 10.13	$ 10.13
Over	1,000,000,000	$ 10.13	$ 10.13

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 8a
Witness: Bourassa

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	157.74	89.76	132.04%
2,000	71.38	161.25	89.87	125.90%
3,000	74.78	164.75	89.97	120.31%
4,000	78.18	168.25	90.07	115.21%
5,000	84.13	171.75	87.62	104.15%
6,000	90.08	175.25	85.17	94.55%
7,000	96.03	178.76	82.73	86.15%
8,000	101.98	182.26	80.28	78.72%
9,000	107.93	185.76	77.83	72.11%
10,000	113.88	189.26	75.38	66.19%
11,000	119.83	195.39	75.56	63.06%
12,000	125.78	201.52	75.74	60.22%
13,000	131.73	207.65	75.92	57.63%
14,000	137.68	213.78	76.10	55.27%
15,000	143.63	219.90	76.27	53.10%
16,000	149.58	226.03	76.45	51.11%
17,000	155.53	232.16	76.63	49.27%
18,000	161.48	238.29	76.81	47.57%
19,000	167.43	244.42	76.99	45.98%
20,000	173.38	250.55	77.17	44.51%
25,000	203.13	281.19	78.06	38.43%
30,000	232.88	331.83	98.95	42.49%
35,000	262.63	382.47	119.84	45.63%
40,000	292.38	433.12	140.74	48.13%
45,000	322.13	483.76	161.63	50.18%
50,000	351.88	534.40	182.52	51.87%
60,000	411.38	635.69	224.31	54.53%
70,000	470.88	736.97	266.09	56.51%
80,000	530.38	838.26	307.88	58.05%
90,000	589.88	939.54	349.66	59.28%
100,000	649.38	1,040.83	391.45	60.28%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
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Up to	10,000	$ 3.50	$ 3.50
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14,000	137.68	213.78	76.10	55.27%
15,000	143.63	219.90	76.27	53.10%
16,000	149.58	226.03	76.45	51.11%
17,000	155.53	232.16	76.63	49.27%
18,000	161.48	238.29	76.81	47.57%
19,000	167.43	244.42	76.99	45.98%
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EXHIBIT

3

entities to verify the points in question. Future rate case legal expenses will be affected if the costs of making these changes are permitted to be included in the allowable test year expenses by the Commission.

#4.1-2 Improper Payment of Property Taxes for Inter-affiliate Firms: PWCo's improper payment of property taxes for SWCo over the years of 2000-2002 (see Jones DT 8) has been admitted by PWCo at Bourassa Rt.21 21-26. Bourassa's excuse for these booking errors being "caused by the fact that the property tax bills are addressed to Brooke Utilities and not specifically addressed to Pine Water or to Strawberry Water" is hogwash, with each bill clearly indicating which entity should pay (see Exhibit XX Jones Surrebuttal). Had this improper activity not been caught by the District, PWCo would have test year expenses that would allow a $16,617 larger than justified recovery of expenses through rates, and if a 10% return on expenses (as recommended by Fernandez) was allowed by the Commission, an extra $1,661 profit would have been allowed, for a total excess recovery from ratepayers of $18,278.

#4.1-3 Improper Accrued Property Taxes: The balance sheet item of accrued property taxes on 12-31-02 appears way high at $29,001 on 12-31-02 test year for PWCo. This is explained by Bourassa at Interrogatory 34 as an error related to PWCo paying property tax bills that really belong to SWCo. If left standing, this excess accrual would allow the rate base to be excessively high (by the amount of the error), allowing for unjustified recovery of return of return on assets employed.

#4.1-4 Improper Recording of Repair and Maintenance Expenses: PWCo's improper recording of repair and maintenance expenses (see Jones DT 8-9) has been admitted by Bourassa at Rt. 26 22-26 and 27 1-7. Had this improper activity not be caught by the District, PWCo would have been able to maintain the $59,423 expense claimed in the 2002 test year, while -$0- was claimed for 2001, $11,261 for 2000, and -$0- for 1999. It is apparent PWCo has poor control over their accounting system or is deliberately moving expenses from company to company or from accounting category to accounting category. The accounting for repair and maintenance expenses is a good example of the allegations by the District that the accounting system, financial records, and financial statements are inaccurate, misleading, and basically out of control. Bourassa claims in Interrogatory 30 that the missing amounts for 1999 and

EXHIBIT

4

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EXHIBIT

5

LAW OFFICE OF
JOHN G. GLIEGE

P.O. Box 1388
Flagstaff, Arizona 86002-1388

Phone: 928 380 0159

jgliege@earthlink.net

February 4, 2004

Jay L. Shapiro
Fennemore Craig
3003 North Central Ave. Ste 2600
Phoenix, AZ 85012-2913

JAY SHAPIRO
FEB 0 6 2004
ACTION _____

Re: Jones Invoices

Dear Mr. Shapiro,

Enclosed please find copies of Harry Jones invoices to the District.

Pursuant to your discovery request, the lawyer fess alone for the district, which have been paid as of this date, are: $29,340.

Sincerely,

LAW OFFICE OF JOHN G. GLIEGE

John G. Gliege

HDJ Management

HC8 Box 363
Payson, AZ 85541
(928) 474-2876
Cell (928) 595-1111
FAX (928) 474-2876

*** INVOICE ***

Terms: Net 10 days

To: John Nelson, Administrator, Pine/Strawberry Water Improvement District

From: Harry D. Jones, HDJ Management

Date: 10-31-03

For management services rendered 10-1-03 thru 10-31-03:

10-1-03	Meet with John Nelson and leave suggested letter to former board members.	.6 hours
10-2-03	Telephone call with Loren Peterson with his suggestions about possible intervention in rate hearing and his ideas of community members to bring into a potential citizens communications group.	1.8
10-3-03	Call from John N. requesting I call Jon Breninger and to review Loren's comments. Go to Roundup newspaper office to review letter to editor from three weeks earlier by Estess. Call John B., make introduction, and set appointment for Sunday,10-5. Call from Loren Peterson about intervention deadline dates.	1.0
10-4-03	Prepare potential survey questions and file and organize documents.	2.2
10-5-03	Prepared agenda to discuss with John Breninger. Met with John B. to discuss his feelings and review his agenda for transition to Bd. of Supervisors. Reviewed records he will prepare to deliver next day.	6.9
10-6-03	Review CAP water rights of Pine Water Co. (none for Strawberry) with CAP offices. Go to bank to arrange to get new signatures on bank account. Lunch with Marty to update him on progress and to give him bank signature card to go to John N. Go to Pine and pick up records, unpaid bills, checks, keys, etc. and review them with John B.	3.8
10-7-03	To Pine to Post Office, storage building, and review and pick up some records to study. Called Mortensen and Goode about records and minutes of last board meeting. Made quick review of	4.6

	records picked up, sorted mail and bills, called John Liege about intervention, prepared for next day meeting with John N.	
10-8-03	Met with John N. to update on my activities and to review legal briefs, allocations of CAP water, etc. Filed documents, read reports, and began preparation for mailing of reports to citizens. Coordinated with Jo Johnson to handle M-M reports and CD-ROMs to be picked up by citizens.	5.8
10-9-03	Met with John N. to coordinate payment of bills and to arrange to have E-mail sent to John Liege. Prepared part of documents for John G., arranged notebooks, and prepared notes for Nancy to be able to do the telephone calls and mailings of the M-M reports and CD-ROMs.	2.7
10-10-03	Prepare copies of rate hearing documents and status for John G. Go to copy store, Jo Johnson's office, Payson Packaging, and Post Office.	1.3
10-11-03	Contact Pine library and John B. Set up mailing and call procedures for distribution of reports and CDs. Check Web sites for County link and PSWID links for internet access to report. Further review rate hearing application to save time of John G. (especially the financial sections).	5.5 Harry
10-11-03	Prepare invoice forms and mailing/pickup checklist for Jo Johnson to use. Make calls to citizens who requested reports two months ago, fill out invoices, and package items ready for pick up or mailing.	2.9 Nancy
10-12-03	Prepare to update John G. on significant details of rate hearing and procedural order of ACC. Further coordinate financial details in rate hearing application with Econ.com report. Complete M-M report review so I can discuss with Buzz Walker and Mike Ploughe when I hand deliver their copies.	6.8 Harry
10-12-03	Place calls to citizens and prepare invoices, mailings and pick up envelopes.	1.2 Nancy
10-13-03	Met with Ray Pugel and called Loren Peterson to get input for meeting with John Nelson	.6
10-14-03	Calls from Printing by George and John Gliege. To Payson P.O. and Printing by George. To Pine mailbox. To Payson Town Hall to meet with Buzz Walker. Pay bills and update mailing records.	3.7 Harry
10-14-03	Complete daily mailing preparation	.5 Nancy
10-15-03	Met John N. to pay bills and set agenda for next days meeting. To Pine to go to storage unit and mail box and pick up new bills. Prepared written agenda for 10-16 meeting with attorney. Reviewed resumes and filed paid bills. Prepared CDs for mailing.	4.6
10-16-03	Make copies of resumes for meeting. Meet with John N. and John Gliege	3.0
10-17-03	Met with Bill McKnight to deliver report and discuss his well that supplies water to Brooke system. Met with Mike Ploughe to review study and arrange meeting with John N. To Post Office.	2.5
10-18-03	Update records and arrange meeting schedule with John N. Called Breninger, resume applicants, and other interested parties and interviewed them over phone. Began drafting interrogatory questions for John G.	5.2

10-19-03	Review E-mail from Loren. Prepare questions for John G. Call Ray Pugel for his e-mail. Make committee candidate calls. Prepare memo to attorney	10.2
10-20-03	Complete balance of mailing and prepare accounts receivable list	2.1 Nancy
10-20-03	Verify final mailing results. Handle E-mail from Pugel and prepare additional questions for Gliege.	3.6 Harry
10-21-03	Lunch with Gregrumph of SRP. To John N. office and post office to deliver mailings. Call from Glenn Brown. Start preparing written testimony.	5.7
10-22-03	Telephone review of draft testimony with Peterson. And Pugel. Review of testimony with Gliege and discuss extention request. To Pine P.O. for mail To nelson and Jo Johnson to review collections and status. Update of testimony and integrate Pugel and Peterson comments. Discuss additional background with Greg of SRP.	6.2
10-23-03	To J. Nelson office to review agenda. Long call from Gliege as to processes and facts. Integrate Gliege comments into agenda. Meet with Dan Jackson and Nelson and discussed legal issuesand testimony with Gliege.	4.0
10-24-03	Call from Kornrumph to discuss data and review his explaination of M & M study. Obtain additional population info. From Nelson and discuss with Greg K.	1.0
10-25-03	Update written testimony with John. Calls with Jim Estess and Alan LaMagna.	7.9
10-26-03	Review and prepare testimony	8.5
10-27-03	Update testimony and re-arrange records. Prepare reply to Gliege and Nelson. Go to Pine to see Perry Schaal and Tom Weeks.	7.2
10-28-03	Review updates to testimony and seed to others. Calls to Jackson, Johnson, Nelson, and Gliege. Update testimony based on days conversations.	7.6
10-29-03	Print update of testimony and e-mail. Review Fed-Ex documents from Jackson. Call Gliege about the new info. To Pine for mail. Called Nelson on way to Laughlin to review status. Review exhibits and update testimony.	7.8
10-30-03	Call Gliege to review latest e-mail. To county offices to copy Exhibits. To P.O. to mail copies to Gliege. Make final adjustments to testimony .	5.6
10-31-03	To Pine P.O. to look for staff reports . See Perry Schaal at Knolls job site. Follow up at P.O. to track delivery to Gliege.	1.3

Total Hours – Nancy 6.7 @ $20.00 =	$ 134.00
Total Hours – Harry 139.2 @ $45.00 =	6,264.00
Total Due	$6,398.00

HDJ Management

HC8 Box 363
Payson, AZ 85541
(928) 474-2876
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*** INVOICE ***

Terms: Net 10 days

To: John Nelson, Administrator, Pine/Strawberry Water Improvement District

From: Harry D. Jones, HDJ Management

Date: 11-30-03

For management services rendered 11-1-03 thru 11-30-03:

11-1-03	Prepare memo on advisory group. Call Gliege for strategy and to review his memo. Review ACC Staff recommendations and call John N. to review status. Call recruits and summarize backgrounds.	10.3 hours
11-2-03	Cal from Jim Estess on 10-24 meeting he is planning. Start Nancy on bank deposit and A/R preparation. Nancy works up bank deposit and prepares A/R list. Revised agenda and call more of the advisors to get resumes accurate.	7.8 Harry 1.2Nancy
11-3-03	To County to see J. Nelson (gone). To Print by George for copies. Call from Brian Boers to confirm participation. Call from Al LaMagna confirming meeting space. Answer E-mails, make corrections to testimony and call Gliege on testimony.	3.0
11-4-03	Go to Print by George twice to deliver originals and to pick up copies. Meet with Bob Cassaro. Put together information packets for advisory group.	3.5
11-5-03	Go to Print by George for agendas. . Call advisory group to arrange delivery of handouts. See John to sign checks and for update. Met with Lynne Gardner, Jim Estess, and Gary Hezel in Pine and go to Pine P.O. to mail last 3 copies. Review Requests to Produce and our Interrogatories.	6.0
11-6-03	Call from Bill Riley. To Pine P.O. and calls to Dee Dee Stodghill. Review Interrogatories as revised by Gliege. Answer E-Mails.	3.3

11-7-03	Review E-mail from Gliege. Call from Gliege for update of status. Met with J. Nelson to discuss engagement of Ploughe and call to Gliege about discovery problems with E-mail between Nelson and Jones. To printer to pay bill and to get 20 copies of interrogatories. Pick up nametags at bank. Review Gliege E-mail and prepare name labels.	1.6
11-8-03	Go to Pine to meet with Advisory Group and go to P.O. Search files for report on water use and growth estimates. Call Hezel to review report and the meeting.	6.2
11-9-03	Update notes and files from 11-8 meeting. Send PSWID volume report to Bureau of Reclamation and SRP. Write E-mail to Gliege. Start on preparation of interrogatory answers and locate resignation letters.	1.9
11-10-03	Call from Joe Hock resigning from Advisory Bd. Call from Loren Peterson and Ray Pugel regarding meeting on Sat. and discussions they want to have with Jim Estess. Review interrogatory objections for Gliege.	5.0
11-11-03	Discuss answers to my questions about obtaining information with Gliege. Locate results of prior surveys for Loren and call and fax him. Talk to Bill Riley and send CD to him for his daughter. Find copy of Borehole study and results for use in testimony.	3.4
11-12-03	Prepare interrogatory answers. Memo to Loren Peterson. Go see Mark Fumusa to review water sales and related testimony. Call Gary Hezel for background. Find reference documents for Exhibits	6.0
11-13-03	Answer interrogatories. Discuss proposed answers and objections with Gliege. Update more answers.	6.5
11-14-03	Prepare Exhibit submittals to Gliege and update interrogatory answers. Go to printer for copy of backup documents. Meet with John Nelson at my office to discuss his answers to interrogatories and to review status. Meet with Mike Ploughe to discuss well costs	3.4
11-15-03	Copy backup Exhibits and go to P.O. to mail to Gliege. Update Exhibits and review those from J. Nelson. Answer interrogatories. Answer questions and review data from Ploughe.	10.3
11-16-03	Review E-mails, study John's documents, and review all documents for Disclosure Book. Prepare all disclosures and copy required documents.	10.8
11-17-03	Call from Loren Peterson. Call from Mark about bonding meeting and related strategy. Copy final documents for Disclosure Book and mail to Gliege. Review PSWID Demand Study and prepare for presentation to Mog. Rim Resource Group next day. Review E-mail from Dick Bond and prepare answers to Dick Bond and J. Nelson	3.6
11-18-03	Met with Tom Whitmer of ADWR to discuss status with Brook and our testimony, and need for accurate data on wells, water production, etc. Study memo from Gliege. Study results of Gliege trip to ACC, ADEQ, and ADWR and compare results with other Brooke records. Call from Gliege about above comparisons.	2.2
11-19-03	Update testimony and interrogatory answers based on new information from Gliege's trip. Lunch with Martinez for update. Calls to various well owners related to use of wells by Pine Water Co. or Brooke. Review answers to interrogatories. Discuss District	5.7

	status and well use with Brent Weeks.	
11-20-03	Call with Jim Estess about not coming to meeting he has called in Pine. Discuss results of record search of wells with Tom Whitmer of ADWR.	.4
11-21-03	Call from Gliege about hearing later in the day (needed sources of my information). Call with Gliege about hearing results. Met with Bob Gardner to try to figure out Pine/Strawberry supply memo and update on intervening.	1.3
11-22-03	Review E-mails and send messages to Gliege and Nelson. Prepare memo to Bob Gardner to have him help understand the problems with the District's Supply and Demand study and Report.	.6
11-24-03	Call from Ray Pugel. Call from Mark Reeder about strategy and meeting schedule. Call from Loren Peterson. Call to Gliege about meeting schedule.	.6
11-25-03	Review Gliege memo on Shapiro's response to interrogatories. Meet with Gliege, Nelson, Martinez, Christensen, to hold conference call with Reeder, Jackson, and bond attorney related to financing District for improvements and potential acquisitions. Reply to Shapiro data requests.	5.7
11-26-03	Discuss Estess meeting and supply/demand study with Glen Brown. Discuss possible petition to District Bd. for conversion to "Domestic" district, possible funding levels, and possible use of Web site to distributed information to citizens. Pick up mail at P.O. Discuss Estess meeting and slow pumping techniques with Bill Riley that may get more production out of current wells.	1.2
11-27-03	Review form of possible petition by citizens to Bd. if District. Respond to E-mails to Peterson and Gliege. Make suggested changes to Petition form. Review Economist. com revised forecast. Prepare suggested bullet points for flyer to Pugel.	6.9
11-28-03	Met with Casero to discuss procedures for testimony. Met with Glen Brown and Gary Hezel related to demand/supply study inaccuracies. Call to Breninger. Read background materials from Gliege. Go to Pine P.O.	5.0
11-29-03	Locate demand/supply background support materials and review why errors had occurred. Discuss problems with Hezel. Review background materials from Gliege. Restructure demand/supply study and recalculate data.	7.9
11-30-03	Read e-mails and search internet for required accounting practices for public utilities. Update responses to Gliege as to Exhibit numbers. Proofread all responses to Shapiro. Review Gliege bill. File all documents. Pay bills.	8.1

Total Hours- Nancy 1.2 @ $20.00 =	24.00
Total Hours- Harry 138.2 @ $45.00 =	6,219.00
Total Due	$6,243.00

HDJ Management

HC8 Box 363
Payson, AZ 85541
(928) 474-2876
Cell (928) 595-1111
FAX (928) 474-2876

*** *INVOICE* ***

Terms: Net 10 days

To: John Nelson, Administrator, Pine/Strawberry Water Improvement District

From: Harry D. Jones, HDJ Management

Date: 12-31-03

For management services rendered 12-1-03 thru 12-31-03:

12-01-03	Call from Glenn Brown. To County office to see Jo Johnson, Nelson, and Martinez. Update on phone with J. Nelson. Visit Buzz Walker at Town of Payson about format of demand spreadsheet and to update him on activities, plus seek help on other possible drilling locations.	2.1 hours
12-2-03	Discussion with Peterson related to his desire to have Petition to Incur Expenses. Review demand spreadsheet and comments from Hezel about Peterson well. Pick up copies of consumer complaints from Peterson and discuss his well output and go to printer for copies. Conference call with Dan Jackson, Nelson, Reader, and Gliege to discuss financing options. Download 150 pages of rebuttal testimony and begin to review it.	6.4
12-3-02	Call to Gliege accidental E-mail to Shapiro. To printer to pick up copies. To Nelson for update and to pay bills and discuss financing options. Conference call with Mark, Mike, Nelson to discuss financing terms. To printer to get copies and pay his bill. To Loren to review rebuttal testimony. Review motions to compel on discovery and to change hearing officers.	3.1
12-4-03	Study rebuttal testimony. Call from Loren about form of petition. To East Verde Park to meet Gardner about spreadsheet and to Pine to put Dee Dee Stodghill on Advisory Board. Read E-mails and handle calls from Nelson and Peterson.	1.8
12-5-03	Review Bourassa rebuttal and fix my testimony about size of tank at Solitude Trails. Read e-mails and review final petition. Study	2.0

	ADEQ reports and compare with other testimony and write reply to Gliege on variances.	
12-6-03	Complete memo on ADEQ reports. Go to Pine to review supply/demand study with Gary Hezel and to discuss alternatives to drilling of deep well recommended in M & M study. Meet with Breninger about demand study, status of M & M study on well design, status of Bureau of Reclamation study and his question of why it takes three years to study prior reports.	3.9
12-7-03	Review E-mails and letter to ACC Chief Counsel and Shapiro. Review rebuttal testimony and write memo to Gliege. Call from Pugel about next days hearing. Review Hardcastle rebuttal and handle calls and reviews of documents being prepared as handouts.	13.4
12-8-03	File paperwork. Call from Jackson. Meet with Nelson and Martinez to review P/S population numbers and status of tonight s meeting. Call to Dan. Go to printer. Sort documents for duplication. Meet Gliege, Martinez and Nelson in Strawberry and at Pine School to attend ACC hearing. Review e-mails and determine various rate schedules for Jackson.	6.2
12-9-03	Memo to Dan and Gliege on Pine Hearing and justifications for motions to compel. Call to Ploughe. Call to Gliege, Peterson, and Pugel about improving testimony of public to be more focused. Update inconsistencies in PWCo testimony and reasons we need 5 years of data.	7.6
12-10-03	Send reasons to compel to Gliege. Call with Mark Reader. Mail stuff to Jackson and Gliege. Meet with Mike Ploughe to review testimony needs. Work on P/S population projections and spreadsheet for Nelson.	5.7
12-11-03	Update P/S demand spreadsheet. Calls from Nelson and Martinez. Call to Gliege about strategy. Calls to Marty, Ray, Loren about meeting schedule. Discuss with Dan about his possible testimony.	1.2
12-12-03	Call Gliege about strategy. Meet with Martinez and Nelson about strategy and to approve demand spreadsheet. Calls to Gliege about strategy and to Dale Hon of Assessors office about how he handles population #s and total parcels in PSWID. Update Jackson on strategy and review how he can help review my testimony. Call Ploughe on how he can help with testimony. Discuss Pine situation with Kyle Hart and Jerry Palmer (Pine resident). Calls to Pugel and Peterson about new Advisory Board members.	5.4
12-13-03	Prepare demand study for District + filing of Doc.s. Discuss testimony with Mike Ploughe. Call Bob Gardner for assistance with demand study and spread sheets to reconcile growth rates, census data, and build-out times. Review Ploughe e-mail. Work on Surrebuttal testimony.	15.6
12-14-03	Prepare Surrebuttal testimony to Hardcastle	12.3
12-15-03	Organize files and prepare materials for duplication. Go to printer. Review demand study with Bob Gardner and prepare new spreadsheet. Call to Dale Hom about data problems. Review my testimony with Dan Jackson and determine not to have him testify.	2.8

	Review revised spreadsheet with Gardner. Pick up printing and mailing boxes.	
12-16-03	Prepare mailings to Advisory Group members. Write e-mails. Call from Gliege on my testimony. Call from D. Jackson on e-mails. To printer and Pine post office. To Payson post office for Phx. Members. Calls to Pugel and Peterson. Call to Nelson on e-mails and Phx. hearing results. Final update of demand study after morning meeting with Bureau of Reclamation.	6.0
12-17-03	Prepare Hardcastle surrebuttal testimony. Call from Gliege and to Mark Reader and From Mark. More surrebuttal.	4.7
12-18-03	Prepare Surrebuttal. Review e-mails and motion for sanctions. Continue on Surrebuttal testimony.	6.7
12-19-03	Prepare Surrebuttal testimony. Update of Pugel and Peterson. Lunch meeting with Nelson and Martinez for update and review of next day agenda. Update with Gliege. Make copies of my testimony and Ploughe testimony for Advisory Group meeting.	9.7
12-20-03	Prepare for advisory meeting, do facility setup, attend meeting, and go to office supply store for printing materials.	6.8
12-21-03	Print and read 120 pages of motion to compel, sanctions, and protective orders from Shapiro. Prepare mailing of handouts to those who missed the meeting on Sat.	2.7
12-22-03	Update resume of Mike Ploughe and prepare to mail. Copy Ploughe resume. Go. to Payson P.O. Go to Pine P.O. for copy of Breninger letter demanding Bd. meeting in Pine. Study Breninger letter and organize files.	3.7
12-23-03	Review memos from Nelson and Hezel and prepare replies to each and to Gliege.	.8
12-24-03	File Documents and memo to Gliege	1.3
12-27-03	Memo to Gliege about Breninger	.4
12-29-03	Discuss news article and Peterson well with Ploughe. Review e-mails and respond to Peterson, Nelson, etc.	2.6
12-30-03	Memo to Peterson	1.1
12-31-03	Respond to Gliege on fact sheet memo. Meet with Nelson to discuss status, upcoming meeting, and what to do with Breninger. Review Breninger motion to dismiss District and his surrebuttal testimony.	4.1

Total Hours 140.1 @ $45.00= 6,304.50

EXHIBIT

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an outside contract, are to be accounted for simply as Contractual Services-Other per NARUC standards, as required by the Commission. In addition to the issues of where to properly record wheeling charges, the cost of purchased water is often confused with meter reading costs. Patricia Behm's meter reading costs are often charged to the Purchased Water account rather than to Contract Services-Other (see Responses CF5-2 and CF5-6 to Data Requests #5 from Staff. Total financial effects of misapplication of the accounting system are difficult to compute until all errors are uncovered in an audit.

#4.1-17 Improper Expenses Identified by Staff: At Bourassa RT, page 13, he concedes the Company accepts Staff's (a) proposed adjustment to Sales Tax expense, (b) plant-in-service, (c) material and supplies expense, and purchased water. These types of admissions, when considered with other adjustments and questions form the District, significantly reduce confidence in the accuracy and reliability of the records and the testimony.

#4.1-18 Disagreements Over Efforts to Find Additional Water Resources: The District has maintained at Jones Dt. 16 that PWCo has spent little effort and resources in an attempt to locate or develop adequate sustainable long-term water resources for the certificated area. The lack of PWCo participation in broad-based efforts to develop resources is covered in Jones Dt. 16. The efforts of Pine/Strawberry Water Improvement District, the Northern Gila County Water Alliance Borehole Project, The Bureau of Reclamation Regional study, and the efforts of Strawberry Hollow Domestic Water Improvement District appear to be disregarded by PWCo based on their apparent believe that no additional water is to be reasonably found or developed in the Pine/Strawberry area (Hardcastle Rt.2). No one study, including the *Investigation of Groundwater Availability* study commissioned by the District are, on there own, absolute definitive answers or conclusion related to the water problem (even if Intervener Breninger personally claims "We Have the Water"). Mr. Hardcastle's notion is wrong that because the District paid for its own study, the study is "right" and is the "gospel", and therefore the District is contradicting itself anytime it takes a position different than its own study. The Borehole project, supported by Gila County, PSWID, Forest Service, State Land, and others has provided encouragement to Loren Peterson, a private landowner, to move forward to the near completion of the Strawberry Hollow DWID's new well (a high-potential significant source of added water to the Pine area). Those

EXHIBIT

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4.1 In his surrebuttal testimony Mr. Jones testifies, "however the District's case and the Staffs' concerns are generally "on target". What does the District mean when it testifies its case is generally "on target." In support of the response, state:

(a) Each allegation or claim by the District that has been found valid or otherwise upheld by the Commission in this case;

(b) Each objection by Pine Water to the District's discovery requests that has been upheld;

(c) The impact on the Company's rate case expense of each matter identified in (a) and/or (b) above.

ANSWER: #4.1 "On target" means that the District's case and the Staff's concerns are generally accurate and factual, and they address the key points of the Rate Hearing. The reader should keep in mind that for every approximate $7,000 error (lower/higher expenses, etc.) as described below, PWCo profits would be about 10% higher/lower than is targeted by the Commission (assumes $70,052 would be the allowed profits as described by Fernandez at Dt. 5 12-13). Please note that many of the allegations posed by the District are not measurable in terms of financial costs, but may be measurable in terms of service quality, confusing or misleading statements, inaccurate reporting to regulators, etc. It should also be noted that inconsistent and inaccurate answers abound in the testimony, responses to interrogatories, certified Annual Reports, and discovery provided to the District and the Commission. Some adjustments requested by the Commission Staff that the District had also identified are included below but remain the domain of the Staff.

#4.1-1 <u>Improper Recording of Ownership of Subject Companies:</u> The District's claim related to improperly reported ownership of the entities involved in this case has been admitted by PWCo. The ownership of PWCo and SWCo was misstated at the ACC Securities Division over a number of years between 1999 and 2002. Ownership of those firms was stated to be Crystal Investments, when now in fact PWCo claims Brooke Utilities, Inc. is the owner. ACC Securities Division Annual Reports of PWCo and SWCo have apparently been corrected by PWCo and SWCo. The current rates case has not been significantly impacted by this problem, however it did waste several days of the District's time to get to the apparent truth, although the District has been denied access to the stock book records of the

EXHIBIT

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entities to verify the points in question. Future rate case legal expenses will be affected if the costs of making these changes are permitted to be included in the allowable test year expenses by the Commission.

#4.1-2 Improper Payment of Property Taxes for Inter-affiliate Firms: PWCo's improper payment of property taxes for SWCo over the years of 2000-2002 (see Jones DT 8) has been admitted by PWCo at Bourassa Rt.21 21-26. Bourassa's excuse for these booking errors being "caused by the fact that the property tax bills are addressed to Brooke Utilities and not specifically addressed to Pine Water or to Strawberry Water" is hogwash, with each bill clearly indicating which entity should pay (see Exhibit XX Jones Surrebuttal). Had this improper activity not been caught by the District, PWCo would have test year expenses that would allow a $16,617 larger than justified recovery of expenses through rates, and if a 10% return on expenses (as recommended by Fernandez) was allowed by the Commission, an extra $1,661 profit would have been allowed, for a total excess recovery from ratepayers of $18,278.

#4.1-3 Improper Accrued Property Taxes: The balance sheet item of accrued property taxes on 12-31-02 appears way high at $29,001 on 12-31-02 test year for PWCo. This is explained by Bourassa at Interrogatory 34 as an error related to PWCo paying property tax bills that really belong to SWCo. If left standing, this excess accrual would allow the rate base to be excessively high (by the amount of the error), allowing for unjustified recovery of return of return on assets employed.

#4.1-4 Improper Recording of Repair and Maintenance Expenses: PWCo's improper recording of repair and maintenance expenses (see Jones DT 8-9) has been admitted by Bourassa at Rt. 26 22-26 and 27 1-7. Had this improper activity not be caught by the District, PWCo would have been able to maintain the $59,423 expense claimed in the 2002 test year, while -$0- was claimed for 2001, $11,261 for 2000, and -$0- for 1999. It is apparent PWCo has poor control over their accounting system or is deliberately moving expenses from company to company or from accounting category to accounting category. The accounting for repair and maintenance expenses is a good example of the allegations by the District that the accounting system, financial records, and financial statements are inaccurate, misleading, and basically out of control. Bourassa claims in Interrogatory 30 that the missing amounts for 1999 and

2001 are $16,325 and $4,447 respectively, and he adjusted the test year down from $59,000 to $42,000, thereby admitting a $17,000 overstatement of expenses for the test year.

#4.1-5 Improper Payment of Bills for Water Hauling for Inter-Affiliate Firms: Improper recording on the books of PWCo of hauling costs for inter-affiliate companies located at Tonto Basin and East Verde Estates (see Jones DT 9 and Jones Rt.18 15-20) has been ignored by PWCo. Supplying the District with bills paid by PWCo for water hauled to other subsidiaries of Brooke was a surprise, but is indicative of the poor accounting and control systems. The amount of improper bills paid over the years cannot be exactly determined, but it is obvious that PWCo has possibly overstated water-hauling expenses and, as such, test year expenses are likely overstated.

#4.1-6 Improper Reporting of Amounts and Sources of Purchased Water: Throughout the discovery process, PWCo appears to be unwilling to provide the answers to questions related to the correct levels and sources of purchased water. In answer to Interrogatory 1 which asks "what private individuals, other utility companies, or other entities does Pine Water Co. . . . acquire water from," Mistie Jared states that "PWCo acquires water from SWCo and Starlight Pines Water Co." No other suppliers are listed. Mr. Hardcastle makes the same claim that "PWCo has purchased water only from SWCo and Starlight Pines Water Co." in a reply to Interrogatory 14 related to terms of water supply agreements. However, the discovery documents from PWCo reflect water purchases from the additional following sources:

(a) Water Sharing Agreements with Solitude Trails Domestic Water Improvement District, Ferrari, and Bloom. Solitude Trails, it has been discovered, supplies 6-12 million gallons per year to PWCo, with over 8 million gallons supplied in the test year.

(b) Water hauling bills included with Attachment 5 of the PWCo answers to Interrogatory #3 were from Pearson Trucking and the bills indicate water was purchased from the Knolls (apparently another Brooke Utilities subsidiary) and the Knolls has not been disclosed as a source of purchased water. In addition, Sheet 82B attached to the response to Data Request 8 of the Commission Staff

EXHIBIT

9

PINE WATER COMPANY
2003 GENERAL RATE CASE
DOCKET NO. W-03512A—03-0279
RESPONSE TO DATA REQUEST NO. 9

Company Response Number: CF 9-2

Q Please provide copy of the 2001 general ledger of Brooke Utilities Inc. which reflects that the Magnolia Project was placed in service in February 2001.

A. PWC's accounting records do not show the date Project Magnolia was placed into service. ADOT and US Forest Service permits were issued prior to construction of the water line and also do not provide an in service date. However, attachment 9-2 is a copy of the first bill sent to Pine Water from Brooke Utilities dated March 1, 2001, which is consistent with Mr. Hardcastle's testimony that the project was placed in service in February 2001. The start read on the new meter was 79000 because Pine Water was not billed for water used to flush and test line.

Brooke Utilities, Inc.
P.O. Box 82218, Bakersfield, CA 93380

INVOICE

Date: March 1, 2001

To: Pine Water Co., Inc.
P.O. Box 82218
Bakersfield, CA 93380

For: Water Delivery Services
Month: February
Year: 2001

Beginning of Month Meter Reading:		79,000
End of Month Meter Reading:		648,000
Water Delivered		569,000
Rate per 1,000 Gallons	$	15.00
Amount Due This Invoice	$	8,535

ALL PAYMENTS DUE UPON RECEIPT

EXHIBIT 10

2.2 The attached file "pinedsc.xls" includes the cash flow analysis and debt service calculation prepared by Mr. Reiker.

Response by: Joel M. Reiker

No payback period has been established by Staff regarding the inter-company payable since Staff is not recommending approval.

Response by: Claudio Fernandez

Staff is not recognizing the inter-company payable in its recommended rates. However, Staff believes that the Company is in a better position to make a determination as to the proposed treatment of the payable. The Company choices could include writing-off the payable, issue equity or payback the inter-company payable.

Response by: Claudio Fernandez

Staff's response to Company data request 2.2

1	Operating Income	$	70,130
2	Depreciation & Amort.		42,478
3	Income Tax Expense		11,589
4			
5	Interest Expense		18,505
6	Repayment of Principal		25,210

Times Interest Earned Ratio (TIER)	
[1+2+3] ÷ [5]	6.71
Debt Service Coverage (DSC)	
[1+2+3] ÷ [5+6]	2.84

1 Per testimony of Claudio Fernandez Schedule CMF-9
2 Per testimony of Claudio Fernandez Schedule CMF-9
3 Per testimony of Claudio Fernandez Schedule CMF-9
5 Per 12/31/2002 annual report & Staff's response to Company data request 2.2 page 2
6 Per 12/31/2002 annual report & Staff's response to Company data request 2.2 page 2

Staff's response to Company data request 2.2

Loan Amount Requested	$149,979		
Down Payment:	$0		
Amount Financed:	$149,979		
Number of years:	15	**Compounding Periods:**	12
Interest rate (r):	8.00%		

LOAN AMORTIZATION SCHEDULE

Period	Loan payment (1)	Beginning-of-month principal (2)	Payments: Interest [r * (2)] (3)	Payments: Principal [(1) - (3)] (4)	End-of-month principal [(2) - (4)] (5)	Annual Interest (6)	Annual Principal (7)	Annual Debt Payment (8)
1	$1,433.28	$149,979.00	$999.86	$433.42	$149,545.58			
2	1,433.28	149,545.58	996.97	436.31	149,109.28			
3	1,433.28	149,109.28	994.06	439.22	148,670.06			
4	1,433.28	148,670.06	991.13	442.14	148,227.92			
5	1,433.28	148,227.92	988.19	445.09	147,782.82			
6	1,433.28	147,782.82	985.22	448.06	147,334.77			
7	1,433.28	147,334.77	982.23	451.05	146,883.72			
8	1,433.28	146,883.72	979.22	454.05	146,429.67			
9	1,433.28	146,429.67	976.20	457.08	145,972.59			
10	1,433.28	145,972.59	973.15	460.13	145,512.46			
11	1,433.28	145,512.46	970.08	463.19	145,049.27			
12	1,433.28	145,049.27	967.00	466.28	144,582.98	11,803.31	5,396.02	17,199.33

EXHIBIT 11

Pine Water Company
Cash Flows Avaialable for Plant Investment Under Staff's Proposals
Test Year Ended December 31, 2002

Exhibit
Witness: Bourassa

Line No.			Repayment Term In Years	Staff Proposed Using Rate Base (8.7% Return)	Staff Proposed Using Operating Margin (11% return)
1	Staff Recommended Earnings			$ 55,657	$ 70,130
2	Less:				
3	Interest Expense			17,534	17,534
4	Available			$ 38,124	$ 52,596
5					
6					
7	Principal Payment on Debt				
8	Existing Debt	$ 55,353	6	$ (9,225)	$ (9,225)
9	Staff's Proposed Debt Financing	$ 149,979	15	(9,999)	(9,999)
10	Available Without Depreciation			$ 18,900	$ 33,372
11	Depreciation			42,478	42,478
12	Repayment of Inter-Company Payable	$ 533,000	5	(106,600)	(106,600)
12	Dividends			-	-
13	Available Cash Flows for Plant Investment			$ (45,222)	$ (30,750)
14					
15					
16					

Pine Water Company
Revenue Requirement on Proposed Projects

Exhibit

Line No.		Storage Tank	Deep Well	Test Well	Generic
1	Rate of Return	11.00%	11.00%	11.00%	11.00%
2	Investment Cost	$ 1,000,000	$ 4,000,000	$ 870,000	$ 500,000
3	Return on Investment	110,000	440,000	95,700	55,000
4	Depreciation at 2.5%	25,000	100,000	21,750	12,500
5	Operating Expenses (1)	-	-	-	-
6	Operating Income Required	$ 135,000	$ 540,000	$ 117,450	$ 67,500
7	Income Tax Rate (40%)	40%	40%	40%	40%
8	Revenue Conversion Factor	1.67	1.67	1.67	1.67
9	Revenue Requirement (Line 3 times Line 8 Plus Line 4 Plus Line 5)	$ 208,333	$ 833,333	$ 181,250	$ 104,167
10					
11	Number of Customers at Year End	1,884	1,884	1,884	1,884
12	Annual Cost per Customer	$ 110.58	$ 442.32	$ 96.20	$ 55.29
13	Monthly Cost Per Customer	$ 9.22	$ 36.86	$ 8.02	$ 4.61
14					
15	Average Monthly Bill 5/8 Inch Residential (14A) Under Present Rates	$ 27.74	$ 27.74	$ 27.74	$ 27.74
16	Increase in Average Monthly Bill as percent	33.22%	132.88%	28.90%	16.61%
17					
18	Average Monthly Bill 5/8 Inch Residential (14B) Under Present Rates	$ 29.50	$ 29.50	$ 29.50	$ 29.50
19	Increase in Average Monthly Bill as percent	31.24%	124.95%	27.18%	15.62%
20					
21	(1) Increases in operating expenses are variable and not subject to estimation at this time.				
22					
23					

EXHIBIT
A-7
admitted

Pine Water Company
Test Year Ended December 31, 2002
Computation of Increase in Gross Revenue
Requirements As Adjusted

Exhibit
Rejoinder Schedule A-1
Page
Witness: Bourassa
REVISED

Line No.			
1	Fair Value Rate base	$	590,689
2			
3	Adjusted Operating Income		(4,548)
4			
5	Current Rate of Return		-0.77%
6			
7	Required Operating Income	$	64,939
8			
9	Required Rate of Return on Fair Value Rate Base		10.99%
10			
11	Operating Income Deficiency	$	69,486
12			
13	Gross Revenue Conversion Factor		1.2646
14			
15	Increase in Gross Revenue		
16	Requirement	$	87,871

Line No.	Customer Classification	Present Rates	Proposed Rates	Dollar Increase	Percent Increase
17					
18					
19					
20					
21	5/8 Inch Meter - Residential	$626,494	$707,279	$ 80,785	12.89%
22	3/4 Inch Meter - Residential	468	652	184	39.29%
23	1 Inch Meter - Residential	4,441	6,342	1,901	42.82%
24	2 Inch Meter - Residential	194	463	269	138.84%
25	5/8 Inch Meter - Commercial	2,003	2,887	884	44.14%
26	1 Inch Meter - Commercial	2,647	3,372	724	27.36%
27	2 Inch Meter - Commercial	5,977	8,942	2,965	49.61%
28					
29	Revenues from Annualization	3,539	3,680	141	3.98%
30				-	0.00%
31				-	0.00%
32	Miscellaneous Revenues	8,436	8,436	-	0.00%
33				-	0.00%
34	Total of Water Revenues	$654,199	$742,052	$ 87,853	13.43%

35
36
37
38 SUPPORTING SCHEDULES:
39 Rejoinder B-1
40 Rejoinder C-1
41 Rejoinder C-3
42 Rejoinder H-1
43
44

EXHIBIT
A-8

Pine Water Company
Revenue Summary
With Annualized Revenues to Year End Number of Customers
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-1
Page 1
Witness: Bourassa

Line No.	Meter Size	Customer Classification	Present Revenues	Proposed Revenues	Dollar Change	Percent Change	REVISED Percent of Present Water Revenues	Percent of Proposed Water Revenues
1	5/8 Inch	Residential 14A	$ 507,049	$ 574,677	$ 67,628	13.34%	78.52%	78.33%
2	5/8 Inch	Residential 14B	119,446	132,602	13,157	11.01%	18.50%	18.08%
3								
4	3/4 Inch	Residential 14B	468	652	184	39.29%	0.07%	0.09%
5	1 Inch	Residential 14A	4,441	6,342	1,901	42.82%	0.69%	0.86%
6	2 Inch	Residential 14A	194	463	269	138.84%	0.03%	0.06%
7								
8								
9	5/8 Inch	Commercial 14A	2,003	2,887	884	44.14%	0.31%	0.39%
10	1 Inch	Commercial 14A	2,647	3,372	724	27.36%	0.41%	0.46%
11	2 Inch	Commercial 14A	5,977	8,942	2,965	49.61%	0.93%	1.22%
12								
13								
14								
15	**Total Water Revenues**		$ 642,224	$ 729,937	$ 87,712	13.66%	99.45%	99.50%
16								
17								
18	**Revenue Annualization (a)**							
19	5/8 Inch	Residential 14A	$ 3,539	$ 3,680	141	3.98%	0.55%	0.50%
20								
21								
22								
23								
24	**Total Revenue Annualization**		3,539	3,680	141	3.98%	0.55%	0.50%
25	**Total Water Revenues with**							
26	**Revenue Annualization**		$ 645,763	$ 733,616	$ 87,853		100.00%	100.00%
27								
28								
29	(a) Customer Growth Annualization is not calculated. Change in customers is not due to growth.							
30								
31								

Pine Water Company
Analysis of Revenue by Detailed Class
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-2
Page 1
Witness: Bourassa
REVISED

Line No.	Customer Classification and/or Meter Size	(a) Average Number of Customers at 12/31/2002	Summer Average Consumption	Summer Revenues Present Rates	Summer Revenues Proposed Rates	Summer Proposed Increase Dollar Amount	Summer Proposed Increase Percent Amount	Winter Average Consumption	Winter Revenues Present Rates	Winter Revenues Proposed Rates	Winter Proposed Increase Dollar Amount	Winter Proposed Increase Percent Amount
1	5/8 Inch Residential 14A	1,502	2,731	$ 27.74	$ 31.77	4.03	14.54%	1,998	$ 25.24	$ 25.66	0.41	1.63%
2	5/8 Inch Residential 14B	360	2,614	29.50	30.99	1.49	5.05%	1,707	26.32	24.73	(1.60)	-6.07%
3												
4	3/4 Inch Residential 14B	1	4,901	38.37	55.87	17.49	45.59%	5,215	39.47	53.25	13.78	34.92%
5	1 Inch Residential 14A	2	31,834	203.75	259.12	55.37	27.17%	28,836	185.91	200.63	14.72	7.92%
6	2 Inch Residential 14A	0	-	64.58	154.24	89.66	138.84%	-	64.58	154.24	89.66	138.84%
7												
8	-											
9	5/8 Inch Commercial 14A	2	14,750	96.02	138.87	42.85	44.63%	9,786	66.48	76.29	9.81	14.75%
10	1 Inch Commercial 14A	1	44,901	281.50	398.46	116.96	41.55%	27,358	177.12	186.47	9.35	5.28%
11	2 Inch Commercial 14A	2	38,801	285.24	439.45	154.21	54.06%	28,358	223.11	302.09	78.98	35.40%
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30	Totals	1,871										
31												
32	Actuall Year End Number											
33	of Customers:	1,884										
34												
35	**(a)** Average number of customers of less than one (1), indicates that less than 12 bills were issued during the year.											
36												
37												

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-3
Page 1
Witness: Bourassa
REVISED

Line No.	Customer Classification and Meter Size	Present Rates	Proposed Rates	Percent Change
1				
2				
3				
4	Rate Code Sheet 14A			
5	**Monthly Usage Charge for:**			
6	Residential,Commercial			
7	5/8 x 3/4 Inch	$ 18.45	$ 19.28	4.50%
8	3/4 Inch	21.22	28.92	36.29%
9	1 Inch	24.54	48.20	96.42%
10	1 1/2 Inch	36.90	96.40	161.25%
11	2 Inch	64.58	154.24	138.84%
12	3 Inch	92.25	308.48	234.40%
13	4 Inch	147.60	482.01	226.56%
14	6 Inch	-	964.01	0.00%
15	8 Inch	-	1,928.03	0.00%
16				
17	Rate Code Sheet 14B			
18	**Monthly Usage Charge for:**			
19	Residential,Commercial			
20	5/8 x 3/4 Inch	$ 20.35	$ 19.28	-5.26%
21	3/4 Inch	30.53	28.92	-5.27%
22	1 Inch	50.88	48.20	-5.27%
23	1 1/2 Inch	101.75	96.40	-5.26%
24	2 Inch	162.80	154.24	-5.26%
25	3 Inch	305.25	308.48	1.06%
26	4 Inch	508.75	482.01	-5.26%
27	6 Inch	1,017.50	964.01	-5.26%
28	8 Inch	-	1,928.03	0.00%
29				
30				
31		**Present Rates**	**Proposed Rates**	
32				
33	Rate Code Sheet 14A			
34	Gallons In Minimum			
35	All	-	-	
36				
37				
38	Rate Code Sheet 14B			
39	Gallons In Minimum			
40	All	-	-	
41				
42				
43				
44	Rate Code Sheet 14A			
45	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
46	5/8 Inch Residential and Commercial	4,000	2,000	
47	1 Inch and Larger Residential and Commercial	4,000	10,000	
48				
49				
50	Rate Code Sheet 14B			
51	**Tier 1:** Gallons upper limit (over 0 gallons (Present), **0 Gallons Proposed**, but not over stated amount			
52	5/8 Inch Residential and Commercial	999,999,999	2,000	
53	1 Inch and Larger Residential and Commercial	999,999,999	10,000	
54				
55				

Pine Water Company
Present and Proposed Rates
Test Year Ended December 31, 2002

Exhibit
Rejoinder Schedule H-3
Page 2
Witness: Bourassa
REVISED

Line No.	Customer Classification and Meter Size	Present Rates	Summer Proposed Rates
1			
2	Rate Code Sheet 14A		
3	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
4	5/8 Inch Residential and Commercial	999,999,999	8,000
5	1 Inch and Larger Residential and Commercial	999,999,999	25,000
6			
7			
8	Rate Code Sheet 14B		
9	**Tier 2:** (Gallon upper limit, up to, but not exceeding)		
10	5/8 Inch Residential and Commercial	999,999,999	8,000
11	1 Inch and Larger Residential and Commercial	999,999,999	25,000
12			
13			
14	Rate Code Sheet 14A		
15	**Tier 3:** (Gallon over)		
16	5/8 Inch Residential and Commercial	999,999,999	999,999,999
17	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
18			
19			
20	Rate Code Sheet 14B		
21	**Tier 3:** (Gallon over)		
22	5/8 Inch Residential and Commercial	999,999,999	999,999,999
23	1 Inch and Larger Residential and Commercial	999,999,999	999,999,999
24			
25			

			Present Rates	Summer* Proposed Rates	Winter* Proposed Rates
26					
27					
28					
29	Rate Code Sheet 14A				
30	Commodity Rates (per 1,000 gallons over minimum and per Tier) **(A)**				
31	All	Tier 1	$ 3.40	$ 3.81	$ 3.19
32	All	Tier 2	5.95	6.66	5.58
33	All	Tier 3	5.95	10.66	9.58
34	All	Tier 4	5.95	10.66	9.58
35					
36					
37	Rate Code Sheet 14B				
38	Commodity Rates (per 1,000 gallons over minimum and per Tier)				
39	All	Tier 1	$ 3.50	$ 3.81	$ 3.19
40	All	Tier 2	3.50	6.66	5.58
41	All	Tier 3	3.50	10.66	9.58
42	All	Tier 4	3.50	10.66	9.58
43					
44	* Summer Months (May, June, July, August, September)				
45	Winter Months (October, November, December, January, February, March, April)				
46					
47					
48					
49					
50					
51					
52					
53					
54					

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 1a
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	23.09	1.24	5.67%
2,000	25.25	26.90	1.65	6.52%
3,000	28.65	33.56	4.91	17.14%
4,000	32.05	40.22	8.17	25.50%
5,000	38.00	46.89	8.89	23.39%
6,000	43.95	53.55	9.60	21.85%
7,000	49.90	60.22	10.32	20.67%
8,000	55.85	66.88	11.03	19.75%
9,000	61.80	77.54	15.74	25.48%
10,000	67.75	88.21	20.46	30.20%
11,000	73.70	98.87	25.17	34.16%
12,000	79.65	109.54	29.89	37.52%
13,000	85.60	120.20	34.60	40.42%
14,000	91.55	130.86	39.31	42.94%
15,000	97.50	141.53	44.03	45.16%
16,000	103.45	152.19	48.74	47.12%
17,000	109.40	162.86	53.46	48.86%
18,000	115.35	173.52	58.17	50.43%
19,000	121.30	184.18	62.88	51.84%
20,000	127.25	194.85	67.60	53.12%
25,000	157.00	248.17	91.17	58.07%
30,000	186.75	301.49	114.74	61.44%
35,000	216.50	354.81	138.31	63.88%
40,000	246.25	408.13	161.88	65.74%
45,000	276.00	461.45	185.45	67.19%
50,000	305.75	514.77	209.02	68.36%
60,000	365.25	621.41	256.16	70.13%
70,000	424.75	728.05	303.30	71.41%
80,000	484.25	834.69	350.44	72.37%
90,000	543.75	941.33	397.58	73.12%
100,000	603.25	1,047.97	444.72	73.72%
Average Usage				
2,731	$ 27.74	$ 31.77	$ 4.03	14.54%

Present Rates:

		Summer	Winter
Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

		Summer	Winter
Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 1b
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.47	0.62	2.84%
2,000	25.25	25.66	0.41	1.63%
3,000	28.65	31.25	2.60	9.06%
4,000	32.05	36.83	4.78	14.91%
5,000	38.00	42.41	4.41	11.62%
6,000	43.95	48.00	4.05	9.21%
7,000	49.90	53.58	3.68	7.38%
8,000	55.85	59.17	3.32	5.94%
9,000	61.80	68.75	6.95	11.25%
10,000	67.75	78.33	10.58	15.62%
11,000	73.70	87.92	14.22	19.29%
12,000	79.65	97.50	17.85	22.41%
13,000	85.60	107.09	21.49	25.10%
14,000	91.55	116.67	25.12	27.44%
15,000	97.50	126.26	28.76	29.49%
16,000	103.45	135.84	32.39	31.31%
17,000	109.40	145.42	36.02	32.93%
18,000	115.35	155.01	39.66	34.38%
19,000	121.30	164.59	43.29	35.69%
20,000	127.25	174.18	46.93	36.88%
25,000	157.00	222.10	65.10	41.46%
30,000	186.75	270.02	83.27	44.59%
35,000	216.50	317.94	101.44	46.85%
40,000	246.25	365.86	119.61	48.57%
45,000	276.00	413.78	137.78	49.92%
50,000	305.75	461.70	155.95	51.00%
60,000	365.25	557.54	192.29	52.65%
70,000	424.75	653.38	228.63	53.83%
80,000	484.25	749.22	264.97	54.72%
90,000	543.75	845.06	301.31	55.41%
####	603.25	940.90	337.65	55.97%
Average Usage				
1,998	$ 25.24	25.66	$ 0.41	1.63%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 2a
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 19.28	$ (1.07)	-5.26%
1,000	23.85	23.09	(0.76)	-3.19%
2,000	27.35	26.90	(0.45)	-1.66%
3,000	30.85	33.56	2.71	8.79%
4,000	34.35	40.22	5.87	17.10%
5,000	37.85	46.89	9.04	23.88%
6,000	41.35	53.55	12.20	29.51%
7,000	44.85	60.22	15.37	34.26%
8,000	48.35	66.88	18.53	38.33%
9,000	51.85	77.54	25.69	49.55%
10,000	55.35	88.21	32.86	59.36%
11,000	58.85	98.87	40.02	68.01%
12,000	62.35	109.54	47.19	75.68%
13,000	65.85	120.20	54.35	82.54%
14,000	69.35	130.86	61.51	88.70%
15,000	72.85	141.53	68.68	94.27%
16,000	76.35	152.19	75.84	99.33%
17,000	79.85	162.86	83.01	103.95%
18,000	83.35	173.52	90.17	108.18%
19,000	86.85	184.18	97.33	112.07%
20,000	90.35	194.85	104.50	115.66%
25,000	107.85	248.17	140.32	130.11%
30,000	125.35	301.49	176.14	140.52%
35,000	142.85	354.81	211.96	148.38%
40,000	160.35	408.13	247.78	154.52%
45,000	177.85	461.45	283.60	159.46%
50,000	195.35	514.77	319.42	163.51%
60,000	230.35	621.41	391.06	169.77%
70,000	265.35	728.05	462.70	174.37%
80,000	300.35	834.69	534.34	177.91%
90,000	335.35	941.33	605.98	180.70%
100,000	370.35	1,047.97	677.62	182.97%
Average Usage				
2,614	$ 29.50	$ 30.99	$ 1.49	5.05%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 2b
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 20.35	$ 19.28	$ (1.07)	-5.26%
1,000	23.85	22.47	(1.38)	-5.78%
2,000	27.35	25.66	(1.69)	-6.17%
3,000	30.85	31.25	0.40	1.28%
4,000	34.35	36.83	2.48	7.22%
5,000	37.85	42.41	4.56	12.06%
6,000	41.35	48.00	6.65	16.08%
7,000	44.85	53.58	8.73	19.47%
8,000	48.35	59.17	10.82	22.37%
9,000	51.85	68.75	16.90	32.60%
10,000	55.35	78.33	22.98	41.53%
11,000	58.85	87.92	29.07	49.39%
12,000	62.35	97.50	35.15	56.38%
13,000	65.85	107.09	41.24	62.62%
14,000	69.35	116.67	47.32	68.23%
15,000	72.85	126.26	53.41	73.31%
16,000	76.35	135.84	59.49	77.92%
17,000	79.85	145.42	65.57	82.12%
18,000	83.35	155.01	71.66	85.97%
19,000	86.85	164.59	77.74	89.51%
20,000	90.35	174.18	83.83	92.78%
25,000	107.85	222.10	114.25	105.93%
30,000	125.35	270.02	144.67	115.41%
35,000	142.85	317.94	175.09	122.57%
40,000	160.35	365.86	205.51	128.16%
45,000	177.85	413.78	235.93	132.66%
50,000	195.35	461.70	266.35	136.34%
60,000	230.35	557.54	327.19	142.04%
70,000	265.35	653.38	388.03	146.23%
80,000	300.35	749.22	448.87	149.45%
90,000	335.35	845.06	509.71	151.99%
100,000	370.35	940.90	570.55	154.06%
Average Usage				
1,707	$ 26.32	24.73	$ (1.60)	-6.07%

Present Rates:

Monthly Minimum:		$ 20.35	$ 20.35
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 3a
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 28.92	$ 7.70	36.29%
1,000	24.72	32.73	8.01	32.40%
2,000	28.22	36.54	8.32	29.47%
3,000	31.72	43.20	11.48	36.19%
4,000	35.22	49.86	14.64	41.58%
5,000	38.72	56.53	17.81	45.99%
6,000	42.22	63.19	20.97	49.67%
7,000	45.72	69.86	24.14	52.79%
8,000	49.22	76.52	27.30	55.47%
9,000	52.72	87.18	34.46	65.37%
10,000	56.22	97.85	41.63	74.05%
11,000	59.72	108.51	48.79	81.70%
12,000	63.22	119.18	55.96	88.51%
13,000	66.72	129.84	63.12	94.60%
14,000	70.22	140.50	70.28	100.09%
15,000	73.72	151.17	77.45	105.06%
16,000	77.22	161.83	84.61	109.57%
17,000	80.72	172.50	91.78	113.70%
18,000	84.22	183.16	98.94	117.48%
19,000	87.72	193.82	106.10	120.96%
20,000	91.22	204.49	113.27	124.17%
25,000	108.72	257.81	149.09	137.13%
30,000	126.22	311.13	184.91	146.50%
35,000	143.72	364.45	220.73	153.58%
40,000	161.22	417.77	256.55	159.13%
45,000	178.72	471.09	292.37	163.59%
50,000	196.22	524.41	328.19	167.26%
60,000	231.22	631.05	399.83	172.92%
70,000	266.22	737.69	471.47	177.10%
80,000	301.22	844.33	543.11	180.30%
90,000	336.22	950.97	614.75	182.84%
100,000	371.22	1,057.61	686.39	184.90%
Average Usage				
4,901	$ 38.37	$ 55.87	$ 17.49	45.59%

Present Rates:

		Summer	Winter
Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

		Summer	Winter
Monthly Minimum:		$ 28.92	$ 28.92
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 3/4 Inch Residential - 14B
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 3b
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 21.22	$ 28.92	$ 7.70	36.29%
1,000	24.72	32.11	$ 7.39	29.90%
2,000	28.22	35.30	$ 7.08	25.10%
3,000	31.72	40.89	$ 9.17	28.90%
4,000	35.22	46.47	$ 11.25	31.94%
5,000	38.72	52.05	$ 13.33	34.44%
6,000	42.22	57.64	$ 15.42	36.52%
7,000	45.72	63.22	$ 17.50	38.28%
8,000	49.22	68.81	$ 19.59	39.79%
9,000	52.72	78.39	$ 25.67	48.69%
10,000	56.22	87.97	$ 31.75	56.48%
11,000	59.72	97.56	$ 37.84	63.36%
12,000	63.22	107.14	$ 43.92	69.48%
13,000	66.72	116.73	$ 50.01	74.95%
14,000	70.22	126.31	$ 56.09	79.88%
15,000	73.72	135.90	$ 62.18	84.34%
16,000	77.22	145.48	$ 68.26	88.40%
17,000	80.72	155.06	$ 74.34	92.10%
18,000	84.22	164.65	$ 80.43	95.50%
19,000	87.72	174.23	$ 86.51	98.62%
20,000	91.22	183.82	$ 92.60	101.51%
25,000	108.72	231.74	$ 123.02	113.15%
30,000	126.22	279.66	$ 153.44	121.56%
35,000	143.72	327.58	$ 183.86	127.93%
40,000	161.22	375.50	$ 214.28	132.91%
45,000	178.72	423.42	$ 244.70	136.92%
50,000	196.22	471.34	$ 275.12	140.21%
60,000	231.22	567.18	$ 335.96	145.30%
70,000	266.22	663.02	$ 396.80	149.05%
80,000	301.22	758.86	$ 457.64	151.93%
90,000	336.22	854.70	$ 518.48	154.21%
100,000	371.22	950.54	$ 579.32	156.06%
Average Usage				
5,215	$ 39.47	53.25	$ 13.78	34.92%

Present Rates:

Monthly Minimum:		$ 21.22	$ 21.22
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Up to	999,999,999	$ 3.50	$ 3.50
Over	1,000,000,000	$ 3.50	$ 3.50

Proposed Rates:

Monthly Minimum:		$ 28.92	$ 28.92
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Summer Present and Proposed

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Rejoinder Schedule H-4
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Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	52.01	24.07	86.14%
2,000	31.34	55.82	24.48	78.10%
3,000	34.74	59.62	24.88	71.63%
4,000	38.14	63.43	25.29	66.32%
5,000	44.09	67.24	23.15	52.51%
6,000	50.04	71.05	21.01	41.98%
7,000	55.99	74.86	18.87	33.70%
8,000	61.94	78.66	16.72	27.00%
9,000	67.89	82.47	14.58	21.48%
10,000	73.84	86.28	12.44	16.85%
11,000	79.79	92.94	13.15	16.49%
12,000	85.74	99.61	13.87	16.18%
13,000	91.69	106.27	14.58	15.90%
14,000	97.64	112.94	15.30	15.67%
15,000	103.59	119.60	16.01	15.46%
16,000	109.54	126.26	16.72	15.27%
17,000	115.49	132.93	17.44	15.10%
18,000	121.44	139.59	18.15	14.95%
19,000	127.39	146.26	18.87	14.81%
20,000	133.34	152.92	19.58	14.68%
25,000	163.09	186.24	23.15	14.19%
30,000	192.84	239.56	46.72	24.23%
35,000	222.59	292.88	70.29	31.58%
40,000	252.34	346.20	93.86	37.20%
45,000	282.09	399.52	117.43	41.63%
50,000	311.84	452.84	141.00	45.22%
60,000	371.34	559.48	188.14	50.67%
70,000	430.84	666.12	235.28	54.61%
80,000	490.34	772.76	282.42	57.60%
90,000	549.84	879.40	329.56	59.94%
100,000	609.34	986.04	376.70	61.82%
Average Usage				
31,834	$ 203.75	$ 259.12	$ 55.37	27.17%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Residential - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.39	23.45	83.94%
2,000	31.34	54.58	23.24	74.16%
3,000	34.74	57.77	23.03	66.30%
4,000	38.14	60.96	22.82	59.84%
5,000	44.09	64.16	20.07	45.51%
6,000	50.04	67.35	17.31	34.58%
7,000	55.99	70.54	14.55	25.98%
8,000	61.94	73.73	11.79	19.03%
9,000	67.89	76.92	9.03	13.30%
10,000	73.84	80.11	6.27	8.49%
11,000	79.79	85.69	5.90	7.40%
12,000	85.74	91.28	5.54	6.46%
13,000	91.69	96.86	5.17	5.64%
14,000	97.64	102.45	4.81	4.92%
15,000	103.59	108.03	4.44	4.29%
16,000	109.54	113.61	4.07	3.72%
17,000	115.49	119.20	3.71	3.21%
18,000	121.44	124.78	3.34	2.75%
19,000	127.39	130.37	2.98	2.34%
20,000	133.34	135.95	2.61	1.96%
25,000	163.09	163.87	0.78	0.48%
30,000	192.84	211.79	18.95	9.83%
35,000	222.59	259.71	37.12	16.68%
40,000	252.34	307.63	55.29	21.91%
45,000	282.09	355.55	73.46	26.04%
50,000	311.84	403.47	91.63	29.38%
60,000	371.34	499.31	127.97	34.46%
70,000	430.84	595.15	164.31	38.14%
80,000	490.34	690.99	200.65	40.92%
90,000	549.84	786.84	237.00	43.10%
100,000	609.34	882.68	273.34	44.86%
Average Usage				
28,836	$ 185.91	200.63	$ 14.72	7.92%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	158.05	90.07	132.49%
2,000	71.38	161.86	90.48	126.76%
3,000	74.78	165.67	90.89	121.54%
4,000	78.18	169.47	91.29	116.77%
5,000	84.13	173.28	89.15	105.97%
6,000	90.08	177.09	87.01	96.59%
7,000	96.03	180.90	84.87	88.38%
8,000	101.98	184.71	82.73	81.12%
9,000	107.93	188.51	80.58	74.66%
10,000	113.88	192.32	78.44	68.88%
11,000	119.83	198.99	79.16	66.06%
12,000	125.78	205.65	79.87	63.50%
13,000	131.73	212.31	80.58	61.17%
14,000	137.68	218.98	81.30	59.05%
15,000	143.63	225.64	82.01	57.10%
16,000	149.58	232.31	82.73	55.31%
17,000	155.53	238.97	83.44	53.65%
18,000	161.48	245.63	84.15	52.11%
19,000	167.43	252.30	84.87	50.69%
20,000	173.38	258.96	85.58	49.36%
25,000	203.13	292.28	89.15	43.89%
30,000	232.88	345.60	112.72	48.40%
35,000	262.63	398.92	136.29	51.90%
40,000	292.38	452.24	159.86	54.68%
45,000	322.13	505.56	183.43	56.94%
50,000	351.88	558.88	207.00	58.83%
60,000	411.38	665.52	254.14	61.78%
70,000	470.88	772.16	301.28	63.98%
80,000	530.38	878.80	348.42	65.69%
90,000	589.88	985.44	395.56	67.06%
100,000	649.38	1,092.08	442.70	68.17%
Average Usage				
-	$ 64.58	$ 154.24	$ 89.66	138.84%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Residential - 14A
Winter Present and Proposed

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Rejoinder Schedule H-4
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REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	157.43	89.45	131.59%
2,000	71.38	160.62	89.24	125.03%
3,000	74.78	163.81	89.03	119.06%
4,000	78.18	167.01	88.83	113.62%
5,000	84.13	170.20	86.07	102.30%
6,000	90.08	173.39	83.31	92.48%
7,000	96.03	176.58	80.55	83.88%
8,000	101.98	179.77	77.79	76.28%
9,000	107.93	182.96	75.03	69.52%
10,000	113.88	186.15	72.27	63.46%
11,000	119.83	191.74	71.91	60.01%
12,000	125.78	197.32	71.54	56.88%
13,000	131.73	202.90	71.17	54.03%
14,000	137.68	208.49	70.81	51.43%
15,000	143.63	214.07	70.44	49.04%
16,000	149.58	219.66	70.08	46.85%
17,000	155.53	225.24	69.71	44.82%
18,000	161.48	230.82	69.34	42.94%
19,000	167.43	236.41	68.98	41.20%
20,000	173.38	241.99	68.61	39.57%
25,000	203.13	269.91	66.78	32.88%
30,000	232.88	317.83	84.95	36.48%
35,000	262.63	365.75	103.12	39.27%
40,000	292.38	413.67	121.29	41.48%
45,000	322.13	461.59	139.46	43.29%
50,000	351.88	509.51	157.63	44.80%
60,000	411.38	605.35	193.97	47.15%
70,000	470.88	701.20	230.32	48.91%
80,000	530.38	797.04	266.66	50.28%
90,000	589.88	892.88	303.00	51.37%
100,000	649.38	988.72	339.34	52.26%
Average Usage				
-	$ 64.58	$ 154.24	154.24	238.84%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	23.09	1.24	5.67%
2,000	25.25	26.90	1.65	6.52%
3,000	28.65	33.56	4.91	17.14%
4,000	32.05	40.22	8.17	25.50%
5,000	38.00	46.89	8.89	23.39%
6,000	43.95	53.55	9.60	21.85%
7,000	49.90	60.22	10.32	20.67%
8,000	55.85	66.88	11.03	19.75%
9,000	61.80	77.54	15.74	25.48%
10,000	67.75	88.21	20.46	30.20%
11,000	73.70	98.87	25.17	34.16%
12,000	79.65	109.54	29.89	37.52%
13,000	85.60	120.20	34.60	40.42%
14,000	91.55	130.86	39.31	42.94%
15,000	97.50	141.53	44.03	45.16%
16,000	103.45	152.19	48.74	47.12%
17,000	109.40	162.86	53.46	48.86%
18,000	115.35	173.52	58.17	50.43%
19,000	121.30	184.18	62.88	51.84%
20,000	127.25	194.85	67.60	53.12%
25,000	157.00	248.17	91.17	58.07%
30,000	186.75	301.49	114.74	61.44%
35,000	216.50	354.81	138.31	63.88%
40,000	246.25	408.13	161.88	65.74%
45,000	276.00	461.45	185.45	67.19%
50,000	305.75	514.77	209.02	68.36%
60,000	365.25	621.41	256.16	70.13%
70,000	424.75	728.05	303.30	71.41%
80,000	484.25	834.69	350.44	72.37%
90,000	543.75	941.33	397.58	73.12%
100,000	603.25	1,047.97	444.72	73.72%
Average Usage				
14,750	$ 96.02	$ 138.87	$ 42.85	44.63%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 5/8 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 18.45	$ 19.28	$ 0.83	4.50%
1,000	21.85	22.47	0.62	2.84%
2,000	25.25	25.66	0.41	1.63%
3,000	28.65	31.25	2.60	9.06%
4,000	32.05	36.83	4.78	14.91%
5,000	38.00	42.41	4.41	11.62%
6,000	43.95	48.00	4.05	9.21%
7,000	49.90	53.58	3.68	7.38%
8,000	55.85	59.17	3.32	5.94%
9,000	61.80	68.75	6.95	11.25%
10,000	67.75	78.33	10.58	15.62%
11,000	73.70	87.92	14.22	19.29%
12,000	79.65	97.50	17.85	22.41%
13,000	85.60	107.09	21.49	25.10%
14,000	91.55	116.67	25.12	27.44%
15,000	97.50	126.26	28.76	29.49%
16,000	103.45	135.84	32.39	31.31%
17,000	109.40	145.42	36.02	32.93%
18,000	115.35	155.01	39.66	34.38%
19,000	121.30	164.59	43.29	35.69%
20,000	127.25	174.18	46.93	36.88%
25,000	157.00	222.10	65.10	41.46%
30,000	186.75	270.02	83.27	44.59%
35,000	216.50	317.94	101.44	46.85%
40,000	246.25	365.86	119.61	48.57%
45,000	276.00	413.78	137.78	49.92%
50,000	305.75	461.70	155.95	51.00%
60,000	365.25	557.54	192.29	52.65%
70,000	424.75	653.38	228.63	53.83%
80,000	484.25	749.22	264.97	54.72%
90,000	543.75	845.06	301.31	55.41%
100,000	603.25	940.90	337.65	55.97%
Average Usage				
9,786	$ 66.48	76.29	$ 9.81	14.75%

Present Rates:

Monthly Minimum:		$ 18.45	$ 18.45
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 19.28	$ 19.28
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	2,000	$ 3.81	$ 3.19
Up to	8,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	52.01	24.07	86.14%
2,000	31.34	55.82	24.48	78.10%
3,000	34.74	59.62	24.88	71.63%
4,000	38.14	63.43	25.29	66.32%
5,000	44.09	67.24	23.15	52.51%
6,000	50.04	71.05	21.01	41.98%
7,000	55.99	74.86	18.87	33.70%
8,000	61.94	78.66	16.72	27.00%
9,000	67.89	82.47	14.58	21.48%
10,000	73.84	86.28	12.44	16.85%
11,000	79.79	92.94	13.15	16.49%
12,000	85.74	99.61	13.87	16.18%
13,000	91.69	106.27	14.58	15.90%
14,000	97.64	112.94	15.30	15.67%
15,000	103.59	119.60	16.01	15.46%
16,000	109.54	126.26	16.72	15.27%
17,000	115.49	132.93	17.44	15.10%
18,000	121.44	139.59	18.15	14.95%
19,000	127.39	146.26	18.87	14.81%
20,000	133.34	152.92	19.58	14.68%
25,000	163.09	186.24	23.15	14.19%
30,000	192.84	239.56	46.72	24.23%
35,000	222.59	292.88	70.29	31.58%
40,000	252.34	346.20	93.86	37.20%
45,000	282.09	399.52	117.43	41.63%
50,000	311.84	452.84	141.00	45.22%
60,000	371.34	559.48	188.14	50.67%
70,000	430.84	666.12	235.28	54.61%
80,000	490.34	772.76	282.42	57.60%
90,000	549.84	879.40	329.56	59.94%
100,000	609.34	986.04	376.70	61.82%
Average Usage				
44,901	$ 281.50	$ 398.46	$ 116.96	41.55%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 1 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
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Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 24.54	$ 48.20	$ 23.66	96.42%
1,000	27.94	51.39	23.45	83.94%
2,000	31.34	54.58	23.24	74.16%
3,000	34.74	57.77	23.03	66.30%
4,000	38.14	60.96	22.82	59.84%
5,000	44.09	64.16	20.07	45.51%
6,000	50.04	67.35	17.31	34.58%
7,000	55.99	70.54	14.55	25.98%
8,000	61.94	73.73	11.79	19.03%
9,000	67.89	76.92	9.03	13.30%
10,000	73.84	80.11	6.27	8.49%
11,000	79.79	85.69	5.90	7.40%
12,000	85.74	91.28	5.54	6.46%
13,000	91.69	96.86	5.17	5.64%
14,000	97.64	102.45	4.81	4.92%
15,000	103.59	108.03	4.44	4.29%
16,000	109.54	113.61	4.07	3.72%
17,000	115.49	119.20	3.71	3.21%
18,000	121.44	124.78	3.34	2.75%
19,000	127.39	130.37	2.98	2.34%
20,000	133.34	135.95	2.61	1.96%
25,000	163.09	163.87	0.78	0.48%
30,000	192.84	211.79	18.95	9.83%
35,000	222.59	259.71	37.12	16.68%
40,000	252.34	307.63	55.29	21.91%
45,000	282.09	355.55	73.46	26.04%
50,000	311.84	403.47	91.63	29.38%
60,000	371.34	499.31	127.97	34.46%
70,000	430.84	595.15	164.31	38.14%
80,000	490.34	690.99	200.65	40.92%
90,000	549.84	786.84	237.00	43.10%
100,000	609.34	882.68	273.34	44.86%
Average Usage				
27,358	$ 177.12	186.47	$ 9.35	5.28%

Present Rates:

Monthly Minimum:		$ 24.54	$ 24.54
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 48.20	$ 48.20
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Commercial - 14A
Summer Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 8a
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	158.05	90.07	132.49%
2,000	71.38	161.86	90.48	126.76%
3,000	74.78	165.67	90.89	121.54%
4,000	78.18	169.47	91.29	116.77%
5,000	84.13	173.28	89.15	105.97%
6,000	90.08	177.09	87.01	96.59%
7,000	96.03	180.90	84.87	88.38%
8,000	101.98	184.71	82.73	81.12%
9,000	107.93	188.51	80.58	74.66%
10,000	113.88	192.32	78.44	68.88%
11,000	119.83	198.99	79.16	66.06%
12,000	125.78	205.65	79.87	63.50%
13,000	131.73	212.31	80.58	61.17%
14,000	137.68	218.98	81.30	59.05%
15,000	143.63	225.64	82.01	57.10%
16,000	149.58	232.31	82.73	55.31%
17,000	155.53	238.97	83.44	53.65%
18,000	161.48	245.63	84.15	52.11%
19,000	167.43	252.30	84.87	50.69%
20,000	173.38	258.96	85.58	49.36%
25,000	203.13	292.28	89.15	43.89%
30,000	232.88	345.60	112.72	48.40%
35,000	262.63	398.92	136.29	51.90%
40,000	292.38	452.24	159.86	54.68%
45,000	322.13	505.56	183.43	56.94%
50,000	351.88	558.88	207.00	58.83%
60,000	411.38	665.52	254.14	61.78%
70,000	470.88	772.16	301.28	63.98%
80,000	530.38	878.80	348.42	65.69%
90,000	589.88	985.44	395.56	67.06%
100,000	649.38	1,092.08	442.70	68.17%
Average Usage				
38,801	$ 285.24	$ 439.45	$ 154.21	54.06%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

Pine Water Company
Bill Comparison
Customer Classification 2 Inch Commercial - 14A
Winter Present and Proposed

Exhibit
Rejoinder Schedule H-4
Page 8b
Witness: Bourassa
REVISED

Usage	Present Bill	Proposed Bill	Dollar Increase	Percent Increase
-	$ 64.58	$ 154.24	$ 89.66	138.84%
1,000	67.98	157.43	89.45	131.59%
2,000	71.38	160.62	89.24	125.03%
3,000	74.78	163.81	89.03	119.06%
4,000	78.18	167.01	88.83	113.62%
5,000	84.13	170.20	86.07	102.30%
6,000	90.08	173.39	83.31	92.48%
7,000	96.03	176.58	80.55	83.88%
8,000	101.98	179.77	77.79	76.28%
9,000	107.93	182.96	75.03	69.52%
10,000	113.88	186.15	72.27	63.46%
11,000	119.83	191.74	71.91	60.01%
12,000	125.78	197.32	71.54	56.88%
13,000	131.73	202.90	71.17	54.03%
14,000	137.68	208.49	70.81	51.43%
15,000	143.63	214.07	70.44	49.04%
16,000	149.58	219.66	70.08	46.85%
17,000	155.53	225.24	69.71	44.82%
18,000	161.48	230.82	69.34	42.94%
19,000	167.43	236.41	68.98	41.20%
20,000	173.38	241.99	68.61	39.57%
25,000	203.13	269.91	66.78	32.88%
30,000	232.88	317.83	84.95	36.48%
35,000	262.63	365.75	103.12	39.27%
40,000	292.38	413.67	121.29	41.48%
45,000	322.13	461.59	139.46	43.29%
50,000	351.88	509.51	157.63	44.80%
60,000	411.38	605.35	193.97	47.15%
70,000	470.88	701.20	230.32	48.91%
80,000	530.38	797.04	266.66	50.28%
90,000	589.88	892.88	303.00	51.37%
100,000	649.38	988.72	339.34	52.26%
Average Usage				
28,358	$ 223.11	302.09	$ 78.98	35.40%

Present Rates:

Monthly Minimum:		$ 64.58	$ 64.58
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	4,000	$ 3.40	$ 3.40
Up to	999,999,999	$ 5.95	$ 5.95
Up to	999,999,999	$ 5.95	$ 5.95
Over	1,000,000,000	$ 5.95	$ 5.95

Proposed Rates:

Monthly Minimum:		$ 154.24	$ 154.24
Gallons in Minimum		-	
Charge Per 1,000 Gallons		Summer	Winter
Up to	10,000	$ 3.81	$ 3.19
Up to	25,000	$ 6.66	$ 5.58
Up to	999,999,999	$ 10.66	$ 9.58
Over	1,000,000,000	$ 10.66	$ 9.58

FIRST SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.,
TO INTERVENER JOHN BRENINGER
(Docket No. W-03412A-03-0279)

EXHIBIT
A-10
Brenninger

Breninger Response Number 1.4

Q. State in detail how you suggest Pine Water "service the Community's normal demand for domestic water year round" as you reference in your direct testimony. In support of your response, please state the estimated cost to undertake such efforts and the impact of such cost expenditures on Pine Water's ratepayers.

A. Intervener Testimony by J. Breninger, page 2, and Attachment "B" discloses the proposed source of groundwater that could be developed to meet the supplemental water demand of the entire Pine & Strawberry community, presently served by three regulated water companies, including Pine Water Co., and four domestic water improvement districts. An estimated cost to implement this supplemental water supply may be found in the document, "Concept/Proposal for PSWID as Supplier of Supplemental Water ~~May 8, 2003~~ Revised in consideration of Project PS 2002-01 Final Report Findings and Cost Estimates 10-1-03, by PSWID Agent for Project" at an initial implementation cost of $4.2 million. This estimate does not provide for property easements or acquisition, a trunk pipeline beyond the well sites delivery point, project overhead costs, or cost of money. This Concept/Proposal document, in the original May 8 version, was adopted by the PSWID Board in the July 2003 meeting, is a public document, and a copy is provided herewith. The spreadsheet analysis referenced below demonstrates the viability of the tentative wholesale price of water. The initial wholesale cost of water produced by this system at the delivery point could be $6.00 per thousand gallons (ptg) and driving to below $3.00 ptg after 7-10 years. This cost estimate requires the repayment of the initial investment and interest along with adequate reserves for depletions and replacements, and provides for the system operations into perpetuity, all to be funded from water delivery revenues. [See spreadsheet entitled, "PSWID Supplemental Water System, compiled by John Breninger, – estimated costs are preliminary and not supported by detailed analysis and quotations against firm requirements. The revenue forecasts are based upon the PSWID Supply and Demand Study… as found in the Intervener Direct Testimony, Attachment "A". Also see the revised chart of "Supplemental Water Requirements"]

THIRD SET OF DATA REQUESTS
FROM PINE WATER COMPANY, INC.,
TO PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT
(Docket No. W-03412A-03-0279)

District Response Number 3.11

Q. In his surrebuttal testimony, Mr. Ploughe refers to "newly developed information in the Pine area has proven that groundwater is clearly developable below Pine itself, from depths much less than 2,000 ft. and with a significant saturated thickness of the Redwall and units below." Please identify the basis for this testimony, including any reports, articles, papers or other documents supporting this testimony.

A. In his surrebuttal testimony, Mr. Ploughe referred to the PSWID commissioned Morrison and Maierle report on several occasions. Though he disagreed with some aspects of the report, it clearly indicates there is reasonable groundwater potential below Pine, even though the author ultimately concludes otherwise. Evidence for this is presented where water level data is shown relevant to a well referred to as the Strawberry Hollow Well in Pine in figure 6-7. The significance of the groundwater elevation at this site was simply overlooked. This data indicates that a well drilled 900-1,000 feet deep, in that area of Pine, AZ, would encounter a deep groundwater source. While the Strawberry Hollow well water level elevation is reported accurately in the report, the subsurface lithology encountered is not. On this same figure, the Strawberry Hollow Well is presented as drilled approximately 200ft. into Precambrian rocks. This is not accurate. The well never encountered the Precambrian rocks and therefore penetrates as much as 400ft. of the saturated Redwall/Martin aquifer system. In consequence, the Redwall and Martin Formations are thicker and deeper than predicted in the report's figure 6-7. To date, no additional written technical reports have been published with information regarding the Strawberry Hollow Well.

EXHIBIT

Breninger Ex. 1

Ref: Docket No. W-03512A-03-0279 **Intervener Testimony, J. Breninger**

HEARING

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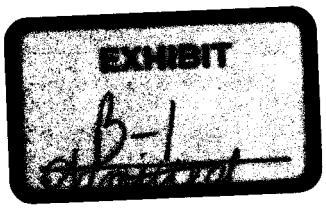
October 28, 2003



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

RECEIVED
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ARIZONA CORPORATION COMMISSION
HEARING DIVISION

SUBJECT: **INTERVENER DIRECT TESTIMONY**

REFERENCE: Docket No. W-03512A-03-0279

Commissioners, and Hearing Officer:

I represent myself to the Commission and Hearing Officer as a private citizen of Pine, Gila County, Arizona, and as a customer of the Applicant. I would testify with pertinent factual information and submittals of supporting evidence for consideration by the Applicant, the Commission Hearings and Staff. As additional standing in the community, I currently serve on the Environmental Planning Committee for the Section 208 of the EPA Clean Water Act administered by the Central Arizona Association of Governments (CAAG) for Gila and Pinal Counties in Arizona; formerly served as a Director on the Board of the Pine / Strawberry Water Improvement District (PSWID); and currently serve as the delegated PSWID Agent administering the PSWID "Project PS 2002-01," [a geo-hydrologic investigation performed under contract to the PSWID]. I will address the long term, reliable water supply issues in the community to the ACC based upon recent developments and considerations, including the completion of the geo-hydrologic investigation and study of these issues.

Intervener's Statement of Position:

I submit to this Commission that the Applicant (Pine Water Co.) has not supplied domestic water to the community of Pine in adequate quantities to meet the year-round demand for a number of years, including 2003. This past year was the highest number of days that the community was in a "Stage 5" status during the summer months. The restrictions imposed on the customers' water consumption under Stages 2 through 5 set the quantity of water delivered far below an acceptable level. This is not "conservation" when it is allowed to continue year after year. It is a violation of public trust and is a mis-appropriation by failing to supply.

According to the Public Notice that I received as distributed to the customers of the Applicant,..."(Company) filed...for an increase of approximately 41 percent over adjusted test year revenues....The Company also seeks authority to incur long-term indebtedness in the amount of $178,000.00."

As significant as this increase in rate and indebtedness may seem, and lacking a full disclosure of what this additional revenue and capital may accomplish to provide an adequate delivery of water to meet the demand, it appears, on the surface, that it will not

solve the water shortage problem. Therefore, as an Intervener, I am against the Commission's approval of the Company's requests in this matter, unless the Company will show and demonstrate that they can, with these increased rates and investment, soon be willing and able to service the Community's normal demand for domestic water year round.

In addition to the two request items noted above in the Public Notice, subsequent documents, including the Notice of Publication submitted 28 August, 2003 , added a third item in the title as, "APPLICATION OF PINE WATER COMPANY FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND..."

Upon reviewing a copy of the Company's Application document furnished by the Company on this date, it appears that the determination of the current Fair value of its utility plant and property only serves to substantiate the requests for the permanent rate increase and the shift of some of the inter-company payable balance into long-term indebtedness and some into equity. It does not appear to apply this determination of value to any new capital investment to improve the supply of water and the ability to deliver same. As an Intervener, I remain against the Company's request.

Intervener Testimony Regarding to Original Two Items of the Application

I refer to my prior Intervener testimony before this Commission on April 8,2003, as contained in Attachment "A" herein, and submit it, in general, as Testimony in this Hearing..

1) Specifically, on Attachment A, page 2, the topic entitled, "**How much water?**" still applies. The Pine / Strawberry Water Improvement District (PSWID) has adopted a daily consumption figure of 375 gallons per day per residential unit as applicable to the District, including the Pine community. The PSWID Board adopted this value on February 8, 2003 in a regular meeting.
2) On Attachment A, page 3, the "**CONCLUSION**" still applies. Particularly, the statements: **"We have the water!"** and **"Put enough capital to work where it does the most good."**
3) On Attachment A, page 2, the statement, "By mid-year 2003, a technical report will have become public from the Pine / Strawberry Water Improvement District (PSWID) that will address the feasibility of withdrawing groundwater from a regional aquifer in the Redwall Limestone." This has now been fulfilled. The final report of this geo-hydrologic investigation is referenced herein as Attachment "B".
4) On Attachment A, page 2, the statement, "This report will identify a number of prospective drilling sites, identify depth to water, and provide preliminary drilling requirements and specifications along with preliminary estimates of costs." The Attachment B report contains this information, except that the "...preliminary drilling requirements and specifications..." is a separate document that has not been released as of this date, but may be forthcoming shortly.

This Intervener requests that the technical information contained in the report document, Attachment B, should be fairly considered by the Company and its parent company, Brooke Utilities, Inc., for improving and upgrading the facilities and assets to service the Community's normal demand for domestic water year round. These points are offered below as significant to the Company's ability to fulfill its CC&N charter from this Commission.:

1) The Attachment B document asserts why the strata currently tapped by Company's wells, and those of the sister company, Strawberry Water Company, are not a reliable nor an adequate supply for the present demand and long-term growth of the Community.
2) The document further asserts and defines the area where the "most favorable conditions" prevail, (aquifer fully confined), for drilling into the regional Redwall Limestone (R-Aquifer). See Fig. 6-10 and Fig. 6-11. Also, interpreting the contour lines depicted on these figures defines a larger area that may be successfully drilled to water at the same static level, but under less favorable conditions (an unconfined aquifer, with less water depth above the impermeable basement rock).
3) The "Summary of estimated costs to drill and pump test well", found in Appendix "C" of the report document, identifies the high cost of drilling and developing a successful well under the local conditions encountered by two previous attempts to penetrate the R-Aquifer from this elevation. The drilling methodologies were carefully evaluated and selected to overcome the demonstrated difficulties that have been encountered in the local area. It is believed that only a high production well, producing 300-500 gallons per minute, will be an economically feasible option under this cost scenario.
4) High pump-rate wells are desirable from both the mechanical and power efficiency standpoints, and also maintain a capacity to meet peak summertime demand. It is preferred to invest in high-production rated wells and pumps and reduce the reliance upon surface storage and water quality processing facilities to balance supply and demand.

Considering these points, it would appear that the level of investment, and perhaps the rate increase, would not provide significant improvement in the water supply and infrastructure to meet the desired demand. Even considering a series of lower cost wells of less depth in the upper strata, with the points stated above as prevailing, a better solution to solving the water shortage problem seems to lie in tapping the R-Aquifer.

More directly to the issue, I submit that it is appropriate that Brooke Utilities and/or its regulated water companies undertake the capital investment to tap this source of water, and that the Commission provide the Rate Base structure modifications for the financial viability of such investment. The Intervener is confident that Company under this arrangement can provide the water supplies for these communities more expeditiously and economically to the beneficial use by the communities than any other options under consideration.

Some will protest that we, the community residents and property owners, cannot afford such water rates. Some will claim we should obtain grants or subsidies to ease the cost impacts of such investments. Only the consumers who must deal with the lack of water and the restrictions on water usage seem compelled to step up and pay the price. Subsidies and grants do not seem to be available when we want them. With the emergency expenditures for the current War on Terror and the disastrous fire conflagrations, as well as the budget plight of the State of Arizona, who is going to throw money our way to develop our water supply? In the end, the price that we consumers pay for our water, if we truly want it, will compensate the costs and provide the return on capital to deliver water to our taps. All other considerations fail, and they fall to the reality of these facts.

The Company and the Commission can greatly enhance the acceptability of the costs and the need for conservation in the community by applying a tiered system of water rates based upon the utilization of waters from both the present well field in the upper strata and the lower strata R-Aquifer. A base level of lesser cost water will continue to be produced from the upper strata, and should be allocated for a base sustenance consumption. Water in ever increasing quantities over time,

pumped from the R-Aquifer, should carry escalated charges for those who wish to pay the price for higher consumption.

The present well field in the upper strata needs to be well managed to reach its optimal maximum production of the lesser cost water. Currently, there are very diverse views regarding the characteristics of the upper strata groundwater. There is a great lack of factual information on hand to evaluate and interpret these differing viewpoints. The published expert opinions are in opposition one to another. The PSWID Project PS 2002-01 invested in the capability to start the long-term collection of water and well data for overcoming this lack of information. The Attachment "E" document provides an overview of the purpose and scope of the "PSWID Wells Database & Resource Management System."

The POSTSCRIPT document, included within the Attachment B document, identifies the PSWID Wells Database System as a useful and forceful tool to gain more insight and operational understanding of the well field pumping from the upper strata. It was the intent of the District, at the time its development was contracted, that this tool would be open to all the water suppliers to the community on a cooperative basis. It requires data input and provides useful information that, over time, will enable a better management of the groundwater resource and provide a simpler, easier to understand picture of the water supply dynamics to the layman. It will also serve as the truth test for the validity of our local groundwater management concepts.

This Intervener recommends to the Company that it press the PSWID to open this cooperative use of this tool, to place present and future data into this system, and to benefit from the knowledge and understanding it may provide.

Additional Supporting and Reference Documentation

A recent assessment and professional overview of the "R-AQUIFER IN NORTHERN ARIZONA" may be found in the Attachment "D" document. This is the Final Abstract of a paper presented at the Arizona Hydrological Society 2003 Annual Symposium in Mesa, AZ. In September.

The Table of Contents of the three volume set of the "PSWID SPECIAL REFERENCE DOCUMENT COLLECTION" may be found in the Attachment "C" document. This document collection includes the accumulation of early documents held by the PSWID Agent and furnished to the Morrison-Maierle Chief Geologist for evaluation as described in the Attachment B document. It also contains most of the documents from a comprehensive literature search and interviews performed during the investigation, as well as some other recent documents made available to the PSWID. This Collection comprises the most complete known assemblage of reports and documents of the geo-hydrological investigations applicable to the Pine and Strawberry area. These documents will be deposited in the Isabelle Hunt Memorial Public Library in Pine, AZ, in the near future. They will be held in a special reference section for PSWID documents and will be available for public inspection and reference.

CONCLUSION:

Would the Commission please take a new look at the rate structure for water that it has ruled for this Community, and reconsider the need for a significant increase in capital investment on the part of the water utilities that can be justified by the rate base. **We have the water!** We need the means to put it into the delivery system. The projected study of demand indicates that the costs may be borne by a considerable increase in consumption. A tiered price/rate structure may be required. The Commission should rule to facilitate the residents of this Community to use all the water they want to pay for! I say again: **Put enough capital to work where it does the most good.**

- End of Testimony -

Respectfully submitted,

John O. Breninger

John O. Breninger, Intervener

ATTACHMENTS:

A. "Presentation of Testimony in Hearing before ARIZONA CORPORATION COMMISSION," RE: Docket Nos. W-03512A-03-0104 and W-03512A-03-0106, April 18, 2003, by John O. Breninger, Intervener, including "Request for Late Filing of Exceptions" dated May 5, 2003
B. "Investigation of Groundwater Availability for the Pine/Strawberry Water Improvement District," Prepared by Michael B. Kaczmarek, RG, Chief Geologist, Morrison-Maierle, Inc., dated July 2003, including PSWID Project PS 2002-01 Report, dated October 1, 2003, entitled "POSTSCRIPT to PSWID Project PS 2002-01 Final Report"
C. Table of Contents, "PSWID Special Reference Documents Collection, Volumes I, II & III," PSWID Project PS 2002-01, dated October 22, 2003
D. Errol L. Montgomery & Edwin H. McGavock, "R-AQUIFER IN NORTHERN ARIZONA", AHS 2003 ANNUAL SYMPOSIUM FINAL ABSTRACT, ERROL L. MONTGOMERY & ASSOCIATES, INC.; 1550 E. Prince Road, Tucson, AZ 85719, emontgomery@elmontgomery.com, (520) 881-4912, fax (520) 881-1609
E. "Purpose and Scope of the PSWID Wells Database System," PSWID Project PS 2002-01 Report dated October 3, 2003, by PSWID Agent John Breninger

FILE:ACC03011JB.doc

ATTACHMENT "A", Intervener Testimony by J. Breninger, Docket No. W-03512A-03-0279, Oct. 28,2003

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April 18, 2003, Revised April 21, 2003 (Corrected Docket Number)

PRESENTATION of TESTIMONY in HEARING before
ARIZONA CORPORATION COMMISSION
RE: Docket Nos. W-03512A-03-0104 and W-03512A-03-0106

Commissioners, and Hearing Officer:

As a qualified Intervener to this subject Hearing today, I represent myself to the Commission as a private citizen of Pine, Arizona, and as a customer of the Applicants. I testify with pertinent factual information and submittals for the Hearing and Commission/Staff consideration from a collection of technical information, from public documents, and additionally as supported from my standing in the Community due to my service with, but not as a representative from, 1) the Environmental Planning Committee for the Section 208 of the EPA Clean Water Act administered by the Central Arizona Association of Governments (CAAG) for Gila and Pinal Counties in Arizona; and 2) the Pine / Strawberry Water Improvement District Board in Gila County. I will address the long-term water supply issues in the Community for the ACC based upon recent developments and considerations.

I submit to this Commission that the Interim Rate Increase and Curtailment Tariff actions requested and being heard today, and in the related Decisions of the Commission, are continuing a pattern of "band-aiding" the water problems of the Pine and Strawberry Area (Community) in an ineffectual manner. I acknowledge that both of these matters seem prudent and needed in the short term of where we are now, but I further submit that such actions subvert and delay a true improvement in the underlying causes of the problems being addressed. The Commission and the regulated water utility need to address the real underlying problem with an appropriate level and application of capital investment that I will address below. I ask the water utility along with the Commission and Staff to consider this in their recommendations and Decisions to progress toward the real and long-term solution. I repeat: **Put enough capital to work where it does the most good.**

As the largest purveyor of water in Pine, Pine Water Co. and the supporting infrastructures of Strawberry Water Co. and the parent company, Brooke Utilities, seem unable to deliver an adequate and consistent supply of water in Pine during the summertime peak demand. In my opinion, the purveyors that serve the Community at-large have over-utilized the available source of water in the Supai Formation, and this water source has proven to be inadequate in the face of prolonged drought and increasing demand. (See Attachment #1, entitled, "Water at Three Levels"). Both of these statements, (over-utilized and inadequate) have been pronounced since as early as 1987 from the Arizona Dept. of Water Resources (ADWR) for this Community. [If the Commission does not have these pronouncements on file, I would be willing to obtain them for the record.] The opportunity to overcome this deficiency will probably happen by going into a regional aquifer within the deeper Redwall Limestone and lower strata.

Up till the present time, this option of deep wells from a regional aquifer has not been accepted, neither as possible nor practical, and consequently, the Community is still short of water as it continues to expand and grow. So, what is new or different today?

By mid-year 2003, a technical report will have become public from the Pine / Strawberry Water Improvement District (PSWID) that will address the feasibility of withdrawing groundwater from a regional aquifer in the Redwall Limestone. A geo-hydrologist has been contracted by PSWID to perform this work, which is nearing completion. This report will identify a number of prospective drilling sites, identify depth to water, and provide preliminary drilling requirements and specifications along with preliminary estimates of costs. A further task of this contract is to evaluate the current literature and collection of the prior technical reports of the water resources in and relating to this Community. This is a new report regarding our groundwater supply, and I request that it be considered by the Commission and Staff to the benefit of the Community as describing the locally undeveloped source of water.

Although this work was undertaken by the PSWID with District taxes in addressing its charter, "...to represent the interests of the Communities in securing long term and reliable sources of water for the Communities,..." the information it represents will be public and intended for use to benefit the Community. PSWID has yet to develop plans for how this source of water would be developed and put to use. PSWID is not currently chartered to serve as a purveyor of water to the community. The Community is served by a mix of private wells, three private water companies regulated by ACC, and four domestic water improvement districts, which are formed as Special Taxing Districts under Title 48 of the Arizona Revised Statutes. A possible consideration by PSWID would be to develop a well field to provide Supplemental Water to these purveyors on a wholesale basis at the well-head delivery points, but this has yet to be considered and the funding addressed.

More directly to the issue, I submit it is appropriate that Brooke Utilities and/or its regulated water companies undertake the capital investment to tap this source of water and that the ACC provide the Rate Base structure modifications for the financial viability of such investment.

Some will protest that we, the Community residents, cannot afford such water rates. Some will claim we should obtain grants or subsidies to ease the cost impacts of such investments. Only the consumers who deal with the lack of water and the restrictions on water usage seem compelled to step up and pay the price. Subsidies and grants do not seem to appear when we want them. In the end, the price that we consumers pay for our water, if we truly want it, will compensate for the costs and capital required to deliver water to our taps. All other considerations fail, and they fall to the reality of this fact.

So, how much water is required to serve this Community? How much of it will the water companies alone need to supply? Can the Supai Formation be further developed to supply this much water?

How much water? Again, the PSWID has reviewed the present and future considerations of this question, and as a result, has adopted on February 8, 2003, "WATER SUPPLY AND DEMAND FOR THE PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT GILA COUNTY, ARIZONA" (See Attachment #2). This demand was projected to the year 2050 and indicates a water consumption far in excess of the quantities currently provided. (See Attachment #3 for a graphical chart of this demand/supply). This demand was based upon anticipated growth and unrestricted consumption, not such as the Community culture currently exhibits under the continuing levels of conservation, restriction and constrained growth. Evidence of the pressure for increased consumption in Northern Gila County is that the **per capita** consumption of water is on the increase, as reported by the Town of Payson and Brooke Utilities. It appears that the conservation ethic just isn't what it used to be!

How much from the water companies? Most of it, as indicated by the number of connections reported by Brooke Utilities and taken as a percentage of the entire community.

More from the Supai Formation? Not likely! Even though more water moves through the Supai than the current wells are able to extract, expert opinion states that this Community already gets more water percentage-wise from the Supai than other locales have been able to achieve.

Also, this is a Community where septic tanks predominate for disposal of human wastewater, and additional potential well sites are severely limited by proximity to wastewater leach fields and tanks. Worse still, as water consumption increases, more sewage effluent will have to be percolated into the soil and find its way into the very water that the current wells draw from. Our fractured and rocky strata are not very helpful in this respect.

Wells in the Supai Formations are vulnerable to reduced flow from drought conditions and this past year's drops in production have demonstrated in both Water Company and private wells that we are near the limit of production under stressed conditions. (Reference: private communication from Bob Hardcastle, Brooke Utilities, that additional customers in Strawberry, who previously obtained water from their private wells, requested service from Strawberry Water Co., and that some Strawberry Water Co. wells were taken out of service due to reduced water levels) - an indication that both Pine and Strawberry wells are at the limit of their production under stress.

Other issues? The cost of water produced from the Supai Formation will continue to be less than that from the Redwall Limestone. The Limestone water will tend to be much harder water. Because of the cost and desirability of Supai water, it will continue to be the preferred supply. However, since it is proving to be inadequate for quantity, it will provide a logical base of supply and cost in any price rate structure. Demand above the base consumption rate will need to be served by the more costly deep well sources as Supplemental Water. The concept of Supplemental Water serves to provide a natural basis for a tiered-rate system, where the base consumption rate serves to provide sustenance level consumption at a lesser price, and the higher price for Supplemental Water serves to pay off the capital investment and higher operational costs.

CONCLUSION

Would the Commission please take a new look at the rate structure for water that it has ruled for this Community, and reconsider the need for a significant increase in capital investment on the part of the water utilities that can be justified by the rate base. **We have the water!** We need the means to put it into the delivery system. Projected demand indicates that the costs may be borne by a considerable increase in consumption. A tiered price/rate structure may be required. The Commission should rule to facilitate the residents of this Community to use all the water they want to pay for! I say again: **Put enough capital to work where it does the most good.**

Respectfully submitted,

John O. Breninger, Intervener

ATTACHMENTS: (full text found on the following pages)

1. "Water at Three Levels", document dated 1/8/02 & revised 4/16.03, John Breninger
2. "WATER SUPPLY AND DEMAND FOR THE PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT GILA COUNTY, ARIZONA", adopted February 8, 2003, PSWID
3. "Supplemental Water vs. Total Water", chart by John Breninger, (supporting Attachment #2)

ATTACHMENT #1, ACC Testimony by John Breninger

WATER AT THREE LEVELS

The Language of Groundwater in Pine and Strawberry

Soil Water
Upper/Lower Supai Water
Redwall Limestone Water

Soil Water – This is water that plants feed on, that makes the ground look moist when you dig holes, or makes things damp when lying on or in the ground. It generally is confined to the upper fifty feet, or less. It is the first dispersal of precipitation on its way to finding a saturated level, or evaporating away into the air, or turning into water vapor held in the soil.

Lack or depletion of soil water near the surface during 2002 is the primary cause of the die-off of Ponderosa Pines in the Pine and Strawberry areas. This water normally is not considered suitable for domestic use.

Upper/Lower Supai Water – This is the water that supplies nearly all of the wells currently in service in the Pine and Strawberry areas. The Upper Supai formation, above the white-banded Fort Apache Formation, is the source of the outflow of Pine Creek and the associated springs in Pine Creek Canyon. This water moves out from under the Mogollon Rim and percolates downward, into and through the Lower Supai Formation, where the wells are able to intercept this flow. This flow does not accumulate into a regional aquifer in this strata, but continues to move through and out of the area as "water on the fly".

A near-relative of this water is that which accumulates in the alluvium of Pine Creek Canyon at the lower levels and forms a local and limited aquifer supplying a number of wells before it, too, continues downward and out of the area into the cavern system of the Redwall Limestone at the lower levels.

This source of water has not proven to be adequate or reliable to supply the demand of the Communities.

Redwall Limestone Water – The legendary source of water, known as the Regional Aquifer, that is denied by some, may yet be found in the Redwall Limestone strata. This water emerges at a number of springs from under the Mogollon Rim, but at a much lower level than the Pine Creek springs. This is the source of the water for Fossil Creek Springs, which have a long, recorded history of a large and very constant flow of water.

Because the Redwall Limestone in the nearby area underlies the Colorado Plateau where it is stable and mostly unbroken or unfaulted, it is probably a fully confined aquifer that receives its recharge from a huge area north of the Rim and east of Pine/Strawberry, perhaps as far as Promontory Point, or even to Showlow and Snowflake.

This is the source of water currently being investigated by the PSWID for a reliable, long-term water supply for the Communities.

Prepared by:
John Breninger, 1/8/02, revised 4/16/03 FILE: Attach1 Water at Three Levels.doc

WATER SUPPLY AND DEMAND
FOR THE
PINE/STRAWBERRY WATER IMPROVEMENT DISTRICT
GILA COUNTY, ARIZONA

Introduction
The Pine/Strawberry Water Improvement District (PSWID) was formed to develop a long-term source of water to adequately supply current and future property owners in the area. In December 1997, the PSWID Board of Directors adopted a Water Consumption Factor for the area. The Board of Directors has agreed that an updated Supply And Demand Model is required. This document provides that model which includes current water production and expected build out of the area.

Discussion
A Water Supply And Demand study is required to support the role of the PSWID in fulfilling the primary function to provide a reliable, long-term water supply to the communities of Pine and Strawberry. The immediate need is for this study to provide the design guidelines for the water demand profiles applicable from now and into the future. These water demand profiles are a necessary input for hydrologists to adequately define well design requirements for quantity, size and water delivery rates. The water demand profiles are also necessary for development of designated sites, individually, in sequence, as the actual supplemental water demand unfolds to: prove the water, plan the water development, secure funding, drill production wells, develop and operate water delivery points.
Data used to reach a conclusion for this model was obtained from the Water Consumption Factor adopted by the PSWID in 1997; 'Official Policy' of the Planning and Zoning Division of Gila County; Urban Design Studio LLC, consulting firm preparing the Gila County General Plan during years 2002 and 2003; and water production figures of the Pine and Strawberry Water companies. Other sources of information are noted within this document.

Considerations
Urban Design Studio LLC, (UDS), in preparation of the Gila County General Plan, and the Gila County Planning and Zoning Division, determine Pine/Strawberry a seasonal use area. UDS formulates less people per homes in their considerations. For example, total build out, under current zoning, suggests 5390 homes and 5121 people for Pine. Thus, they suggested to PSWID, forecasting water requirements for the number of people would be more appropriate than homes or connections. PSWID does not totally agree with this approach. PSWID believes that this does not allow for heavy water consumption during summer months and holiday weekends. Part time, seasonal usage differentials seem to be disappearing in the area, and water consumption per capita appears to be on the increase as reported by the local water providers' statistics.
Numerous sources of water consumption data were studied in the preparation of the PSWID 'Water Consumption Factor'. Using the census figure of 2.3 persons per household, daily consumption figures ranged from 345 gpd in Camp Verde Az. to 524 gpd in McFarland Ca. PSWID has adopted the target of 375 gpd.

UDS has calculated the following total build out under current zoning:

Strawberry	2559	Homes
	2431	People
Pine	5390	Homes
	5121	People
Total	7949	Homes
	7552	People

In addition, PSWID requires data relative to water consumption by commercial units in the communities to complete this model. The Yellow Pages of QwestDex Commercial, year 2002, was used to gather types and numbers of individual business in Pine and Strawberry. These businesses, depending on estimated water usage, were adjusted to equivalent residential units. For example, medical, dentist, was adjusted to reflect 2 residential units, while agricultural and ranch, was adjusted to reflect 10 residential units. This added 848 residential units to the forecasted 7949 for a total of 8797.

Restaurants	9
Motels, B& B, RV Parks	7
Beauty Shops	2
Retail/Counter Services	13
Combination	2
Laundries, Ice Making	3
Industrial	39
Total	75 X 4 = 300 residential units
Churches & Orgs.	6
Health Care, Medical Dental, Fitness Cent.	4
Other Prof. Services	27
Total	37 X 2 = 74 residential units
Animal Care, Ranch Agriculture	5 X 10 = 50 residential units

Total 424 residential units. Assume amount to double by year 2025 and remain flat through 2050, PSWID added the 848 equivalent units.

Water Demand @ Rated Usage: 8797 Units X 375 gpd = 3,298,875 gpd
(Assume 50% maximum utilization of pumping capacity)

May-Sept. Dec. 20 thru Jan.5 resort area multiplier X 1.8 = 5,937,975 gpd
(Assume 90% maximum utilization of pumping capacity)

Holiday weekend peak demand multiplier X 4.0 = 13,195,500 gpd
(Assume peak demand to be buffered by local storage over 5-day span and 95% maximum utilization of pumping capacity)

Base rate of water supply yield = 6,597,750 gpd @ 100% pumping capacity
Or 4581 gpm continuous well production. Adjusted for 90% operational efficiency = 5091 gpm operational well production.

Water production predicted by month in year 2050:

January	115,460,625
February	92,368,500
March	102,265,125
April	98,966,250
May	220,364,850
June	178,139,250
July	220,364,485
August	184,077,225
September	148,449,375
October	102,265,125
November	98,966,250
December	131,295,225

Total annual water production is predicted as 1,692,982,650 (1.7 billion) gallons or 5,196 acre-feet of water.

Average daily water production as reported by Pine and Strawberry Water Companies over the past four years equals 680,000 gallons per day, or 472 gallons per minute. Estimated water production of the one additional private water company, and the four domestic water improvement districts is 149,625 gallons per day, or 104 gallons per minute.
Total current annual water production is estimated as 302,959,000 gallons.

Summary

Arizona is a desert state where water is continually becoming a scarce commodity. Pine/Strawberry in the past year, with emphasis in Pine, experienced severe water availability conditions. Pine/Strawberry has been known for many years to have a short supply of water, and is dramatically affected by drought conditions. It should be expected that water conservation measures would always be necessary, but not a hardship as they have been in the past. An adequate water supply can and should be developed to meet the expected growth in population by year 2050.

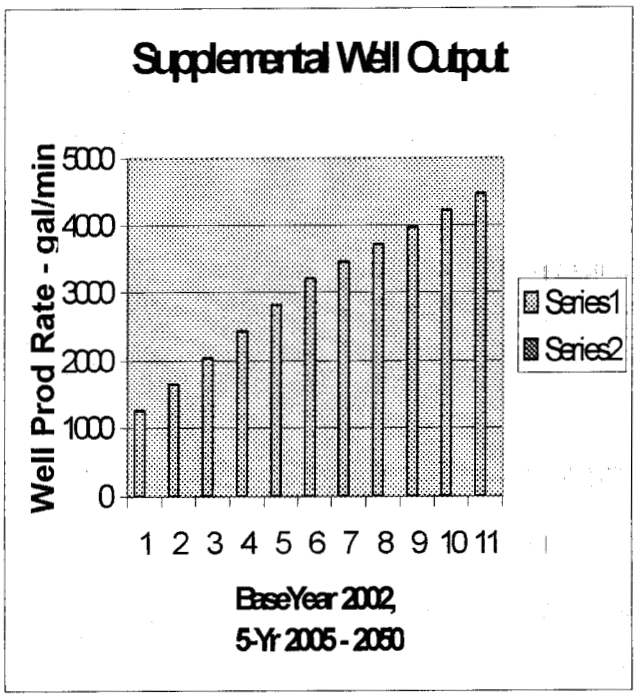
Prepared by Pine/Strawberry Water Improvement District
Committee members:
Gary Hezel
Betty Gooder
John Breninger

Adopted by Pine/Strawberry Water Improvement District Board of Directors
February 8, 2003

ATTACHMENT "A", Intervener Testimony by J. Breninger, Docket No. W-03512A-03-0279, Oct. 28,2003
ATTACHMENT #3, Supplemental vs Total Water Requirements – Pine/Strawberry Area

Supplemental Water Reqmts
(Ref: 1-11-02 Preliminary Draft)
Well Production, gpm

(Originated 12-30-02)	Yr 2002	Yr 2005	Yr 2010	Yr 2015	Yr 2020	Yr 2025	Yr 2030	Yr 2035	Yr 2040	Yr 2045	Yr 2050 (Revised)
375gpd usage	1831	2221	2610	3000	3389	3779	4031	4283	4536	4788	5040
Current Production	576	576	576	576	576	576	576	576	576	576	576
Reqd Supl 375gpd	1255	1645	2034	2424	2813	3203	3455	3707	3960	4212	4464



- END - ATTACHMENTS

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May 5, 2003

Arizona Corporation Commission
Attn: Docket Control
1200 West Washington Street
Phoenix, Arizona 85007-2927

Subject: Request for Late Filing of Exceptions

RE: Docket Nos. W-03512A-03-0104 and W-03512A-03-0106
Recommendation of the Administrative Law Judge to the Commissioners (Commission's Working Session and Open Meeting tentatively to be held on May 13, 2003 and May 14, 2003
Pursuant to Hearing of April 18, 2003. Phoenix, Arizona, Dwight Nodes, presiding Administrative Law Judge

I hereby request the Commission (Docket Control) to receive and allow my late filing of exception to the proposed Opinion and Order recommended by the Administrative Law Judge as referenced above in the Matter of the Pine Water Company, Inc. (Curtailment Tariff/Rates). I regret not meeting the assigned deadline for filing, and beg forbearance as I was away and unable to respond in a timely manner.

I believe that a statement concluded from my testimony as a qualified interverner (in propria persona) did not accurately reflect my testimony. I have discussed this with Judge Dwight Nodes on this date, and I believe I have his concurrence to this correction.

The exception I submit corrects, for the record, a statement made in the document Section II. Discussion, D. Other Issues, page 10, Line 5, to wit:
"...Supai Formation..."
should be: "...Redwall Limestone Formation..."

I reference, by explanation, excerpts from the page 1, of my testimony document, "PRESENTATION of TESTIMONY in HEARING before ARIZONA CORPORATION COMMISSION, RE: Docket Nos. W-03512A-03-0104 and W-03512A-03-0106"
"As the largest purveyor of water in Pine, Pine Water Co. and the supporting infrastructures of Strawberry Water Co. and the parent company, Brooke Utilities, seem unable to deliver an adequate and consistent supply of water in Pine during the summertime peak demand. In my opinion, the purveyors that serve the Community at-large have over-utilized the available source of water in the Supai Formation, and this

ATTACHMENT "C", Intervener Testimony by J. Breninger, Docket No. W-03512A-03-0279, Oct. 28,2003

PSWID Project PS 2002-01

PINE / STRAWBERRY WATER IMPROVEMENT DISTRICT
P.O. Box 134
Pine, Arizona 85544

October 22, 2003

PSWID SPECIAL REFERENCE DOCUMENT COLLECTION VOLUMES I, II and III

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[Extracted from the Annotated Bibliography from the Project Final Report to PSWID]:
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Volume II of III

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- END of Vol. II -

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Preliminary List of Studies for Pine-Strawberry Area Revised May 28, 2002
(Documents furnished for Review with RFQ&P Project PS 2002-01)

1) ~~"Hydrologic Analysis and Report for the Pine Canyon Watershed", Unpublished Report # 2530, Payson District, Tonto National Forest, Forest Service, U.S. Dept. of Agriculture, 1967. [Surface water in Pine Creek Basin and Watershed Management considerations]~~ [Moved to Volume I, No.29]

2) "The Impact of Second-Home Development on Water Availability in North Central Arizona", M.E. Bond & Robert H. Dunikoski, Bureau of Business and Economic Research, College of Business Administration, Arizona State University, Tempe, Arizona 85291, April 1977, Eisenhower Consortium Institutional Series Report No. 1 [Overview of studies, 1977 inventory of second-homes, Water consumption data and projected future demands, and water supply considerations (includes Gila County).]

3) "Basic Data for Selected Wells and Springs in the Pine-Payson-Kohl's Ranch Area, Gila County, Arizona" Prepared in cooperation with the U.S. Geological Survey, Arizona Water Commission - Report No.9, Phoenix, Arizona, August 1977. [Contains explanation of well and spring information for Arizona (well numbering system based on location), and water depth/flow data]

4) ~~"A Hydrogeologic Investigation of the Pine-Strawberry Area, Arizona", Gary L. Hix, under the supervision of John S. Sumner, Ariz. Cert. No. 6832, Prepared for the E & R Water Company, Mesa, Arizona, May 1978. [Contains well numbering description, initial phase of a total hydrogeologic development plan, well data, and detailed hydrogeologic description of the area]~~ [Moved to Volume I, No. 15]

5) ~~"Hydrologic Evaluation of the Portals Subdivisions in the Pine Canyon, Pine, Gila County, Arizona", for Austin Meyers by Paul A. Manera, Ariz. Cert. No.4788, February 28, 1979. [Describes elements of supply, including the geologic framework, Static water levels, Transmissivity, and well data from six (6) wells in The Portal Subdivisions]~~ [Part 1 Moved to Volume I, No.21], [Part 2 Moved to Volume I, No. 20]

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~~Strawberry Hollow, Strawberry Creek Areas, Supply vs. Demand, data from a "wet" period, Conclusions]~~ [Moved to Volume I, No.3]

7) ~~"Report on Pine Area Water Shortage", July 17, 1989, Arizona Department of Water Resources [Includes ADWR Statement of Position Regarding Groundwater conditions in the Pine-Strawberry Area, Greg Wallace, Chief Hydrologist, Arizona Dept. of Water Resources, October 16, 1987. Letter communication to Mike Peterson, Gila County Planning Department, Globe, Arizona; Also includes Preliminary Report dated June 1987. This report is reportably the basis for ADWR considering the water supply for the area to be "inadequate" to support additional development from the 1989 level, concludes that additional "dry" years data is needed]~~ [Moved to Volume I, Nos.1 & 2]

8) ~~"ENVIRONMENTAL ASSESSMENT Proposed Underground Waterline from Strawberry to Pine, Arizona along Highway 87", Responsible Official, Charles Bazan, Forest Supervisor, United States Department of Agriculture, Forest Service, Southwest Division, July 20, 1999. [Includes biblio., selected well data for Strawberry]~~ [Moved to Volume I, No. 24]

9) "Preliminary Hydrology Report in Support of Aquifer Protection Permit (APP) Application, Pine Meadows Wastewater Treatment Plant, ADEQ file no. 21397".Haley & Aldrich, Inc., Tucson, Arizona, November 20, 2000. [Includes: Addendum Report, Additional Geology and Hydrology Information in Support of Aquifer Protection Permit Application" Haley & Aldrich, Inc., Tucson, Arizona, January 19, 2001.]

10) "Letter Report, Water Resources Study, Strawberry/Pine, Arizona" Marvin F. Glotfelty, R.G., Principal Hydrogeologist, Clear Creek Associates, PLC. March 27, 2002 [Includes hydrographs in the Strawberry and Pine areas, flow net analysis, and regional groundwater elevation contour maps.]

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- END of Vol. III -

FILE: Project PS 2002-01 Spcl Docs Table of Contents.doc

AHS 2003 ANNUAL SYMPOSIUM FINAL ABSTRACT

R-AQUIFER IN NORTHERN ARIZONA

Errol L. Montgomery, ERROL L. MONTGOMERY & ASSOCIATES, INC.; 1550 E. Prince Road.,Tucson, AZ 85719, emontgomery@elmontgomery.com, (520) 881-4912, fax (520) 881-1609; Edwin H. McGavock, ERROL L. MONTGOMERY & ASSOCIATES, INC., 1550 E. Prince Road., Tucson, AZ 85719, (520) 881- 4912, fax (520) 881-1609.

Synopsis

The R-aquifer is the source of water for most large springs in northern Arizona and is a partly-developed source of large and sustained municipal water supply.

Abstract

The R-aquifer is the most important aquifer system in northern Arizona with respect to regional extent, amounts of groundwater transmitted, and potential yield to wells. Geologic units that comprise the R-aquifer include, in ascending order, Tapeats Sandstone, Muav Limestone, Martin Formation and Temple Butte Limestone, Redwall Limestone, Naco Formation, and brittle rocks of the Lower Supai Group. At many locations, close hydraulic connection occurs between these units. However, at places the Tapeats is separated from overlying formations by poorly permeable Bright Angel Shale; at these places groundwater in the Tapeats may be saline. Depth to the top of the R-aquifer beneath the Coconino Plateau, and near Flagstaff and Williams is 2,500 feet or more. Because much of the R-aquifer consists of brittle carbonate rocks, the occurrence of fractures and solution openings is important to lateral and vertical transmission of groundwater.

R-aquifer strata crop out in the walls of the Grand Canyon and in other more limited areas including Big Chino basin, Verde Valley, and at places along the Mogollon Rim. The units occur in the subsurface in much of the area between the Colorado and Verde Rivers. Near the Arizona border with New Mexico, the units pinch out along the margins of the Defiance Uplift. Thickness of the R-aquifer ranges from a featheredge near the Defiance Uplift, to more than 3,000 feet near Lake Mead; average thickness is about 1,000 feet. Except near outcrop areas, the entire thickness of the R-aquifer is saturated in much of the area between the Colorado and Verde Rivers. Small saturated thickness occurs near Peach Springs, where groundwater level is near the top of the Tapeats Sandstone.

Patterns of groundwater recharge, movement, and discharge for the R-aquifer are not fully understood. The principal recharge zone is believed to occur in a broad band located parallel to and a short distance north from the Mogollon Rim, passing near Williams and Flagstaff. Important recharge occurs by downward groundwater movement through fractured rocks of the Supai Group from the overlying C-aquifer at large structural features such as the East Kaibab monocline and Mesa Butte Fault, and at structural depressions such as the Anderson Mesa Fault and Lake Mary graben, and the Lyman Lake trough. Milky-appearing water containing fine gas bubbles is often pumped from C- and R-aquifer wells located adjacent to large structures associated with important recharge to the R-aquifer. Although recharge along large structural features is important, amounts of diffuse downward groundwater movement through sparsely fractured and poorly permeable rocks of the Supai Group may be predominant. Principal

lateral movement of groundwater in the R-aquifer is believed to occur through arterial zones along solution enhanced fracture systems controlled by geologic structures of regional scale. These structural systems include the East Kaibab Monocline, the northern part of the Mesa Butte Fault system, and the Oak Creek Fault system. Groundwater from the R-aquifer provides about 500 cubic feet per second base-flow discharge to the Colorado and Verde Rivers and tributaries, and includes:
70 cfs near Havasu Spring,
220 cfs in the Blue Spring area along the Little Colorado River,
75 cfs along the Verde River near Clarkdale,
60 cfs along Oak Creek at and near Page Springs, and
42 cfs from Fossil Springs near the town of Strawberry.

The R-aquifer presently provides much or all of water supply for Tusayan, Valle, Williams, and Sedona.
Yields from wells at Tusayan, Valle, and Williams are 250 gallons per minute or less; these yields are controlled by small well diameter and pump size rather than by aquifer conditions.
Present pumping rates from R-aquifer municipal wells at Sedona range from about 500 to 1,000 gpm, although analysis of aquifer conditions indicates that larger yields may be obtained.
Yields from R-aquifer production water wells located near Clarkdale are more than 600 gpm.
Near Page Springs, several R-aquifer wells have been constructed recently; initial artesian flow from these wells was more than 1,000 gpm.

Largest yields from wells appear to occur where drilling conditions permit construction of large diameter wells, and under favorable geologic conditions where fractures are abundant and where fracture openings have been enhanced by dissolution of carbonate minerals.

Future large-scale groundwater withdrawals from the R-aquifer are most likely to occur under favorable geologic conditions near Flagstaff where the overlying C-aquifer is almost fully exploited, in Verde Valley where groundwater in the Verde Formation contains large concentrations of arsenic, and near Williams and other locations where the C-aquifer is not saturated.

Errol L. Montgomery: President, Errol L. Montgomery & Associates, Inc. from 1979. Wyoming State Engineers Office 1963-65; Wright Water Engineers, Denver, 1965-67; Professor, Northern Arizona University, 1970-77; Harshbarger and Associates, 1969-70 & 1977-79. PhD Hydrogeology and Geophysics, University of Arizona, 1971.

Edwin H. McGavock: Project Hydrologist, Errol L. Montgomery & Associates, Inc. from 1994. U.S. Geological Survey, Water Resources Division, 1962-93. M.S. Geology, University of Virginia, 1962.

[Format edited for emphasis by John Breninger, PSWID, 9-22-03]

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ATTACHMENT "E", Intervener Testimony by J. Breninger, Docket No. W-03512A-03-0279, Oct. 28,2003

PSWID Agent, John Breninger
PINE / STRAWBERRY WATER IMPROVEMENT DISTRICT
P.O. Box 134
Pine, Arizona 85544-0134

October 3, 2003

Reference: PSWID Project P/S 2002-01
REPORT: **Purpose and Scope of the PSWID Wells Database System**

PURPOSE:

Understanding the nature and character of the groundwater supply in the Communities of the Pine / Strawberry Water Improvement District (PSWID) became part of the vision, "...in securing long term and reliable sources of water for the Communities..."

A geohydrological study of the northern Gila County area was commissioned by PSWID in 2002 to provide, "Engineering Services to Develop a District Water Resource and Action Plan for the purpose of Documenting Present Conditions and Identifying Potential New Sources of Groundwater in the Pine / Strawberry Area of Gila County, Arizona". Factual data on the performance of the local wells and the broader geophysical characteristics of the area were notably absent or dispersed and unavailable for this study.

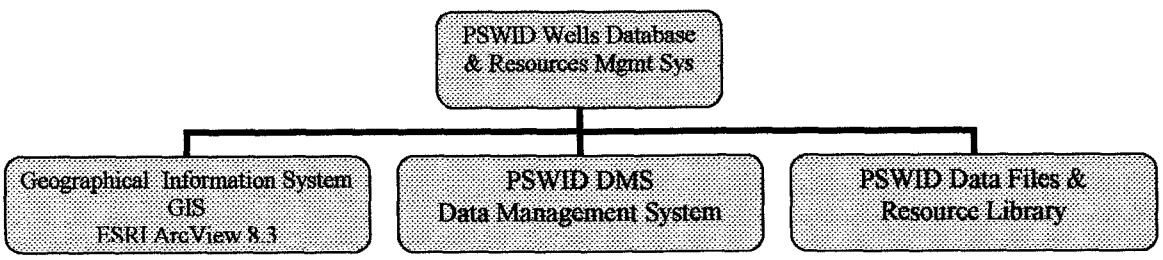
Therefore, the invitation for bids for the requested engineering services included a firm requirement to: "Establish an inventory of wells into a database suitable for collection and integration of groundwater data. Provide operational guidelines to gather and utilize well data and to produce reports from the database."

The system, as designed for PSWID, was built around a Geographical Information System (GIS) software package that could integrate a wide range of geophysical data and mapping capability with the groundwater data. The database management system (DMS) was fully matched with the GIS capability. The result is a tool that includes study, analysis, display and data management components suitable for infrastructure and resources operations, organization and management far into the future. This system integrates well with other GIS based systems, and may well become a core system to serve a wider functionality than just the PSWID.

SCOPE:

The PSWID Wells Database System consists of the major -elements shown in Figure 1.

FIGURE 1 – PSWID Wells Database Functional Block Diagram



The functions and usage of the PSWID Wells Database & Resources Management System include:

1. Provide a working database for the well registrations information and the related locations, output performance data, and hydrologic characteristics for the area. (Database will consist of entire set of registered wells for the Pine and Strawberry area from the ADWR and USGS files, including: active, inactive, un-completed and abandoned wells. Database may be maintained with update additions and changes). Code P
2. Provide a suitable mapping capability for the topographic, geologic, streets and highways, property parcels, and political boundaries. (Updates may include Gila County data when available)
3. Identify and display patterns of well pumping output and static water levels. Provides clear understanding of water conditions, using present and/or past data. (doesn't require complex interpretations or training to read a 3-D picture - displays the true elevations of water levels in a 3D contour map – not just depths to water from unrelated well heads). Code P
4. Provide tracking of the well performance under seasonal and multi-year performance patterns. (System will accept automatic data collection and input files – not just manual data) Code P
5. Provide a display of static water levels in true elevations for selected wells in the Communities, and provide a simplistic 3-dimensional pictorial view of the historic and dynamic effects of changes to the groundwater status. (Capable of animation for displaying water level changes dynamically). Code P
6. Provides guidance on pumping patterns as cause-and-effect history is captured. Can display effects of interactions among wells, horizontal and vertical connections and couplings, and slope gradients of water levels. Codes A, P
7. Identify patterns of well performances under stressful pumping and provide for the analysis of possible ground fracture patterns to improve and optimize the output of the well field. (capable of selected well sets and time periods for display reports). Codes A,P
8. Subsequent additions to the database include satellite geophysical maps and provisions for water quality reports to display overlays of water quality characteristics. Code P
9. The Security and Password permission structures remain to be developed to safeguard the reliability and integrity of administration of the system and data files under both investigative and operational conditions. Codes A, P

DATABASE STATUS CODES:

A – Further ANALYSIS programming required and is under way

P – Further application software and/or system PROGRAMMING required and is under way

Respectfully submitted,
John Breninger
PSWID Agent

FILE: Project PS2002-01 Report 10-3-03A.doc

ATTACHMENT "B"
Intervener Direct Testimony,
by J. Breninger
Docket No. W-03512A-03-0279

August 2003

Investigation of Groundwater Availability for the Pine/Strawberry Water Improvement District

Prepared for:
Pine/Strawberry Water Improvement District
P.O.Box 134
Pine, AZ 85544

MORRISON MAIERLE, INC.

Investigation of Groundwater Availability for the Pine/Strawberry Water Improvement District

Prepared by:
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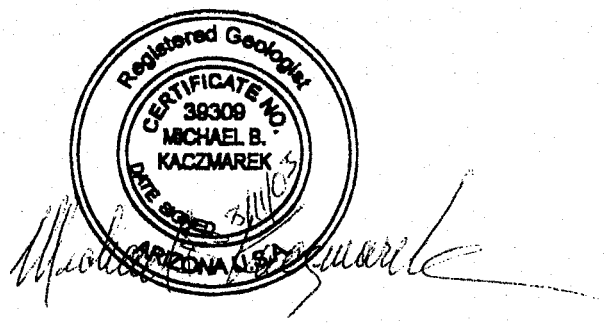

Preface by:
John O. Breninger, Agent
Pine/Strawberry Water Improvement District Board, and
Deep Production Well Exploration Committee

Prepared for:
Pine/Strawberry Water Improvement District
P.O. Box 134
Pine, AZ 85544

JULY 2003

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EXECUTIVE SUMMARY

The communities of Pine and Strawberry have historically experienced severe water shortages in the summer months. The on-going shortages currently jeopardize the future growth of the community on undeveloped private properties and limit addition of new customers to water companies for existing subdivisions that have not reached full build-out. Recent investigations conducted by the Pine/Strawberry Water Improvement District (PSWID) reveal that the water supply shortages caused by seasonal decreases in well yields are the result of limitations inherent in the hydraulic properties of the fractured rock aquifers that supply water to wells in the PSWID area. The limitations of groundwater flow through the fractured rocks to pumped wells cause predictable decreases in well yields as pumping times increase. Although drought or below average precipitation conditions exacerbate the seasonal groundwater shortages, they are not the fundamental cause of the shortages, a conclusion supported by the fact that water shortages have historically occurred at the end of as many as 12 consecutive years of above average precipitation trends. The investigations show the currently utilized groundwater sources, in the Schnebly Hill and Supai strata, are inadequate to support existing demands let alone future growth.

Investigation of the PSWID area for alternative sources of groundwater supplies has identified a deep aquifer in the Redwall Limestone and associated strata as the most favorable groundwater resource from which to develop additional sustainable water supplies for the area. An exploration well referred to as the Strawberry Borehole was drilled through the Redwall and associated strata in year 2000, under the sponsorship of the Northern Gila County Water Plan Alliance and the supervision of the PSWID, and verified that groundwater with good chemical quality for use as public water supply is available in the units. The investigations identify the northwestern part of the PSWID area as the most favorable location for development of a well field in the Redwall Limestone and associated strata.

A site for a test/production well is recommended in the southwest quarter of Section 20, T12N, and R8E. A 12-inch nominal diameter test well, suitable for later use as a production well, is recommended. The estimated depth to the top of the Redwall Limestone is 1,560 feet and the total depth of the well potentially may reach 2,110 feet. The anticipated depth to the static water level in the well is 1,505 feet. The 12-inch diameter configuration of the well will allow installation of deep-set pumps and motors capable of pumping rates ranging from 150 gpm to more than 1000 gpm, depending on the yield of the aquifer and the needs of the communities supplied by the well.

PREFACE

PURPOSE: In 2002, the Pine/Strawberry Water Improvement District (PSWID) undertook an investigation, (PSWID Project P/S 2002-01), to identify potential new sources of groundwater and to document the present groundwater conditions in and around the District area. This Preface identifies the objectives of the subject PSWID Project and highlights the work performed since November 4, 2002 by the Consultant, Morrison-Maierle, Inc., of Helena, Montana. The Preface statements are intended for public information from PSWID and an introduction of the Consultant's Chief Geologist, Mr. Michael B. Kaczmarek, the presenter of the preliminary findings and report to the Board and the public at a PSWID Special Meeting on July 19, 2003.

INTRODUCTION: This Preface is intended to summarize in concise, laymen's language what the Project is for and what the PSWID Board and the Communities are receiving in the work performed on this Contract. These statements in no way supersede the findings, technical report, or the presentation of Mr. Kaczmarek or Morrison-Maierle Inc.

HISTORICAL PERSPECTIVE: The Pine & Strawberry area of Gila County is a Community of historical significance in Arizona. The Community's domestic water needs are largely obtained from ground water and served by a mix of private wells, regulated water utilities, and domestic water improvement districts. The Pine/Strawberry Water Improvement District (PSWID) boundaries encompass the general extent of the area, excluding the service areas of the domestic water improvement districts noted above, but the District itself does not provide domestic water service to the Community. The map showing the approved boundaries of the District is shown in Figure 1-1 and others of this report. The Arizona Department of Water Resources has deemed this area to have an "inadequate water supply."

This District was formed in 1996, and, "The purpose of the Board is to represent the interests of the Communities in securing long term and reliable sources of water for the Communities,..." (Reference PSWID Bylaws). This Project is a significant step towards fulfilling this purpose.

The firm of Morrison-Maierle, Inc. was selected to perform the professional Geohydrological/Engineering Services desired by the PSWID Board to assist in the development and evaluation of data being collected in the Northern Gila County area and to develop a District Water Resource and Action Plan directed at groundwater development and the well siting of deep production wells in the Pine / Strawberry area of Gila County, Arizona.

Desired Outcomes: (Reference: RFQ&P / PROJECT NUMBER: P/S 2002-01)
[Information comments per this Preface shown in Bold Italic font]

The following criteria and expectations were utilized to guide and direct the efforts of the Engineering firm or firms working on this project:

The PSWID Board desired the development of a District Water Resource and Action Plan for the Study Area and contracted for the professional services to perform this Scope of Work. The plan included, at a minimum, the following components:

1. Existing Groundwater Resources and Methods of Delivery shall be documented and evaluated for current and future planning purposes.

   [Refer to M-M Report, Section 5.1, pages 47-45]

   COMMENT 1A: [Summary – The surface flow of Pine Creek only marginally supported the needs of a 140 person population base in 1967 – with very little potential for development of a higher utilization.]

   [Refer to M-M Report, Section 5.2–5.5, pages 48–73, Pine general area and Portals subdivisions]

   COMMENT 1B: [The Kaczmarek review of the historic pump data, interpretations and conclusions based on radial flow analyses explains that these results are not consistent with the inadequate production of water from the associated well fields. Even the conflicting interpretive reports from ADWR on the amount of the water supply were not only overly optimistic, they also applied values to broad areas that were appropriate only to fractures of limited distribution and extent. Pine and Strawberry do not have nearly the amount of groundwater available in the strata pumped by the existing well fields that were generally represented.]

   [Refer to M-M Report, Section 5.6, PAGES 73–85, Selected Strawberry and Pine wells pump tests]

   COMMENT 1C: (Ref. Page 75) "Similar to other historic analyses of pumping tests and groundwater flow in this area, ... inappropriately applies radial flow analysis to linear flow conditions. ... Therefore the estimates of groundwater availability presented in the report are likely in error".
   [The referenced report, published in 2002, continues to portray that there is more water in this area than the area's wells production performance indicates.]

2. Evaluate and establish a baseline reference of prior information and data, including that presently held by PSWID, for new exploration and

development of water resources. The list of documents held by PSWID may be found in the [RFQ&P] Appendix, "Preliminary List of Studies for Pine - Strawberry Area."

[Refer to M-M Report, Section 5.7, pages 85 – 87, Discussion of Radial vs. Linear Flow implications]

COMMENT: (Reference page 96) "...the adequacy of the groundwater resource...has been demonstrably inadequate to support...the demands for water supply in the Pine area and marginal in the Strawberry area. ...Accordingly, it is necessary to seek alternative sources of water for the PSWID communities."

3. Establish an inventory of wells into a database suitable for future collection and integration of groundwater data. Provide operational guidelines to gather and utilize well data and to produce reports from the database.

   [Refer to M-M Report, Section 1.2, pages 4 – 5, GIS Effort]

   COMMENT: [The Wells Database was developed for PSWID on this Contract and provides an initial download of 1604 well registrations data from ADWD; the programming to permit the management of the data and generating reports; and a geographical information systems (GIS) software package. This database system is the basic set of tools that may serve PSWID well into the future of developing and managing sources of water for the Communities.]

4. Two to Five locations for drilling future production wells shall be identified, evaluated and ranked in order of suggested development. Engineering Methodology, Site Conditions, Anticipated Depth to Groundwater, Legal Requirements, Environmental Issues, Development Costs and other factors shall be identified in the District Water Resource and Action Plan and taken into consideration when ranking order is established.

   [Refer to M-M Report, Executive Summary, page v, and Section 6.4, pages 113 - 137]

   COMMENT 4A: [Most favourable area for drilling to Redwall Limestone – Fig. 6-10, page 114]

   COMMENT 4B: [Initial recommended test/production well site – Fig.6-11, page 116]

   COMMENT 4C: [Well Design Considerations – Section 6.4.2, page 117 ff.]

5. Provide budgetary estimate of costs, drilling specifications and preliminary well design requirements for wells at each of the sites recommended.

   [Refer to M-M Report, Executive Summary, page v, and Section 6.4.2, pages 117 - 120]

   COMMENT: [See Appendix C of M-M Report]

6. A topographical map, identifying the two to five drilling locations, shall be developed and included in the recommendations in the District Water Resource and Action Plan.

   [Refer to M-M Report, Section 6.4, Fig. 6-10 & 6.11, pages 114 & 116]

   COMMENT: [The topographic maps contained in the M-M technical report, are also in an electronic format and will become part of the data files in the PSWID Wells Database and GIS system.]

7. Other Observations and Recommendations, as may be appropriate, to provide a thorough and complete Planning Document for continued use by the PSWID Board, are invited.

   [Refer to M-M Report, Section 6.4.3, 6.4.4, 6.4.5 and Section 7]

   COMMENT: [The technical observations and discussion are grouped under three headings:]

   6.4.3 Structural Considerations
   6.4.4 Hydrogeologic Considerations
   6.4.5 Source of Recharge

   [These observations may form the basis for future planning and development of a long term, reliable source of groundwater supply for the Pine / Strawberry Community. Further exploration to prove the supply of water and evaluate the deep regional aquifer characteristics is part of that future development.]

   [ADDITIONAL COMMENT: See "Local Observations, Section 7, pages 137 – 144]

Project Preface
Respectfully prepared and submitted July 2003

John Breninger, Chairman
PSWID Deep Well Exploration Committee

1. INTRODUCTION

This report provides the results of an investigation commissioned by the Pine/Strawberry Water Improvement District (PSWID) for the purposes of documenting present conditions and identifying potential new sources of groundwater in the Pine and Strawberry area of Gila County, Arizona, according to a scope of work initially described in RFQ&P Project Number P/S 2002-01, dated July 24, 2002 and modified by subsequent contract negotiations.

1.1. General Background

Domestic water for the Pine/Strawberry area is provided by a combination of private wells; regulated utility companies; and Domestic Water Improvement Districts (DWID). Information provided in the PSWID document, "PS 2002 PERCEPTIONS of WATER SUPPLY in the PINE-STRAWBERRY AREA", dated August 17, 2002, indicates there are approximately 150 privately owned wells in use to provide domestic and irrigation water. Regulated utilities listed in the foregoing document include the Pine Water Company, Inc. (formerly E&R Water co.); the Strawberry Water Company, Inc., both owned by Brooke Utilities Inc.; and the Hunt Water Company in Strawberry. Domestic Water Improvement Districts include the Pine Creek Canyon DWID, the Pine Water Users DWID, the Solitude Trails DWID, and the Strawberry Hollow DWID. Figure 1-1 shows the exterior boundaries of the PSWID, the exterior boundaries of the Pine and Strawberry community areas, and four areas that are excluded from the PSWID although they are within its exterior boundaries. The three public water companies serve those parts of the PSWID that are not included in the Domestic Water Improvement Districts. The Fuller Ranch area in Strawberry is an additional exclusion, but is included in the service area of the regulated water utility.

The water supply in Strawberry is somewhat more reliable than that in Pine; however, the groundwater source in both communities is subject to limitations. Since the latter half of the 1980's, Pine has experienced recurrent water supply shortages. In 1989, Pine experienced a water supply shortage characterized by the Arizona Department of Water Resources (ADWR) as a shortage of 37,000 gallons per day (gpd) (ADWR, 1989; p. 1); however, this was based on a demand limited to <u>five gallons per person per day</u>. Demand for water prior to the emergency and curtailment of water use was estimated to be about 360,000 gpd (250 gpm) on weekends and 120,000 gpd (83 gpm) on week days (ADWR, 1989; p. 8) compared to well field production of 43,000 gpd (30 gpm), resulting in a shortage of 317,000 gpd (220 gpm) on weekends and 77,000 gpd (53 gpm) on week days. The 1989 shortage was partially offset by trucking water from Strawberry to Pine.

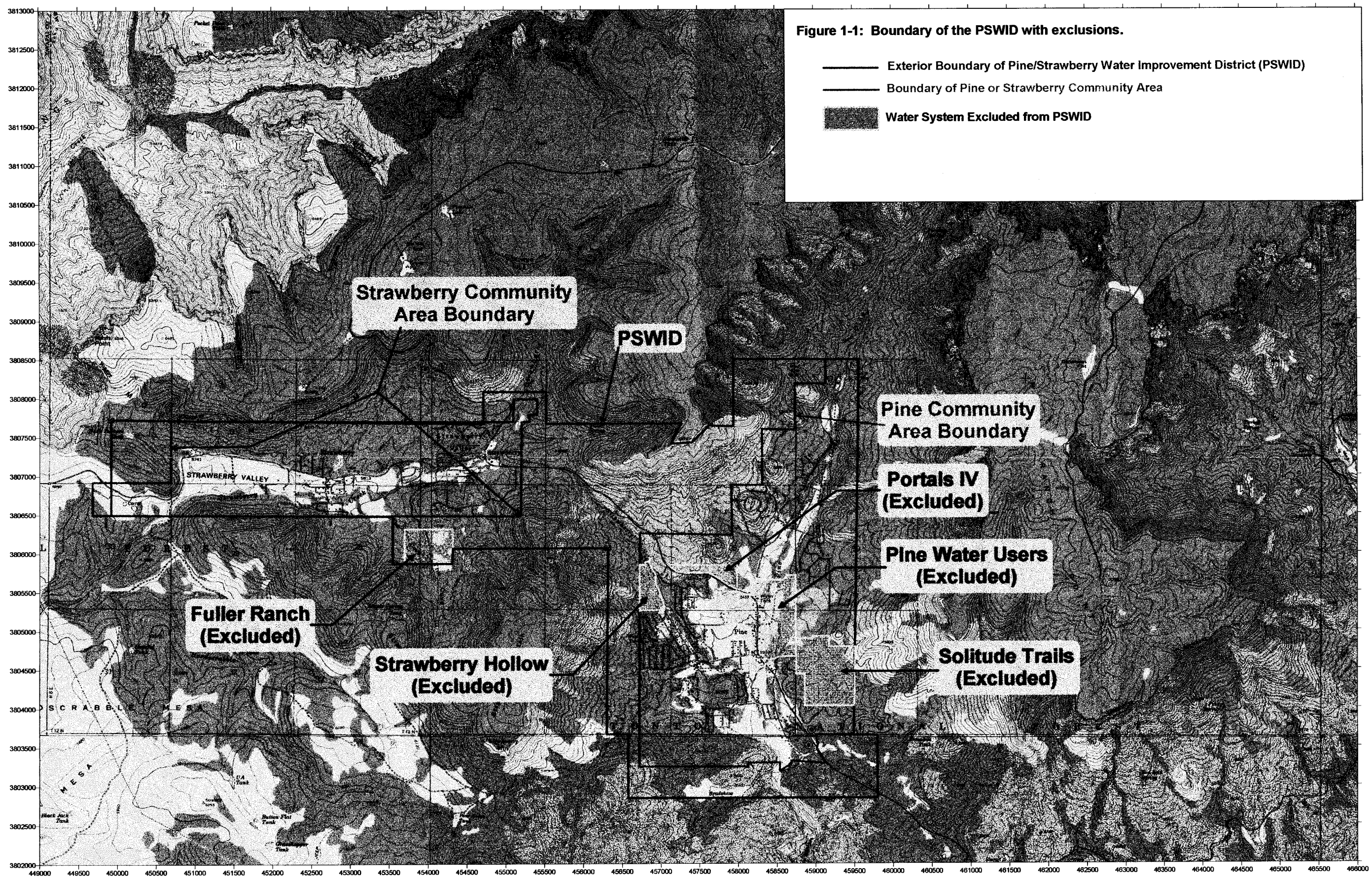


Figure 1-1: Boundary of the PSWID with exclusions.

Exterior Boundary of Pine/Strawberry Water Improvement District (PSWID)

Boundary of Pine or Strawberry Community Area

Water System Excluded from PSWID

In April 1996, an information packet prepared by ADWR to address water supply concerns in the Pine/Strawberry area stated:

> "***Since 1973, the state has analyzed the water adequacy for every new subdivision in the Payson/Pine/Strawberry area to determine if there is enough water available to meet the proposed use for 100 years. Throughout this time, almost all subdivisions in the area have received a Statement of Inadequate Water Supply from the state. The primary reason for the inadequate supply has been the drought sensitive nature of the area.***
>
> ***During the past 2 decades, subdivisions totaling about 5,100 lots have applied for water adequacy statements, 98% of which have not demonstrated adequacy.***"

In an Environmental Assessment for a proposed water line between Strawberry and Pine, to allow excess capacity from wells in Strawberry to be used to offset shortages in Pine, the U.S. Forest Service stated:

> "***Previously, Pine residents that are customers of E&R Water Company have been under water use restrictions imposed by the water company – as allowed by the Arizona Corporation Commission (ACC), including a 40% reduction in indoor use, no outdoor use, and limited livestock watering. During the summer of 1997, Brooke Utilities hauled 4.5 million gallons of water from Strawberry to Pine to ease the water shortage. Five additional wells have since been drilled in Pine but only two have achieved a water standard necessary for economic development and there is uncertainty over a long-term reliable source of water in Pine.***" (Payson Ranger District, 1999)

Since 1999, an 8-inch water transmission line has been constructed by the Brooke Utilities Company to convey water from wells in Strawberry to offset shortages in Pine. However, the transmission line cannot is not the solution to water shortages at Pine, where enforced curtailment of domestic water use continues, but simply provides an alternative to trucking water to Pine.

It was in the face of the historic water supply shortages in the Pine/Strawberry area that concerned citizens formed the PSWID. The historic seasonal failure of many wells in the area during summer demands, coupled with the poor success rate associated with drilling new wells, indicated the existing groundwater source developed by wells down to about 500 feet was already over utilized and not adequate to meet future increases in demand for water. Accordingly, the PSWID, working in cooperation with other entities, participated in drilling of a

deep exploration well in Strawberry to investigate the potential for developing groundwater from deeper strata, particularly the Redwall Limestone and associated Martin Formation. The deep exploration well, referred to as the "Strawberry Borehole" was successful in verifying availability of groundwater from the Redwall/Martin strata and provided samples of the groundwater which, when analyzed, indicated the chemical quality of the water was quite good and suited for use in public water supplies.

Subsequently, the PSWID funded the 2002-2003 investigations reported herein for the purpose of developing additional information about potential alternatives to the historically developed groundwater source, with particular emphasis on how to conduct additional investigation of the deep aquifer in the Redwall/Martin strata, including identification of favorable sites for a test/production well or well field and provision of a design for a test/production well.

The 2002-2003 PSWID investigations included a general review of the existing source of groundwater, historically regarded as strata of the Supai Group. The review provided some new information about the local geology that can change the historic perceptions about the sources of groundwater. The new information included recognition of Schnebly Hill strata in the upper part of a sequence formerly regarded as consisting entirely of Supai strata. Other new information included reevaluation of existing pumping test data from PSWID area wells with contemporary aquifer test interpretation techniques. Reexamination of the test data discovered that groundwater flow to wells completed in the Schnebly Hill and Supai strata is controlled by fractures that impose limitations on long-term well yields.

Geologic outcrops were surveyed with precision Global Positioning Satellite (GPS) methods so that an accurate map of the local geologic structure could be constructed. The geologic structure maps produced were used to reassess the distribution of Schnebly Hill, Supai, and Naco strata in the PSWID as well as to evaluate the most favorable location at which to drill a test/production well within the PSWID boundaries. A favorable location was found for construction of a well field into the Redwall Martin strata at depths ranging from 1,950 to 3,100 feet, assuming penetration of 550 feet of Redwall Martin strata.

1.2. GIS Effort

Separately from the geologic and hydrologic investigations, steps were taken to equip the PSWID with computer hardware and software for the District's use in on-going evaluation of groundwater conditions and support of the planning effort. It was intended that the system provided would be suitable for use far into the future. The effort to provide this system was subcontracted to the consulting firm of GeoSystems Analysis, Inc. (GSA) in Tucson, Arizona.

GeoSystems Analysis, Inc. (GSA) has developed a system that will assist the Pine / Strawberry Water Improvement District (PSWID) with long-term monitoring of its groundwater resources. This system integrates two components: a Geographical Information System (GIS), and a groundwater and well Data Management System (DMS) database. The GIS operates in Arcview 8.3, a software package designed by the Environmental Systems Research Institute that permits a user to compile and present multiple data layers from several sources. The DMS is created in MS Access®, and consists of internal data storage tables and an interface that permits the user to select and retrieve existing data, and to enter and manage newly-acquired data.

To initiate both systems, an area of interest to the PSWID was defined, and data were collected in appropriate formats. For the GIS platform, data were compiled from the Arizona Land Resource Information System and the Arizona Regional Imagery Archive. These data included digital raster graphics, digital orthophoto quarter quadrangles, digital elevation models, and Arcview shapefiles. The history of the data compiled for the GIS platform, including how it was developed and how it had been manipulated over time, was collected with the data and incorporated into the system. The GIS platform will allow a user to overlay and compare dissimilar types of information, compile data from several sources into a single presentation, analyze relationships and trends in the data, and design and present interactive maps.

Data incorporated into the DMS is derived from three sources: the Arizona Department of Water Resources (ADWR) Well Registry Distribution Database, the USGS Groundwater Site Inventory (GWSI), and a sample data set of additional well information provided by the PSWID. The data consist of approximately 1,605 wells currently registered with the ADWR, additional construction and water level information for about 100 wells from the GWSI, and synthetic test data for nine wells from PSWID. The user interface, designed by GSA, allows stored data to be retrieved according to criteria, such as dates and locations, selected by the operator. A built-in report produces basic well data, lists water levels, and a constructs a well hydrograph in printable form for any chosen well. Data input forms allow approved system administrators to enter new water level, pumping, and water quality data, and to edit or update existing data. The DMS is designed to be expandable to meet the future needs of the PSWID.

1.3. Summary of Findings

The 2002-2003 PSWID investigations determined that the principal source of groundwater currently in use in the PSWID area (Figure 1-1) is sandstone units in the Schnebly Hill Formation, underlying the Strawberry community area, and fractured sandstone, siltstone and limestone in the upper part of the Supai Group, underlying the Pine area. Analysis of pumping test data from wells in the two communities revealed that the hydraulic performance of the Schnebly Hill

and Supai Group strata is controlled by flow in fractured rock; however, the Schnebly Hill strata also store and transmit groundwater in the porous rock containing the fractures whereas the only storage and flow of groundwater in the Supai Group strata is through fractures with no contribution from the rock containing the fractures.

Accordingly, wells in the Strawberry area have been more reliable than wells in the Pine area because abstraction of groundwater from fractures penetrated by wells in the Strawberry area is supported by release of groundwater from porous rocks in the Schnebly Hill strata. The fractures delivering water to pumped wells completed in the Supai Group strata in the Pine area do not receive groundwater from storage in the surrounding rock and the release of groundwater storage to support pumping at Pine is solely from the fractures.

The response of the Schnebly Hill and Supai aquifers to pumping tests at Strawberry and Pine indicates the hydraulic characteristics of the fracture systems conveying groundwater to the pumped wells impose inherent limitations on groundwater yield. The hydraulic characteristics of the fracture systems dictate that maximum well yields initially available from the fractures during short-term pumping tests will inevitably decrease in response to longer duration pumping. The limitations causing decreasing well yield with increasing pumping duration are mitigated to some extent by release of groundwater to the pumped fractures from the surrounding porous rocks in the Schnebly Hill Formation, giving wells in this formation somewhat more reliability than wells in the Supai Group; however, wells in both aquifers ultimately exhibit decreasing yield in response to increased pumping during periods of increased seasonal demand for water.

The decrease in well yields is experienced on a seasonal basis in response to increased community demand for water during the summer months. The decrease in well yields is a function of increased pumping duration to meet demands for water during the summer months and results from the hydraulic limitations of the fractured rock, not from a seasonal lack of recharge to the aquifers. The onset of water shortages in 1989, when seasonal demand exceeded the production capacities of the well fields, occurred at the end of 12 years of above average precipitation trends in the region. Therefore, it is obvious the water shortages were not the result of drought. The shortages occurred despite above average precipitation conditions and, presumably, above average recharge conditions.

Therefore, it cannot be anticipated that climatic conditions will change for the better and resolve the chronic water shortage problem, even temporarily. However, it can be anticipated that the currently on-going period of below average precipitation conditions will make the water shortage problem worse. This is an important distinction because the ADWR (1996) has stated the groundwater supplies are inadequate due to sensitivity to drought. Long-term

precipitation records showing shortages occurred at the end of 12 years of above average precipitation demonstrate that the shortages were not the result of drought and therefore were caused by an inadequate groundwater resource.

Long-term precipitation records indicate the current below average precipitation trends began at the end of 1992. The same long-term records include periods of below average precipitation trends for as much as 25 consecutive years with only a few included years of above average conditions. Accordingly, the current period of below average precipitation, now in its eleventh year, may be only the beginning of a much longer period of below average conditions.

A factor contributing to the water shortages occurring since at least 1989 has been overestimation of the available water resource by consultants responsible for calculation of the groundwater resource available to the communities, as required under the Adequate Water Supply Program administered by the Arizona Department of Water Resources (ADWR). This factor has been recognized by the ADWR and summarized in a 1996 ADWR Information Packet or the Payson/Pine/Strawberry Area as follows:

> "***The Adequate Water Supply Program began in 1973 because of state law makers' concerns over land in Arizona being sold without available long-term water supplies. To address this concern, the Adequate Water Supply Program was designed to ensure disclosure of the water supply situation of a property offered for sale. When DWR was created in 1980, it assumed administration of the program.***
>
> ***Under the law, a developer proposing to offer four or more lots of subdivided or unsubdivided land for sale of lease must demonstrate to DWR if an adequate water supply will be available to satisfy the needs of the proposed development for at least 100 years. Importantly, if the developer does not demonstrate that an adequate water supply exists, the property may still be developed. However, a statement disclosing the lack of an adequate water supply must be included in the public report and all promotional materials and contracts for the development.***
>
> ***Since 1973, the state has analyzed the water adequacy for every new subdivision in the Payson/Pine/Strawberry area to determine if there is enough water available to meet the proposed use for 100 years. Throughout this time, <u>almost all subdivisions in the area have received a Statement of Inadequate Water Supply from the state.</u> The primary reason for the inadequate supply has been the drought sensitive nature of the area.***" (ADWR, 1996) Emphasis Added

Although the calculations of the 100-year supply for various subdivisions in Pine and Strawberry by various consultants have repeatedly shown the available groundwater resource exceeded anticipated demands, the ADWR has recognized that the aquifers consist of fractured rock with limited storage capacity. Therefore, the ADWR issued Statements of Inadequate Water Supply for "almost all subdivisions in the area" because they correctly perceived that such aquifers are sensitive to drought.

Examination of the 100-year water supply calculations in further detail reveals two limitations in that work. One limitation is that the calculations of groundwater flow through the aquifers were based on the concept that representative values of aquifer "transmissivity" could be used to calculate the groundwater flow. However, review of the test data used to support the calculations reveals that the values of aquifer transmissivity obtained were applicable only to the very limited widths of the fracture systems providing flow to the pumped test wells, not to the entire width of the areas used for calculation of the water resource. Thus, the consultants used values of transmissivity applicable to narrow fracture systems to estimate groundwater flow across broad areas.

The second limitation in the use of the pumping test data from the various subdivisions was the failure to recognize the type of aquifer flow indicated by the response to the tests and the significance of that type of aquifer flow to long-term reliability of well yields. The consultants treated the aquifer response to pumping as if it were radial flow in a homogeneous, porous aquifer material of infinite extent. The equations they used to evaluate long-term response of the wells to pumping were based on the radial flow analytical model of aquifer flow, a model that is not applicable to the aquifers in the PSWID area.

Application by this investigation of more recently developed analytical methods reveals that the aquifer flow to pumped wells is not radial and is not through a homogenous, porous aquifer. The contemporary analytical methods used during this investigation show the flow through the aquifer to pumped wells is along fractures that are highly bounded by relatively impervious rocks that constrain the groundwater flow to essentially linear flow paths. Hydraulic losses along the linear flow paths, and the limited open area of fractures within the aquifer to transmit groundwater flow, exert considerably more constraints on flow to pumped wells than predicted by the radial flow models used by the consultants for their projections. An inherent characteristic of linear flow systems is that the maximum well yields initially available will decline as pumping duration increases. The previous consultants did not recognize the linear flow or its effects on well yields. However, linear flow in fractured rock is the most significant factor contributing to the water supply shortages in the communities of Strawberry and Pine, regardless of drought or fluctuations in recharge to the aquifers.

In fairness to the consultants who performed the previous calculations of 100-year supplies, the radial flow methods they used have been a commonly accepted standard of practice by consultants and regulators for many years. However, as the growth of society places more burdens on our natural resources, consultants and regulators recognize the need to apply more exacting methods for evaluating resources such as groundwater, and more appropriate methods developed from past research are slowly being adopted. The analytical methods used by this investigation for recognizing and evaluating linear flow were developed by the early 1980's, but have taken nearly two decades to be recognized and assimilated into mainstream practice by engineers and hyrogeologists in this country.

The limitations revealed by the results of this investigation, regarding the aquifers currently used by existing private and public water company wells in the area, indicate the aquifer systems in the Schnebly Hill and Supai strata are not an adequate resource to support existing or future water demands in the PSWID area. The ADWR came to this same conclusion for slightly different reasons, and issued Statements of Inadequate Water Supply for most of the area.

The seasonal diminution of well yields in response to increased pumping has resulted in historic and continuing water shortages in both Pine and Strawberry since at least 1989. Development of private land in the communities has not reached full build-out and demand for domestic water supply is anticipated to increase in the future, as more homes and businesses are developed in the area. The on-going water shortages have limited the ability to add more homes to the existing service areas of water companies supplying the communities and future development of private property will continue to be adversely affected by the lack of adequate water supply for the communities. Therefore, there is an immediate need to identify and develop additional sources of water to support both the existing communities and future growth. Since surface water sources are not physically and legally available for immediate development, groundwater resources offer the best potential to develop additional water supplies in a timely manner.

The investigations commissioned by the PSWID, and reported herein, indicate the groundwater resources in the Schnebly Hill and Supai strata, historically used for water supplies in Pine and Strawberry, are inadequate to meet current water demand, let alone to support continued growth and future increases in demand for water. Although the latter conclusion is implicit in the history of on-going water shortages, there has always been some debate as to whether the shortages were caused by an inadequate resource or caused by improper management, operation and maintenance of the public water supply wells. The present investigation has determined that the physical properties of the aquifers are the cause of the shortages, that the seasonal decreases in well yields are a function of the aquifer hydraulics and are predictable, and that the differences in

well yields and reliability of wells between the two communities are caused by the presence of different aquifer systems under the respective communities.

Recognizing the inadequacy of the water resources in the Schnebly Hill and Supai strata to satisfy the demand for water supplies in the PSWID area, this investigation evaluated alternative groundwater sources. The Coconino Sandstone, north of the Mogollon Rim, is recognized as a productive regional aquifer; however, the part of the aquifer available to the PSWID is the recharge area for the aquifer, offering little groundwater storage, and is therefore sensitive to drought and fluctuations in recharge conditions. Although initially attractive well yields might be obtained from the Coconino above the rim, there is no indication that long-term continuous pumping rates can be sustained by the resource, due to the foregoing factors. Therefore, the Coconino Sandstone does not appear to be a favorable source of long-term sustainable water supplies for the PSWID, at least within any reasonable distance from the communities.

The alternative identified by the investigation is a deep aquifer contained in primarily limestone strata in the Redwall Limestone and Martin Formation. These strata are referred to collectively as the "Limestone Aquifer". In order to evaluate the potential to develop groundwater from the Limestone Aquifer, a precision survey of elevations on the geologic structure of the PSWID area was completed with precision GPS surveying methods. Geologic structure maps developed from the survey data were used to examine the relationship of the Redwall/Martin structure to the groundwater elevation measured in the Strawberry Borehole that penetrates the Redwall/Martin strata in Strawberry. A map showing the depth from the land surface to the top of the Redwall Limestone was developed from the survey data and digital elevation models of the local terrain, obtained from State of Arizona databases. The data were evaluated to identify the most favorable location for a test/production well within the private land boundaries of the PSWID.

An associated result of evaluation of the geologic structure in the PSWID area was identification of the Schnebly Hill Formation in the PSWID area, a fact not previously recognized, and considerable revision of the definition of the different layers in the local Supai strata. The foregoing efforts, combined with construction of a structural elevation map from the precision GPS survey control points, supported computer generation of a revised geologic map of the strata underlying the PSWID area. Identification of the extent, thickness and distribution of the revised definitions of the various geologic strata contributed greatly to understanding the performance of existing wells in the area.

The analysis of the data for the Limestone Aquifer indicates the most favorable area for completion of water wells into the Limestone Aquifer is the north half of the south half of Section 20, T12N, R8E, at the northwestern end of the Strawberry Valley. Projections of the potentiometric surface of the groundwater and the geologic structure indicate there is a reasonable expectation that the

entire thickness of the Redwall Limestone in the latter area is fully saturated with the groundwater elevation above the top of the Redwall Limestone. The area is associated with a structural trend that suggests aquifer permeability may be enhanced by fractures and solution openings in the limestone beneath the site.

A test/production well site is recommended near the northwestern corner of the PSWID. The land surface elevation at the site, estimated from the 7.5-minute topographic map of the area, is about 5,870 feet. The depth to the top of the Redwall Limestone at the test/production well location is estimated to be 1,560 feet. It is anticipated that as much as 550 feet of Redwall and Martin strata may be penetrated by a test/production well, providing a total estimated well depth of 2,110 feet. The estimated depth to the static water level at the recommended test/production well site is 1,505 feet. A 12-inch diameter well is recommended.

The investigation reported herein incorporates considerable new information into the status of knowledge about groundwater distribution and availability in the PSWID area. More importantly, the investigation presents new concepts and new ways of perceiving the groundwater systems in the vicinity of the PSWID. The new information and concepts provided by this investigation indicate there is a need for considerable additional investigation to refine the quantification of groundwater resources in the area as well as to quantify existing and future demand for water. It is anticipated that this report will provide a new framework for effective accomplishment of future investigations of the groundwater resources in the PSWID area.

2. GEOLOGIC CONCEPTS

The storage, flow, and distribution of groundwater in the subsurface of the earth are controlled by the nature of the subsurface strata, their porosity, permeability, geometry, and discontinuities. Accordingly, the availability and reliability of groundwater resources in the PSWID are strongly influenced by the geologic characteristics of the area. The purpose of this chapter is to describe the sequence, composition and structure of the geologic strata in the subsurface of the PSWID area and show how those factors relate to the availability of groundwater for development by water wells. This chapter also addresses some of the anecdotal information circulating in the public venue.

The majority of the wells in the PSWID area are completed in a sequence of geologic strata historically referred to collectively as the Supai Group. Weisman (1984) provided the most detailed description of these strata in the PSWID in a Master's Thesis project. Other regional investigators provided descriptions of parts of the Supai sequence based on exposures in nearby Fossil Creek and Calf Pen Canyons and Weisman and Weir (1990) applied the usage of Weisman (1984) to a geologic map of the Fossil Springs Roadless Area.

In 1990, Professor Ronald Blakey with the Department of Geology, Northern Arizona University, published research that identified strata in the upper part of the traditional Supai beds as a new geologic formation referred to as the Schnebly Hill Formation. The research by Blakey (1990) identified the Schnebly Hill Formation in a measured section of outcrops in Fossil Creek Canyon and at locations as far to the east of the PSWID as the Fort Apache Reservation. Recognition of the Schnebly Hill strata as geologically separate and different from the underlying Supai strata was a major contribution by Blakey (1990) to the knowledge of geology in north central Arizona, and by extension, in the PSWID area.

This report extrapolates the measured sections of the Schnebly Hill and Supai Group from Blakey (1990), including their subdivisions, from Fossil Creek into the PSWID. When the distribution of the redefined Schnebly Hill and Supai strata is compared to water well locations and water well pumping test data in the PSWID area, it is readily apparent that not only are the Schnebly Hill strata geologically separate from the underlying Supai beds, but they also provide a different type of hydraulic and hydrologic performance to water wells than do the Supai beds. Recognition of the differences in geology and hydrology between the Schnebly Hill and Supai Group provides the basis to explain many of the differences observed between wells completed in Strawberry versus those completed in Pine. Pumping test data from wells in the two communities demonstrate that the hydraulic response of the Schnebly Hill Formation, which underlies Strawberry, is much more favorable to reliability of wells under long-term sustained pumping durations than the hydraulic response of the Supai, which underlies Pine.

2.1. Stratigraphy

In order to understand the significance of geologic conditions in influencing groundwater availability, it is necessary to understand some basic geologic concepts. The geologic materials of interest to this study are sedimentary materials that were deposited as horizontal strata by the advance and retreat of oceans across the Colorado Plateau area. The individual layers of sediment are regionally extensive and are defined by geologists as "formations" based on their composition (lithology) and age. Formations may be subdivided into "members" or may be grouped together collectively as "groups" of strata with a common depositional environment and age. The science of classifying the strata as to group and formation, etc., is referred to as "stratigraphy" and groups, formations, and members are called "stratigraphic units".

Stratigraphic nomenclature can be quite confusing to everyone, including geologists. This is because early in the process of naming formations, the regional continuity of many of the layers was not recognized and the same layer was given different names at different locations. As geologic mapping and research progressed, it was recognized that many of the different formations with different names were actually laterally equivalent to one another.

The problem of recognizing lateral equivalency of different formations across a region like the Colorado Plateau was further complicated by a factor geologists call "facies". Facies are simply the aspect, appearance and characteristics of a rock unit, usually closely related to or reflecting the conditions of its origin. The problem is that a single layer of strata, geologically equivalent and continuous over a large region, may consist of different facies at different locations. This happens because different types of depositional environments existed contemporaneously across the area where the layer or formation was deposited and different types of materials were deposited contemporaneously at the different locations. Therefore, in the early days of geologic mapping and dating of geologic formations, the equivalency of one type of strata to a different type of strata at a different location was not initially recognized. Accordingly, a regionally extensive formation consisting of sedimentary rocks of the same geologic age may have different formation names at different geographic locations.

For example, the Coconino Sandstone (a formation) in the PSWID area is laterally equivalent to the De Chelly Sandstone of northern Arizona, the De Chelly Sandstone Member of the Cutler Formation in other areas, and the Glorieta Sandstone of New Mexico; yet all were given different formation names at different times and places by different investigators. This report adopts the stratigraphic nomenclature of the Colorado Plateau used in Bills et al. (2000), with appropriate modifications to match conditions at Pine and Strawberry, and makes mention of laterally equivalent stratigraphic names only where appropriate for clarity.

2.2. Porosity and Permeability

Porosity and permeability are important concepts in groundwater flow. Porosity is the voids, pores, or interstices between the mineral grains in a rock mass. The pores may consist of inherent porosity provided by primary interstices between the mineral grains, such as in a sandstone, or may consist of secondary openings caused by fractures. Porosity may or may not be interconnected. Therefore, a rock may be porous but not permeable, if the pores are not well connected. In a permeable rock, the pores are interconnected such that vapor or fluid may flow or be transmitted through the rock mass.

2.2.1. Hydraulic Conductivity

Permeability is the capacity of a porous material for transmitting fluid, usually defined as the relative ease of fluid flow under a known pressure difference. In the science of groundwater, permeability is referred to as "hydraulic conductivity" or the quantity of water that will flow through a unit area under a unit head during one unit of time. Hydraulic conductivity is slightly different than permeability in that permeability is a property of only the porous media whereas hydraulic conductivity is a property of both the porous media and water. Typically in the

United States, hydraulic conductivity is referred to as gallons per day per square foot or cubic feet per day per square foot that reduces to feet per day.

2.2.2. Transmissivity

A related concept is transmissivity. Transmissivity is a macroscopic property of an aquifer, namely the property of transmitting water through its entire thickness. Transmissivity is defined as the rate of flow of water at the prevailing temperature through a vertical strip of aquifer one unit wide, extending the full, saturated thickness of the aquifer, under a unit hydraulic gradient. In other words, transmissivity can be defined as the saturated thickness times the hydraulic conductivity. In the United States, transmissivity is typically referred to in gallons per day per foot or square feet per day.

Hydraulic conductivity as distinguished from porosity is a very important concept. Fine-grained materials such as very fine-grained sandstone and/or siltstone may offer high intrinsic porosity, where the grain-to-grain pores are not filled with secondary cement. Although the volume of water stored in such rocks may be volumetrically large, the pore-to-pore interconnections are relatively small such that they offer significant resistance to groundwater flow. The resistance is quantified in the concept of hydraulic conductivity. The hydraulic conductivity and transmissivity are very low in such rocks, and the flow of groundwater through the fine-grained materials is very slow, thus resulting in low yields to wells.

2.3. Structure

Another important geologic concept is that of geologic structure. The initially flat sedimentary rock layers deposited on the Colorado Plateau are now deformed. The deformation consists of folds and discontinuities. Upward folds are termed "anticlines" by geologists and downward folds are termed "synclines". Folds as such are not a significant factor in the geology of the PSWID area; however, the regional tilt of the Colorado Plateau strata is a very significant factor in the search for additional groundwater resources in the PSWID.

Fractures provide discontinuities in the rock that may be extremely significant to the flow of groundwater to wells. Fractures that offset the strata are referred to as "faults" and are present where tectonic forces have sheared the strata. Fractures that do not offset the strata are referred to as "joints" and may have been caused by tension around folds or other forces causing extension of the rock mass. Therefore, joints are often associated with folds and aligned in some geometric relationship with the axis of the folds. In the Colorado Plateau strata at and north of the PSWID, most of the significant fractures are associated with fault zones. Folds and faults are an important aspect of identifying areas where fractures in the rock may have enhanced hydraulic conductivity for groundwater

flow by providing secondary openings in otherwise inherently low permeability materials.

Bills et al. (2000) describe the potential effects of faults on groundwater flow as follows:

> "***In general, fractures formed under compressional stress tend to remain fairly tight and closed, which results in little if any increase in ground-water flow. Fractures formed under tensional stress tend to be more open, which results in increases in ground-water flow in places. In some cases, the blocks on either side of a fault can grind the sedimentary rock into a fine powder that fills the fault zone and substantially reduces ground-water flow. Information on displacement of faults also is necessary to determine the continuity of water-bearing zones and confining layers.***" (Bills et al., 2000; p.28)

Experience with water wells on the south face of the Mogollon Rim has shown that groundwater production is provided from fractures in most of the strata. In many locations, the inherent hydraulic conductivities of the different strata are too low to support significant flow to water wells; however, wells obtain usable production from groundwater flow in fractures. Even porous units like the Coconino Sandstone provide enhanced production where wells penetrate fractures. Thus, an understanding of the fractures is necessary to an understanding of the factors affecting the availability of groundwater to wells and controlling the reliability of the flow to the wells when they are pumped.

The PSWID and surrounding area is traversed by a number of small tensional faults. Although most productive wells in the area are not located on the faults, local water well drillers report that most of the wells penetrate and produce groundwater from fractures or some type of voids in the local strata within the PSWID. This suggests the wells penetrate open joints, possibly associated with the normal faults, and that the joints may be present for considerable distances on each side of faults. However, other explanations are possible.

One local driller with considerable experience in the PSWID area observes that wells drilled between the toe of the Mogollon Rim and the top of the Diamond Rim typically do not penetrate many open joints in the rock whereas wells drilled between the top of the Mogollon Rim and the toe of the Mogollon Rim typically penetrate quite a few open fractures and "broken" zones (Chris Miller, 2003). This experience is peculiar to the PSWID area, probably because that is where most of the wells have been drilled. As previously stated, most of the wells penetrating open joints or "broken" zones in the subsurface of the PSWID are not closely associated with recognized faults, a fact that suggests the open joints are not necessarily related directly to the identified faults.

The foregoing observations may indicate the presence of moderately deep open joints along the south face of the Mogollon Rim due to a tendency for the strata on the relatively steep slope below the rim to extend or tilt downhill under the force of gravity. Tension exerted on the truncated strata on the south-facing slope below the Mogollon Rim by gravity may explain the apparently widespread presence of open joints penetrated by wells in the PSWID with no apparent close association with known faults.

2.4. Solution and Cementation

Other forms of enhanced secondary permeability providing large values of hydraulic conductivity include enlargement of primary porosity or enlargement of fractures by solution in carbonate rocks such as limestone and dolomite. Solution enlargement of pores and/or fractures by dissolution of mineral matrix can greatly increase the hydraulic conductivity of carbonate strata by offering interconnected conduits for groundwater flow. The other side of this coin is precipitation of carbonate and/or silica cement in pores and/or fractures in rock. Secondary cement fills pores and voids, including fractures, and reduces or eliminates porosity and associated permeability. Accordingly, cemented rocks may not offer much potential to produce groundwater.

2.5. Unconfined and Confined Conditions

Unconfined aquifers are those in which the water table forms the upper boundary of the aquifer and is not confined by an impermeable layer. The groundwater surface in an unconfined aquifer is referred to as the "water table". Confined aquifers are those in which the water level in the aquifer rises above the top of the aquifer and is confined in the aquifer, under pressure, by an impermeable layer. The level to which water will rise in a well penetrating through the confining layer and into the aquifer is referred to as the "potentiometric surface". The potentiometric surface is analogous to the water table but represents a pressure surface whereas the water table is a physical surface. Both terms represent the hydraulic head in the aquifer and when water level elevations from either type of system are plotted on a map and contoured, the resultant map is called a water-table surface or potentiometric surface, as appropriate, and provides an indication of the directions of groundwater flow in the aquifer.

3. GEOLOGIC HISTORY

The PSWID is located on the south-facing slope of a topographic feature called the Mogollon Rim. The Mogollon Rim is an escarpment with as much as 2,600 feet of vertical relief, about 1,475 feet at Pine and Strawberry, comprising the southern flank of the Colorado Plateau in northern Arizona and is the northern limit of a transition zone from the Colorado Plateau structural province to the Basin and Range structural province of southern Arizona. The Colorado Plateau area to the north of Mogollon Rim has been one of the more geologically stable

parts of the earth's crust in the western United States, a fact described by Baars (1962; p. 150), as follows:

> "***The Colorado Plateau physiographic and structural province is a high semi-arid plateau and canyon land that includes most of eastern Utah, the northern third of Arizona, northwestern New Mexico, and the southwestern corner of Colorado . . . The area is typified by sparse desert vegetation and rugged topography developed on generally horizontal sedimentary rocks. Tectonically, the plateau is relatively stable compared with the Basin-and Range structural province on its southern and western boundaries and the Rocky Mountain province of the northern and eastern margins.***"

Thus, the sedimentary strata deposited on that portion of the earth's crust under the western United States have been preserved in the area now known as the Colorado Plateau whereas the same strata in the areas surrounding the Colorado Plateau have been greatly deformed and displaced. The geologic strata of the Colorado Plateau comprise the framework containing the groundwater resources available to the PSWID. Although the PSWID is located on the very edge of the structural plateau, where structural movements have caused the sedimentary strata to be displaced downward along faults, the PSWID is located on the truncated face of the relatively stable strata north of the major displacements along faults. Therefore, the geologic factors controlling the distribution and availability of groundwater within the PSWID area are very similar to those applying to the Colorado Plateau to the north.

Over geologic time, structural warping of the continental plate under the western United States caused repeated advance and retreat of oceans across the area, including that part now preserved as the Colorado Plateau. As much as several thousand feet of sediments were deposited over geologic time representing hundreds of millions of years (Bills et al, 2000). Lithification processes consolidated the thick sequence of sediments into the rock strata presently underlying the Colorado Plateau. Table 3-1 shows the geologic time scale.

Crustal deformation of the western United States started in late Cretaceous time and continued through the early Tertiary in several phases, generally ending in the Paleocene. Geologists call a period of mountain building an "orogeny". The crustal deformation starting in late Cretaceous time was a period of mountain building along the entire western part of the north-American continent and is referred to as the Laramide Orogeny. Compressive forces resulting in folding and faulting of the continental strata were accompanied by emplacement of intrusive rocks and ore bodies in the subsurface and emanation of volcanic materials onto the land surface.

Table 3-1: Geologic time scale.

Eon	Era	Period		Epoch	Time Starting (millions of years)
Phanerozoic	Cenozoic	Quaternary		Holocene	0.01
				Pleistocene	1.6
		Tertiary	Neogene	Pliocene	5.3
				Miocene	23.7
			Palaeogene	Oligocene	36.6
				Eocene	57.8
				Paleocene	66.4
	Mesozoic	Cretaceous		late Cretaceous	97.5
				early Cretaceous	144
		Jurassic		late Jurassic	163
				middle Jurassic	187
				early Jurassic	208
		Triassic			245
	Palaeozoic	Permian			286
		Carboniferous		Pennsylvanian	320
				Mississippian	360
		Devonian			408
		Silurian			438
		Ordovician			505
		Cambrian			570
Proterozoic	Precambrian				4,600
Archaean					

The Laramide Orogeny (and earlier crustal movements) resulted in uplift of the area south of the Mogollon Rim to form a highland consisting of Precambrian granite and quartzite. The same crustal compression, from late Cretaceous through Paleocene time, raised the southern end of the Colorado Plateau structural province to essentially its present elevation, tilting the flat-lying sedimentary rocks 1-2° to the east and north (Bills et al., 2000). Compression and uplift were accompanied by deformation of the sedimentary strata on the Colorado Plateau into broad regional faults and folds. Continued movement along deep seated faults separated the sedimentary strata on the plateau from the Precambrian strata supporting the highlands to the south, thus forming the structural boundary of the south end of the Colorado Plateau.

At the end of compression and uplift, a continuous erosion surface, draining to the northeast, developed across the Precambrian granite and quartzite in the highland to the southwest, and continued across the contemporary Mogollon Rim area, well into the central Colorado Plateau region. Although sediments from this erosion surface are not present in the PSWID portion of the Mogollon Rim, their presence to the east provides the basis for dating the development of the

Mogollon Rim. The clastic debris deposited on the erosion surface have been referred to historically as the "Rim Gravels"; however, Potochnik (1989) proposed the name "Mogollon Rim Formation" for these deposits and described their significance as follows:

> "***The Mogollon Rim formation is an alluvial braidplain deposit that blanketed part of the southern Colorado Plateau and Transition Zone province in east-central Arizona during the Eocene. These coarse clastics were shed northeastward off the flanks of the actively rising Laramide Mogollon highland onto a locally channeled but regionally flat erosion surface that bevels increasingly older Tertiary(?) through Precambrian rocks towards the southwest. Evidence for contemporaneous uplift is recorded by facies relationships across several northwest–trending intrabasinal faults that cross the Transition Zone. Regional transport of sediment was generally eastward toward the Baca Basin in New Mexico. At least three large trunk streams from the Mogollon highland distributed discrete lithologic suites of clasts across a broad alluvial braidplain. The source area extended west and southwest beyond the present Tonto basin and Globe-Miami mining district. Deposition began with the widespread distribution of a coarse boulder conglomerate across the moderately channeled bedrock surface. As bedrock lows were filled, clast size diminished, and arkosic sand dominated the rivers. The alluvial plain was deposited in a semiarid climate, but the source area was sufficiently humid to support large-volume rivers. Paleocurrents suggest a 31° northward rotation of paleoslope following deposition of the basal conglomerate. Increasingly tuffaceous sandstones in the upper member signal incipient mid-Tertiary magmatism in latest Eocene time. The basal contact serves as a datum or post-depositional structural lowering of the Transition Zone. The previously active northwest-trending faults in the area were later reactivated with the opposite sense of movement, causing the Mogollon Rim formation in the Transition Zone to be downfaulted and downwarped at least 760 m to the south.***" (Potochnik, 1989; abstract)

Thus, Potochnik (1989) documents that reactivation of the faults that resulted in the Mogollon Rim occurred sometime after the Eocene. Peirce et al. (1979) date the minimum age of volcanics overlying the rim gravels at 28 million years ago, suggesting the reactivation of the faults resulting in the Mogollon Rim occurred in the Oligocene.

Mayer (1979) states that the Diamond Rim fault was active from 25 to 15 million years ago, indicating local reactivation of the faults along the south end of the Colorado Plateau started in the Oligocene. The reactivated faults are high-angle, deep-seated faults in the Precambrian that developed well before the Laramide Orogeny. As late-Tertiary crustal movement lowered the area south of the Colorado Plateau and the Basin and Range structural province developed, the drainage of the former Eocene erosion surface across the region was reversed along the structural Transition Zone between the Colorado Plateau and the Basin and Range. The ancestral drainage divide, now represented by the Mogollon Rim, was south of the present Mogollon Rim and aligned along the Diamond Rim fault. Continued lowering the Basin and Range province south of the ancestral Mogollon Rim lowered base levels so that the ancestral rim at the southern end of the Colorado Plateau was modified by erosion. Mayer (1979) describes the headward retreat of the escarpment as follows:

> "***The evolution of the Mogollon Rim near Pine, Arizona can be outlined from the data presented above . . . Prior to 30 m.y. ago, drainage was flowing north-northeast from the Basin and Range onto the Colorado Plateau (Pierce et al., 1978). By about 25 m.y. ago the drainage had been reversed, at least locally and a drainage divide established near the present Mogollon Rim. Development of erosional relief followed the drainage reversal. Other separate escarpments may have existed due to resistant formations capping the Supai Formation.***
>
> ***Between 25 and 15 m.y. ago faulting along the Diamond Rim fault superposed a new escarpment on the previous relief. Pedimentation and retreat of this escarpment followed. About 12 m.y. ago, basalts flowed onto the pediment and across the fault. From 12 m.y. ago to the present, the Rim continued retreating while canyon cutting began on the pediment by headward erosion from the south.***
>
> ***The absence of thick fan deposits underneath the basalts suggests that the sediment was transported further to the south. Pine Creek, may have been a tributary to the Tonto drainage system. This supports the work of Pederson and Royse (1970) who believe the East Verde River to have been part of the Tonto drainage system in Miocene time. Therefore, the lowering of the base-level represented by the initial drainage divide and the younger escarpment was due to the combined effect of local faulting and base-level lowering south of the present Mogollon Rim.***" (Mayer, 1979; pp. 54-55)

Mayer (1979) estimates the rate of retreat of the younger rim to its present location as the Mogollon Rim at 354 – 857 meters (1,160 – 2,800 feet) per million years. Mayer (1979) also shows that after retreat of the Mogollon Rim away from the Diamond Rim fault, basalt flowed onto the erosion surface between the Rim and the Diamond Rim fault, forming Buckhead Mesa. Other volcanic deposits are present on different ages of erosion surfaces below the Mogollon Rim at locations such as Hardscrabble Mesa. Volcanic deposits on Strawberry Mountain and Milk Ranch point, however, are above the ancestral Mogollon Rim over which the basalts flowed down onto the erosional surface below the retreating rim.

Weisman (1984) cites several sources of information in describing the relationship between the volcanics and the ancestral Mogollon Rim:

> "***In the Fossil Creek Canyon area, Twenter (1962) reported that the ancestral Mogollon Rim lies preserved against 3,000 to 4,000 feet of Tertiary basalt flows and ash fall deposits. In this area the existence of the ancestral scarp obviously pre-dates the oldest volcanics, although no basal flows were dated. Younger volcanics from the upper slopes of the canyon, however, have been dated by Peirce and others (1979) as 10.16 and 9.3 million years old.***" (Weisman, 1984; p.70)

and,

> "***Volcanic rocks in the study area have been dated as 11.4±0.27 million years old on Baker Butte (Peirce and others, 1979) and 14.23±0.74 million years old on Milk Ranch Point (Peirce and Shafiqullah, 1982, personal commun.) However, these are dates from the top of flows and , thus, are minimum ages. In this study area*** (portions of the Pine and Buckhead Mesa Quadrangles)***, as in Fossil Creek, the rim pre-dates the oldest known volcanics. The thick pile of volcanic rocks that filled the ancestral valley building up and covering the edge of the ancestral rim in Fossil Creek (Twenter's Fig.2, 1962) has no analog in nearby areas. In this study area, basalt either flowed down the southward-dipping erosional ramp*** (from the top of the Mogollon Rim) ***stopping short of the edge or spilled off the ancestral escarpments formed on the southern boundaries of Strawberry Mountain and Milk Ranch Point.***" (Weisman, 1984; p.71)

Weisman (1984) therefore concludes that both Milk Ranch Point and the south end of Strawberry Mountain are remnants of the ancestral Mogollon Rim, preserved from headward erosion and retreat by resistant caps of basalt.

As shown by the brief summary presented above, a significant event in the geologic history of the PSWID area and surrounding area at the southern extent of the Colorado Plateau was the change from deformation and uplift, due to compression, to down-dropping of the Basin and Range province under extension. As previously mentioned, fractures formed under compression may offer less favorable conditions for groundwater flow than fractures formed under tension.

Mayer (1979) summarizes a number of primary references from which he draws the inference that prior to about 30 million years ago, forces between colliding plates of the earth's crust resulted in compression of the continental crust and associated crustal shortening, including the uplift of the Laramide Mogollon highland and the Colorado Plateau, as well as uplift of much of the eastern Rocky Mountains. After about 30 million years ago, development of the San Andreas transform fault realigned the stress directions between the tectonic plates, allowing the western part of the continental plate to change from compression to extension. Formation of the Basin and Range province south of the Colorado Plateau resulted from extension of the crust and continues today.

As summarized in Bills et al. (2000), all the faults in the part of the Colorado Plateau between the Mogollon Rim and Flagstaff are younger in age than the pre-Laramide faults, but include faults formed under both compression and extension. Most of the faults in the PSWID area appear to displace the volcanics as well as the underlying strata, thus indicating they formed in the post-Laramide period of extension and down dropping of the Transition Zone and Basin and Range provinces south of the Mogollon Rim. In explaining the significance of the different ages of faults, Bills et al. (2000) state:

> "***In the study area*** (the Lake Mary area south of Flagstaff and other areas around Flagstaff, all on the Colorado Plateau north of Pine and Strawberry)***, the two principal strikes of faults are north-northeast and north-northwest. The north to northeastward-striking faults are interpreted as reactivation of structure that originates deep in the Precambrian unit by compressional stresses . . . The Oak Creek Fault, which is the principal fault of this type, currently has offsets of 200 to 500 ft along the strike of the fault. In the study area, most of the faults strike north to northwest. The north- to northwest-striking faults are one of the youngest structural features on the Colorado Plateau. Some of these faults are the result of basin and range extension that postdates the Laramide orogeny. Many of these features are within the still active Cataract Fault zone. A few of these faults extend through the volcanic rocks and recent alluvial material, which indicates they are still active. The mechanism for these faults and associated fractures are***

current extensional stress fields and processes now active on the Colorado Plateau . . .

Sedimentary rocks of the regional aquifer are all fractured and folded to varying degrees. Most of the fracturing is related to major fault zones. Although most faults extend through the whole aquifer thickness, other fractures may be formation specific. Thus, these fractures can act as either conduits or barriers to ground-water flow. Shattered rock in these fractured zones is permeable; however, gouge zones, which consist of fine-grained to clay-sized material produced by grinding along the fault plane, are impermeable. In addition, the Kaibab Formation is brittle and contains many joints, solution channels, and other openings that can act as conduits for the flow of water. The lithology of the regional aquifer changes from formation to formation and also vertically and laterally within the formations. The most productive water-bearing material tends to be the fine- to medium-grained sandstones. Because of these structural and lithologic characteristics, the regional aquifer is heterogeneous and anisotropic and has a complex ground-water flow system." (Bills et al., 2000; pp.28-29)

Although faults and fractures formed under tension, during structural extension of the area, may offer better conditions for groundwater flow than faults and fractures formed under compression, it is important to note that faults originally formed under compression may have been reactivated under extension. Accordingly, northeastward-striking faults may also offer good conditions for groundwater flow as described by Bills et al. (2000):

"***These researchers*** (G.M. Mann and Dr. A.E. Springer, geologists at Northern Arizona University) ***found that (1) north-to northeastward-striking fractures originate from compressional stress, (2) north- to northwestward-striking fractures originate from and are related to tensional stresses, and (3) some northeastward-striking fractures are related to reactivation of deep-seated faults caused by regional extension. . . . North-eastward-striking fractures generally parallel the direction of ground-water flow and surface drainage. Surface drainage may be better developed along these older structural features, and dissolution of formational material may have increased ground-water flow along these structures.***" (Bills et al., 2000; p.30)

Obviously, this brief summary of the geologic history of the PSWID area refers to only a small portion of a large body of research about the Colorado Plateau,

development of the Basin and Range structural province, and the formation of faults in the PSWID area. The summary is provided to give the lay reader an overview of the processes that resulted in the contemporary geologic terrain and produced the conditions that affect modern efforts to develop groundwater resources in the area.

4. HYDROGEOLOGIC UNITS

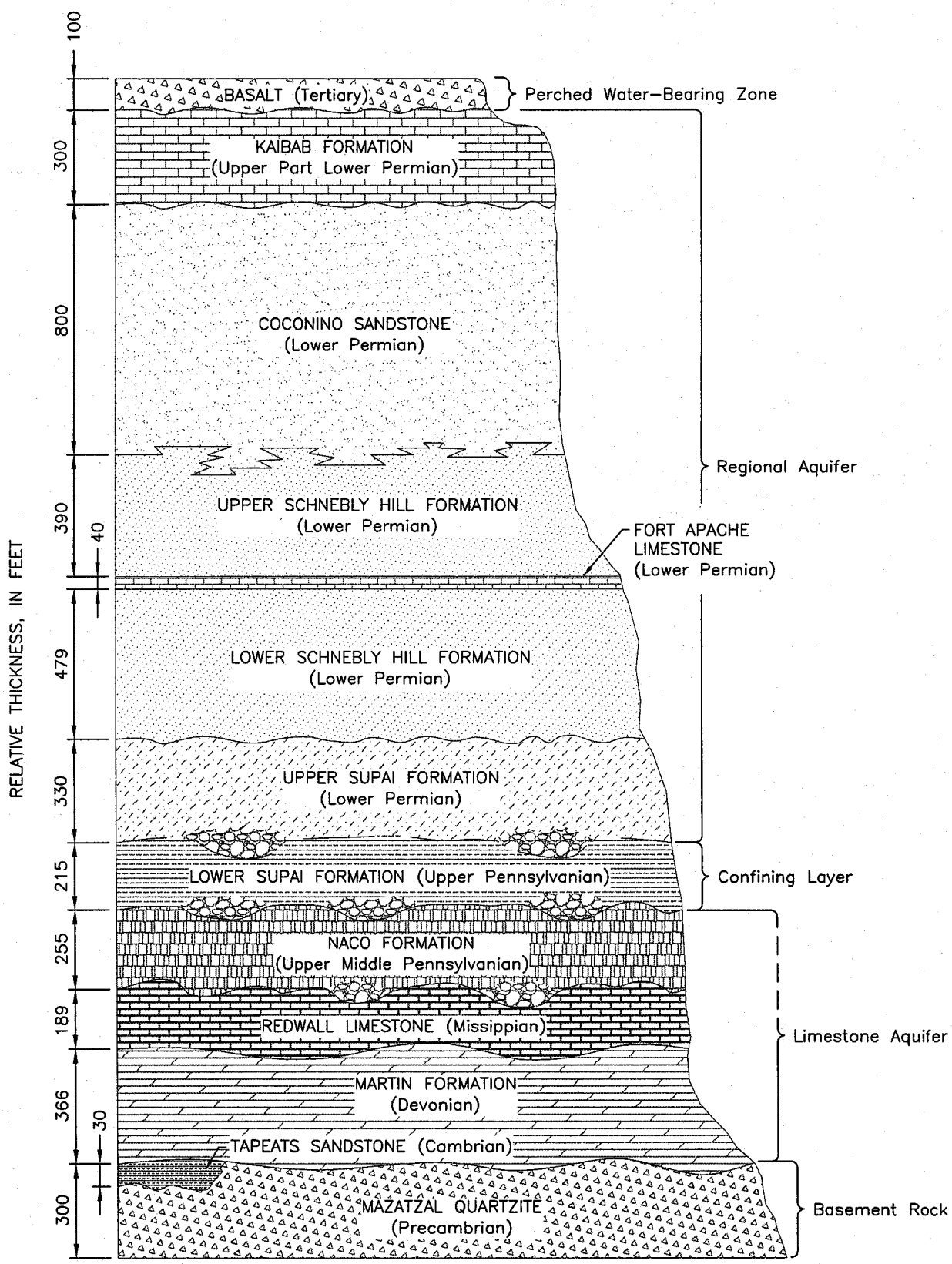
Figure 4-1 shows the generalized stratigraphic section of rock units in the PSWID area. Figure 4-2 is a geologic map showing the distribution of outcrops of the various strata at the land surface. The strata shown on Figures 4-1 and 4-2 include water-bearing materials that function as aquifers as well as relatively impermeable materials that function as confining layers between the aquifers, except where they are fractured.

The water-bearing strata can be generally grouped into three aquifer systems wherein associated strata act collectively as one aquifer, although with different hydraulic properties in the different layers in the system. The three aquifer systems are the Perched Aquifer, the Regional Aquifer, and the Limestone Aquifer.

4.1. Perched Aquifer

As shown on Figure 4-1, the uppermost aquifer system is contained in basalts where groundwater is perched on interbeds of sediments and volcanic ash that prevent the water from draining through the volcanics into the underlying Kaibab and Coconino units. The perched aquifers discharge water around the margins of the volcanics as contact springs. In that part of the Mogollon Rim above Pine and Strawberry, the basalts may be observed resting on an eroded surface cut into Kaibab limestone, Coconino sandstone, and at the southern ends of Milk Ranch Point and Strawberry Mountain the basalt rests on eroded Supai.

Not all of the basalts may contain perched groundwater. In some of the area, recharge entering the basalt probably flows through the basalt to recharge the Kaibab and/or Coconino units. The basalts offer a receptive surface for infiltration of precipitation and runoff and may play an important role in collecting recharge that ultimately enters the underlying Kaibab and Coconino units. The basalt strata are generally located outside of the areas of private property available for development and are therefore not a potential source of water to the PSWID, notwithstanding the issues of low yield and seasonal reliability. An exception is the westernmost end of the private property extending onto the area west of Strawberry Valley. The thickness of Tertiary volcanics in this area may be as much as 1,300 feet or more and is part of the area where Twenter (1962) described several thousand feet of Tertiary basalt flows and ash deposits preserving the ancestral scarp of the Mogollon Rim.



Modified From Bills et al. (2000)

FIGURE 4-1: Generalized Stratigraphic Section in PSWID Area

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H:\WATER RESOURCES\8385 PSWID\acad\Stratigraphic Section.dwg Aug/12/2003

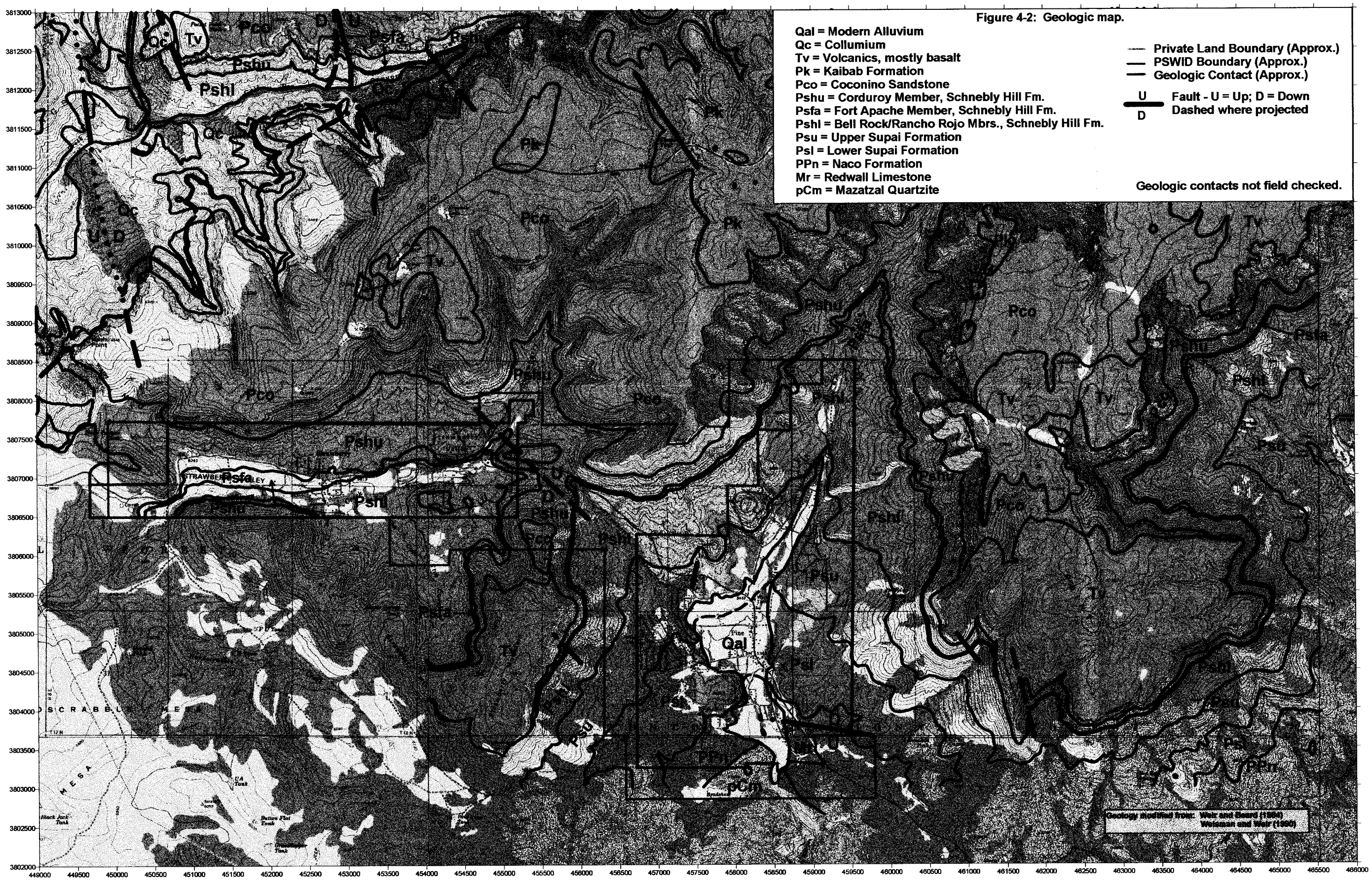


Figure 4-2: Geologic map.

4.2. Regional Aquifer

The Kaibab limestone (where present), the Coconino Sandstone, the Schnebly Hill Formation, and, where sufficiently fractured, the upper Supai Formation act collectively as an aquifer system (Figure 4-1). The principal water-bearing zones in the Regional Aquifer are the Kaibab, Coconino, and Schnebly Hill strata. This aquifer system is the source of water to the well fields for Flagstaff, Arizona, and was named the "Regional Aquifer" by Bills et al. (2000), although the Regional Aquifer of Bills et al. (2000) includes middle Supai that is not distinguished separately in the PSWID and regards the lower Supai as a confining unit. The lower Supai probably acts as the main confining unit above the Limestone Aquifer at Pine; however, it will yield water from fractures.

The Kaibab limestone is highly jointed and contains considerable solution cavities that allow water to move rapidly through the formation, where it is present below the water table. It is a receptive surface to receive recharge where it is present at the land surface above the regional water table. The Coconino Sandstone and parts of the Schnebly Hill Formation offer the best primary porosity and hydraulic conductivity to store and transmit groundwater whereas the upper and lower Supai Formation offer limited hydraulic conductivity due to their fine-grained and cemented nature, but they do contribute water to wells from fractures.

Based on the geophysical logs from the test well drilled in Strawberry in 2000, referred to as the Strawberry Borehole, and based on measured geologic sections in Fossil Creek Canyon by Blakey (1990), the generalized thick nesses of the Schnebly Hill and Supai Group in the PSWID area are 909 feet of Schnebly Hill, 330 feet of upper Supai, and 215 feet of lower Supai. The Fort Apache Limestone is located midway in the Schnebly Hill Formation and averages about 40 feet thick with about 390 feet of Schnebly hill sandstone above and about 479 feet of sandstone below the 40-feet thick limestone unit. The approximate distribution of exposures of these strata on the land surface in the PSWID is shown on the geologic map of bedrock outcrops on Figure 4-2.

It is apparent from Figure 4-2 that wells started on the floor of the Strawberry Valley will penetrate 450 to 479 feet of lower Schnebly Hill sandstone, depending on the amount of erosion and alluvial infilling in the valley floor. The amount of Schnebly Hill sandstone (and limestone) available for penetration by wells increases to essentially the entire 909 feet of Schnebly hill in the area between the valley floor and the northern extent of the private lands in Strawberry. The amount of Schnebly Hill sandstone available at the southern boundary of the private lands in the Strawberry Valley probably averages about 400 feet. The lower sandstone of the Schnebly Hill Formation is present under most of the Strawberry Hollow, with about 479 feet of thickness available at the top of the pass between Strawberry and Pine, thinning to zero feet where it is truncated by

the terrain at an elevation of about 5640 feet two-thirds of the way from the pass towards Pine.

Figure 4-2 indicates the strata in the subsurface of Pine are considerably different than at Strawberry. Pine is almost entirely located on upper and lower Supai strata. The only Schnebly Hill Formation in the subsurface of Pine is a narrow zone under the uppermost elevations of the various Portals subdivisions on the west side of Pine Creek where probably less than 200 feet of the unit is available for penetration by wells. For example, the Portals IV Well 1 (Manera, 1994) appears to penetrate 215 feet of Schnebly Hill Formation with the remaining 165 feet of the 380-feet deep well completed in upper Supai strata. The southernmost part of Pine is located over Naco Formation (as defined by Blakey (1990)) less than 200 feet thick and which might be mistaken on well logs for Redwall Limestone due to the predominance of limestone in the Naco.

Thus, the hydrogeologic conditions in the uppermost 400-500 feet of strata underlying Strawberry are much more favorable to groundwater development than any of the subsurface material underlying Pine. This is because the Schnebly Hill Formation underlying Strawberry is a somewhat more permeable sandstone unit than the finer-grained strata of the Supai underlying most of Pine. It is possible that sandstone layers within the Schnebly Hill Formation yield groundwater to wells in the absence of fractures whereas the composition of the Supai strata underneath Pine indicates well yields must likely depend on groundwater flow from fractures.

4.2.1. Kaibab Formation

Weisman (1984) indicates about 300 feet of Kaibab Formation is present in the area above the Mogollon Rim north of the PSWID and divides the formation informally into three parts consisting of an upper porous, fine-grained sandstone; a middle sandy limestone and dolomite; and a basal calcite and silica cemented, soft, fine- to very fine-grained sandstone. Weisman (1984) does not indicate the thick nesses of the individual parts of the Kaibab. The Kaibab is typically quite jointed and exhibits considerable porosity in the carbonate section.

4.2.2. Coconino Sandstone

The Coconino Sandstone is a pale orange to light brown or white, cross-stratified, fine- to medium-grained sandstone consisting of about 95 percent grains of wind-deposited quartz grains. Secondary overgrowths of silica cement are typical in the rock, providing reflective surfaces that give the rock surface a distinctive sparkle in sunlight. The Coconino is relatively porous sandstone and is the principal water-bearing unit of the Regional Aquifer. Although the Coconino exhibits sufficient hydraulic conductivity to provide good yields of water to wells, the highest yields to wells are obtained from fracture zones where permeability is greatest. The Coconino Sandstone along the northern edge of

the Mogollon Rim above the PSWID is at the top of the recharge area for aquifers in the region and therefore is saturated through only part of its thickness and offers only limited groundwater storage due to the fact most of the aquifer is located down-gradient from the Rim. The thickness of the Coconino in the PSWID area was not determined by this investigation; however, interpretation of the geologic contacts plotted on the topographic map base in the vicinity of Pine Creek Canyon suggest about 800 feet of Coconino Sandstone in that area.

4.2.3. Schnebly Hill Formation

The Schnebly Hill Formation is a stratigraphic classification proposed by Blakey (1990) for a sandy red-bed sequence included in the upper part of the Supai by previous investigators. Based on a measured section along Fossil Creek, Blakey (1990), the Schnebly Hill Formation is assigned a thickness of 909 feet for the purpose of this investigation. The Fort Apache Limestone, a prominent ledge-forming unit on the face of the Mogollon Rim above the PSWID area, is located midway in the red-bed sequence. In the PSWID vicinity, Blakey (1990) divides the formation into five members.

4.2.3.1 Sycamore Pass Member

The uppermost member, called the Sycamore Pass Member is less than 150 feet thick at Fossil Creek and thins abruptly to the southeast. The unit consists of nearly 100 percent cross-stratified quartz sandstone and forms cliffs which make the unit hard to distinguish from the overlying Coconino Sandstone with which it interfingers.

This investigation did not identify the thickness of the Sycamore Pass Member in the PSWID; however, plotting of the entire thickness of the members above the bass of the Fort Apache Member on Figure 4-2 places the top of the Schnebly Hill Formation at the base of the cliffs formed by the Coconino Sandstone. This suggests the Sycamore Pass Member thins from nearly 150 feet in Fossil Creek to essentially zero in Pine Canyon. Accordingly, the Corduroy Member appears to comprise the materials between the base of the Coconino and the top of the Fort Apache Member in the PSWID area. If the Sycamore Pass Member is present in Pine Canyon, it has not been distinguished from the Coconino Sandstone; however, projection of the Schnebly Hill Formation thickness from Fossil Creek into the PSWID area on Figure 4-2 suggests the Sycamore Pass Member simply thins out between Fossil Creek and Pine Canyon. Weisman (1984) describes the contact between the upper part of the Schnebly Hill Formation (Weisman's upper Supai) and the Coconino as follows:

> ***". . . the unit is predominantly siltstone and very fine-grained sandstone (with minor limestone) that becomes slightly more coarse-grained toward the top of the unit. (The base of the transition zone, which is marked by 100 to 150 foot cliffs, is***

included in the lower Coconino Sandstone on the field map because basal cliffs were easier to locate for field identification than to determine where a gradational zone terminates.)" (Weisman, 1984; pp. 52-53)

4.2.3.2 Corduroy and Fort Apache Members

The Sycamore Pass Member overlies and intertongues with the Corduroy Member that consists of siltstone, mudstone, gypsum, and thin carbonates. The Corduroy Member overlies the Fort Apache Member consisting of about 40 feet of limestone and dolomite with a medial limey siltstone sandwiched between the upper and lower carbonate layers and one to two feet of a basal limey siltstone unit.

Weisman (1984) characterizes the Schnebly Hill Formation above the Fort Apache Member as calcareously cemented, including infilling of small fractures with calcite, but other parts of the unit are not cemented or only partly cemented. Weisman (1984) also describes two limestone units, 10-25 feet thick, in the upper Schnebly Hill, above the Fort Apache Member. The predominately fine-grained sandstone and siltstone nature of the Schnebly Hill strata above the Fort Apache Member, combined with the observed cementation, suggests the Corduroy Member is not a major aquifer zone in the PSWID area, but can yield water to wells where fractured. The principal implication of these characteristics is that the bulk of the rock is not favorable to the storage or flow of large amounts of groundwater and must be fractured to yield significant amounts of groundwater to wells.

4.2.3.3 Bell Rock Member

Most of the Schnebly Hill Formation below the Fort Apache Member in the PSWID area is comprised of the Bell Rock Member (Blakey, 1990), consisting predominantly of ripple-laminated, very fine-grained sandstone and silty sandstone. Weisman (1984) and Weisman and Weir (1990) included this unit in their lower Supai unit.

The Bell Rock Member, while part of the Regional Aquifer and favorable to groundwater storage and slow groundwater flow, is fine-grained and is not likely to provide large yields to individual wells except where enhanced by fractures. Although the Schnebly Hill strata in the Regional Aquifer between the PSWID area and Flagstaff are described collectively as yielding considerable groundwater (Bills et al., 2000), much of the groundwater production in the latter area is probably from to the relatively thick (up to 740 feet) of Sycamore Pass Member in that area. The apparent absence of the Sycamore Pass sandstone in the upper Schnebly Hill in the PSWID area indicates the Schnebly Hill, while perhaps more porous, permeable and productive than the Supai, is not a high-

yield aquifer like the Coconino Sandstone and may provide adequate yield to wells only where fractured.

However, the relatively greater porosity and permeability the Bell Rock Member, relative to the Supai, offers groundwater storage that is apparently not present in the fine-grained and calcareous-cemented Supai beds. The groundwater stored in the Bell Rock Member strata, while able to move only slowly through the fine-grained materials, provides a source of groundwater storage that can be released to fractures penetrated by wells, thus sustaining pumping production and greatly improving the reliability of such wells, as compared to wells penetrating fractures in the Supai where the only available storage is within the fractures themselves. Accordingly, it may be anticipated that water wells penetrating fractures in the Bell Rock Member in the lower part of the Schnebly Hill Formation will offer greater reliability during continuous pumping than wells penetrating similar fractures in the Supai.

4.2.3.4 Rancho Rojo Member

Blakely (1990) proposed a new member in the Schnebly Hill, based on a type section at the Rancho Rojo Subdivision about 8 miles south of Sedona. About 25 to 30 feet of the unit are exposed in Fossil Creek Canyon. The Rancho Rojo Member consists of cross-stratified, very fine-grained sandstone that typically forms a distinctive light orange cliff and is mappable as an individual stratigraphic unit across broad areas. The unit was lumped into the lower Supai unit of Weisman (1984) and Weisman and Weir (1990). The porosity of the fine-grained unit may be another source of groundwater storage to be released into fractures to sustain the reliability of production from wells completed into the lower Schnebly Hill Formation.

4.2.4. Supai Formation

The Supai Formation is a thick sequence of very fine-grained red beds that include minor amounts of conglomerate and a few layers of limestone. Weisman (1984) in attempting to describe the unit, made the following statements:

> "***The lower Supai is characterized by a conglomerate sequence, 250 to 270 feet (72-82 m) thick, that is overlain by 570 to 670 feet (174-204 m) of reddish-orange to reddish-brown siltstone*** (Weisman included the lower part of the Schneby Hill in the upper part of this unit). ***The limestone-siltstone pebble conglomerate beds are interstratified with beds of sandstone, siltstone, and minor shale and limestone, . . .***" (Weisman, 1984; p. 40)

and,

"***No recognizable divisions in the Supai Formation (with the exception of the Fort Apache Member) could be discerned in the field area although Ron Blakey (1984, personal commun.) states that units corresponding to his descriptions of the Supai of central Arizona (1980) are evident in Calf Pen Canyon. . . . The siltstones are calcareous, occasionally micaceous, and predominantly orange red to dark red to pale gray (rarely) in color. Bedding characteristics range from massive (unbedded) to thinly laminated. . . .*** " (Weisman, 1984; p. 40)

Separating the Schnebly Hill Formation from the upper part of the sequence described by Weisman (1984) as Supai beds, the lower part of her sequence may be summarized as reddish-orange to reddish-brown siltstone with no recognizable divisions but with lesser amounts of interbedded sandstone, shale and limestone. The most important aspect of this description is that the unit is predominantly siltstone and is predominantly cemented with calcareous cement. The conglomerate beds are described by Weisman (1984) as lenses ten's of feet in extent but laterally discontinuous, and horizontally and vertically gradational with the surrounding siltstone and sandstone.

The description provided by Weisman (1984) of that part of the Supai corresponding to the definition of the Supai by Blakey (1990), is consistent with the characteristics of the upper and lower Supai described by Blakey (1990) when it is recognized that the upper part of the Supai unit of Weisman (1984) is actually the Schnebly Hill Formation. The Schnebly Hill Formation is also included as part of both the upper and lower Supai in Weisman and Weir (1990). Recognizing the Schnebly Hill Formation as a separate and distinct unit, Blakey (1990) divides the Supai into an upper and a lower unit in the PSWID and surrounding area, as follows:

"***The Supai Formation consists of a poorly studied red-bed sequence and has been inconsistently subdivided and assigned to various stratigraphic units . . . The treatment of the unit herein is considered a compromise, because further detailed study will likely result in more precise definition, correlation, and subdivision.***

Two parts can generally be recognized in the central and eastern Mogollon Rim. The lower part . . . consist(s) ***chiefly of limey and nodular very fine-grained structureless sandstone, trough cross-stratified sandstone and conglomerate, and limey mudstone to the west with addition of micritic*** (finely crystalline) ***and calcarenitic*** (sandy) ***limestone to the east. The unit is primarily reddish gray to reddish brown to locally pale grayish orange in color and forms ledges, steep slopes, and***

> ***local cliffs. T hickness a verages 90 m (300 f t). L ocal l arge-scale, cross-stratified, calcareous sandstone of possible eolian*** (wind deposited) ***origin is present in parts of the Fossil Creek area.*** (Blakey, 1990; p. 1205)

and,

> "***The upper part of the Supai Formation is a complex assemblage of red beds. Sandstone and conglomerate content, composition of conglomerates, and bedding styles vary across the region. . . . To further confuse matters, a complex of fluvial channels, bleached sandstone and mudstone, carbonaceous material, and anomalous high radioactivity is present near the middle of the Supai Formation, probably at or near the Pennsylvanian-Permian boundary. Peirce and others (1977) described and correlated this interval throughout the central and eastern Mogollon Rim and into the adjacent subsurface. At Fossil Creek, the complex fills a northwest-trending channel roughly 1 km wide and 10-25 m deep. This channel, or paleovalley, is filled with fine- to very fine-grained quartz sandstone and limestone-pebble conglomerate. . . . The complex overlies several conglomerate units, one of which is very prominent in the area, and is overlain by several more conglomerate beds.***" (Blakey, 1990; pp. 1205-1206)

Recognizing that Weisman (1984) evidently assigned about 130 feet of red beds at the base of the Supai as defined by Blakey (1990) to the Naco Formation and considered the lower Supai to be 250 to 270 feet thick, the conglomerates described by Blakey (1990) as in the middle of the Supai were described by Weisman to be the lower Supai. Thus, much of what Weisman (1984) described as lower Supai is equivalent to the medial channel sands and conglomerate and upper Supai of Blakey (1990) as well as including that part of the Schnebly Hill Formation located below the Fort Apache Member. Weisman (1984) incorporated into her definition of the Supai everything from the base of the Coconino Sandstone to approximately 130 feet above the top of the interbedded limestone and shale in the Naco Formation. Refinement of the stratigraphy by Blakey (1990) divides the Weisman (1990) Supai sequence into the following units:

Schnebly Hill Formation	909 feet
upper Supai including medial conglomerates	330 feet
lower Supai including about 130 feet of red beds assigned to the Naco by Weisman	215 feet
Total Thickness	1,454 feet

It is important to separate the Schnebly Hill Formation from the Supai Formation, because the two units appear to offer significantly different properties for storing and transmitting groundwater. It is probably less important to separate the upper Supai from the lower Supai; however, the presence of conglomerates and the fine-grained quartz sandstone described by Blakey (1990) at Fossil Creek, and by extension, in the PSWID by Weisman (1984), may offer more favorable conditions for groundwater storage and transmittal in parts of the upper Supai than in the lower Supai.

It is anticipated the generally fine-grained siltstone particle size and pervasive calcareous cementation of the Supai strata limit storage and transmittal of groundwater essentially to fracture openings with little or no significant storage of groundwater in the pores of the rock. This is significant in that wells abstracting water from the fractures must rely solely upon the groundwater stored in the fractures with little or no recharge of the fractures from groundwater stored in the host rock surrounding the fractures. By comparison, the characteristics of the overlying Schnebly Hill Formation suggest depressuring of fractures by wells will result in release of groundwater from storage in the pores in the rocks surrounding the fractures, thus providing much greater reliability to wells completed in fractures in the Schnebly Hill Formation as compared to those completed in fractures in the Supai strata.

4.3. Naco Formation

A good description of the Naco Formation was not found during the literature research for this project. Blakey (1990), summarizing information from Huddle and Drobovolny (1945), describes the unit as ledge and slope forming light gray limestone; nodular bluish-gray to pinkish limey mudstone; gray to purplish to locally reddish sandy mudstone, and rare tan to pinkish sandstone. An outcrop of Naco Formation exposed along Highway 87, north of the East Verde River, includes a lower member consisting of chert breccia, structureless mudstone, and purplish-brown sandy mudstone and sandstone (Huddle and Drobovolny, 1950; p. 89). The thickness of the basal unit is not known, but at least 30 to 40 feet of the materials appear to be present. Exposed above the basal unit is an unknown thickness of alternating beds of limestone, two to three feet thick, interbedded with two- to three-feet thick beds of soft, calcareous mudstone and siltstone.

The location of the contact between the base of the Supai and the top of the Naco Formation on Figure 4-2 is based on structural projection of the unit thicknesses previously described, using the base of the Fort Apache Limestone as the control elevation. The resultant location of the Supai/Naco contact is significantly different than that shown on the U.S. Geological Survey geologic map of the Pine Quadrangle (Weisman and Weir, 1990). The map by Weisman and Weir (1990) locates the top of the Naco at about the location of the top of the upper Supai on Figure 4-2. The reason for the large difference between the location of the Naco contact on the two maps is due to differences in the definition of the top of the Naco Formation as selected by Blakey (1990) in the Fossil Creek measured section and the top of the Naco Formation as mapped by Weisman and Weir (1990) and by Weir and Beard (1984). Weisman (1984) sums up the problem as follows:

> "***Apparently every researcher who investigated the Naco Formation formulated Naco-Supai boundary criteria that best accommodated their own field area conditions. Consequently, there are nearly as many boundaries defined as there are researchers.***" (Weisman, 1984; p.29)

Weir and Beard (1984) described the Naco Formation as about 400 feet thick in Fossil Creek Canyon compared to about 200-250 feet indicated by Blakey (1990). Weisman and Weir (1990) described the Naco as 200-300 feet thick in the Pine quadrangle, where the unit is poorly exposed, but do not state their basis for this conclusion. Weisman and Weir (1990) describe their selection of the top of the Naco as follows:

> "***The boundary between the Supai Formation and the underlying Naco Formation lies in a poorly exposed, gradational sequence of limestone and clastic beds. In this quadrangle the contact was arbitrarily mapped at the base of the lowest limestone-pebble conglomerate. This placement of the contract, judging from the few outcrops observed, is higher than or about the same as that used by Brew (1965, p.81), who placed it at "****the top of the uppermost grayish-red and light-gray mottled calcilutite overlain by a thick, slope-forming, pale-red siltstone and sandstone sequence.***"

Brew (1965) defined the Naco to be 330 feet thick at Fossil Creek. However, other researchers (Huddle and Dobrovolny, 1945) restricted the Naco at Fossil Creek to the ledge and slope-forming light gray limestone and intercalated nodular bluish-gray to pinkish limey mudstone and did not include the upper clastic beds included in the unit by Brew (1965). Blakey (1990) followed the convention of Huddle and Dobrovolny (1945), limiting the Naco Formation to about 200 feet of predominantly gray and purplish-gray limestone and mudstone

and assigning about 130 feet of overlying reddish-brown sandstone and mudstone to the Supai.

Corkhill (2000) identified 255 feet of Naco on the geophysical log of the Strawberry Borehole, putting the Supai/Naco contact at 1,040 feet, but did not explain his reasons. The first major deflection of the Gamma Ray log of the Strawberry Borehole in the interval between 1,040 and the top of the Redwall at 1,295 feet occurs at 1,110 feet, indicating the first mudstone layer in the Naco. This suggests the contact could be placed anywhere between 1,040 and 1,110 feet on the geophysical log. Blakey (1990) makes the following statement in regards to selecting the upper contact of the Naco:

> "***The 40-70 m of rocks in question*** (the upper 130 feet of reddish-brown sandstone and mudstone at Fossil Creek)***, variously assigned to the Supai Formation, Earp Formation, Naco Formation or B-2 . . . is a complicated, very poorly exposed sequence of sandstone, limestone, and fine-grained red beds. Their age (based on a late Virgilian fauna), stratigraphic position, and lithologic character suggest both Supai and Naco affinities. The preference herein to assign the rocks to the Supai Formation (lower part) is perhaps a moot point, given the poor outcrops and difficulty of establishing mappable contacts.***"

Based on the foregoing considerations, the Naco was assigned a thickness of 255 feet for compilation of Figures 4-1 and 4-2. Reducing the thickness from the 255 feet assigned by Corkhill (2000) to the 200 feet measured by Blakey (1990) in Fossil Creek Canyon would be an arbitrary decision under the circumstances and would not resolve the difference between the upper Naco contact on Figure 4-2 and that shown by Weisman and Weir (1990).

Perhaps the best available information is the fact that the Strawberry Borehole began penetrating voids at a depth of 1,041 feet, suggesting that the first limestone units below the Supai red beds probably occurred at that depth. This interpretation is supported by the open-hole geophysical logs of the Strawberry Borehole and is likely the reason for Corkhill's selection of 1,040 feet depth as the top of the Naco at the borehole. If this assumption is correct, the selection of the contact at 1,040 feet by Corkhill (2000), presumably at the first limestone layer, is consistent with Blakey (1990) who excluded the overlying red beds and interbedded thin limestones, and puts the contact at the top of a limestone layer that might be more readily identified in the field than the top of the relatively softer red beds.

The role of the Naco as an aquifer is not well known; however, the log of the Strawberry Borehole indicates 14 intervals where the drilling rods dropped through voids as the borehole was drilled through 255 feet of Naco Formation. It

is not known if the voids were open fractures or solution cavities. They were all above the water table, thus rendering moot the question of aquifer potential in the Naco under Pine or Strawberry; however, the voids suggest the unit could transmit large amounts of groundwater, assuming it were below the water table and the voids are interconnected. As described later in this report, the Naco remains above the potential water table throughout most of the area where water wells might be drilled into the unit on private lands in Pine and Strawberry. As indicated on Figure 4-1, the Naco is considered to potentially act as an aquifer, where it is below the water table, in concert with the Redwall Limestone and Martin Formation.

4.4. Limestone Aquifer

The third aquifer system in the PSWID, in addition to the perched aquifer and the Regional Aquifer, is the so-called limestone aquifer consisting of the Redwall Limestone, the Martin Formation, and potentially, parts of the Naco Formation. Only a small part of the Redwall Limestone is exposed in the PSWID area where a fault brings the unit to the surface at the south end of Pine. The Martin Formation is not exposed at the surface in the PSWID but can be viewed in the East Verde Canyon along the road between Pine and Payson, just north of the river, and in other areas where the East Verde River cuts through the Little Diamond Rim south of Control Road.

Little is known about the Limestone Aquifer in the PSWID area. Wells penetrating either the Naco Formation or the Redwall Limestone in Pine penetrate empty voids above the water table. This has the effect of allowing water flowing into the well bores from the overlying Supai strata to drain down the well and be lost into the empty voids in the Limestone Aquifer. This phenomena is described by Hix (1978) as follows:

> "***An open fracture and solution channel*** (in the Redwall Limestone) ***can be seen just south of Pine along the east side of Highway 87. A crevice about 18 inches wide and dipping steeply downward to the north can be found along the north bank of the stream . . . One mile north and slightly west of this entrance, a dry water well was observed. This well is reported to be 910 feet deep. An unsuccessful attempt was made to sound this well. Over 400 feet of wire did not reach water. This writer observed and noted the well to be blowing air with a definite musty, damp smell. This well may have intercepted a branch of a fracture in the Redwall.***
>
> ***There have been reports of water wells within the Pine area that have been lost when dynamite was used to loosen the rock. This is what would be expected of a formation I which***

the water was controlled by solutions channels rather than a consistent permeability. . . ." (Hix, 1978)

The above commentary by Hix (1978) is consistent with the geologic structure of the Pine area. The Redwall Limestone, which is exposed at the south edge of the community, and the overlying Naco, which may contain solution channels, are well above the local water table in the Limestone Aquifer of about elevation 4,365 feet, as measured in the Strawberry Borehole. A well penetrating to a depth of 910 feet in the southern part of Pine would have a bottom elevation of 4,500 to 4,600 feet, well above the water surface elevation of 4,365 feet measured in the Limestone Aquifer at the Strawberry Borehole.

In order to develop groundwater from the Limestone Aquifer, it will be necessary to locate wells down dip, along the north side of Pine or Strawberry. An analysis of the factors that must be considered to site such wells is provided later in this report.

4.4.1. Redwall Limestone

Huddle and Dobrovolny (1952) measured 189 feet of Redwall Limestone along Highway 60 at points 3.7 to 11 miles north of the bridge over the East Verde River, more than 100 feet of Redwall in Fossil Creek Canyon where the base is not exposed, and 67 feet in a draw about a half mile east of the bridge where Highway 60 crosses the East Verde River. At the latter section, the Redwall consisted of white and gray, coarsely crystalline limestone with a few nodules of gray, dense chert. The limestone was mainly in loose blocks with fracture and void fillings of red sandy mudstone from the overlying Naco Formation. Hix (1978) and Weisman (1984) observed the Redwall resting directly on Precambrian quartzite along Highway 60 just south of the junction with Control Road. Accordingly, it is clear the thickness of the Redwall Limestone under the PSWID area may be different from one location to another, depending on whether or not islands of Precambrian rock protruded above the level of deposition in the Redwall sea.

In what appears to be a composite section described as "Measured along United States Highway No. 60, at point 3.7 to 11 miles north of bridge over river", a total thickness of 189 feet of Redwall consists of an upper 108 feet of limestone in beds 10 to 38 feet thick, 2 feet of red mudstone cavity filling, 17 feet of limestone solution breccia, 5 feet of sandstone solution cavity filling, and 57 feet of limestone in beds ranging from 5 to 27 feet thick. Chert nodules and beds of gray- and white-banded chert are present in a number of intervals. Huddle and Dobrovolny report solution breccias and collapse breccias as well as cavern fillings at the top of the Redwall.

The geologic history of the Redwall Limestone includes development of caverns, sink holes and a system of underground or internal drainage through solution-

enlarged channels in the limestone, prior to burial of the Redwall by Naco strata. The fossil caverns and sinkholes are now filled with red sandy mudstone and clay or with collapse breccia in a sandy red clay matrix. Large deposits of travertine (calcium carbonate rock deposited by precipitation of calcite from groundwater discharged out of springs in the Redwall) downstream from Redwall springs such as Fossil Creek Springs indicate that solution channels have continued to develop in the limestone. Wells penetrating solution channels in the Redwall presumably could obtain relatively high yields where the solution channels are below the groundwater level. In order for such wells to be reliable in the PSWID area, it is necessary to drill them as far north as possible so that they will penetrate a part of the Limestone Aquifer offering as much groundwater storage as possible to support pumping of the wells.

The open-hole Gamma Ray log of the Strawberry Borehole from year 2000 and the cased-hole log from 2003 indicate the top of the Redwall is at 1,295 feet in the borehole. The same logs suggest the base of the Redwall may be at about 1,400 feet of depth, indicating about 105 feet of Redwall Limestone are penetrated by the exploratory borehole. However, an alternate interpretation is that the Gamma Ray response at 1,400 feet and below corresponds to cavity fillings in the Redwall. Another large response of the Gamma Ray from about 1,560 to 1,610 feet could also be interpreted to represent the uppermost green shale unit or the entire upper member of the Martin Formation. The latter interpretation would make the Redwall Limestone 265 feet thick at the Strawberry Borehole. The interpreted range of thickness of 105 to 265 feet, based on the geophysical logs, brackets the thickness of as much as 189 feet measured in outcrops south of Pine.

The static water level measured in the borehole January 17, 2003 was at a depth of 1,382 feet, 18 to 180 feet above the bottom of the Redwall Limestone, depending on which interpretation of the geophysical logs is used to identify the base of the Redwall.

4.4.2. Martin Formation

Huddle and Dobrovolny (1952) provide the best description of the Martin Formation and divide the formation into three members. They describe the members as somewhat arbitrary and grading into one another with a total thickness ranging from 300 to 400 feet. They describe 366.4 feet of Martin Formation in exposures along Highway 60 south of Pine.

4.4.2.1 Upper Martin Member

The upper member consists of calcareous sandstone, limestone, and shale ranging in thickness from 32 to 194 feet. The 194-feet thick section is displayed in a canyon about one-half mile east of where Highway 60 crosses the East Verde River. Another section between the East Verde River and Pine, along

Highway 60, displays 103.5 feet of the upper member. A green shale unit is often present at the top of the upper member, but may have been removed by erosion in some areas. The green shale ranges from 6 to 75 feet in thickness (Huddle and Dobrovolny, 1952; p. 76).

The open-hole Gamma Ray log of the Strawberry Borehole from year 2000 provides a strong response beginning at a depth of about 1,400 feet, possibly corresponding to the green shale at the top of the Martin Formation, and indicating about 40 to 50 feet of shale. An alternate interpretation is that the upper member of the Martin is indicated by a strong Gamma Ray response beginning at about 1,560 feet, as previously discussed in regards to the thickness of the Redwall Limestone.

4.4.2.2 Middle Martin Member

The middle member of the Martin consists of a cross-bedded sandstone and a cliff-forming limestone that collectively range in thickness from 50 to 77 feet (Huddle and Dobrovolny, 1952; p. 75). The sandstone ranges from zero to 90 feet thick and includes interbedded sandy shale and sandy limestone. The limestone unit above the sandstone ranges from 38 to 98 feet thick and is characteristically a thick-bedded cliff-forming unit, although it may grade laterally into sandstone locally. The outcrop one-half mile east of where Highway 60 crosses the East Verde River contains 51.3 feet of the middle unit including 13.5 feet of sandstone at the base.

4.4.2.3 Lower Martin Member

The upper part of the lower member of the Martin consists of 77 to 138 feet light buff-weathering beds of thin- to medium-bedded dense dolomitic limestone containing a few chert nodules and interbedded with very thin layers of green shale (Huddle and Dobrovolny, 1952; p.75). The middle part of the lower member consists of 20 to 53 feet of dark-brown or black to light-gray dolomitic limestone that weathers brown and gives off a fetid petroleum odor when freshly fractured. The lower three feet of the middle unit are a transition into the underlying sandstone and consist of dark-gray sandy dolomitic limestone with interbedded sandstone and green to black shale in beds 0.01 to 0.1 foot thick (Huddle and Dobrovolny, 1952; p. 74). The lowermost part of the lower Martin member is a basal sandstone consisting of 10 to 20 feet of light yellow-brown conglomeratic sandstone characterized by granules and pebbles of quartz and quartzite embedded in a fine- to coarse-grained matrix (Huddle and Dobrovolny, 1952; p. 74). Angular boulders are present in the basal sandstone at Natural Bridge.

4.5. Older Strata

The Precambrian strata in the subsurface of the Pine/Strawberry area consist of a quartzite locally called the Mazatzal Quartzite. The quartzite is crystalline and non-porous and will not store or transmit groundwater except in fractures and is therefore not considered to be a significant aquifer for the purposes of this investigation. Erosion of the Precambrian rock surface resulted in considerable relief. Accordingly, different stratigraphic units may be found resting on the Precambrian rocks at different locations.

Strata older than the Martin Formation, are present in low parts of the erosional surface on the Precambrian. Weisman (1984) provides a good discussion of the age and origin of these units. For the purpose of simplification in this report, the units are considered to be the Tapeats Sandstone or an equivalent and consist of a basal conglomerate overlain by a sandstone unit. If these strata are present under the PSWID, their significance to groundwater development is nil; however, they may be hydraulically and hydrologically associated with the Limestone Aquifer, if they offer any potential to store and transmit groundwater. Exposures of these strata along the East Verde River near Highway 87 suggest the strata are not particularly porous and groundwater flow may be limited essentially to fractures.

5. HISTORIC WATER SUPPLY DATA

The request for proposals for this project, RFQ&P/PROJECT NUMBER: P/S 2002-01, required in the scope of work a review of historic documentation in the PSWID files, stating under Desired Outcomes:

> "2. ***Evaluate and establish a baseline reference of prior information and data, including that presently held by PSWID, for new exploration and development of water resources. The list of documents held by PSWID may be found in the Appendix, "Preliminary List of Studies for Pine-Strawberry area."***

This part of the report is provided in response to the requirement for review of historic documentation.

Very little historic information is available about water supply or water demand in the Pine/Strawberry areas. However, the sparse information available documents a history of increasing demand for water in the face of inadequate sources of supply as the population in the communities grew. The historic record suggests the groundwater sources developed by the communities, to supplement the original surface water source in Pine Creek, were vulnerable to drought and/or seasonal fluctuation. The record also indicates the wells in the Strawberry area continued to produce water when many of the wells in the Pine area had

failed. The historic perception that the groundwater sources are sensitive to drought implies that the groundwater systems supplying the wells and springs do not contain adequate storage of groundwater to support demands during periods of diminished recharge or increased pumping duration.

Accordingly, the historic documents blame shortages on drought conditions or, implicitly, on improper management and maintenance of wells and pumps, and do not consider any other possibilities, namely that the local aquifer hydraulic performance may be inadequate to support long-term sustained pumping regardless of recharge conditions related to drought or above average moisture conditions. The inadequacy of the aquifer to support demand was evidently not considered because all of the historic documentation found in the PSWID files indicates the volume of the groundwater resource greatly exceeds the projected demands for water. The historical calculations that water resources availability exceeded demand implied that shortages were either caused by drought or by poor maintenance of the pumping and distribution systems. However, this investigation finds that the historical calculations of water resources availability are highly optimistic and, not only is the available resource likely to be much smaller than estimated historically, the hydraulic characteristics of the aquifers provide inherently limiting conditions that dictate wells will experience loss of yield when subjected to continuously sustained pumping over long periods of time.

The historic record includes hydrogeologic analyses that provide calculations showing the flow of groundwater (groundwater "flux") beneath specific residential developments, combined with groundwater storage, is adequate to supply the anticipated demand for residential water use for 100 years. Yet the historic documents also show that wells in the Pine area in particular have repeatedly lost yield during the summer months. The contradiction between the hydrogeologic predictions of adequate groundwater resources, based on tests of the groundwater system, and the history of inadequate groundwater production, indicates that factors in addition to groundwater recharge and storage influence the reliability of wells in the area.

The following sections of this chapter discuss the historic documentation in detail and provide analyses showing the hydraulic properties of the local aquifer system in the PSWID area, as determined from local pumping tests, have been incorrectly determined with the result that the availability of groundwater has been overestimated and the inherent hydraulic limitations in the aquifer system have not been recognized. The fundamental error in the historic calculations has been the failure to recognize that groundwater flow to the pumped wells, and through the Schnebly Hill and Supai strata in general, is profoundly influenced by fractures.

The calculation of the groundwater flow under the Portal I and Portal II subdivisions (Manera, 1979), the Arizona Department of Water Resources

estimate of 100-year groundwater supplies at Pine and Strawberry (ADWR, 1987), the 1994 calculation of the 100-year groundwater supply for the Portal IV subdivision (Manera, 1994), and the 2002 water resources study of the Pine Water Company and Strawberry Water Company service areas (Glotfelty, 2002) are all based on the assumptions that (1) the aquifers tested exhibited radial flow of groundwater through porous media to the pumped wells and (2) the hydraulic parameters of the aquifers calculated with analytical methods for radial flow are representative of groundwater flow conditions throughout the areas studied.

Reexamination of the latter historic pumping test information and groundwater flow calculations finds that groundwater flow through the aquifer system underlying the PSWID area, in the Schnebly Hill and Supai Group, is not radial flow. The pumping test responses reviewed in the historic documents are diagnostic of groundwater flow restricted to highly bounded flow paths in linear fractures of limited lateral extent, not radial flow through a porous media of widespread extent as assumed in the analyses presented in the historic documents. Consequently, three conclusions are inevitable: (1) the radial flow analytical methods applied to the pumping test interpretations were not appropriate analyses for the type of aquifer response obtained; (2) the values of aquifer transmissivity determined by the inappropriate radial flow analyses and used to calculate groundwater flow are incorrect and are not representative of the hydraulic properties controlling the amount of groundwater flow through the areas studied, and (3) the inherent limitations imposed on long-term well yield by the hydraulic characteristics of linear flow in fractured rock were not recognized.

The foregoing considerations explain the vast difference between the historic analytical predictions of adequate groundwater supplies, exceeding reasonable demand, and the ongoing experience of water shortages in the PSWID area.

The lithology of the Schnebly Hill and Supai strata, described in the previous chapter on the hydrogeologic units in the PSWID area, indicates the capacity of the rocks, consisting of fine- and very fine-grained sandstone and siltstone, to store and transmit groundwater is very limited and, in general, should not be realistically expected to provide the range of yields experienced by water wells in the area. This observation alone is sufficient reason to suspect that the principal source of flow to the wells is through fractures that significantly enhance the hydraulic capacity of the rocks.

However, dependence on groundwater flow through fractures is not sole justification to assume that the hydraulics of the aquifer systems place limitations on groundwater storage, well yield, or distribution of transmissivity throughout the aquifer. Likewise, the presence of a fractured rock aquifer is not sole justification to assume that analytical solutions for radial flow are not appropriate. Sufficient fracturing of a rock mass can provide a fractured rock aquifer that mimics the hydraulics of a porous media, providing an aquifer response to pumping controlled by radial flow. The latter type of fractured rock aquifer does not

impose the hydraulic limitations on groundwater flux and long-term well yields inherent in linear flow controlled by discrete fracture systems that are essentially planar in nature and therefore impose strong boundaries that limit the area of groundwater flow through the rock mass. Accordingly, it is necessary to interpret pumping test data, using conventional analytical methods, to determine if the aquifer response obtained is for radial flow or for linear flow. Application of conventional methods to the pumping test data provided in the historic documents listed above indicates linear flow conditions controlled the test responses.

It is well beyond the scope of this report to explain the highly technical considerations of aquifer test interpretation. However, a brief summary of analytical methodology is appropriate herein to explain the conclusions of this report that the historic pumping test data were not correctly interpreted and to document the primary sources of the conventional methods for analyzing groundwater flow in pumping tests. The fundamental analytical solution for transient groundwater flow conditions was provided by Theis (1935) and expanded on by Theis (1940). The solution is referred to as the Theis non-equilibrium equation or the Theis "type curve", and is applicable to radial flow through a homogenous porous media of essentially infinite extent compared to the area affected by pumping. It was the first non-steady state solution for radial groundwater flow incorporating the concepts of groundwater storage (storativity) and pumping duration (time), thus allowing a solution for transient flow conditions when the rate of drawdown is changing significantly during the early part constant rate pumping, i.e., when the cone of depression is rapidly expanding.

It was soon recognized that after a sufficient duration of constant rate pumping, the rate of drawdown was changing very slowly such that it was essentially steady state or in "equilibrium" with the pumping rate. This simply meant that the cone of depression was no longer expanding rapidly. Cooper and Jacob (1946) developed a modified version of the Theis equation, applicable to the late part of a radial flow response when the rate of drawdown is "stabilized" or in "equilibrium". Use of the term "stabilized" to describe steady state drawdown has caused some confusion to laymen because it does not mean that drawdown has ceased increasing, only that it is increasing at a constant rate. The so-called Cooper-Jacob solution or "modified non-equilibrium equation" is therefore a special condition of the Theis solution and can be applied only when flow to the pumped well is radial and after pumping duration is sufficient to result in steady state drawdown late in a test.

Manera (1994) and Glotfelty (2002) used the Cooper-Jacob solution to analyze the pumping test data in the PSWID area. Presumably, Manera (1979) also used the Cooper-Jacob method; however, the analysis was not available to this investigation for review. Application of standard analytical methods to determine if the historically documented pumping test responses were that of radial flow or linear flow were not applied. Reexamination of the test data by this investigation,

using the standard methods, found that the test responses were those of linear flow.

Contemporary standard methods for distinguishing between radial flow, linear flow, and a host of other potential flow conditions in an aquifer were summarized by Gringarten (1982) with a history of their derivation from groundwater research and petroleum reservoir analysis. The bibliography of the paper by Gringarten (1982) provides an abundance of primary research citations. Boehmer and Boonstra (1986) provided further clarification of the mathematics of linear groundwater flow and presented simple concepts for distinguishing between radial flow and linear flow as well as between different types of linear flow, expanding on the concepts summarized in Gringarten (1982). A comprehensive summary of standard analytical methods for groundwater flow analysis and pumping test interpretation is provided in Kruseman and de Ridder (1991), or in more recently revised editions of that text. The analytical methods used in this investigation to reexamine the historically documented pumping test data were drawn from the foregoing sources of standard methods.

Recognition that groundwater flow to wells in the PSWID area is controlled by linear fractures that constrain groundwater flow to narrow flow paths, relative to the width of the PSWID area, greatly changes the perception of how the available resource must be estimated. Water wells developed in bedrock aquifers that store and transmit groundwater primarily through fractures often exhibit initially high yields that progressively decline with increased pumping duration. The declines in well yields penetrating these types of fractured rock systems are simply a function of the hydraulic factors controlling the flow of groundwater through the fracture systems to the pumped wells and are not necessarily related to seasonal or long-term absence of recharge, although a lack of recharge exacerbates the hydraulic limitations and decline of well yields. Cessation of pumping until groundwater levels recover will restore the well yields in these systems, if inadequate recharge is not an accessory factor. Typically, the time required for groundwater levels to recover may be considerably longer than the preceding pumping duration.

The aquifer hydraulic parameters, such as transmissivity and storativity, determined by pumping tests conducted where fractures control groundwater flow in the rock mass, apply only to the fractures in the rock, not to the surrounding rock mass. Since most of the rock mass in an area being investigated may not be fractured, use of the fractured rock aquifer hydraulic parameters to estimate groundwater flow through the entire width of the area of investigation will greatly overestimate the flow of groundwater through the area, i.e., the "flux" referred to in many of the historical studies, because the flow is limited to the width of the fracture, not the width of the entire area. Likewise, variations in fractured rock hydraulic properties from one test well to another must be taken into account in applying the values in estimates of groundwater flow through an area. Accordingly, the calculation of groundwater flow across a

broad area, based on hydraulic parameters that are applicable only to the limited area of a localized fracture system surrounded by less permeable materials, is a major factor in the difference between historic predictions of adequate water supply and the subsequent shortages experienced.

Wells penetrating fractured rock aquifers that constrain flow to the wells along linear flow paths in the bedrock typically exhibit relatively high yields in the spring and early summer. Well yields decline during summer due to high demands for water and relatively long pumping durations. As demand for water declines in the fall and winter, the pumping durations become small or the wells are not used and the water levels at the wells recover in the absence of long-term sustained pumping. The recovery of the water levels restores the yield of the wells. The pattern of initially high well yields in the spring followed by progressive loss of well yield is typically interpreted to be the result of seasonal recharge patterns with groundwater levels declining due to lack of recharge in the summer. However, in many fractured rock aquifers, the seasonal pattern is controlled by the hydraulics of the fractured rock system and will occur irrespective of the seasonal recharge pattern. Declining groundwater levels in the absence of recharge, of course, aggravates the pattern of declining well yield during times of increased pumping duration, but the primary factor causing the loss of yield is the inherent aquifer hydraulic properties in fractures that cause declining well yield during periods of prolonged pumping, regardless of recharge conditions.

Accordingly, the historic record, although not overly abundant in details, provides conclusive information about the properties of the aquifer system currently utilized by private and public wells in the Pine/Strawberry area. The recognition of linear flow in highly constrained fracture systems, combined with recognition of the distinction between aquifer response in Schnebly Hill strata versus that in Supai strata, provides an explanation for the various conditions historically experienced in the PSWID wells. In addition, comparison of the sparse record of monitored groundwater levels to historic precipitation trends suggests the aquifer system in the Schnebly Hill and Supai strata does not contain sufficient stored groundwater to provide reliability during multiple years of below normal precipitation and recharge, even though historic loss of well yields might be explained solely by fractured rock aquifer hydraulics.

Some of the historic records contained in the PSWID files are discussed below. The records exhibit some of the contradictions mentioned above and document a history of water supply problems. The history of problems is consistent with the anticipated performance of a fractured rock aquifer system, as documented by the available test data. The records discussed may not be comprehensive of all of the history of water supply development and shortages in the PSWID; however, they are comprehensive of the data contained in the PSWID files and are adequate to support an expert opinion about groundwater conditions in the PSWID area.

5.1. Tonto National Forest Report

In 1967, the Tonto National Forest approved an unpublished internal document presenting an analysis of hydrologic conditions in the Pine Canyon watershed. Although this report is not particularly significant to interpretation of groundwater conditions in the PSWID area, it provides some historic insight into development of the water resources in the area. Page 6 of the document, referring to the Pine Creek channel upstream from a diversion structure described as "the Pine Detention dam", states:

> ***"The base flow of this perennial stream approaches 0.5 cfs. At least as much is lost to deep seepage. At 1.0 cfs,*** (cubic feet per second) ***some fraction of flow still runs over the detention dam with the intake closed."*** (Tonto National Forest, 1967; p.6)

Page 24 of the same document provides a summary of stream flow measurements along the length of Pine Creek from an unknown location upstream from Parsnip Spring to the historic diversion structure on Pine Creek. The stream flow measurements are evidently crude measurements based on observation of surface flow rate velocity multiplied times the cross-sectional area where flow rate equals velocity times area. Nonetheless, the measurements reflect an increase in surface water flow from 0.8 cfs at the upstream measurement to 1.3 cfs just above the diversion dam on May 25, 1966. The increase in baseflow on May 25, 1966 is apparently due to groundwater draining from the Coconino Sandstone and the Schnebly Hill Formation. The basis for the conclusion that base flow is about 0.5 cfs is not stated. The measurements showing an increase in flow between the upstream area and the diversion dam indicate the loss to "deep seepage" is in the channel downstream from the dam, not in the channel above the dam, at least at the time of the measurements. This suggests the loss was into the alluvium along the channel, and potentially into the Naco Formation or Redwall Limestone.

The Tonto National Forest report provides the following description of the municipal water supply system for Pine:

> ***"The detention dam is constructed of rubble-masonry and is about four feet deep (total height). . . . The dam was constructed in 1965 and is capable of diverting up to 200 miners inches of water (5 cfs) through a 12" diameter controlled intake. The total capacity of this inlet, with frictional losses considered, approximates four to five cfs (see Appendix p.28). The collecting and distributing system is adequate to keep the 10,000 gal. tank full most of the year, or the present domestic and irrigation needs of Pine satisfied during normal years (about 140 people). A separate system dependent on two wells is used by the subdivided*** (sic)

> ***property owners. George Randall, the Pine Water System manager, is certain that future needs for Pine will require water beyond present storage capacity.***
>
> ***Six months out of twelve (approximately November through May), Pine Water*** (sic) ***consumption (irrigation and domestic use) amounts to only 80% of the total natural stream flow on the average. During June, most of July and October, the full stream flow and more (in storage) is being used. During the other three months*** (sic)***, use averages about 80% of the natural stream flow. This*** (sic) ***data was provided by Mr. Randall."*** (Tonto National Forest, p. 9)

The foregoing commentary implies that in 1966-1967, all of the stream flow in Pine Creek, as augmented by 10,000 gallons of storage, was needed to meet the demands of a population of 140 people in the months of June, July, and October. Why 80 percent of the stream flow was adequate to satisfy demand in August and September is not stated; however, those are months of summer thunderstorm activity and stream flow in August and September may therefore have been greater than in June, July, and October.

The statement that "the full stream flow and more" was used in June, July and October suggests the stream flow was marginally adequate for the population of 140 people. However, a base flow "that approaches 0.5 cfs" is a flow that approaches 224 gpm. A flow of 224 gpm is far more than needed to satisfy municipal water requirements for a population of 140 people, a consideration that suggests the 1967 Tonto Forest report does not provide all the facts. Either the stream flow that could be diverted in June, July and October was much less than 0.5 cfs or, more likely, a significant part of the diverted flow was used for non-residential irrigation rather than for domestic use including residential lawns and gardens. Otherwise, use of 100 percent of a base flow of 0.5 cfs for residential use for 140 persons is equivalent to 2,308 gpd/c (gallons per day per capita).

5.2. Hydrologic Evaluation of the Portal Subdivisions

A report prepared by Manera and Associates, Inc. (Manera, 1979) provides some insight into water use in the PSWID area in the 1970s as follows:

> ***"There are presently 51 residential units in the subdivisions*** (Portal I, II, III and Canyon Shadows)***. Twelve units (24%) are full time water users with the remaining 39 units (76%) being part time or weekend water users. A seven year history shows that the average water usage is 3010 gallons per month for the full time residents and 648 gallons per month for the part time or weekend users."*** (Manera, 1979; p. 1)

In addition, the report describes the results of aquifer tests and provides well depth and yield data strongly indicating well yields were controlled by highly bounded fractured rock flow. However, the calculation of groundwater flow through the area, groundwater "flux", was based on the concept that aquifer hydraulic constants derived from radial flow interpretation of the pumping tests were representative of groundwater flow conditions across the width of the groundwater flow path, taken to be equal to the width of the subdivision, not the limited width of a fracture system.

5.2.1. Water Use

The data provided by Manera (1979) indicates a water use of about 100 gpd (gallons per day) per home for full time residents. Although Manera (1979) does not indicate the number of residents per home, an assumption that residency ranged from 2.0 to 2.5 residents per home provides a water use of 40 to 50 gpd/c for full time residents. Although the foregoing per capita statistics are assumed, they are not an unreasonable range of assumption for the area. By comparison, if one assumes four weekends per month or 8 days of occupancy per month for 2.0 to 2.5 people per home for part time or weekend users, the water use is 81 gpd per home or 32.4 to 40.5 gpd/c. This is not inconsistent with the use by full time residents but does not support the currently prevailing perception that per capita water use by part time residents is much greater than by full time residents, at least not as of 1979.

5.2.2. Water Well Data

Minera (1979) summarizes statistics for five wells drilled in the NE quarter of section 25 and one well drilled in the SE quarter of section 24, T12N, R8E. Figure 5-1 shows the location of the wells. Well depths ranged from 177 to 480 feet and well yields ranged from 8 gpm to 95 gpm. There was not a correlation between well depth and well yield despite the fact all six wells were drilled in geologically similar terrain along the west side of Pine Creek canyon. The Myers-Portal I, Well 1, and the Myers-Portal II, Wells 2, 3, and 5 wellheads are below the top of the upper Supai, defined in this report to be about 330 feet thick. Accordingly, the latter wells are completed in upper Supai, as used herein, and Wells 3 and 5 may penetrate slightly into the lower Supai. The Meyers-Portal III well in Section 24 and the Portal II Well 4 wellheads are near the middle of the lower part of the Schnebly Hill Formation and the well depths of 480 and 405 feet, respectively, indicate these wells penetrate through the Schnebly Hill and into the upper Supai. The static water levels of 202 and 167 feet, respectively, are at or above the estimated base of the Schnebly Hill Formation at these locations; therefore, it is not possible to determine if the water came from the Schnebly Hill, the upper Supai, or a combination thereof.

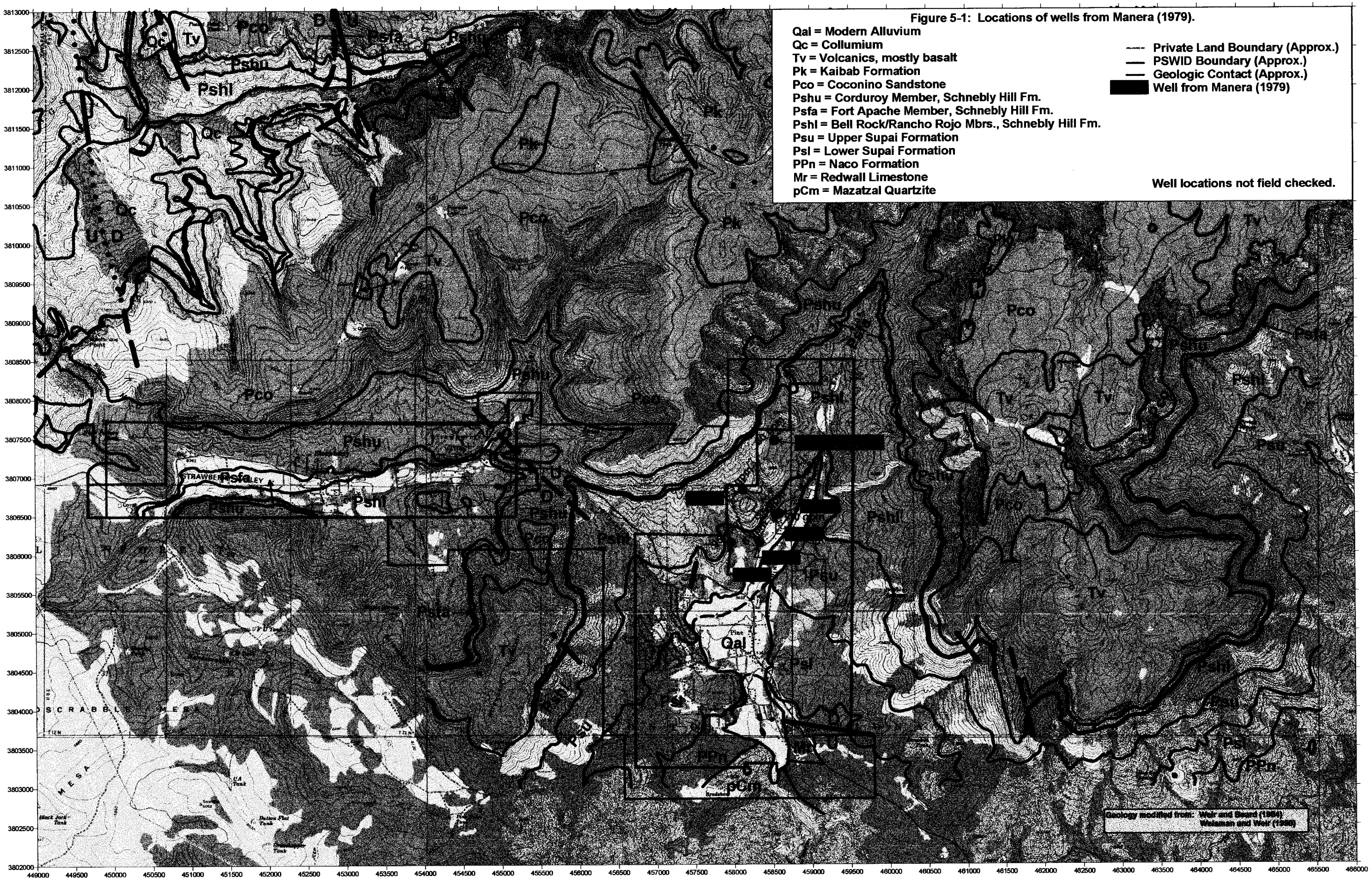


Figure 5-1: Locations of wells from Manera (1979).

The lack of correlation between the well depths and the well yields implies that the water-bearing zones are not related to individual layers within horizontally bedded strata. Likewise, there is no evident relationship between well yield and whether the wells were completed in the Schnebly Hill Formation or upper Supai. Therefore the availability of water to the wells was controlled by other factors, probably the number and openness of fractures penetrated by the well bores. This interpretation is consistent with the fine-grained nature of the Schnebly Hill and upper Supai strata, as previously described.

Manera (1979) used the historic water demand of 3,010 gallons per month per household cited above as the basis to predict a water demand of 31 gpm or 50 acre-feet per year (ac-ft/yr) for full time residency of 443 units in the subdivision areas. He performed pumping tests on several of the Portal wells and analyzed the data from one well. Based on the aquifer transmissivity determined from the pumping test and the hydraulic gradient across the area determined from groundwater elevations in the six wells, Manera (1979) calculated that the flow of groundwater under the property was 167 gpm as compared to the demand of 31 gpm.

Unfortunately, the pumping test data compiled by Manera (1979) are missing from the PSWID records. Review of the Manera (1979) report indicates the tested well from which transmissivity was calculated was the well referred to as the Myers-Portal III well in the SW, NE, SE, Sec 24, T12N, R8E, that penetrates about half of the lower Schnebly Hill Formation and most of the upper Supai. The well was reportedly cased to its total depth of 480 feet. The static water level was 202 feet in February 1979. Manera (1979) states that when the well was tested at 80 gpm, the pump broke suction after 1080 minutes of pumping. The pumping rate was then reduced to 60 gpm, after allowing the well to recover to static, and after 1160 minutes at 60 gpm, the pumping water level stabilized at about 322 feet (about 119 feet of drawdown) for an additional 1000 minutes of pumping.

5.2.3. Hydrogeologic Interpretation

The Manera (1979) report offers a number of insights into the aquifer conditions in the Schnebly Hill and upper Supai, even without the test data. The first insight is provided by the description of the test discharge rate. Typically, some initial pumping is performed prior to the accomplishment of the constant rate test. The initial pumping is usually a stepped rate test to evaluate the well hydraulics (as opposed to the aquifer hydraulics), but may be some short tests to establish a simple relationship between the pumping rate and the drawdown. This relationship is referred to as the specific capacity of the well and may be expressed as the gallons per minute rate divided by the drawdown in feet. The relationship, combined with some judgment, is used to select a pumping rate that can be sustained for the planned duration of the test, without the pumping water

level in the well declining to a depth where the test pump breaks suction due to inadequate submergence.

The steps taken to determine that an initial pumping rate of 80 gpm was appropriate are not described by Manera (1979); however, the fact that 80 gpm was sustained for 1080 minutes before drawdown became excessive for the test pump setting, rather than in a few hours or less, suggests the 80-gpm rate was selected on the basis of careful consideration of the early time-drawdown response in the well. After the 80-gpm rate proved excessive, the well was allowed to recover and was pumped at 60 gpm. Manera (1979) describes drawdown as "stabilized" after 1160 minutes of pumping at 60 gpm.

The water level in a pumped well does not stabilize unless there is a source of recharge such as a lake or stream contributing recharge that offsets the need for the pumped water to be derived from stored groundwater. Without a source of immediate recharge, the pumped water must necessarily be derived from stored groundwater and drawdown must continue as groundwater is removed from storage in the aquifer. Therefore, when Manera (1979) states that drawdown stabilized for the last 1,000 minutes of the test, that is a strong clue that the 60-gpm test rate in the last 1,000 minutes was actually in a slow decline such that the pumping water level stayed nearly constant. This is a very typical condition where the discharge rate is not maintained constant, but is allowed to decay slowly so that the decreasing rate of discharge and the time-drawdown response in the well meet at a stabilized pumping level that may be maintained for a long period of time with submergence of the pump inlet marginally adequate to prevent a complete break in suction at the pump. The discharge rate continues to decrease under such conditions; however, at a very slow rate of decrease.

The description of the problems with the pumping test rate and the description of stabilized drawdown provided by Manera (1979) therefore indicates a situation in which the best projections of the drawdown rate, by experienced personnel, were not successful in preventing excessive drawdown within the duration of the pumping test, at either 80 gpm or 60 gpm. The descriptions provided by Manera (1979) appear to be a classic example of a well in an aquifer where the flow of water to the well is controlled by linear flow along fractures rather than by radial flow through a porous media. Preliminary projections of drawdown in such wells, based on radial flow concepts, always underestimate the rate of drawdown and result in excessive drawdown during pumping tests. Thus, the experience with pumping rate and drawdown described by Manera (1979) is a strong clue that the well was competed in a fractured rock aquifer exhibiting a linear flow response.

The latter conclusion is supported by the data provided by Manera (1979), indicating well yields of 8, 10, 13, 35, 60 and 95 gpm from the six wells described in the report. As previously discussed, the well yields do not correlate strongly with either the geologic stratification or the well depths. The wide range of well

yields and lack of strong correlation between water-bearing zones indicate the wells most likely obtain groundwater from fractures intercepted by the well bores. The possibility that the water-bearing zones in the Schnebly Hill and upper Supai aquifer system may produce from fractures of such limited extent that they constrain aquifer flow to linear paths, as compared to production from a homogenously porous media or rock so densely fractured that radial flow to a well is possible through the fractures, has profound implications regarding the volume of groundwater stored in the aquifer as well as the potential for variability in groundwater flow and availability to wells across the area.

Fractures of limited distribution and extent offer far less groundwater storage capacity than a porous media such as sandstone. Likewise, the amount of groundwater flowing through the fractures may be highly variable from one location to the next, depending on the size and number of fracture openings and the degree of interconnection between fractures. The latter conditions may be the cause of the wide range of well yields obtained by the wells described in Manera (1979). If this is the case, the prediction of groundwater flow across the area, based on the tests of one well, may not be representative of the average conditions in the area. This factor may contribute considerably to the differences between historic technical quantifications of the groundwater resource and subsequent shortages experienced at levels of demand that were less than the predicted resource, inherent limitations in aquifer hydraulic properties notwithstanding.

The Manera (1979) report makes a valuable contribution to our understanding of the Schnebly Hill and upper Supai aquifer system. Recovery of the field data from Manera's 1979 tests, missing from the PSWID records, would be a worthwhile endeavor. Those data are bound to provide a better understanding of the aquifer when evaluated in the light of modern aquifer test interpretation techniques that were not universally known or available in 1979.

5.3. June 1987 Preliminary Report

During the late 1970's and early to mid-1980's, the Pine/Strawberry area experienced considerable growth in the form of residential subdivisions. The historic documents indicate growing concern about water supplies for the area. A September 9, 1987 letter from the Gila County Development Office Director, Mr. Bob Bigando, to Mr. Dale Jones and Concerned Residents of Pine/Strawberry touches on these issues as follows:

> "***Thank you for inviting our office to participate in your meeting regarding the future water supply for the Pine/Strawberry community.***
>
> ***For many years we have been aware that a water delivery problem existed in the Pine/Strawberry community and were***

concerned about the long term (sic) *capacity of the water supply to support the rate of development that the area experienced in the late 1970's and early 1980's.*

Since no hard data existed regarding the potential water capacity, we advised the Board of Supervisors of the desirability of contacting the Department of Water Resources and requesting that a study be done. In response, the Board submitted a request to the DWR, and, as you are aware, a preliminary report was issued in June.

Though our Department was not officially notified of the report, we were given a copy to review, by Supervisor Jones. Subsequently, we contacted the Department of Water Resources and were advised that a "final" report would be issued following a comment period. In response to our most recent inquiry, the DWR indicated that the response period could last up to three years. We concur with the residents of Pine/Strawberry that we need to begin to take some positive steps to address the issues raised in the preliminary report pending issuance of the final report.

We are deeply concerned, but not alarmed, by the content of the preliminary report. Were there a number of proposed new developments in the Pine/Strawberry area, we would be even more concerned.

The phenomenal increase in subdivision development that was experienced in recent year, however, has virtually ground to a halt. At the present time there are no proposed subdivisions pending in the Pine/Strawberry area.

No final plat or development plans have been submitted for the proposed Solitude Pine Resort which was indicated as a concern to the residents in a recent newspaper article. As it now stands, the preliminary plat has expired, and any further development would be subject to a complete re-review and public hearing process. Further, we have had no communication from the developer in over a year.

Under these circumstances, we feel that [it] *is advisable to proceed very deliberately and to carefully explore all the options available to us in order to see that such future development as may occur does not jeopardize the welfare of the current residents and property owners of Pine and Strawberry. If the Pine-Strawberry* (sic) *is to continue to grow*

we share your concern that it grow at a rate and to an extent that water supplies will permit. . . ."

5.3.1. Groundwater Supply

The basis for the tentative conclusions and recommendations stated in the Gila County Development Office letter of September 9, 1987, is provided by the preliminary Arizona Department of Water Resources report. The preliminary report of June 1987 (ADWR, 1987) compares groundwater supply to water demand in the Pine/Strawberry area as of 1986. The ADWR (1987) report refers to annual groundwater flow into the area from the adjacent "lateral Sandstone aquifer", presumed to be the Coconino Aquifer, as "groundwater flux". Table 1 of the ADWR (1987) preliminary report summarizes the 1987 perception of the available groundwater resource.

Table 5-1: Reproduction of Table 1, ADWR (1987).

Table 1
Groundwater Available
Pine-Strawberry Area (1986)
(reproduced from (ADWR, 1987; Table 1)

Area	Groundwater In Storage *(AF/YR)	Groundwater Flux (AF/YR)	Total (AF/YR)
Pine Creek	22	237	259
Strawberry Hollow	14	38	52
Strawberry Canyon	57	79	136
Total	93	354	447

*Amount in storage distributed over 100 years.

The context of the ADWR (1987) report indicates the estimates of groundwater flux are based on the concept of a representative value of aquifer transmissivity applied across the entire width of the areas addressed, and do not take into consideration the possibility that groundwater flow is constrained to relatively narrow fracture systems, rather than flowing through widespread porous rock under the area. Likewise, the estimates of groundwater storage presented in Table 5-1 were based on application of a representative value of storativity (effective porosity) to the entire rock mass, not to a fracture system comprising a limited part of the overall rock mass. Recognizing that the wells in the area provide response to aquifer tests indicating linear flow of groundwater along fractures that constrain groundwater flow and storage to narrow zones, it is clear that the rough estimates in the ADWR (1987) report likely overestimate the availability of groundwater.

The ADWR (1987) estimates of the available groundwater resource as of the end of 1986 are for groundwater contained in the Schnebly Hill-Supai strata, characterized in the ADWR (1987) report as the "Mudstone/Shale/Limestone aquifer". The perception in 1986 and 1987 was that the Mudstone/Shale/Limestone aquifer contained considerable stored groundwater, at least as compared to the local water demand. However, it was also recognized that the groundwater levels at the time of the 1987 report were high due to a period of above normal recharge. These perceptions were described as follows:

> ***"A large increase in the groundwater elevation in the Mudstone/Shale/Limestone aquifer occurred between 1977 and 1987. This variation is probably associated with the "wet" period that occurred within those years. In spite of the abundance of precipitation within that period, water elevations in the lateral Sandstone aquifer (Coconino Sandstone) did not show any gains, but suffered severe declines (1.5-13.4 ft/yr). This probably caused by the limited vertical extent and the fractured nature of the aquifer, which lacks the storage capacity of the Mudstone/Shale/Limestone aquifer. A conservative estimate of the groundwater in storage in the Mudstone/Shale/Limestone aquifer yielded a value of about 2160 acre-feet*** (under Pine Creek, or about 22 ac-ft/yr for 100 years).
>
> ***The groundwater flux coming from the northeast paralleling Pine Creek was estimated to be about 11.0 AF/yr. The groundwater flux coming laterally from the sandstone formation was estimated to amount to about 226 AF/yr." (ADWR, 1987; pp. 1-2)***

The above statements are typical of much of the contradictory historical commentary about groundwater conditions in the PSWID area. It is clear from the above statements that groundwater levels in the nearby regional Coconino aquifer were declining at 1.5-13.4 feet per year. If correct, this meant that discharge from the Coconino was exceeding recharge, a condition inconsistent with the perception of a "wet" period. As far as the Coconino aquifer was concerned, this was a "dry" period and groundwater levels were falling accordingly. (In fact the period from 1977 to 1987 was a period of above average precipitation trends; therefore, falling groundwater levels in the Coconino aquifer during the same period of time simply indicate that nothing is simple as it first appears to be in regards to hydrology.)

5.3.2. Groundwater Fluctuations

If the 1977-1987 period was a time of declining groundwater levels in the Coconino aquifer, implying below normal recharge to the regional aquifers, why were the groundwater levels in the Schnebly Hill-Supai strata (Mudstone-/Shale/Limestone aquifer) reportedly rising? The 1987 ADWR report explains that this is the result of less groundwater storage in the Coconino aquifer than in the Supai strata. The contradiction in the latter statement is self-evident.

If the groundwater levels in the Coconino were declining due to inadequate recharge, the transfer of that same amount of water into the Schnebly Hill-Supai strata from the Coconino would not cause an increase in groundwater levels in the Schnebly Hill-Supai if the Schnebly Hill-Supai offered greater groundwater storage capacity than the Coconino. In order for groundwater levels to rise in the Schnebly Hill-Supai strata as the result of natural recharge plus drainage of water out of the Coconino and into the Schnebly Hill-Supai, the potential storage volume of the Schnebly Hill-Supai would necessarily be equal or less than that of the Coconino. In general, the groundwater storage properties (effective porosity) of un-cemented Coconino sandstone significantly exceed those of the relatively fine-grained Schnebly Hill-Supai strata, except where the Schnebly Hill-Supai strata are affected by localized fractures and/or solution cavities. Therefore, it is anticipated the Coconino materials potentially offer more groundwater storage than do the Schnebly Hill-Supai strata on a unit volume basis.

The fact that the ADWR observed declining groundwater levels in the Coconino aquifer from 1977 to 1987 while groundwater levels in the Schnebly Hill-Supai strata in the Pine/Strawberry area increased is not an unusual phenomenon in groundwater hydrology; i.e., it is not unusual for groundwater levels on one end of an aquifer system to rise while groundwater levels on the other end of the system decline. While it sounds trite to say that this happens because "water runs downhill", this is exactly what happens. During periods of drought or below average recharge, the groundwater stored in the recharge area of an aquifer continues to drain toward the lower end of the system, even though more recharge may not enter the aquifer. This causes the groundwater levels in the recharge area to decline because there is no groundwater storage up gradient from the recharge area to replace the natural flow of groundwater toward the low end of the system. This is why recharge areas experience relatively larger seasonal and long-term fluctuations, compared to down-gradient areas in an aquifer, in response to fluctuations in recharge.

By comparison, down-gradient areas receive the benefit of the groundwater flowing from recharge areas. Thus, while recharge areas may be in a period of declining groundwater levels, areas downstream may continue to exhibit rising groundwater levels while they receive the benefit of the groundwater flow draining out of the recharge areas. Taking this concept a step further, if the down-gradient part of a flow system offers less storage volume than the recharge

area per unit of material, the rise in groundwater levels in the downstream area due to the receipt of flow from the upstream area will thus be accentuated in both absolute rise and duration.

Considering the fact the Coconino sandstone generally offers considerably more effective porosity than the Schnebly Hill-Supai strata, it is not unreasonable to conclude that a transfer of groundwater from the Coconino strata into the underlying Schnebly Hill-Supai strata would result in rising groundwater levels in the Schnebly Hill-Supai while groundwater levels in the Coconino declined. The latter concept is also consistent with the idea that most of the groundwater storage and flow in the Schnebly Hill-Supai strata is controlled by fractures of limited extent, relative to the overall mass of rock, and therefore of limited groundwater storage capacity. Therefore, the most likely explanation of why groundwater levels were observed to rise in the Schnebly Hill-Supai strata while groundwater levels in the Coconino strata declined, is the small groundwater storage capacity of the Schnebly Hill-Supai strata, relative to the Coconino, and the fact that the Schnebly Hill-Supai strata tend to restrict the downward drainage of groundwater out of the Coconino.

5.3.3. 1986 Estimate of Water Demand

The 1987 ADWR report summarizes groundwater availability for Strawberry Canyon, Strawberry Hollow, and Pine Creek as 447 acre-feet per year. The demand for water in these same areas, calculated by ADWR for the end of 1986, is summarized as follows:

> ***"The water demand in the Pine-Strawberry area has increased enormously in the last 8 years. From a total water demand of about 163 AF/yr in 1979 to about 384 AF/yr in 1986, a 135% increase in water use for that period.***
>
> ***The drilling of new private domestic wells plus new irrigated areas account for a large part (~69%) of that increase. In 1979, there were about 96 private wells registered with the Department. In 1986, this number had increased to about 164. The irrigated area, for the same period, increased from 27 to about 119 acres. The water companies, on the other hand, have increased their water demands, at a more or less constant and slower pace (~9 AF/yr).*** (ADWR, 1987; pp.4-5.)

Comparison of the 1987 ADWR estimate of 447 ac-ft/yr of available resource to the estimated demand of 384 ac-ft/yr, indicates that by 1986, almost all of the available resource was needed to supply the demand. This fact was recognized by the ADWR who stated:

> ***"Comparison of the total water demand with the total dependable water supply, in Figure 1, indicates that in 1986 the Pine-Strawberry area was using about 86% of its dependable supply. In spite of the large percentage of dependable supply used, the Mudstone/Shale/Limestone aquifer showed gains, not declines, in water levels.***
>
> ***Comparison of the water elevation data for 1974 and 1987 indicates that water levels in the Mudstone/Shale/Limestone aquifer have increased (1.4-8.4 ft/yr). As mentioned previously, these increases are a direct response of the aquifer to the natural replenishment from the excess precipitation that occurred between 1979 –1986*** (sic).
>
> ***If the water demand continues increasing at the present rate, in about 2 more years the Pine-Strawberry area will be using 100% o f i ts d ependable s upply. A fter t hat, a dditional f uture demands will be accelerating the overdraft of the aquifer. If a "Dry" period were to occur severe declines might occur."*** (ADWR, 1987, p.4)

As previously discussed, an alternative interpretation of the observed rises in the groundwater levels in the Schnebly Hill-Supai strata (Mudstone/Shale/Limestone strata) from 1977 to 1987 is that they resulted from drainage of water out of the overlying Coconino strata, where declining water levels were observed during the same period. In the alternative interpretation, the declining water levels in the overlying Coconino therefore might be a harbinger of a future decrease in the availability of the resource in the Supai strata, particularly if what was perceived to be a wet period became a dry period. The potential for future shortages resulting from a change in the apparently above normal precipitation pattern was recognized by the ADWR (1987), who stated the following conclusions:

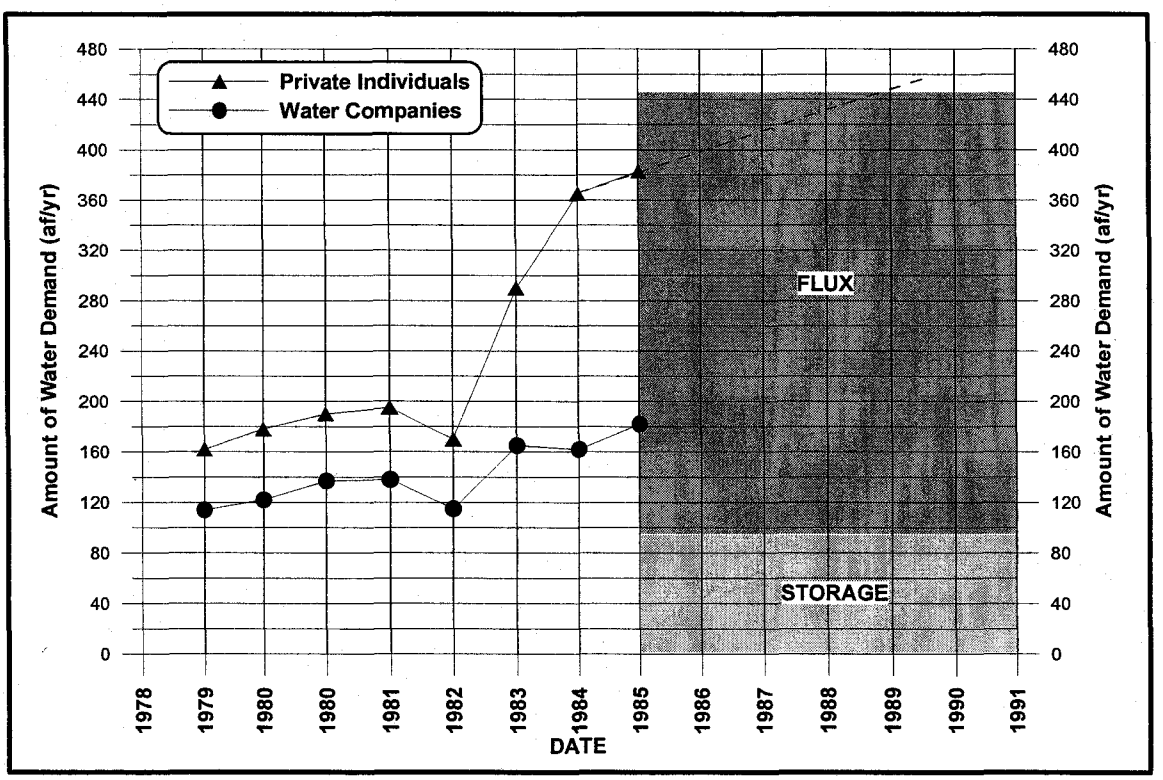
> ***"(1) The Pine-Strawberry area is reaching its limit with regard to the amount of development that can be sustained with a dependable water supply over a long period of time (100 years).***
>
> ***(2) The available groundwater level data cover a "wet" period. Therefore, it is unknown how the Mudstone-/Shale/Limestone aquifer will respond to a "Dry" period. Continuous groundwater monitoring is essential.***
>
> ***(3) The relationship between spring flow and groundwater level variations is unknown. Monitoring is needed to evaluate the amount of replenishment caused by the Pine Creek stream.***

(4) ***The hydraulic parameters (T and Sy) used to estimate the groundwater in storage and the groundwater flux are uncertain, although they might be on the conservative side."*** (ADWR, 1987; p.5)

It is clear from the latter citation that the ADWR in 1987 not only recognized the potential for a period of drought to result in a shortage of groundwater, they also acknowledged the uncertainty in the values of aquifer transmissivity and aquifer storativity used to estimate the storage and flux values summarized in Table 5-1. They state that the values used "might be on the conservative side"; however, subsequent re-evaluation of test data, as discussed elsewhere in this report, indicates the values used were not only overly optimistic, they involved wholesale application to broad areas the relatively large transmissivity and storativity values that were appropriate only to fractures of limited distribution and extent.

Included in the preliminary report of June 1987 (ADWR, 1987) was a hand-drawn figure that compared water demand to the estimated flux and storage of groundwater in Strawberry Canyon, Strawberry Hollow, and Pine Creek. The hand-drawn figure is reproduced on Figure 5-2, projecting that the entire estimated groundwater resource for the latter areas would be developed in two to three years, if the 1985-1986 trends continued.

Figure 5-2: Reproduction of ADWR (1987) water demand figure.



5.3.4. 100-Year Supply Estimate

The Preliminary report of 1987 (ADWR, 1987) is an important document in that it recognized that the 1986 level of water demands might already exceed the dependable resource, when long-term fluctuations in recharge were considered. The conclusion that the 1986 level of development might exceed the resource without future growth, and without the onset of a drought, made it clear as early as 1986 that the aquifer system in the Schnebly Hill-Supai strata would not support any significant amount of continued growth and was very likely vulnerable to a period of below normal recharge, even without future growth.

The latter conclusions may not have been entirely clear due to the confusing language about the rising groundwater levels in the Schnebly Hill-Supai strata and about more groundwater storage available in the Schnebly Hill-Supai than in the Coconino. Additional confusion may have been generated by the estimates of 2160, 1400, and 5670 ac-ft, respectively, of groundwater stored under the Pine Creek, Strawberry Hollow, and Strawberry Canyon areas. The implication of those estimated groundwater storage volumes was that if annual flow (flux) ranged from 38 to 237 ac-ft/yr, the groundwater storage of up to 5670 ac-ft offered a comfortable margin of safety to support the 1986 level of demand, even if there were a few years of drought in succession.

For example, the ADWR (1987) estimated availability of 9230 ac-ft of storage under the three areas. If recharge and "flux" declined to zero for a few years, the estimated of volume of storage should have been adequate to support the 1986 level of demand, 384 ac-ft/yr, for 24 years. Accordingly, there may not have been a lot of concern about a few years of drought since subsequent periods of above normal recharge would make up any short-term deficit that might occur during a few dry years.

The basis for the estimate of groundwater storage is partly revealed by the ADWR (1987) description of the Strawberry Canyon area that states:

> ***"In this area the Mudstone/Shale/Limestone aquifer extends for about 840 acres. Using a conservative saturated thickness of 135 ft., the groundwater in storage underneath this area is about 5670 Acre-ft."***

Groundwater storage of 5670 ac-ft in a saturated thickness of 135 feet distributed throughout 840 acres is equivalent to an average porosity of 5 percent throughout the rock mass. This value falls at the low end of the range of porosity for sandstone that is indicated in a number of tables published in the technical literature, generally indicating a range of 5 to 30 percent porosity for sandstone.

However, such tables do not take into account compaction and cementing of sandstone that take place during the lithification process that converts relatively

consolidated rock into harder, more compact rock. Likewise, the assumption that the Schnebly Hill-Supai strata are comprised mainly of sandstone with an average porosity of 5 percent is not consistent with the outcrops observed in the PSWID which consist of limey and nodular very fine-grained structureless sandstone, silty fine-grained sandstone, cemented conglomerate, limey mudstone, and microcrystalline limestone, all of which appear to offer far less than 5 percent porosity.

As discussed elsewhere in this report, the sparse aquifer test data available from wells completed in Schnebly Hill and Supai strata in the PSWID area exhibit particular types of linear flow response. The response of the wells in the Schnebly Hill strata indicates the sedimentary rock hosting the fractures releases groundwater from storage in pores in the rock when the fractures are pumped. Similar tests conducted in Supai strata indicate the release of groundwater is entirely from storage in the fractures with no contribution from the rock hosting the fractures. These test data indicate the average porosity of unfractured Supai strata in the PSWID area is essentially insignificant to the release of groundwater to pumped wells and certainly not an average of 5 percent. As stated in Freeze and Cherry (1979; p. 154):

> ***"As sands become more cemented and compacted (i.e., more lithified) the contribution of fractures to the bulk permeability of the material increases. The tendency of large permeability values to occur in the horizontal direction is replaced by a preference for higher fracture permeability in the vertical direction. The nature of the anisotropy in the fractured medium can reflect a complex geological history involving many stress cycles."***

The above statement regarding the permeability of sandstone strata is equally applicable to the effective porosity of such strata and is consistent with the results of the aquifer tests which indicate linear flow to pumped wells controlled by discrete fracture zones of high conductivity surrounded by a host rock of low conductivity which does not release groundwater storage to the fractures.

Taking the foregoing factors into consideration, the assumption of a bulk porosity of 5 percent throughout a given saturated thickness of Supai strata is inconsistent with other evidence, particularly the aquifer response to pumping, and does not appear to be realistic. The aquifer response indicates there is essentially no storage of groundwater in bulk porosity in the Supai rocks and the storage of groundwater available to development by wells is limited to fracture systems of unknown, but limited extent. Accordingly, there is no basis to assume the groundwater storage estimated in the ADWR (1987) preliminary report as 9230 ac-ft for distribution over 100 years actually exists. The data suggest the actual groundwater storage available for distribution over a 100-year period is significantly less than a volume based on a presumptive value of 5 percent

porosity and that a safety margin may not exist for a period of little or no recharge to the aquifer.

Although the 1987 preliminary report may have overestimated the groundwater storage in the Pine/Strawberry area, the fact that demand was nearly equal to the estimated flow of groundwater through the area was not lost on the ADWR investigators. In a June 10, 1987 letter from ADWR Deputy Director of Engineering, transmitting the preliminary report to the Gila County Board of Supervisors, the ADWR cautions the Board of Supervisors as follows:

> ***"In response to your letter of December 23, 1986, and as a follow up on our letter of January 27, 1987, attached is a preliminary report on the water supply situation in the Pine/Strawberry area. This report indicates that your concerns regarding the rapid growth of the area were justified. The Department of Water Resources will continue to collect field data and periodically review the situation.***
>
> ***The presently available water level information correlates with the wet multi yearly cycle which started in about 1977. Therefore, it is of prime importance to continue collection of hydrologic information into the dry cycle which will follow. The Department of Water Resources will continue issuance of inadequacy statements for developments in the discussed area unless some hard hydrologic evidence indicates that conditions in portions of the area are more favorable than considered at this time."*** (Douglas Toy, Deputy Director – Engineering, ADWR, to Adolph B. Trujillo, Chairman, Gila County Board of Supervisors, June 10, 1987)

5.4. Report on Pine Area Water Shortage July 1989

Following presentation of the Preliminary Report of 1987 to Gila County, the water company serving the community of Pine experienced a severe water shortage in the summer of 1989. The shortage was partly offset by hauling about 40,000 gallons per day of water from Strawberry for use in the Pine water system operated at that time by the E&R Water Company. The need to haul water from Strawberry to Pine continued from time-to-time after 1987 to as recently as 1997.

The fact that the wells at Strawberry did not suffer the critical water shortage problems experienced in the wells operated by the E&R Water Company initially left questions as to whether the1989 shortage was the result of a lack of groundwater at Pine or was instead related to pump problems and distribution problems. Since 1989, it has become obvious that wells at Pine do not enjoy as reliable a source of groundwater as the wells at Strawberry. The results of this investigation suggest that is because the wells in Strawberry are completed in

the Schnebly Hill Formation whereas the wells in Pine are completed in the upper and lower Supai.

The present operators of the same E&R Water Company well field, now owned by Brooke Utilities, Inc., observe that their wells in the Strawberry area are more reliable than those in the Pine area. They have also attempted to develop additional wells in the Pine area with a low level of success. Consequently, Brooke Utilities, Inc. installed an 8-inch water line to connect their well field in the Strawberry area to the water system they operate in the Pine area so that water from Strawberry wells could be transferred to Pine without trucking the water as done in the past.

In the Environmental Assessment for the 8-inch water line, (Payson Ranger District, 1999), the need for the 8-inch water line was summarized as follows:

> ***"Previously, Pine residents that are customers of E&R Water Company have been under water use restrictions imposed by the water company – as allowed by the Arizona Corporation Commission (ACC), including a 40% reduction in indoor use, no outdoor use, and limited livestock watering. During the summer of 1997, Brooke Utilities hauled 4.5 million gallons of water from Strawberry to Pine to ease the water shortage. Five additional wells have since been drilled in Pine but only two have achieved a water standard necessary for economic development and there is uncertainty over a long-term reliable source of water in Pine. Well data collected by Brooke Utilities indicates surplus water production and storage in their Strawberry system."*** (Payson Ranger District, 1999; p.2)

The antecedents to the conditions described in 1999 to justify the 8-inch Strawberry-Pine pipeline have their roots in the Pine water shortage of 1989, described by ADWR (1989). Appendix A of ADWR (1989) shows E&R Water Company meter records for the summer of 1988 indicating production from the Pine Water System wells, as reproduced on Table 5-2.

The metered records shown in Table 5-2 are significant in that they record the demand for water from the wells in the Pine Water System prior to the shortage that began in early July, 1989. Implicit in the demand is the condition that the wells provided at least the metered volume of sales. Thus we know the minimum production from the Pine Water System wells, even though there is no record of well production and the metered sales do not include transmission losses or unmetered use. The report by ADWR (1989) indicates there were 11 wells in the system in 1989; however, it is not clear how many of the 11 wells were in operation:

Table 5-2: E&R Water Company metered water sales.

E&R Water Company Pine Water System Metered Water Sales	
Month	Gallons
June 1988	3,823,590
July 1988	3,775,330
August 1988	3,165,530
September 1988	2,694,720
October 1988	2,563,490
November 1988	2,191,310
December 1988	2,036,120
January 1989	2,064,240
February 1989	1,707,600
March 1989	1,795,140
April 1989	2,565,720
May 1989	3,762,900
June 1989	3,541,000

> ***"The results of field measurements of wells by the Department's Hydrology Division personnel found three wells with a combined reliable capacity of about 30 gallons per minute . . . Other wells were inoperative or not arranged for flow measurements."*** (ADWR 1989; p. 12)

The sale of 3,541,000 gallons in the month of June 1989, just prior to the onset of the water supply shortage, required a minimum average 24-hour-per-day pumping rate of 81.97 gpm from 11 wells, or 7.45 gpm per well. If only 8 wells were in production, each well would be required to produce 10.2 gpm; likewise five wells would be required to yield 16.4 gpm each, to satisfy the metered sales. Therefore, the record provides some indication of the minimum production requirement from individual wells; even though actual well production was not measured.

The most significant aspect of this record is that the wells produced more than 3.5 million gallons in June 1989, a rate of production not unlike the previous summer of 1988, but suddenly declined in yield in July 1989. The ADWR (1989) report states that well production in the Pine Water System had decreased to an average of 43,000 gallons per day (gpd) in July 1989 or about 36.4 percent of the June production. An additional 40,000 gpd was being hauled from Strawberry to Pine by trucks. In the absence of any identified change in the system or in the demand, the question is why the wells suddenly failed in 1989, shortly after a period of time in which the ADWR (1987) described a rise in groundwater levels over a 10-year period from 1977 to 1987.

The answer is provided in ADWR (1989) that states:

> ***"The Department of Water Resources' Hydrology Division performed field measurements on the water company's wells and determined total continuous production did not exceed 43,000 gallons per day and that groundwater levels were low and at some locations below pumping levels."*** (ADWR, 1989; p. 4)

The measured production of 43,000 gpd is equivalent to 1,290,000 gallons per month production in a 30-day month such as the preceding month of June when 3,541,000 gallons were produced. The observed production of 43,000 gpd is equivalent to a 24-hour-per-day pumping rate of 29.86 gpm. As previously cited, the ADWR staff found three wells producing a combined capacity of 30 gpm in July 1989, a fact indicating that only three of the 11 wells in the system were producing a significant yield of water at that time.

In view of the latter observations, there is no reason to seriously contemplate that the shortage experienced in Pine in 1989 and in subsequent years was the result of mechanical failures in the system, distribution system limitations, or bad management of the wells. The ADWR (1989) observations clearly document a rather abrupt decrease in the well yields in the Pine Water System due to a decline in the pumping water levels, and apparently in static water levels, at least at some of the wells.

The latter conclusion was evidently rejected by a part of Pine/Strawberry community, partly on the basis that a widespread loss of well yields did not occur throughout the area. For example, the wells in Strawberry provided the groundwater production that was trucked to the Pine system. Thus, the question arose that if the failure of the public water supply wells at Pine was due to a area-wide decline in groundwater levels, presumably linked to fluctuations in annual precipitation and recharge, why did not such "dry" conditions affect wells at Strawberry and the surrounding area.

Although such reasoning is logical, it overlooks another possibility, which is that long-term use of wells completed in a fractured rock aquifer had resulted in a progressive long-term decline in average annual groundwater levels that finally reached a threshold at which well yields were adversely and noticeably affected. As discussed in the following section of this report, a characteristic of fractured rock aquifers is initially high yield followed by a progressive decline in yield as the duration of pumping increases. This effect may be manifest in short-term pumping tests or may appear gradually over a period of years as groundwater is withdrawn from such a fractured aquifer. A gradual decline in average annual groundwater levels and ultimately in well yield in one area might therefore be a function of the pumping and use of the wells whereas other wells in nearby areas may be used in a different way and not experience the same loss of yield.

Likewise, small but significant differences in the hydraulic properties of the fractured rock from one area to another might cause wells in one area to be less reliable under long-term sustained pumping than wells in nearby areas, subject to the same hydrologic conditions and similar patterns of use.

As previously discussed, the most important factor appears to be that wells in the Strawberry area are completed in the Schnebly Hill strata whereas wells in the Pine area are completed in the Supai strata. The principal difference between the hydraulic properties of these two groups of strata, as shown by aquifer tests reported by Glotfelty (2002) in a subsequent part of this report, is that during pumping tests, the Schnebly Hill strata released groundwater storage from the rock mass as well as from fracture openings whereas the Supai strata only released water from the fracture openings and no water was released from storage in the rock mass between the pumped fractures.

Local differences in fractured rock aquifer characteristics and performance may be a "wild card" that makes it hard to distinguish between climatic effects, mechanical and hydraulic factors, management effects, and the effects of demand for water when comparing well performance at Strawberry to that at Pine. However, the effect of a loss of system capacity caused by the hydraulic limitations of the aquifer system is disastrous to the water users. During the Pine shortage in 1989, the ADWR (1989; p. 4) summarized the amount of water available to some 1,400 residences, if the water supply were to be limited to the 43,000 gpd provided by the wells in July 1989, as follows:

> ***"If all hauling of water terminates and only the well production is available, water usage will only be available at a rate of 30 gallons per home per day. The use of water without hauling must be limited to the minimum possible needs, estimated at about 5 gallons per capita daily, divided as follows: drinking, 3 pints; cooking 2 quarts; personal cleanliness, 1 gallon; laundry and dishwashing, 2 gallons. Exceeding this usage would deplete the water storage reserve. This low usage rate considers the wells maintaining their present production capacity."*** (ADWR, 1989; p.4)

Similar restrictions may potentially be imposed during water shortages at the time of this writing.

5.5. March 1994 Geohydrologic Evaluation – Portal IV Subdivision

Manera (1994) authored a report describing geohydrologic conditions in the Portal IV Subdivision, immediately west of and contiguous to the Portal II Subdivision of Manera (1979). Pumping test data provided in Manera (1994) are a definitive source of information about the hydraulic function of the upper Supai

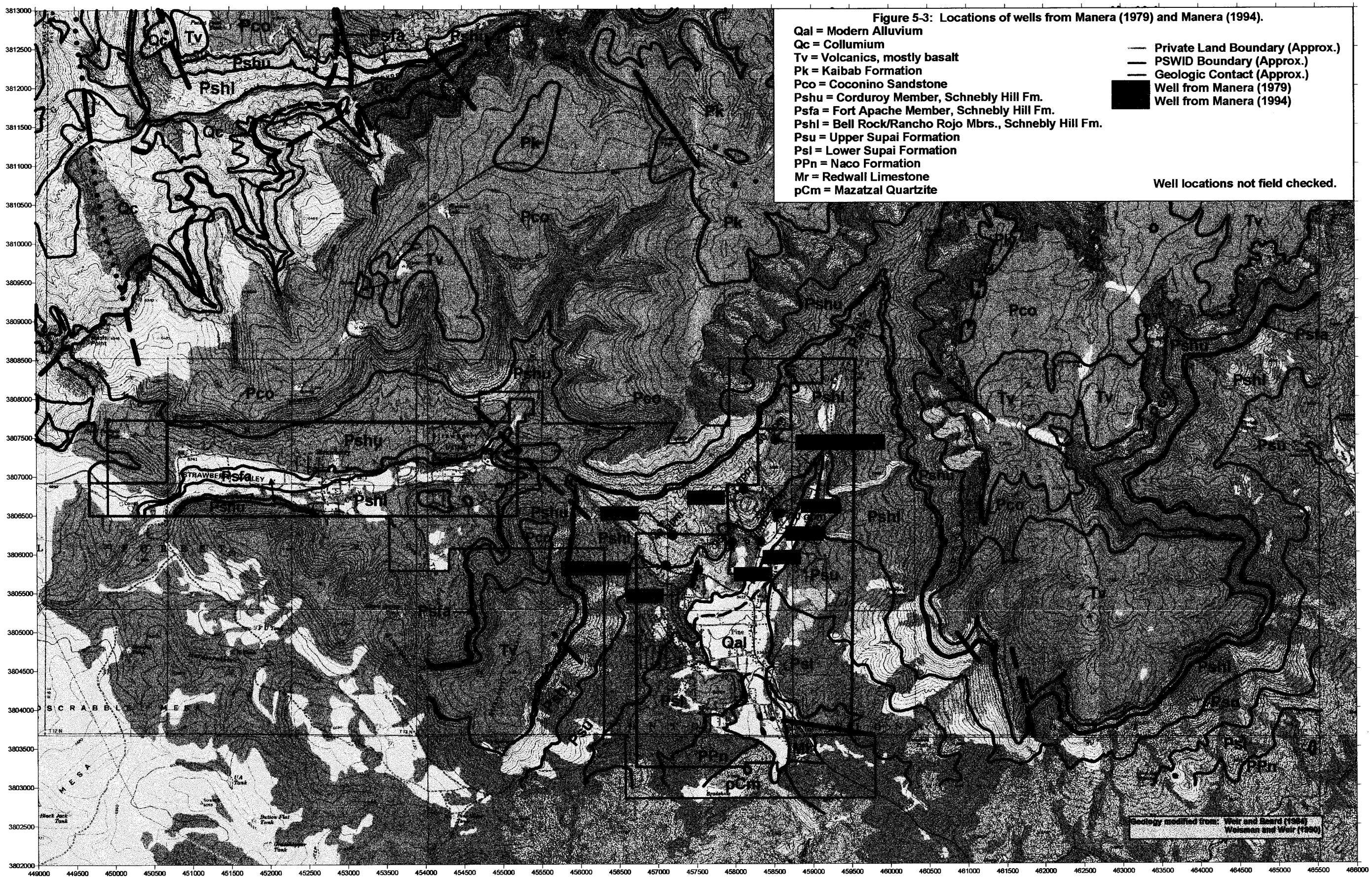


Figure 5-3: Locations of wells from Manera (1979) and Manera (1994).

aquifer strata penetrated by the wells at locations shown on Figure 5-3. In addition to aquifer test data, Manera (1994) summarizes the perception of residential water demand used for planning purposes in the Pine/Strawberry area in the 1990's.

Reexamination of the pumping test data from Manera (1979) shows that the aquifer response to pumping was that of highly bounded linear flow in fractures. Moreover, the test response indicated the only release of groundwater from storage during the test was from the fractures with no contribution from the rock surrounding the fractures. Therefore, it must be concluded that groundwater flow and storage in upper Supai strata in the vicinity of this well are limited to narrow paths along fractures and that the rock surrounding the fractures does not store, release, or transmit significant amounts of groundwater. Accordingly, the interpretation of the aquifer test by Manera (1979), using the Cooper-Jacob method for radial flow, was inappropriate and did not provide a valid value of aquifer transmissivity. Similarly, application of a representative value of transmissivity to calculate the groundwater flow across the width of the entire area was not appropriate in view of the fact the test indicated groundwater flow is constrained to narrow fractures.

5.5.1. Water Use

As compared to Manera (1979), where seven years of recorded water use indicated an average monthly use of 3,010 gallons per month or about 100 gpd per residence, Manera (1994) uses a value of 110 gpd per unit for planning purposes. The basis for the 110 gpd per unit figure was cited in Manera (1994) as "***the fifteen (15) year daily average use of approximately three hundred (300) dwelling units in Portal 1, Portal 2, Portal 3, Strawberry Creek Hills and Canyon Shadows subdivisions***." These statistics reflect only a small increase in use per dwelling between the 1979 full time residences (Manera, 1979) and the 1994 residences. Manera (1994) does not distinguish between full time and part time residency demands, nor does either of the Manera reports provide information about summer water use versus winter water use.

5.5.2. Geology

In regards to the geology of the Pine area, Manera (1994) makes the following statements:

> ***"The records of Aero Drilling and Pumps, Inc. (Appendix A) show that 215 feet of the Supai formation and 165 feet of the underlying Redwall (Naco) limestone was*** (sic) ***penetrated while drilling Portal IV Well 1. At the site of Portal IV Well 2 the Supai formation was absent with only the limestone encountered during the drilling process."*** (Manera, 1994; p.5)

The Well Data Report in Appendix A of Manera (1994), as obtained from Aero Drilling and Pumps, Inc., shows Well 1 penetrating "Redwall Limestone" from essentially 215-380 feet, ignoring a 4-foot shale layer from 274-278. Figure 5-3 shows Well 1 starts in the lower Schnebly Hill Formation, approximately 140 feet above the base of the unit. This puts the first "Redwall Limestone" penetrated by the well an estimated 75 feet below the top of the upper Supai, as defined in this report. The total depth of the well ends approximately 90 feet above the bottom of the upper Supai.

Well 2 penetrates "Redwall Limestone" at 10-215 feet, shale from 215-230 feet, and "Redwall Limestone" from 230-360 feet. Well 2 is sited about 40 feet below the top of the upper Supai and, with a total depth of 360 feet, potentially penetrates 70 feet into the lower Supai.

Comparison of the locations of Portals IV Wells 1 and 2 to the structural map of the top of the Redwall Limestone, constructed for this investigation, indicates the depths to the top of the Redwall limestone are approximately 987 and 692 feet, respectively, at Wells 1 and 2. Likewise, the depths to the top of the Naco Formation, which includes considerable limestone, are approximately 732 and 437 feet, respectively, at the sites of Wells 1 and 2. Accordingly, the total well depths of 380 and 360 feet, for Wells 1 and 2 respectively, are not adequate to penetrate to either the Naco or the Redwall strata at those sites.

Description of the limestone cuttings from the two wells as "Redwall Limestone" is a logical interpretation of the data by the driller, based on the amount of limestone penetrated. However, the relationships shown on Figure 5-3 show the wells must be completed in the upper Supai, as defined herein. Although there are limestone layers ranging from 6 to 45 feet thick in this interval, as described by Weisman (1984), their presence does not explain the amount of limestone reported by Aero Drilling in either well.

A likely explanation for the amount of limestone logged in these two wells is the presence of the conglomerate lenses in the upper and middle Supai as described by Weisman (1984) and Blakey (1990). The conglomerate consists of a mixture of limestone pebbles and siltstone pebbles. Drill cuttings from the combination of carbonate layers, which according to Weisman (1984) are closely associated with conglomerates, and drill cuttings from the limestone pebbles in the conglomerates could easily give the impression that the boreholes were penetrating limestone strata with red silt, sand and clay infillings in fractures and cavities. Considering the position of the two wells on the geologic structure, penetration of the limestone layers and limestone pebble conglomerates in the upper Supai, as defined herein, is the most likely explanation for the carbonate drill cuttings logged as "Redwall Limestone" by Aero Drilling and Pump.

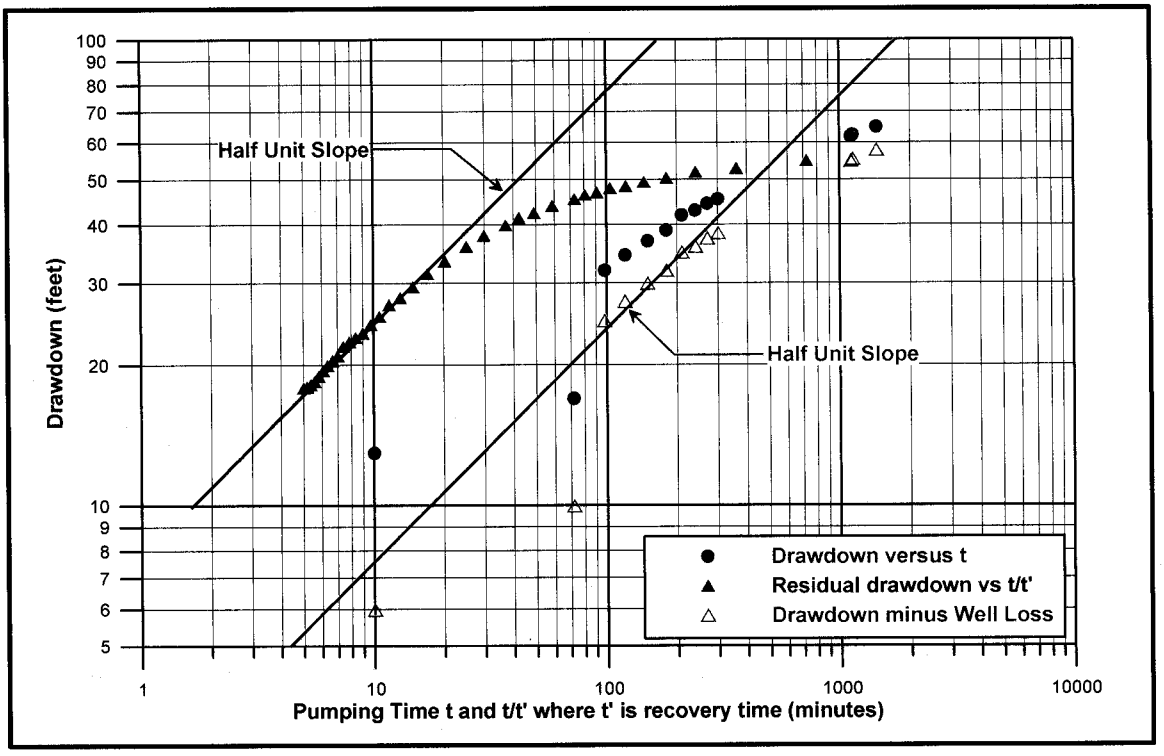
5.5.3. Pumping Test Analysis

Appendix C of Manera (1994) provides the time-drawdown measurements for a pumping test of Portal IV Well 1. The static water level of 232 feet prior to the test indicates the groundwater in the well is produced from the upper Supai as the base of the Schnebly Hill strata penetrated by the well is at about 140 feet. The pumping rate started at 138 gpm and declined to 123 gpm over 24 hours. The time-weighted average pumping rate was 129 gpm, indicating a maximum departure from the average pumping rate of less than 7 percent during the duration of the test.

Figure 5-4 shows a double log (log-log) plot of drawdown in feet versus elapsed pumping time in minutes. A log-log plot is the diagnostic plot used to evaluate the type of aquifer response obtained during any pumping test. Figure 5-4 also shows residual drawdown during recovery plotted versus t/t' where t is the time since pumping started and t' is the time since pumping stopped. Although the residual drawdown plot is normally shown only on a semilogarithmic plot, where time is logarithmic and drawdown is arithmetic, the residual drawdown is shown on the log-log plot on Figure 5-4 for the purpose of evaluating the type of aquifer response obtained.

The drawdown data in Figure 5-4 are subject to casing storage effects that reduce drawdown in the early part of the test. This is because water in the well

Figure 5-4: 1994 test of Portal IV Well 1 at 130 gpm average pumping rate.



casing provides part of the pumped water during the early pumping, thus slightly offsetting drawdown. The drawdown data are also subject to the effect of well loss drawdown throughout the pumping period. Well loss drawdown is the initial drawdown required to create a hydraulic gradient into the well to overcome entrance losses through the casing and formation near the well and to establish the differential pressure required to cause flow between the aquifer and the inside of the well at the given pumping rate. Well loss drawdown does not exist during recovery after pumping. Analysis of the data indicates well loss drawdown was about seven feet. A drawdown plot, corrected for seven feet of well loss, is shown on Figure 5-4 as "Drawdown minus Well Loss".

The time-drawdown plots on Figure 5-4 also reflect the progressive decrease of the pumping rate from an initial rate of 138 gpm at the start of the test to 123 gpm at the end of the test. The continuous decrease in the pumping rate caused a progressive reduction in the trend of the time-drawdown plot throughout the test. The residual drawdown, measured after pumping stops and the water level in the well is recovering, reflects the hydraulic response of the aquifer to pumping withdrawals absent the effects of casing storage and well loss that are associated with pumping. As shown on Figure 5-4, the initial recovery measurement, taken two minutes after pumping ceased, is about 10 feet less than the final drawdown during pumping. The 10 feet of drawdown offset along the drawdown axis in the first two minutes of recovery consists of 7 feet of well loss and 3 feet of recovery of the water level in the aquifer outside the well casing during the first two minutes of recovery.

For the first 75 minutes after pumping stopped, the water level in the well recovered relatively slowly, with the rate of recovery gradually increasing until, after 75 minutes of recovery, the rate of recovery stabilized at a half unit slope on the log-log plot. The initially slow rate of recovery exhibited by the Portals IV Well 1 during the first 75 minutes of recovery indicates the cone of depression around the pumped well was significantly constrained by boundaries consisting of materials that were not yielding groundwater.

The half unit slope response after 75 minutes of recovery is very significant. A half unit slope means that one log cycle of drawdown or recovery requires two log cycles of time. A half unit slope is a diagnostic response indicating linear flow of water to the pumped well, rather than converging radial flow. Linear flow is exhibited by gravel aquifers in narrow stream channels surrounded by less permeable materials, so-called "strip aquifer" response, and by fractured rock aquifers where the flow of groundwater to the pumped wells is controlled by discrete, essentially planar fractures. Underground mine workings and caverns in limestone penetrated by wells may also exhibit linear flow response.

The linear flow response exhibited by the Portals IV Well 1 is interpreted to indicate groundwater flow controlled by fractures. A half unit slope response

indicates not only that flow to the pumped well is linear, but that the rate of drawdown in the linear feature is controlled by the release of groundwater stored in the linear feature, not by the release of groundwater stored in the less permeable materials hosting the linear feature. In other words, the rock strata did not produce significant groundwater from porosity during this test and the well obtained its supply of water solely from storage in the fractures in the rock.

Because the geology at the Portals IV Well 1 indicates the water-bearing zones in the well are contained in the upper Supai strata, the results of this test indicate that the Supai strata at this location do not offer significant groundwater storage or capacity to transmit groundwater, except through fractures. The half unit response during the test indicates the pumped water was released from storage in the fractures and not from storage in porosity or interconnected micro-fractures in the sandstone, siltstone, and limestone hosting the fractures.

If a significant release of groundwater from micro-fractures or porous rock had occurred, the time-drawdown plot would have assumed a quarter unit slope, or in highly fractured rock, a radial flow response. A quarter unit slope consists of one log cycle of drawdown for four log cycles of time. A quarter unit slope on a log-log plot is a diagnostic aquifer response indicating the materials hosting the fractures are releasing water to the fractures such that the rate of drawdown is controlled by the release of storage from the rocks surrounding the fractures, not by the release of storage within the fractures. Therefore a quarter unit slope response implies the aquifer contains either primary rock porosity or widely distributed fractures as compared to the absence of such indicated by the half unit slope response. The quarter unit slope response did not occur in the test of the Portals IV Well 1.

Figure 5-4 shows that the drawdown response during pumping, as corrected for well loss, reasonably conforms to a half unit slope throughout the pumping test, if the effects of casing storage are ignored in the early part of the test and the effects of a continuously decreasing pumping rate are taken into account. The second data point during drawdown is anomalous, indicating the measurement was wrong or recorded incorrectly. Thus, both the drawdown and residual drawdown response obtained from the Portals IV Well 1 test are indicative of highly bounded groundwater flow through relatively planar fractures. An alternate interpretation would be linear flow through widespread solution cavities in a thin limestone layer or along solution-enlarged fractures or bedding planes.

5.6. March 2002 Water Resources Study

A second source of aquifer test data is provided in a letter report submitted by Clear Creek Associates (Glotfelty, 2002) to Mr. Thomas Wilmoth of Fennemore Craig, P.C., regarding a water resources study of the Strawberry/Pine area. Glotfelty (2002) provides test data from four wells operated by Brooke Utilities. Figure 5-5 shows the locations of the wells.

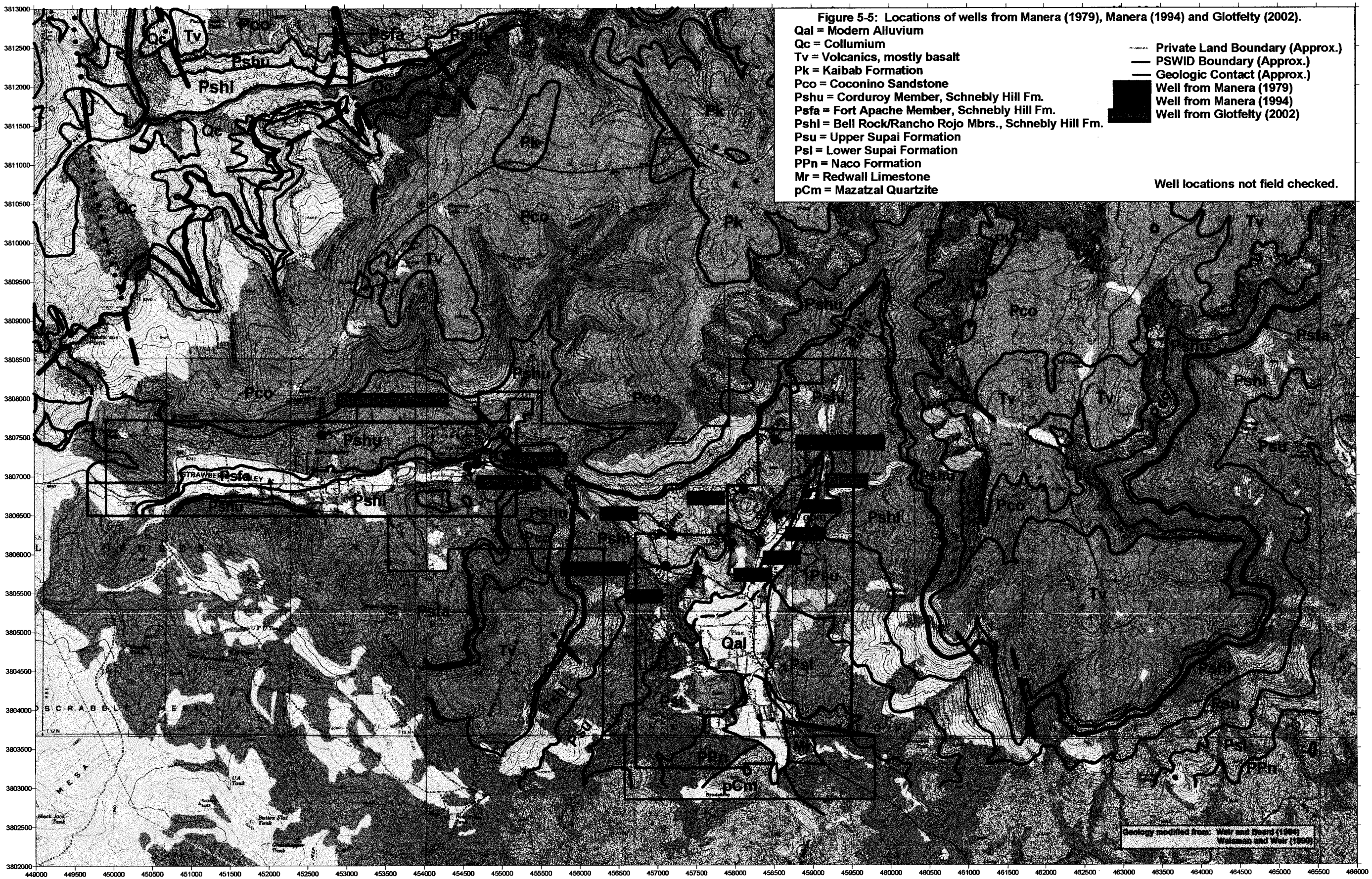


Figure 5-5: Locations of wells from Manera (1979), Manera (1994) and Glotfelty (2002).

Similar to other historic analyses of pumping tests and groundwater flow in this area, the report by Glotfelty (2002) inappropriately applies radial flow analysis to linear flow conditions. Likewise, the report applies the erroneous aquifer transmissivity values, obtained by inappropriate application of the radial flow analysis, to represent groundwater flow across the width of the area, not recognizing that groundwater flow at the tested wells was limited to relatively narrow fractures. Therefore, the estimates of groundwater availability presented in the report are likely in error.

Reexamination of the test data provided in Glotfelty (2002) reveals another important factor in the performance of aquifers in the Schnebly Hill and Supai Group. Namely, the tests of wells completed in the Bell Rock Member of the Schnebly Hill Formation in Strawberry indicate that the rock surrounding the fractures penetrating the wells released groundwater from storage. Accordingly, the water pumped from those wells was not derived solely from storage in the fractures, but was instead derived primarily from storage in the rock surrounding the fractures. The test response obtained from the well completed in the upper Supai strata in Pine indicated that all of the pumped water from that well was obtained from storage in fractures with no contribution of water from storage in the rock surrounding the fractures. This indicates the amount of groundwater storage in the Schnebly Hill Formation is significantly greater on a unit volume basis than that in the Supai strata.

The Strawberry View III well is located on the north central edge of the Strawberry community and penetrates the top of the lower part of the Schnebly Hill strata near the land surface. The Johnson #1 and Johnson #2 wells are located at the east end of the Strawberry community just downstream from the crossing of Highway 87 over Strawberry Creek and also start near the top of the lower part of the Schnebly Hill Formation, as shown on Figure 5-5. The Bloom well is located on the east side of Pine Creek, nearly a mile upstream from Highway 87 and about a mile and a half from the crossing of Highway 87 over Pine Creek, and starts an estimated 180-200 feet below the top of the upper Supai. The static water levels in the wells indicate the groundwater is contained in the lower part of the Schnebly Hills strata at the Strawberry View III, Johnson #1 and Johnson #2 wells and in the upper Supai, probably subject to recharge from Pine Creek, at the Bloom Well.

5.6.1. Strawberry View III Well Test

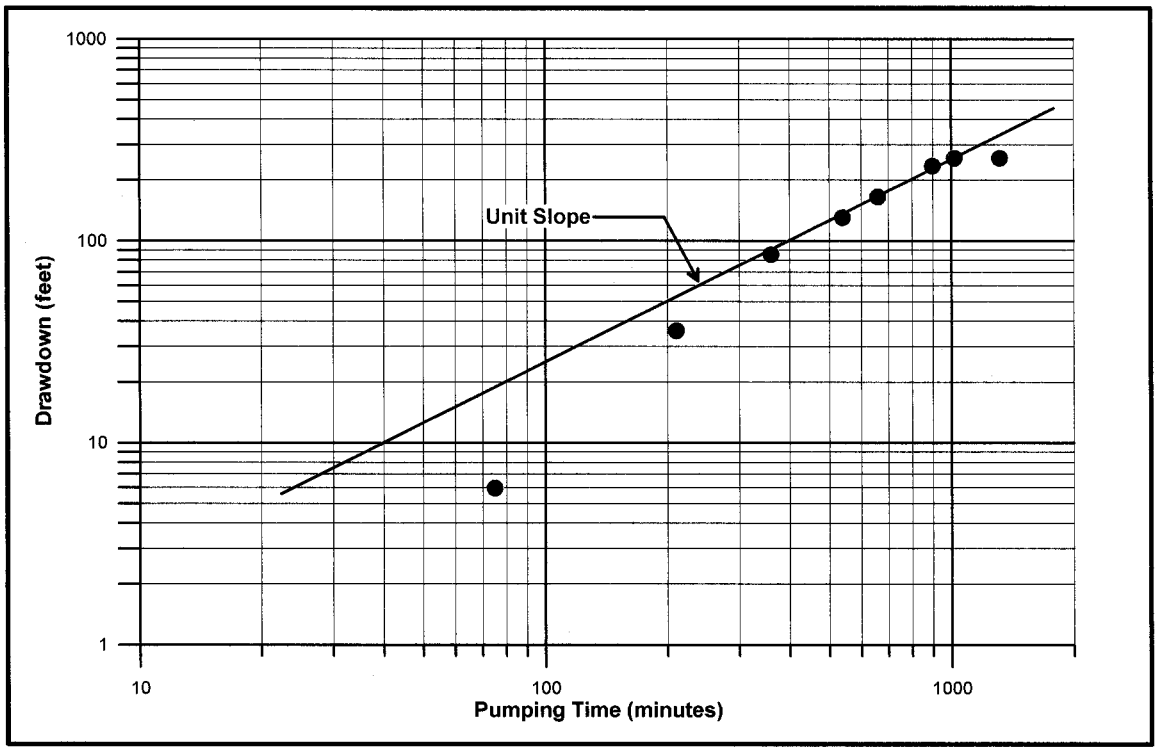
Figure 5-6 shows the diagnostic log-log time-drawdown curve for a "constant" rate test of the Strawberry View III well test. Data provided in Attachment B of Glotfelty (2002) indicates the test was started at a discharge rate of 29 gpm that gradually decreased to 25 gpm during the 1320-minute test. The time-weighted average rate during the test was 26.3 gpm. Recovery data were not provided

and the plot shown on Figure 5-6 is not corrected for well loss. The static water level in the well was 214 feet on 7/29/96 when the test was started.

After the first 200 minutes of pumping, the time-drawdown curve assumes a unit slope on the log-log plot. A unit slope consists of one log cycle of drawdown for each log cycle of time. A unit slope means that the change in head in the well was proportional to pumping duration; a condition generally interpreted to mean the rate of drawdown was controlled by well casing storage. However, the duration and pumped volume of the 1320-minute test indicates the casing storage was not adequate to influence the test past the first 100 minutes or less of pumping. In fact, the first two data points in the test fall below the unit slope line, probably due to the effects of casing storage superimposed over the aquifer response.

The unit slope response of the late data indicates the rate of drawdown was controlled by release of storage without a concomitant inflow of any significance. Since the well casing volume is not large enough to provide the volume of storage required to generate such a response, it is necessary to conclude the storage was provided by a void in the bedrock strata, penetrated by the well. The unit slope response does not provide any indication of the shape of the void; however, the absence of a departure from the unit flow indicates the size of the void was very large with respect to the rate of flow through the void, such that the

Figure 5-6: 1996 test of Strawberry View III Well at 26.3 gpm average rate.



walls of the void did not exert any resistance or head loss upon the flow of groundwater to the well. Thus, the rate of drawdown was essentially that which would be obtained if the water were pumped from a large tank. The abrupt departure of the last point on the test from the unit slope curve is interpreted to indicate the pumping water level had approached the pump inlet.

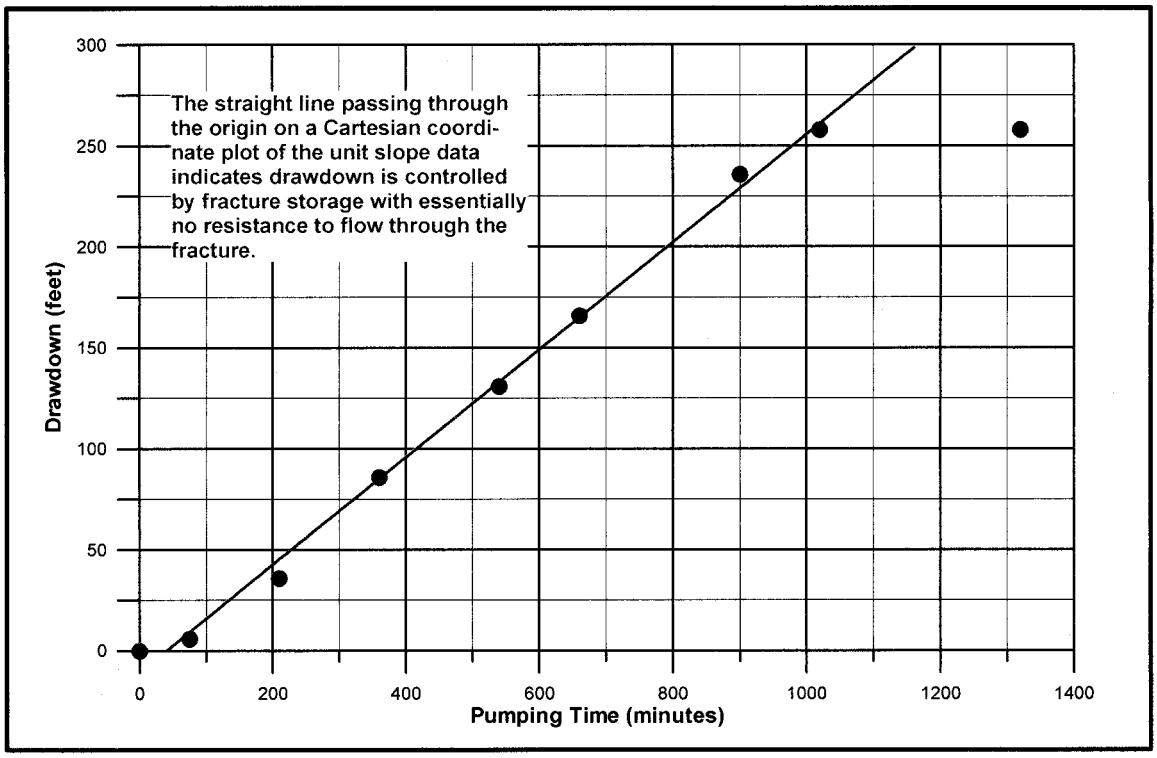
Thus, the response obtained during the test indicates the pumped water was obtained from a void in the rock, rather than from small fractures or porous strata. The void might be a large fracture or a zone of large solution cavities in a limestone layer. The volume of the void was small enough that the storage was being depleted during the test. Unfortunately recovery data were not provided with the test to show what happened when pumping stopped; however, it is manifest from the test response that the inflow (if any) to the void during pumping was negligible compared to the pumping rate.

A specialized plot for examination of storage effects on time-drawdown response is a Cartesian coordinate plot of drawdown versus the pumping time in which drawdown is proportional to time such that a straight line through the origin of the plot results. Figure 5-7shows a Cartesian plot of the Strawberry View III well test data. The data form a straight line, as expected for storage-controlled drawdown. The straight line is offset slightly from the origin, indicating less drawdown than expected in the first data point. The offset is likely the result of well casing storage superimposed over the later response to the aquifer storage. Accordingly, the intercept of the straight line with the time axis is a good approximation of the length of time during which casing storage affected the time-drawdown response.

Although the response obtained during the Strawberry View III well test is not strictly a fractured rock, linear flow response, it indicates the groundwater was stored in a large fracture or solution cavity of finite extent and which certainly cannot be considered representative of the hydraulic properties of the rock mass across the entire width of the aquifer. Therefore, the results of the test are applicable to an unknown but limited part of the aquifer mass and cannot be extrapolated to represent broad areas of groundwater flow through the aquifer. The diagnostic plot also indicates that the Cooper-Jacob straight-line solution is not an appropriate analytical method for interpretation of the pumping test and that, in fact, the test is not amenable to a solution for aquifer transmissivity.

The Strawberry View III well is completed in the Bell Rock Member of the Schnebly Hill Formation and may possibly penetrate into the upper Supai. The unit slope response requires a relatively large void to provide the water. These factors suggest the well penetrates a large, open fracture in the Bell Rock or, possibly, a cavernous zone in limestone in the upper Supai. This is consistent with the fact that many wells in the PSWID area are reported to intercept fractures and voids (Miller, 2003); however, the nature of the fracture or void is

Figure 5-7: Specialized plot of 1996 test of Strawberry View III Well.



unknown. The response of the water-bearing zone penetrated by the Strawberry View III well may be related to the question of what caused the Strawberry Valley, i.e., the well may be sited on a fracture zone.

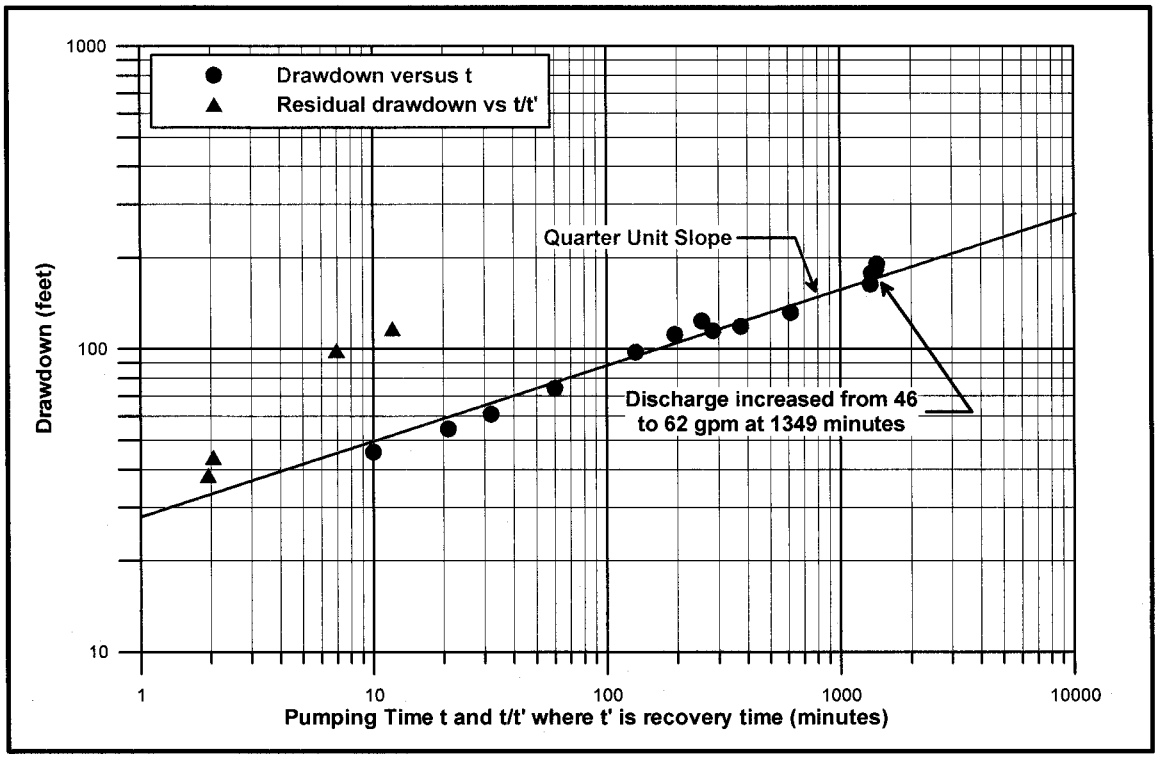
However, the geologic evidence in the Strawberry Valley does not support the concept of a fault or fracture zone aligned with the east-west axis of the valley. The surface upon which the basalt on Strawberry Mountain is deposited is thought to be the ancestral surface extending from the north, southward to the ancestral Mogollon Rim, preserved along the south end of Strawberry Mountain by the basalt cap. This being the case, the modern Strawberry Valley has been cut through the surface north of the ancestral rim and the Strawberry Mountain mass is a remnant of the old surface above the ancestral rim, bounded on the southeast by the Pine Creek valley, eroded through the ancestral rim, and on the southwest by the ancestral pediment between the rim and the basement fault to the south. The Strawberry Mountain mass has therefore been in a position over a considerable period of geologic time where it is potentially in tension due to gravity pulling the mass into the ancestral valley to the south. Therefore, it is reasonable to speculate that the void penetrated by the Strawberry View III well may be the manifestation of movement of the Strawberry Mountain mass southward under gravity and, in fact, the Strawberry Valley may be aligned with a zone of tensional fractures related to such movement.

This is not to imply that fractures or geologic structure were the primary causes of the alignment of the Strawberry Valley. Prior to creation of the Strawberry Valley, but following emplacement of basalt on the south-sloping erosion surface above the ancestral Mogollon Rim, surface water flowing down the south-sloping erosion surface was blocked by the basalt resting on the former erosion surface. This forced the surface drainage to flow east or west, around the basalt flow, to drain off the ancestral rim. As modification of the Mogollon Rim proceeded, the Strawberry Valley was likely cut by erosion into the ancestral slope above the rim, by water forced to flow westerly, along the northern edge of the basalt cap on Strawberry Mountain which blocked the former southward flow off the rim.

5.6.2. Johnson Well No. 1 Test

Figure 5-8 shows the time-drawdown response of the Johnson Well No. 1 to a "constant" rate test that averaged 52 gpm (based on a time-weighted average of the different rates during the test). The test response on the diagnostic log-log plot is that of a straight line with a quarter unit slope. The test data are not corrected for well loss, but the plot indicates such a correction would not change the slope of the curve. As explained previously, a quarter-unit slope response indicates linear flow to the well through a fractured-rock aquifer in which the fractures are functioning as a conveyance system and the rate of drawdown is

Figure 5-8: 2001 test of Johnson Well #1 at 52 gpm average rate.

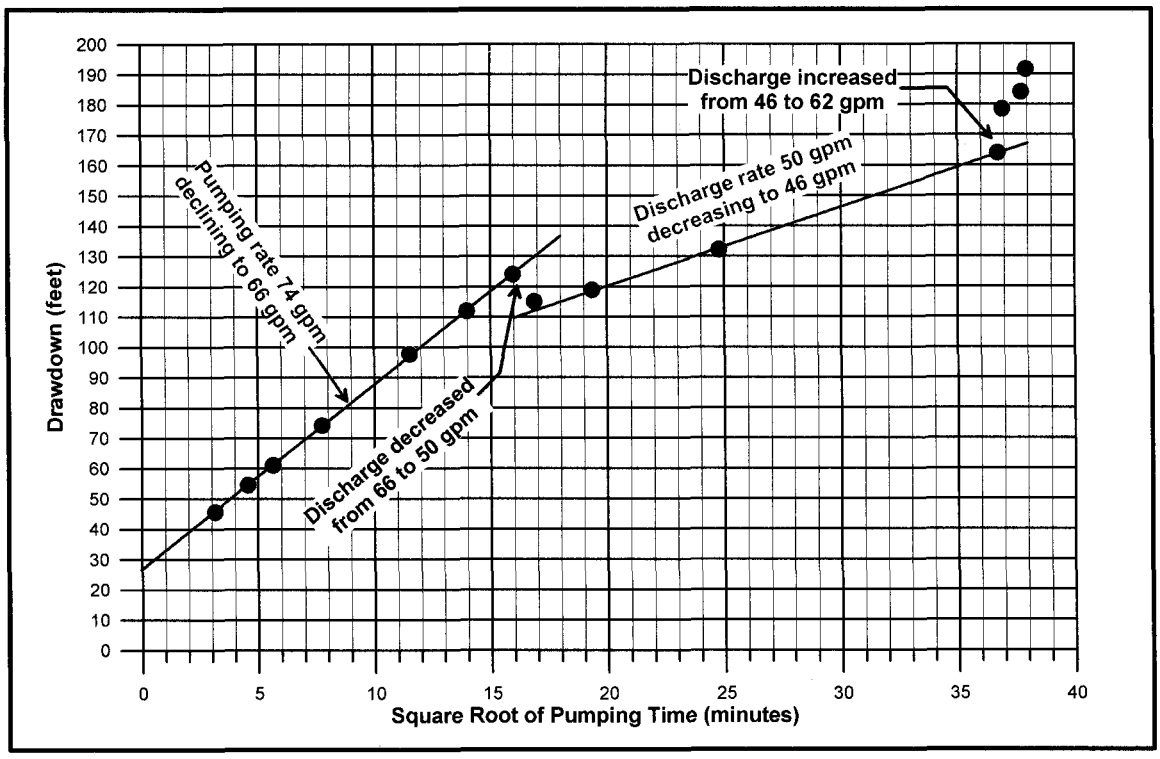


controlled by the release of groundwater from storage in porous rock hosting the fracture system. The porosity may be inherent primary porosity or secondary porosity due to interconnected fractures or micro-fissures.

The field data summarized in Attachment B of Glotfelty (2002) indicate the pumping rate was adjusted twice during the pumping test. One adjustment was at 285 minutes pumping time when the rate was throttled from 66 gpm to 50 gpm and the other was at 1349 minutes when the rate was increased from 46 gpm to 62 gpm (Attachment B includes a 60-minute error in the pumping time calculation, starting at 2100 hrs). Accordingly, it is necessary to examine how the changes in discharge rate affected the time-drawdown response summarized as a quarter unit slope on Figure 5-8.

This is accomplished with a specialized plot for linear flow in which linear flow makes a straight line through the origin of a plot of arithmetic drawdown versus the square root of time. Figure 5-9 shows the specialized plot for the Johnson Well No. 1 test.

Figure 5-9: Linear flow plot of 2001 test of Johnson Well #1.



The data from the Johnson Well No. 1 describe a good straight line on Figure 5-9; however, the straight line is displaced away from the origin along the drawdown axis. The amount of displacement is approximately 27 feet and may be considered to represent the well loss drawdown during the pumping test. When the discharge rate was decreased from 66 to 50 gpm, the slope of the data

changed; however, the data continue to provide a straight-line response indicative of linear flow and displaced away from the origin of the graph by drawdown related to the earlier pumping. After the pumping rate was increased to 62 gpm in the late part of the test, the data did not appear to regain a steady state rate of drawdown. The straight-line responses on Figure 5-9 indicate the aquifer penetrated by the Johnson Well No. 1 provided a linear flow response.

The Johnson Well No. 1 and the neighboring Johnson Well No. 2 are the only wells out of the five tests available to this report that exhibited a release of groundwater storage from the rock containing the fractures. These two wells and the Strawberry View III well which exhibited the response of pumping from a large void, are completed in the Bell Rock Member of the Schnebly Hill Formation whereas the other wells tested, which show the release of groundwater limited to the storage in the fractures with no contribution from the surrounding rock, are completed in upper Supai strata. The limited data therefore indicate the hydraulic properties of the Schnebly Hill Formation are much more favorable to groundwater production than those of the upper Supai strata. The quarter unit slope response indicates much more favorable aquifer conditions at the Schnebly Hill well sites than at the Supai test sites, not only because the quarter unit slope drawdown response is a less rapid rate of drawdown than the half unit slope response, but because the release of groundwater stored in the rock mass of the Schnebly Hill Formation indicates potential for more reliable long-term pumping rates than in the Supai Group.

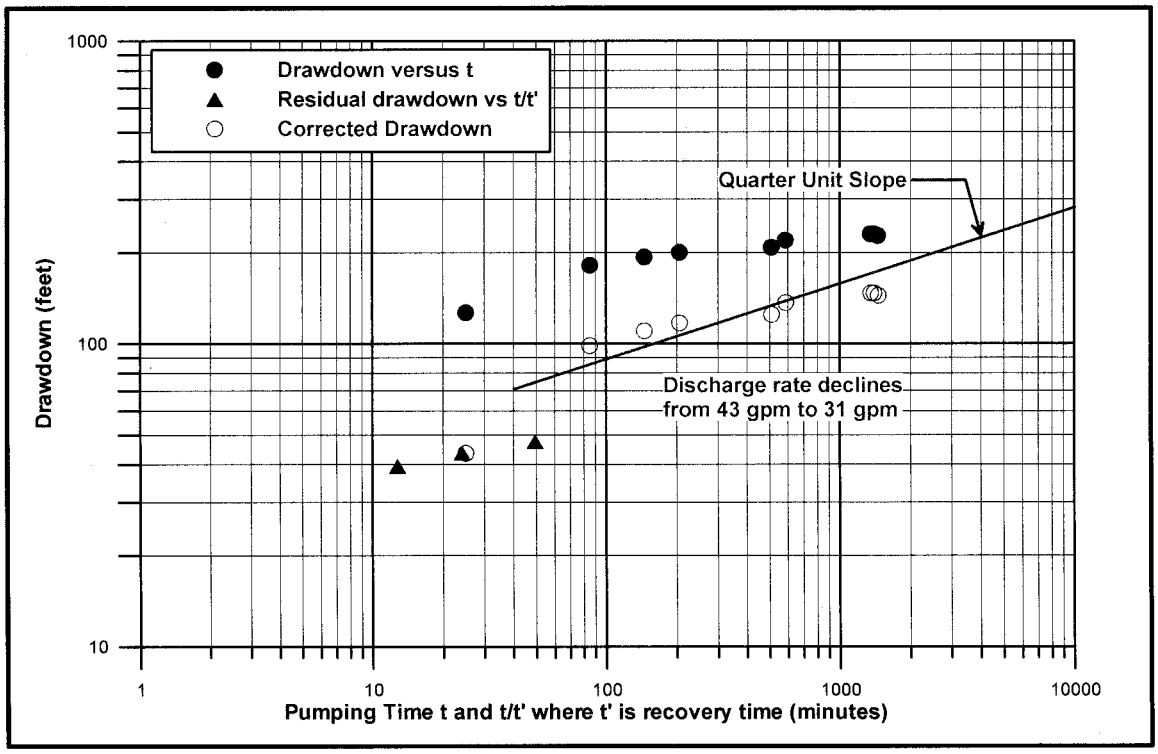
The release of groundwater from storage in the rock surrounding the fractures penetrated by the two Johnson wells implies that a "cone of depression" is developing around the fractures. Although the "cone of depression" may in fact be an elongate area of depressured aquifer extending out from a linear fracture system, the shape is not as important as the fact that drawdown in the rock around the fracture will eventually mimic the response of radial flow to a pumped well. When this happens, the pseudo-radial flow response will conform to a straight line on a semilogarithmic plot, i.e., the Cooper-Jacob solution. Although the tests conducted to date are not of sufficient duration for the Cooper-Jacob solution to be applicable to the available data, the presence of the quarter unit slope and the anticipation of pseudo-radial flow at some time in the future indicates there will be some constant rate yield that the well will support without any further significant loss of yield. This is a much better situation than the half unit slope responses in the Supai wells which dictate a foregone conclusion that drawdown at some duration of pumping will result in a decrease in well yield and that well yield will continue to decrease with increased pumping duration after the onset of decreased yield.

5.6.3. Johnson Well No. 2 Test

Figure 5-10 shows the time-drawdown response of the Johnson Well No. 2 to a "constant" rate test that averaged 32 gpm (based on a time-weighted average of

the different rates during the test). The test response on the diagnostic log-log plot is that of a straight line with a quarter unit slope. The sparse recovery data were used to make an estimated correction for well loss and the corrected drawdown curve is shown on Figure 5-10. When the decline in discharge rate from 43 gpm at the beginning of the test to 31 gpm after 1453 minutes of pumping is taken into consideration, the diagnostic log-log plot of the data conforms reasonably well to a quarter unit slope response. The discussion of the quarter unit slope response provided for the Johnson Well No. 1 is equally applicable to this well.

Figure 5-10: 2001 test of Johnson Well #2 at 32 gpm average rate.



5.6.4. Bloom Well Test

Figure 5-11 shows the time-drawdown response of the Bloom well, on the east side of Pine Creek, to three separate constant rate tests that averaged 30.5, 30.4 and 30.5 gpm, respectively, based on time-weighted averages of the rates recorded during the tests. The durations of the tests were 740 minutes the first day, 720 minutes the second day, and 525 minutes the third day. Figure 5-11 shows the time-drawdown curve flattened after about 500 minutes of pumping during each of the three tests, presumably because the pumping water level had declined to near the pump inlet.

Figure 5-11: 1999 tests of Bloom Well.

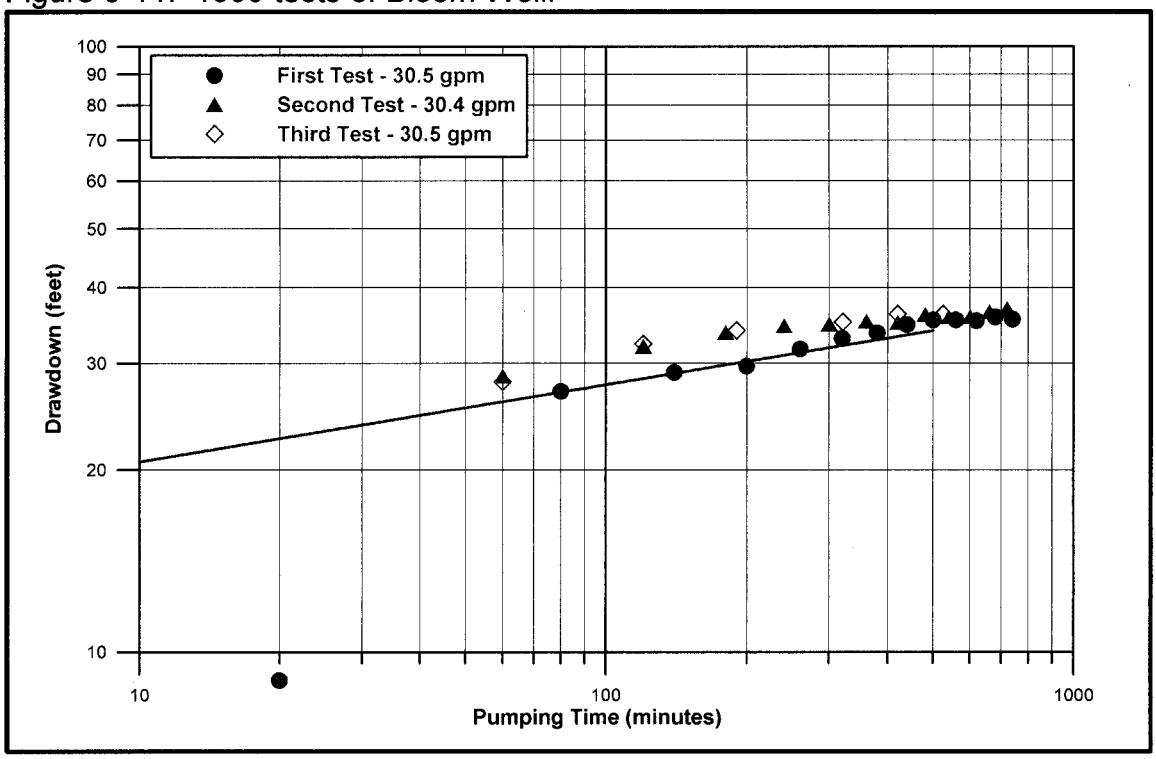
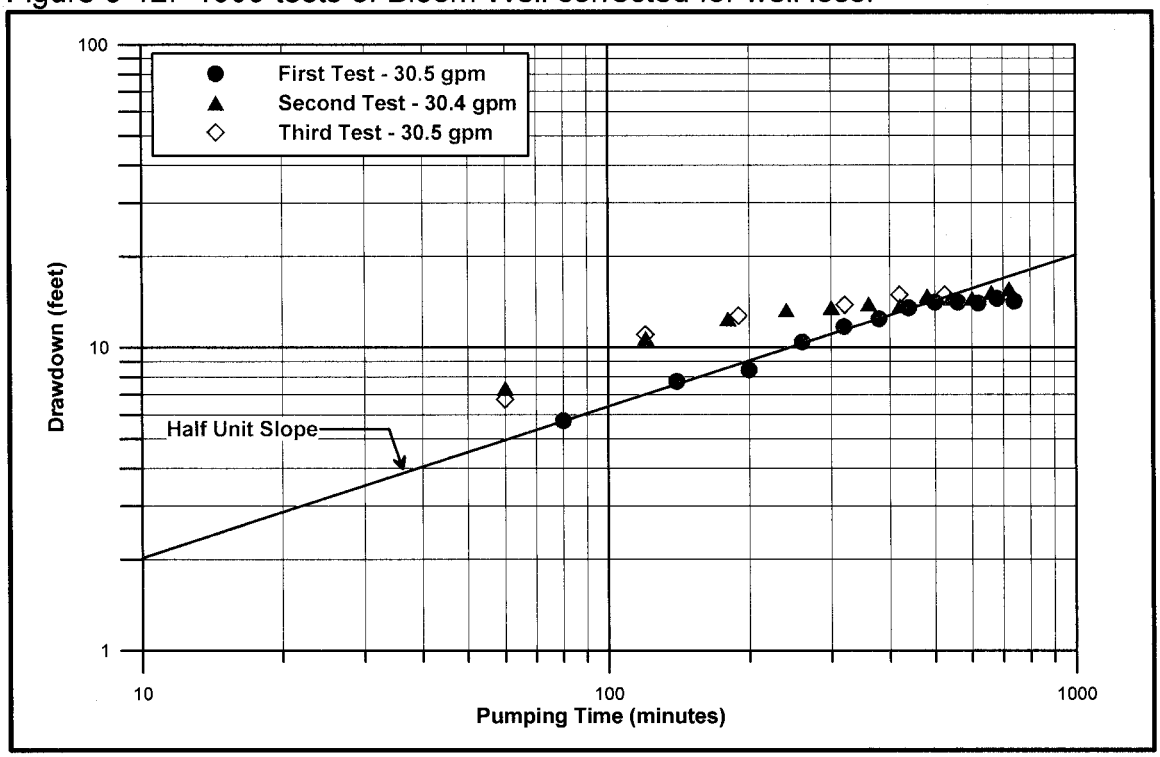


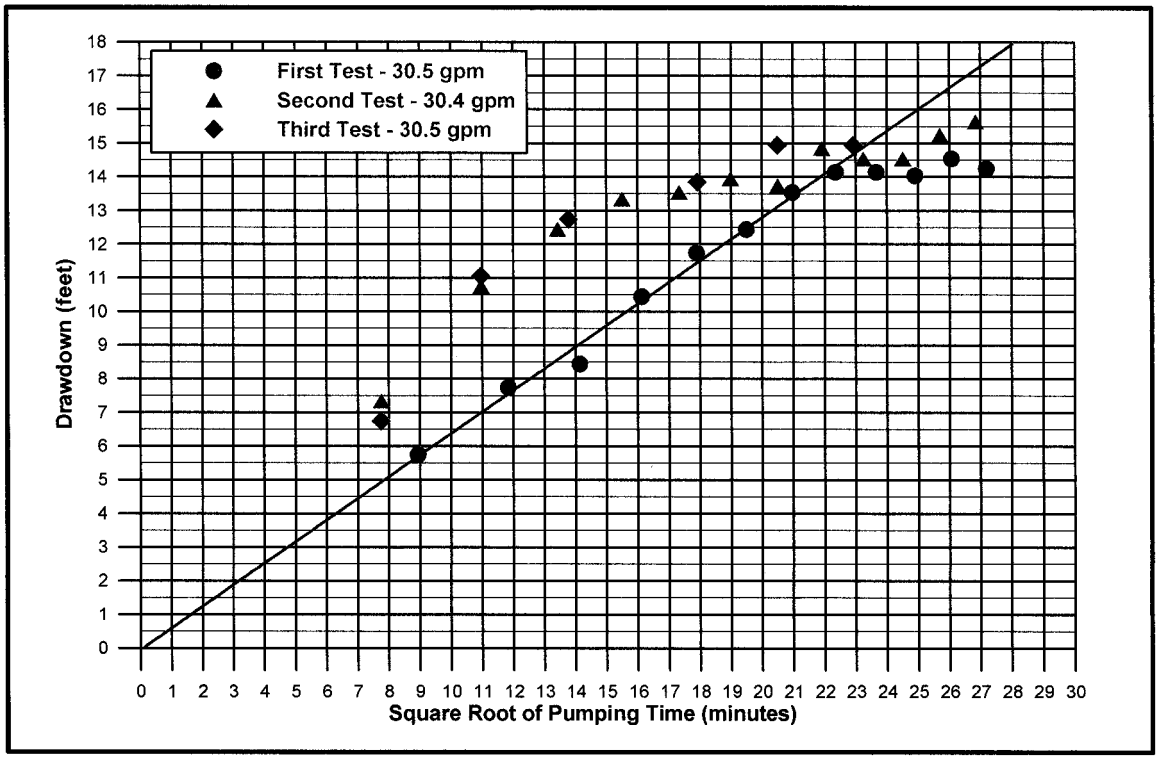
Figure 5-12: 1999 tests of Bloom Well corrected for well loss.



A projection of the test data from the first day of pumping intercepts the drawdown axis of Figure 5-11 at about 21 feet, providing a rough approximation of well loss drawdown. Figure 5-10 shows the time-drawdown data for the three tests as corrected for 21.25 feet of well loss. The basis for 21.25 feet of well loss is that it corrects the specialized plot of drawdown versus the square root of pumping time, as shown on Figure 5-13, to pass through the origin of the time and drawdown axes. The time-drawdown responses of the diagnostic log-log plots of the corrected drawdowns shown on Figure 5-12 follow a half unit slope until the pumping water level essentially stabilizes. This may indicate the water level has approached the pump inlet; however, the records show the pumping rate was consistent throughout each of the three tests and did not decline significantly during the period of stabilized drawdown. This indicates the stabilized drawdown was likely due to recharge from Pine Creek, rather than due to the pumping water level reaching the pump inlet. There is an increase in drawdown between the initial test and the last two tests. The increased drawdown on the second and third day of pumping might indicate the well did not fully recover from the initial day of pumping, or it may simply indicate slight differences in the pumping rates between the three tests due to an imprecise method of observing and measuring the discharge rate.

Figure 5-13 is used to verify the conclusion from the diagnostic plot on Figure 5-12 that the aquifer provided a linear flow response, with the drawdown data

Figure 5-13: Linear plot of 1999 tests of Bloom Well corrected for well loss.



plotting as a straight line versus the square root of pumping time. The plot of drawdown versus the square root of time provides an enhanced view of the difference between the first test response and that of the second and third tests. The slight curvature in the slope of the data in the last two tests indicate they were likely subject to the effect of residual drawdown remaining from the first test. If this interpretation is correct, it indicates the groundwater levels in the aquifer did not fully recover from pumping between tests. The recovery time between the first and second test was 11.5 hours and 12 hours between the second and third tests. It is not unusual for aquifers with linear flow response to require recovery times longer than the pumping durations to fully recover to static levels, a factor that contributes to loss of well yield when such wells are subjected to sustained pumping over long periods. As suggested by Figure 5-13, this results in progressively increasing cumulative drawdown (and associated decrease in well yield) each time a new pumping cycle is started before the well is fully recovered from the previous pumping cycle. Over the course of a season of summer pumping to meet high water demands, the cumulative drawdown may have a significant effect in reducing the yield of the well.

The fact the Bloom well test shows linear groundwater flow to the well as controlled by fractures, and no significant release of groundwater storage from the rock mass bounding the fractures, indicates the aquifer performance cannot be considered representative of the hydraulic properties of the rock mass across the entire width of the aquifer. Therefore, the results of the test are applicable to an unknown but limited part of the aquifer mass and cannot be extrapolated to represent broad areas of groundwater flow through the aquifer. The diagnostic plot also indicates that the Cooper-Jacob straight-line solution is not an appropriate analytical method to determine the hydraulic properties of the aquifer from the pumping test.

5.7. Radial vs. Linear Flow Implications

The verification by this analysis that groundwater flow in the Schnebly Hill and Supai Group takes place along linear flow paths controlled by fractures rather than as a "flux" across the cross-sectional width of flow through porous strata results in several conclusions regarding estimation of the volume of groundwater flow through any given area:

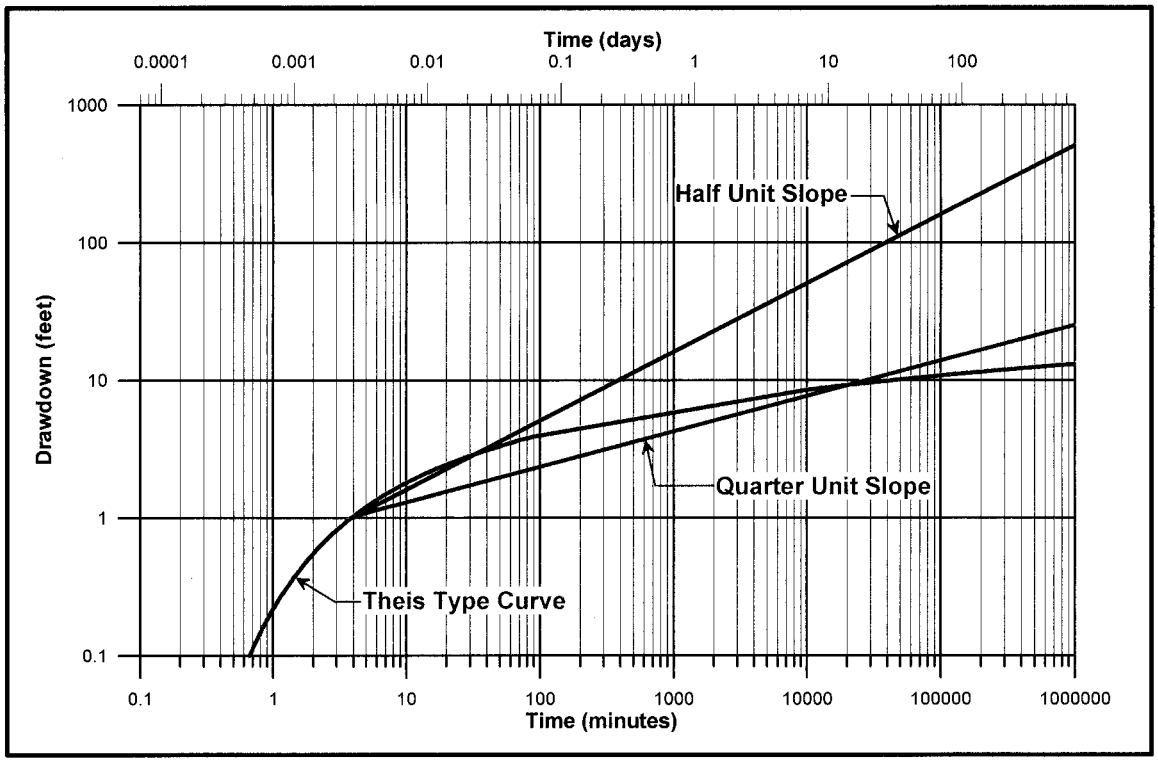
1. The presence of linear flow changes how aquifer transmissivity is determined from the test data. Transmissivity must be calculated from the appropriate linear flow analysis, not from the Cooper-Jacob solution for confined radial flow at late pumping times. The historic calculations of aquifer transmissivity erroneously applied the Cooper-Jacob radial flow solution to aquifer systems exhibiting linear flow.

2. The presence of linear flow changes how the transmissivity applies to the rock mass underneath an area where calculations of an Adequate Water Supply are attempted. The application of the term "transmissivity" to flow through linear fractures is a matter of convenience; however, it must be recognized that linear flow fracture transmissivity is not physically the same as radial flow transmissivity. Whereas radial flow transmissivity, if considered representative, is applied to the entire width of an aquifer system, linear flow transmissivity applies only to the fracture tested and cannot be applied to the remainder of the rock mass under an area of investigation. Moreover, linear flow transmissivity in various fractures across the width of an area may differ greatly from fracture to fracture, a fact demonstrated in the PSWID by the significant differences in well yields from one location to another and from one depth to another. Therefore, fracture flow transmissivity cannot be applied wholesale to estimate the groundwater flow through an area without some consideration of how the width of the fracture flow path is constrained by the fracture boundaries. This step was not taken in the historic calculations of groundwater flow and availability.

3. Control of groundwater movement through the aquifer by linear flow in fractures changes how the sustainability of well yields is assessed. Assuming adequate recharge is available, the sustainable yields of individual wells are constrained by the local hydraulic characteristics of the fractures penetrated. The constraints imposed by the local hydraulic characteristics are described by the response of the aquifer to pumping tests. Therefore, time-drawdown curves from pumping tests provide the fundamental tool to assess the long-term sustainable pumping rates of wells. Simplistically, projection of the time-drawdown response into the future shows how long it will take the water level in a well to decline to the pump inlet. When the water level declines to the pump inlet during pumping, the yield of the well will decrease. Historic evaluations of well yields have been based on application of the Cooper-Jacob method for radial flow, applied incorrectly to linear flow conditions.

Figure 5-14 compares the Theis type curve for radial flow to the half unit and quarter unit responses for linear flow, without and with release of stored water from the host rocks, respectively. Recalling that the Cooper-Jacob solution is simply a modification of the Theis type curve, for that part of the Theis type curve that is changing slowly (after 100 minutes or more on the conceptual example on Figure 5-14), it is clear from Figure 5-14 that the half unit and quarter unit slope drawdown responses obtained by the various historic tests of wells in the PSWID will cause water levels in the wells to reach the pump inlets much sooner than predicted by erroneous application of the Cooper-Jacob or Theis type curve.

Figure 5-14: Conceptual comparison of radial and linear flow response.



It is also apparent in the simplistic conceptual example on Figure 5-14 that the greatest disparity in the predicted pumping water levels is between the half unit slope and the radial flow curve (Theis type curve). Accordingly, erroneous application of radial flow equations to predict drawdown at wells exhibiting a half unit slope, such as the wells completed and tested in the Supai Group in the PSWID, will result in a much greater error than incorrect application of the radial flow equations to wells exhibiting a quarter unit slope, such as the wells completed and tested in the Bell Rock Member of the Schnebly Hill Formation in the PSWID. The conceptual example on Figure 5-14 is consistent with the experience in the PSWID wherein the wells completed in the Supai strata, primarily in the area of Pine, have experienced a greater incidence of lost yield problems than the wells completed in the Schnebly Hill strata in the Strawberry area.

5.8. Precipitation and Groundwater Level Trends

Based on the foregoing considerations, there is little doubt that the most significant factor affecting the reliability of well yields in Pine and Strawberry is the inherent nature of the fractured rock aquifer. Wells abstracting groundwater from fractures with linear flow response typically provide initially good yields that later decrease with increased pumping time. During times of relatively low water demand, when there are ample periods of recovery between pumping cycles, the limitations on the well yields are not obvious. During times of high water

demand, when the periods of recovery between pumping the wells are small, the limitations imposed on well yields by the linear fracture flow conditions become obvious and pronounced with initially high well yields decreasing significantly.

The limitations imposed on well yields by the fracture flow hydraulics take place independently of long-term or short-term fluctuations in groundwater levels. As previously stated, the failure of a well operating under fracture flow limitations to recover fully between pumping cycles becomes cumulative during periods of high demand, causing progressively lower groundwater levels in the well during the passage of time. The progressive decline in the water level in such a well is a function of the pumping rate and duration and is caused because the non-pumping periods are not sufficiently long to allow the groundwater level in the fractures to recover between periods of pumping. However, such a decline is often mistakenly interpreted to be the result of "drought" conditions or a "dry summer"; i.e., it is assumed to result from inadequate recharge.

It is important to recognize that the hydraulic conditions controlling drawdown of water levels and recovery of water levels during pumping and non-pumping cycles in wells subject to linear flow in fractured rock are the cause of the seasonal decreases in well yields and manage the wells accordingly. Stated another way, water systems depending on such wells for water supply will experience seasonal decreases in well yields due to the nature of the aquifer. The seasonal decreases in well yields do not happen because of dry years or inadequate recharge, but occur due to the nature of hydraulic factors controlling the flow to pumped wells in the aquifer.

However, a decline in groundwater levels in the aquifer due to natural recession of groundwater levels during a time of below average recharge is simply added to the decline caused by pumping wells in the fractured rock aquifer, and therefore makes the problems caused by the aquifer hydraulic conditions just that much worse. Accordingly, water users dependent on water wells in such a fractured rock system cannot depend on periods of above average precipitation and recharge to cure the problems caused by the nature of the fractured rock hydraulics. On the other hand, the problems caused by the fractured rock hydraulics will be amplified by groundwater level declines caused by below average precipitation and recharge conditions. Drought conditions exacerbate the limitations imposed on well yields by unfavorable fractured rock hydraulics.

5.8.1. Precipitation Trends

Figure 5-15 shows plots of monthly precipitation values from stations at Childs, Payson, and Heber Ranger Station. The Childs record begins September 1915, Payson, August 1948 and Heber in August 1950. The monthly precipitation values shown on Figure 5-15 exclude any month in which more than five daily precipitation values were missing from the records. Figure 5-15 demonstrates

Figure 5-15: Monthly precipitation.

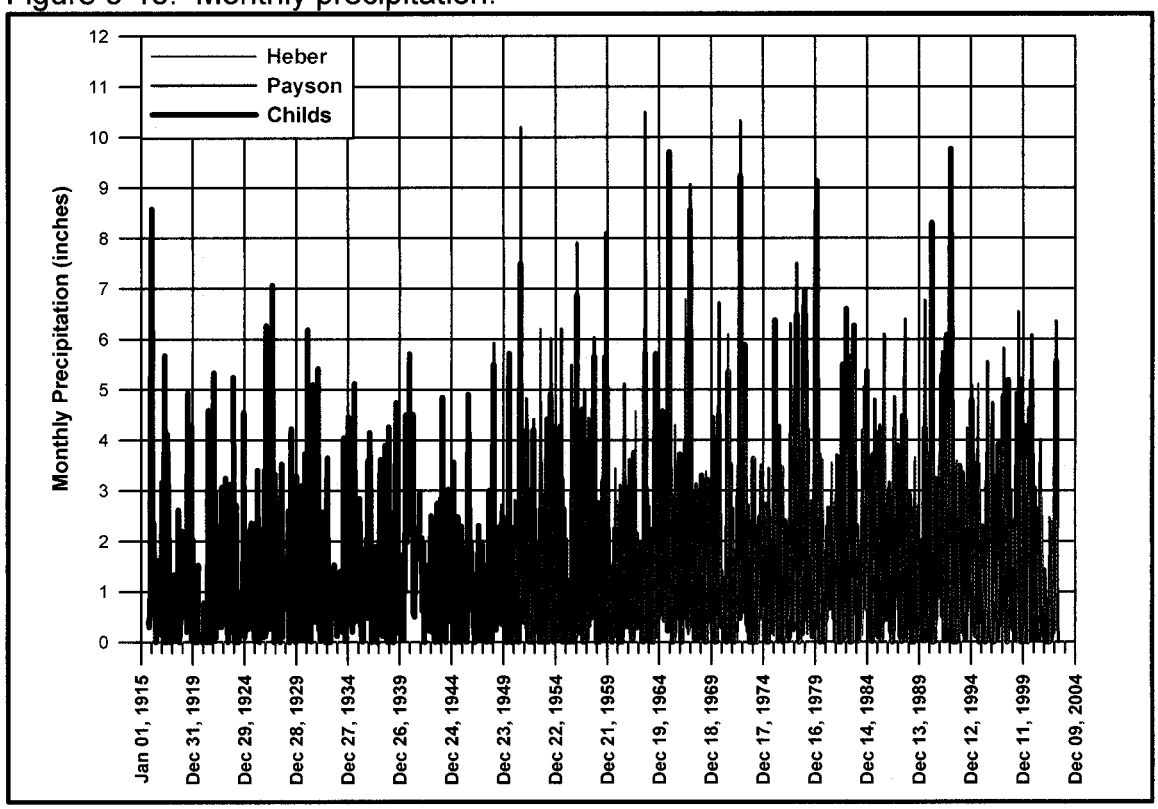
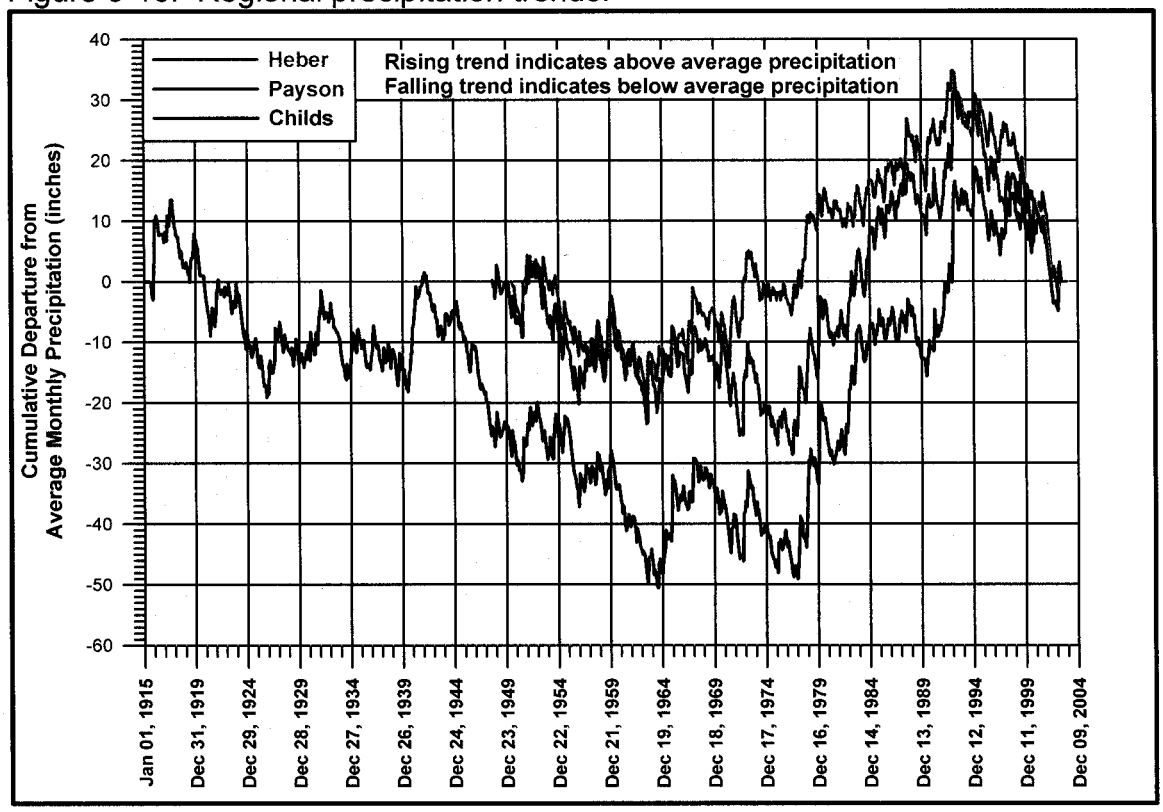


Figure 5-16: Regional precipitation trends.



the difficulty of perceiving trends from monthly or annual values of precipitation or any type of time-series plot.

One tool commonly used to evaluate trends of precipitation, stream flow, and other time-series data is the cumulative departure from an average or mean plotted versus time. Figure 5-16 shows a plot of cumulative departure of monthly precipitation from the average monthly precipitation for the period of record at each of the three precipitation stations. The value of zero cumulative departure corresponds to the average monthly value for the period of record. The fact that cumulative departure values are greater or less than the average value at zero has no particular significance. However, the trend of the cumulative departure is significant in that increasing trends indicate periods of above average precipitation and decreasing trends indicate periods of below average precipitation.

Each of the three precipitation stations shown on Figures 5-15 and 5-16 are located at different elevations and subject to the influence of somewhat different factors. The station at the Heber Ranger station is on the north side of the Mogollon Rim at an elevation of 6,590 feet and perhaps more influenced by winter precipitation than the other two stations. The Payson and Childs stations are on the south side of the Mogollon Rim; however, the Childs station is at an elevation of 2,650 feet whereas the Payson station is at 4,910 feet elevation. Accordingly, the data from the Childs station exhibit more variability than Payson and are more reflective of the desert climate and the influence of summer thundershowers. Considered collectively, the Payson station may most closely represent precipitation trends at Pine and Strawberry; even though the PSWID area probably exhibits its own local characteristics, differing somewhat from the Payson station. However; the precipitation trends at all three stations are essentially the same, with minor variations, and it is anticipated that precipitation trends in the PSWID are likewise similar.

The long-term record from the Childs station shows below average precipitation from 1915 through the end of 1963. The shorter records from Payson and Heber follow the same trend; however, in mid-1962 both the Payson and Heber stations exhibit a change to above average precipitation trends. The above average trend continued at Heber through 1992; however, the Payson record reflects a period of below average precipitation from 1967 through early 1977 before resuming the above average trend through 1992. The lower elevation Childs station shows a similar pattern but with no strong trend developing between 1963 and 1977.

All three stations exhibit a marked increase in above average precipitation between 1977 and 1987 followed by a short period of below average precipitation from mid 1987 through early 1990. The above average precipitation trend resumed from early 1990 through 1992. The overall trend at all three stations, following a long period of below average precipitation ending in 1962 or 1963,

was a period of average or above average precipitation from 1962 or 1963 through 1992, about 30 years, including less than three years of below average conditions from mid 1987 through early 1990, followed by below average precipitation from 1992 to the present (June 2003).

Starting at the end of 1992, all three stations show the onset of a period of below average precipitation that continues to the present. The below average trend accelerates at Heber and Payson beginning in 1998. The trends at Childs are the same, but with more variability. The information on Figure 5-16 supports the ADWR (1987) conclusion that the period from 1977 through 1987 was a period of above average precipitation, thus indicating that the experiences with water shortages, water rationing, and hauling of water starting in 1989 occurred after 10 years of above average precipitation. Therefore, the decreases in well yields and the historic water shortages occurred despite availability of above average precipitation. Hence, it follows that decreases in well yields and water shortages may be worse during below average precipitation and recharge conditions.

5.8.2. Groundwater Trends

Figure 5-17 shows the locations of four wells in the PSWID where the ADWR collects groundwater level data on a reasonably frequent basis. Figure 5-18 compares the precipitation trends to the hydrographs from the two wells at Strawberry, based on the ADWR data. Figure 5-19 compares the precipitation trends to the hydrographs from the two wells at Pine.

The wells at Strawberry are completed in the Bell Rock Member of the Schnebly Hill Formation in the eastern part of Strawberry and therefore enjoy the benefit of groundwater released into fracture flow from the rock containing the fractures. The wells at Pine are completed in the upper Supai, one near the bottom of Strawberry Hollow and the other just east of Pine Creek in the north central part of Pine, and therefore may be assumed to obtain groundwater storage solely from the fractures with no contribution from the rocks containing the fractures.

Regression analysis of the groundwater levels for the two wells in Strawberry (Figure 5-18), limited to that part of the data collected from December 1992 and later during below average precipitation conditions, shows a rate of groundwater level decline ranging from 8.985 feet per year (ft/yr) at Well 1 to 14.416 ft/yr at Well 2. Regression analysis of the data for the wells in Pine (Figure 5-19) indicates a rate of groundwater level decline of 2.176 ft/yr at Well 3 and no rising or declining trend at Well 4. Thus, declining groundwater level trends in both wells at Strawberry and at one well in Pine show correspond to the period of below average precipitation conditions. The fact that Well 4 in Pine does not show an upward or downward trend in water levels is probably due to recharge of the fractures penetrated by the well by infiltration of local surface water into the upper Supai strata out of Pine Creek.

Figure 5-18: Well hydrographs compared to precipitation trends at Strawberry.

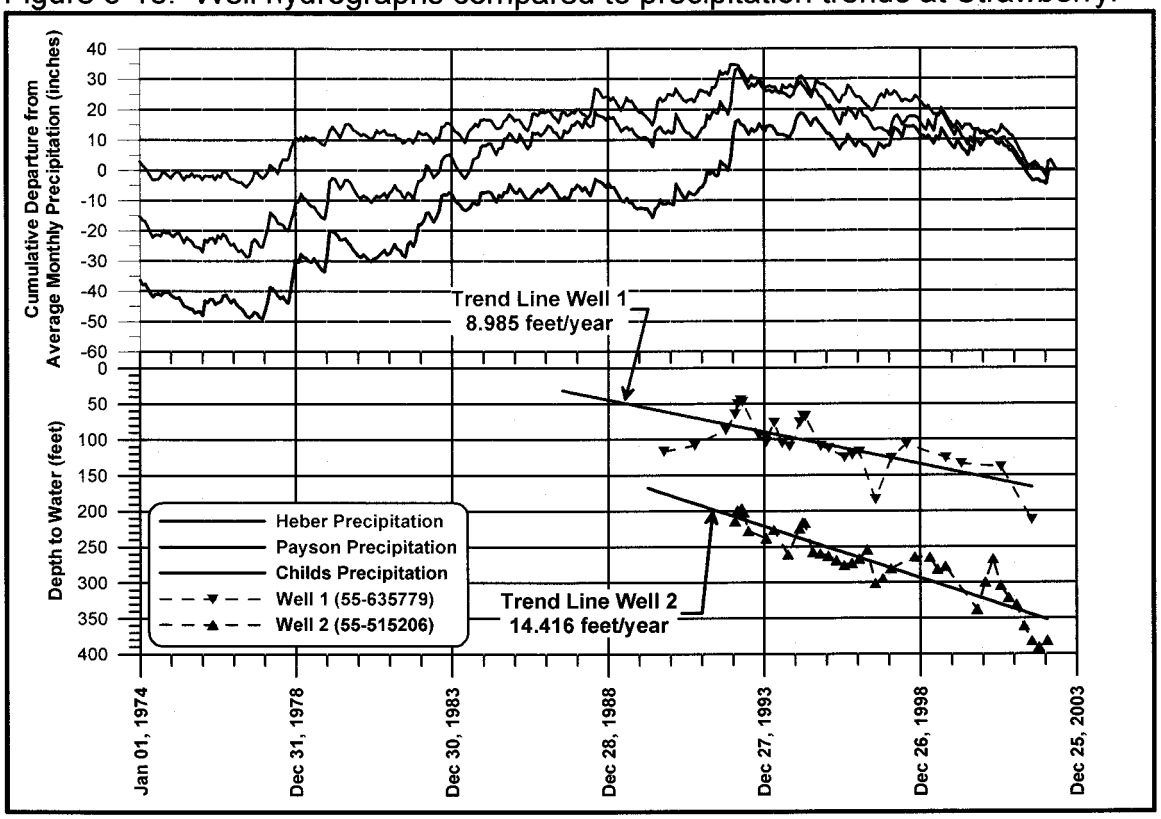
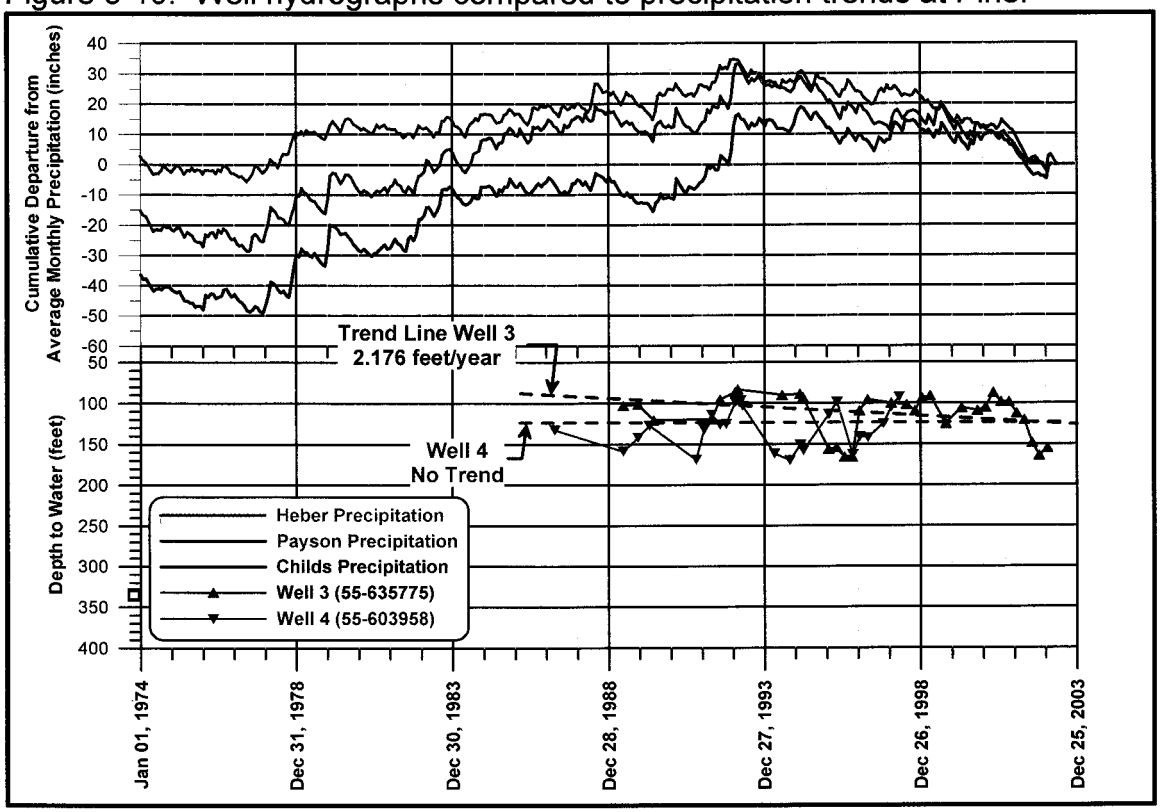


Figure 5-19: Well hydrographs compared to precipitation trends at Pine.



The relationships shown on Figures 5-18 and 5-19 do not support a distinction between the long-term decline of groundwater levels caused by pumping versus the natural recession rate of groundwater levels caused by below average precipitation and recharge. This is because each of the wells monitored for groundwater levels is a pumped well used for community or domestic water supply. Each hydrograph therefore potentially includes an element of long-term drawdown caused by the pumping.

The groundwater hydrographs (with the exception of Well 4 which is suspected to be subject to localized recharge) exhibit long-term trends indicating declining groundwater levels since the end of 1992. The hydrographs also show short-term or seasonal fluctuations superimposed over the long-term trends. In nearly all instances, the short-term seasonal pumping induced fluctuations recover fully back to the trend lines, suggesting that below average precipitation conditions are a significant factor in the long-term declining trends. However, the differences in the rates of recession between the trend lines imply that pumping rates and durations also play a role in creating the long-term trend. The other variable that likely affects the long-term trends is differences in local fractured rock aquifer hydraulics between the three well sites and differences in pumping rates and/or durations at the three wells. Data have not been sought in this investigation regarding the latter factors.

Well 1 (ADWR 55-635779) - Although it is not possible to separate the long-term declining groundwater level trends into components for pumping versus precipitation causes, the significance of the trends cannot be lost on anyone examining the data. At an average annual recession rate of 8.985 ft/yr, the 11-year average decline in the groundwater level at Well 1 in Strawberry, since the onset of below average recharge conditions began at the end of 1992, is 98.8 feet. The highest groundwater level depth at Well 1 was 44.8 feet on April 21, 1993 and the lowest level, subject to seasonal pumping effects superimposed over the long-term trend on August 16, 2002, was 212.35 feet or a total decline of 167.55 feet for long-term recession combined with seasonal pumping effect in about 10 years.

Well 2 (ADWR 55-515206) – At an average annual recession rate of 14.416 ft/yr, the 11-year average decline in the groundwater level at Well 2 in Strawberry is 158.6 feet. The highest groundwater level depth at Well 2 was 195.8 feet on April 21, 1993 and the lowest level, subject to seasonal pumping effects superimposed over the long-term trend on November 5, 2002, was 390.6 feet or a total decline of 194.8 feet in about 10 years.

Well 3 (ADWR 55-635775) – At an average annual recession rate of 2.176 ft/yr, the 11-year average decline in the groundwater level at Well 3 in Pine is 23.9 feet. The highest groundwater level depth at Well 3 was 83.3 feet on March 18, 1993 and the lowest level, subject to seasonal pumping effects superimposed

over the long-term trend August 16 through November 14, 1996, was 165.6 feet or a total decline of 82.3 feet in about 3.5 years. The long-term trend of declining static levels has continued at this well; however, the pumping pattern reflects decreased use until early 2002 when combined long-term decline and short-term pumping cause a depth of water of 164.1 feet by November 5, 2002.

Well 4 (ADWR 55-603958) – Data collected from Well 4 do not exhibit a trend. Seasonal fluctuations caused by seasonal pumping are about 75 feet. As previously stated, it is likely the fracture system from which this well abstracts groundwater is locally recharged by infiltration of surface water from Pine Creek or infiltration of groundwater from the alluvial deposits along Pine Creek. The available recharge must exceed the capacity of the fracture system to accept recharge, thus causing the groundwater level in the well to return to essentially the same level every year. Likewise, operation of the pump causes the pumping water level to decline to essentially the same level every year, during the period of high demands for water.

5.8.3. 2001 to 2002 Season

The long-term recession rates exhibited by the wells monitored by the ADWR, particularly those at Strawberry, are alarming. It does not matter if the cause of the declining groundwater levels is pumping or drought conditions or a combination thereof; however, the recession rates correspond to below average precipitation conditions, showing that the droughty conditions are a contributing factor to the loss of well yield associated with declining groundwater levels. Wells 1, 2 and 3 all exhibit a pronounced decline in groundwater levels starting in early to mid-2001 that continues until late 2002. Data are not available from Well 4 for the same period of time. The data show a small recovery in February 2003 but more current data are not available to see if the recovery continued past February 2003. Well 3 exhibits a similar fluctuation in 1993-1994, but the other wells do not exhibit a similar fluctuation of drawdown-induced pumping spanning more than one season.

The groundwater decline in response to pumping during 2001-2002 appears to be greater than in previous years in the period of record. This is particularly true at the domestic well, Well 2 (ADWR 55-515206) in Strawberry. Pumping caused the depth to water in this well to decline from a depth of 266.9 feet on May 17, 2001 to 390.6 feet on November 5, 2002. The depth of 390.6 feet to water was the lowest water level recorded in this well since the record started February 17, 1993 by 52.7 feet.

The relatively anomalous declines in groundwater levels in the monitored wells during pumping in the 2001-2002 period correspond to the period of accelerated departure of monthly precipitation below the average value, as can be seen on Figures 5-18 and 5-19. The record is presently too short to make conclusions about the slight recovery of groundwater levels in February 2003; however, that

recovery corresponds to a trend in cumulative departure from average precipitation of three months of above average precipitation, including the February 2003 value. The foregoing relationships suggest the unusually dry conditions in 2001-2002 caused the anomalously large decline in associated groundwater levels either directly or indirectly. The decline may have been caused directly by the effects of inadequate recharge or it may have resulted indirectly from increased pumping durations during the dry period.

5.8.4. Summary

The historical documentation reveals that production of groundwater from the Schnebly Hill and upper Supai strata is inherently limited by the hydraulic characteristics of groundwater flow through fractures to the pumped wells. The fractures highly constrain the flow to pumped wells such that initially good yields progressively decrease as pumping duration increases and associated non-pumping times for recovery of groundwater levels decrease. Moreover, the potential for competition and interference between wells completed in this type of aquifer system is high, suggesting that the ability to overcome the problem of constrained well yields by simply drilling more wells into the system is limited due to the potential for mutual interference between wells.

Comparison of groundwater level hydrograph data collected by the ADWR from pumped wells in the PSWID area to long-term precipitation trends indicates that the seasonal declines in well yields caused by the inherent hydraulic properties of the aquifer system are amplified by below average precipitation conditions. However, historic shortages of water occurred during extended periods of above average precipitation trends; therefore, the historic water shortages were not the product of drought conditions but resulted from the demand for water exceeding the production capacity of the wells, as limited by the aquifer hydraulic characteristics, particularly in the Pine area which offers less favorable aquifer characteristics than the Strawberry area.

It is concluded, based on the foregoing considerations, that the adequacy of the groundwater resource in the Schnebly Hill and upper Supai aquifer system in the PSWID has been demonstrably inadequate to support the historic and currently existing levels of demand for residential water supply in the Pine area and marginal in the Strawberry area and therefore does not offer any reasonable potential to support continued population growth in the PSWID area with the concomitant need for increased production of water supply. Accordingly, it is necessary to seek alternative sources of water for the PSWID communities.

6. ALTERNATIVE WATER SOURCE

Preliminary steps to identify an alternative source of water were taken in Strawberry in May and June, 2000, through a cooperative effort of the Northern Gila County Water Plan Alliance, the PSWID, Gila County, the U.S. Forest

Service, the U.S. Bureau of Reclamation, the U.S. Geological Survey, the Arizona Department of Water Resources, the Salt River Project, and the City of Payson. The collective effort of these entities resulted in the funding and accomplishment of an exploratory drilling program to gather information about the deep subsurface geology of the area, culminating in construction of an 1,872-feet deep well at Strawberry in 2000, referred to herein as the "Strawberry Borehole".

The Strawberry Borehole was successful in determining that groundwater is present in the Redwall and deeper strata; however, funding limitations and construction difficulties prevented the well from being completed in a manner in which it could be subjected to pumping tests. Accordingly, the well can presently be used to monitor the groundwater level in the Limestone Aquifer at this location, but has not provided information about the potential yield from the Limestone Aquifer.

In July 2002, the PSWID released a Request for Proposals (RFP), seeking a consultant to help build on the previously collected information to identify new sources of water supply for future development. The introduction to the RFP summarized the objectives of the study as follows:

> "***The Pine/Strawberry Water Improvement District is seeking a qualified firm, or firms, to provide Geohydrologic/Engineering Services for the development of a District Water Resource and Action Plan directed at development and the well siting of deep production wells in the Pine/Strawberry area of Gila County, Arizona.***
>
> ***The Pine/Strawberry Water Improvement District is seeking new sources of potable water that would be less sensitive to drought and climatic changes than the currently used water sources.***
>
> > ***HISTORICAL PERSPECTIVE: The Pine & Strawberry area of Gila County is a Community of historical significance in Arizona. The Community's domestic water needs are largely obtained from ground water and served by a mix of private wells, regulated water utilities, and domestic water improvement districts. The Pine/Strawberry Water Improvement District (District) boundaries encompass the general extent of the area, including the entities listed above, but the District itself does not provide domestic water service to the Community. The map showing the approved boundaries of the***

District is shown in Appendix A. The Arizona Department of Water Resources has deemed this area to have an "inadequate water supply."

Efforts have been under way for several years to collect data and begin the process of identifying potential sources. The Northern Gila County Water Plan Alliance (of which the P/SWID is a partner) in cooperation with the Arizona Department of Water Resources is in the third year of a five-year geologic-hydrologic study of the Mogollon Highlands (which includes the Pine-Strawberry area). This five-year study is being conducted by the U.S. Geologic Survey and is described in more detail on the USGS website. In June of 2000, the Northern Gila County Water Plan Alliance, in partnership with the Pine/Strawberry Water Improvement District, Gila County, the Arizona Department of Water Resources and the U.S. Forest Service completed the drilling of an exploratory borehole, approximately 1870 feet deep, in the community of Strawberry. Geological samples gathered during the drilling process have been documented and used to correlate with previously obtained geologic information to formulate an opinion of the sub-surface geology of the immediate area. Groundwater was encountered during the drilling process and water in the borehole presently stands at approximately 1380 feet below the surface. A detailed report of findings, prepared by the Arizona Department of Water Resources, is also available for this project.

The Pine/Strawberry Water Improvement District would like to build on the available data and proceed in identifying potential sites for future production wells capable of accessing a more reliable groundwater source." (P/S 2002 DOCUMENT Dated 07/23/02)

The investigation of alternate sources of water reported herein has been conducted pursuant to the objectives stated in the above RFP.

The hydrogeologic conditions in the region around and including the PSWID offer three potential sources of groundwater for development consisting of the perched aquifer in the volcanics, where present; the Regional Aquifer system consisting of the Kaibab, Coconino, Schnebly Hill, and Supai strata; and the deep Limestone Aquifer.

Only the Schnebly Hill and Supai strata are present within the PSWID as a known aquifer system. Basalt layers (volcanic rock) are present as caps on Strawberry Mountain and the Mogollon Rim, including Milk Ranch Point;

however, their topographic positions indicate they offer little potential for storage of groundwater and are largely drained out to the adjacent lower terrain, thus offering little or no potential as sources of water supply.

Kaibab and Coconino strata are present north of the Mogollon Rim but offer two potential disadvantages. One disadvantage is that topographic features such as Pine Canyon, Strawberry Canyon, Weber Creek, Calf Pen Canyon, and Fossil Creek Canyon are all incised through the Kaibab and Coconino strata and therefore drain groundwater out of the formations throughout the area reasonably near to the PSWID. Accordingly, wells drilled into the Kaibab-Coconino part of the Regional Aquifer immediately north of the PSWID will penetrate a significantly drained part of the aquifer. A related condition is the fact that the portions of the Kaibab-Coconino aquifer immediately north of the PSWID area is at the uppermost end of that aquifer system and therefore offers limited groundwater storage, even where not drained out to lower terrain. It is probable that groundwater abstraction rates required to satisfy present and future demands for water in the PSWID will result in mining of groundwater in the Kaibab-Coconino system along the northern edge of the PSWID area with resultant depletion of the available groundwater storage that is already affected by drainage to lower terrain. The second potential disadvantage of the Kaibab-Coconino system is that a long pipeline will be required to convey water to the PSWID from potential well sites in this system.

The strata of the Limestone Aquifer are present in the subsurface of the PSWID and outcrop at the southern edge of Pine. However, they have not been historically regarded as a potential source of groundwater, partly because of the history of certain wells in the Pine area penetrating dry voids in the Redwall strata into which drained the production from the overlying Supai strata, leaving the wells with no water for production. Hix (1978; p. 23) dismissed the Limestone Aquifer as a potential source of groundwater, stating:

> "***There have been reports of water wells within the Pine area that have been lost when dynamite was used to loosen the rock. This is what would be expected of a formation in which the water was controlled by solution channels rather than a consistent permeability. Aquifers of this type are generally unreliable producers and are subject to contamination and seasonal variations in rainfall. Drilling water wells with targets of this nature is risky and could be considered a hit or miss proposition.***"

In addition to the foregoing unfavorable description of the Redwall Limestone as a potential aquifer, it has been recognized that the surface flow of Pine Creek historically submerged into the alluvial gravel along its channel and did not resurface downstream where the gravel is dammed by the Mazatzal quartzite. It was correctly perceived that the historic loss of surface flow occurred along the

surface channel of Pine Creek near where the alluvium rests on the Naco Formation and Redwall Limestone, and that the water was lost to the Redwall. The loss of surface flow into the Redwall Limestone was taken as another indication of the fact that the unit was above the water table and dry.

Completion of the Strawberry Borehole project, demonstrating that groundwater is present in the Limestone Aquifer in the subsurface of the PSWID, changed the perception of the problem from one of concluding that no groundwater was available in the Redwall/Martin strata to one of recognizing that the strata might be dry under only part of the PSWID and wondering where to drill to develop water from a part of the Limestone Aquifer that is not dry. A preliminary review of the existing information, including the ADWR (1987) and ADWR (1989) reports about the area and the declaration by ADWR that the PSWID is an area of "inadequate water supply", focused the attention of this investigation away from the Supai strata, and away from what is now recognized as Schnebly Hill strata. Likewise, review of the available data focused attention away from the Kaibab-Coconino strata as the first priority for identifying a new source of water. Instead, the primary focus of this investigation was the Limestone Aquifer consisting of the Redwall Limestone and Martin Formations.

6.1. Fossil Springs

One of the factors that focused the attention of this investigation on the Redwall/Martin strata early in planning the work is the discharge from Fossil Springs in the canyon of Fossil Creek. Fossil Spring discharges from the Redwall Limestone near the contact with the Naco. The spring has been variously described as from the Naco or the Redwall due to the juxtaposition of the several hundred yard long spring zone along the contact between the two formations, but there is no doubt the main source of the flow is groundwater discharged from the Redwall Limestone.

Figure 6-1 is a hydrograph of the flow diverted from the channel of Fossil Creek below Fossil Springs into a flume conveying the water to the Irving Power Plant some 4.5 miles downstream. The measured flow is water diverted to the power plant and does not include small flows that bypass the diversion and continue down the streambed of Fossil Creek. Likewise, the measurements of the diversion do not distinguish between water discharged from Fossil Springs and flow in Fossil Creek from the watershed upstream from Fossil Springs. However, most of the time the flow is essentially all from Fossil Springs and most of the time nearly all of the flow is diverted into the flume. The few times in the record when the measured flow is less than 38 to 40 cubic feet per second (cfs), it is because not all the water is being diverted, i.e., the fluctuations that show relatively low flows are related to changes in the diversion into the flume, not to changes in the discharge rate from Fossil Springs.

Figure 6-1: Monthly average flow at USGS gage on Fossil Creek.

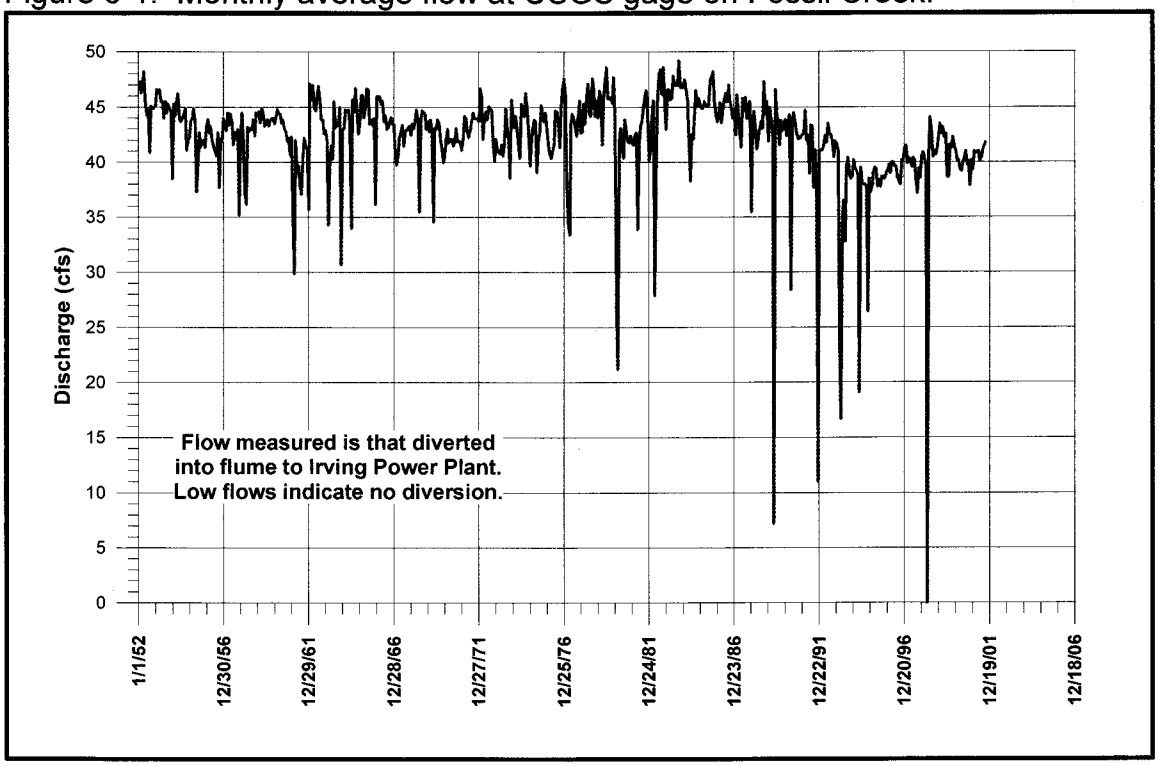


Figure 6-2: Cumulative departure from monthly average flow to Irving Plant.

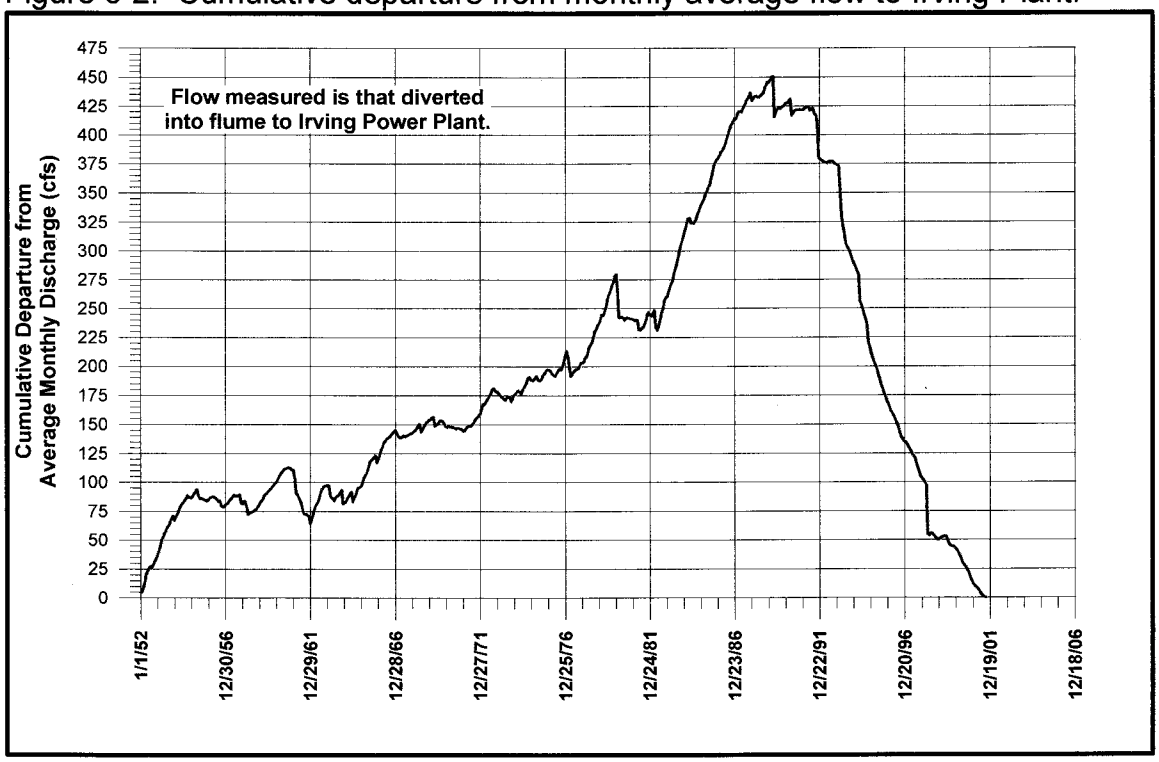
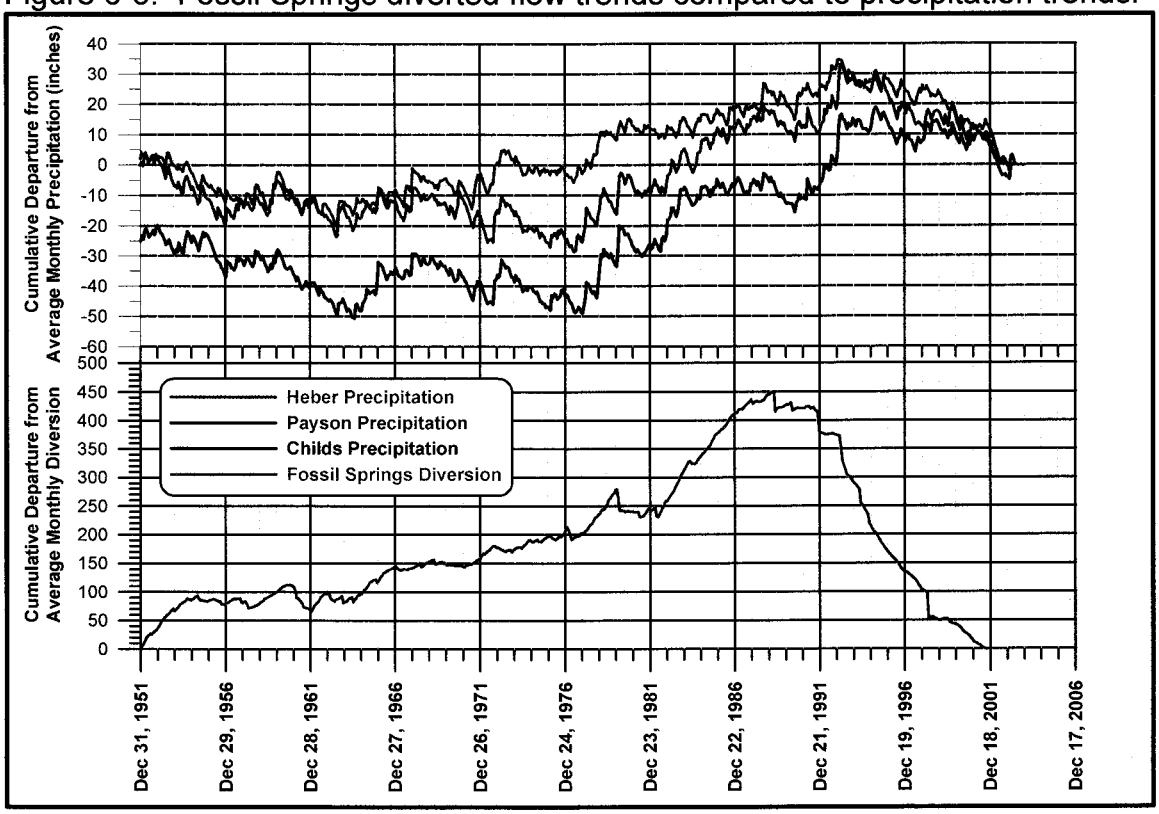


Figure 6-3: Fossil Springs diverted flow trends compared to precipitation trends.



The flow of diverted water averages 42.3 cfs for the period of record shown on Figure 6-1. A cubic foot per second (cfs) is equal to 448.86 gallons per minute so an average flow of 42.3 cfs is equivalent to an average flow of 18,987 gpm.

Figure 6-2 shows cumulative departure from the average flow for the period of record. The hydrograph on Figure 6-1 shows seasonal fluctuations of 3.5 to 5.0 cfs (depending on what period of time in the record is examined) superimposed over the long-term trends of the hydrograph. The seasonal fluctuations are likely the measure of the range of surface water flow contributed from the Fossil Creek watershed upstream from Fossil Springs. Since they are small (3.5 to 5.0 cfs) with respect to the average flow of 42.3 cfs, it may be concluded the long-term trends reflect trends in the discharge from Fossil Springs. This being the case, the trends of the cumulative departure plot on Figure 6-2 indicate the trends of the discharge from Fossil Springs and therefore, reflect the trends of the groundwater elevations in the Redwall Limestone or Limestone Aquifer at this location.

Figure 6-3 provides a comparison of trends in the diverted flows to regional precipitation trends. As described previously, the relationship to zero cumulative departure is not significant; however, rising, constant, or falling trends indicate above average, average, or below average conditions, respectively. The trends of the diversion flows are, of course, potentially modified to an unknown extent by

how the diversion was operated. Taking into account potential modification by diversion operations, there is a reasonably good correlation between the regional precipitation trends and trends in the amount of water diverted, thus showing there is a correlation between the flow of groundwater from Fossil Springs and regional precipitation trends.

The long-term range of flow from Fossil Springs, as shown on Figure 6-1, is therefore from a maximum of approximately 47 cfs, in the above average precipitation period between 1977 and 1987, to a minimum of about 37.5 cfs, in 1993, during a period of below average precipitation, all ± 5.0 cfs or less of surface water flow. This is equivalent to a range in flow from 18,852 to 14,588 gpm when a surface water flow contribution of 5.0 cfs is subtracted from the total diverted flow.

The long-term flow from Fossil springs, ranging from an estimated 14,588 to 18,852 gpm over a 50-year period, indicates the flow from the springs discharges from a relatively large body of stored groundwater that is sensitive only to long-term trends in precipitation and recharge and relatively insensitive to seasonal and other short-term trends. This degree of reliability satisfies one of the principal tenants of the PSWID RFP, namely, identification of "***sources of potable water that would be less sensitive to drought and climatic changes than the currently used water sources.***" Accordingly, the work plan for this investigation was focused on determining where to drill to develop a water supply from the large body of groundwater storage in the Redwall Limestone and associated strata.

6.2. Redwall Limestone Structure

Once the Redwall Limestone was identified as a primary target for drilling, selection of a favorable location was a matter of geometry between the land surface elevations, the elevations on the top of the Redwall, and the elevation of the potentiometric surface (water table). In order to determine the structure of the Redwall and its relationship to the potentiometric surface of the groundwater as well as to the land surface, a precision survey was made to control points on the geologic structure, utilizing precision GPS surveying methods.

The control points were surveyed on the basal contact of the Fort Apache Member of the Schnebly Hill Formation. The Fort Apache Member, referred to colloquially as the Fort Apache limestone, is a geologic horizon that provides a marker bed of regional extent on the southernmost end of the Colorado Plateau. Locations of the control points were selected carefully to provide an adequate and appropriate distribution of data to support construction of a structural elevation map of the unit by standard statistical methods. A major consideration in selecting the control points was consideration of the various faults mapped by Weisman (1984) and Weisman and Weir (1990). The control point locations were selected to minimize or eliminate the influence of faults on statistical

projection of a surface between the points. It was easy to minimize the effect of the faults due to their localized extent and due to their relatively small offsets. The influence of faults with large offsets, extending into the area from the north (Weisman and Weir, 1990) was avoided by locating the control points so as not to straddle such faults. The statistical method used to project the structural surface between the data points was first-order Kriging applied with Golden Software Surfer™ 8.0. Appendix A contains the coordinates for the surveyed control points used to construct the structural contour maps in this report.

After control elevations were established on the base of the Fort Apache Member, it was necessary to adjust those elevations to the top of the Redwall Limestone. This was accomplished by subtracting a constant thickness of 1,279 feet from the Fort Apache Member elevations. The basis for the 1,279 feet between the base of the Fort Apache Member and the top of the Redwall Limestone is as follows:

Schnebly Hill Fm. Below Fort Apache Mbr.	479 feet
upper Supai	330 feet
lower Supai	215 feet
Naco Formation	255 feet
Total Thickness	1,279 feet

Figure 6-4 depicts the structural elevation contours projected to represent the top surface of the Redwall Limestone in the PSWID area and shows the locations of the control points, including the Strawberry Borehole, used for statistical construction of the map. The Schnebly Hill Formation includes 40 feet of Fort Apache Member, 390 feet of Corduroy Member referred to as upper Shcnebly Hill above the Fort Apache Member, and 479 feet of combined Bell Rock and Rancho Rojo Members referred to as lower Schnebly Hill on Figure 6-4. The geologic formation contact lines on all figures represent the lines of zero depth from the land surface to the projected structural surfaces.

The structural elevation contours on the upper surface of the Redwall Limestone, shown on Figure 6-4, are valid only within the area circumscribed by the control points and are not valid if projected across major faults such as the north-south aligned fault between Tin Can Draw and Sandrock Canyon that cuts across Nash Point. It is not clear if the latter fault extends through the subsurface southward across the west end of the Strawberry Valley, obscured by basalt and residuum, or if it ends on Nash Point; however, the structural contours suggest the fault extends across the west end of the Strawberry Valley.

The Redwall structure, assuming it is congruent to that of the Fort Apache Member, dips gently to the northwest. An anomalous low in the structure occurs under Strawberry Mountain and extends under the eastern end of Strawberry Valley. The low area in the structure is well defined by data points, including

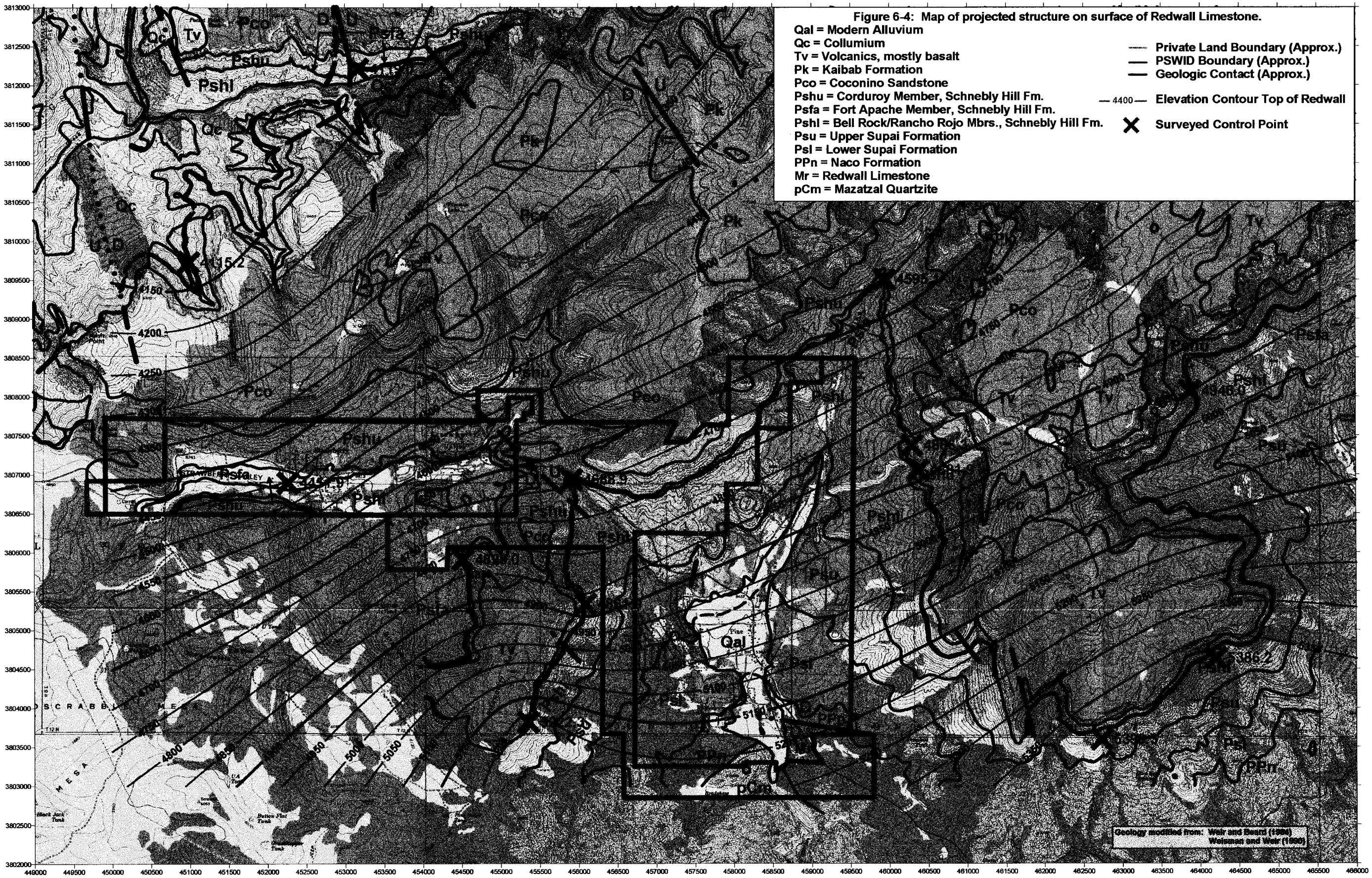


Figure 6-4: Map of projected structure on surface of Redwall Limestone.

OVERSIZED DOCUMENT

Figure 6-5: Locations of geologic cross section

SEE SUPERVISOR (EXHIBIT CABINET)

Figure 6-6: Cross Section A to A' - Groundwater elevations projected to line of section.

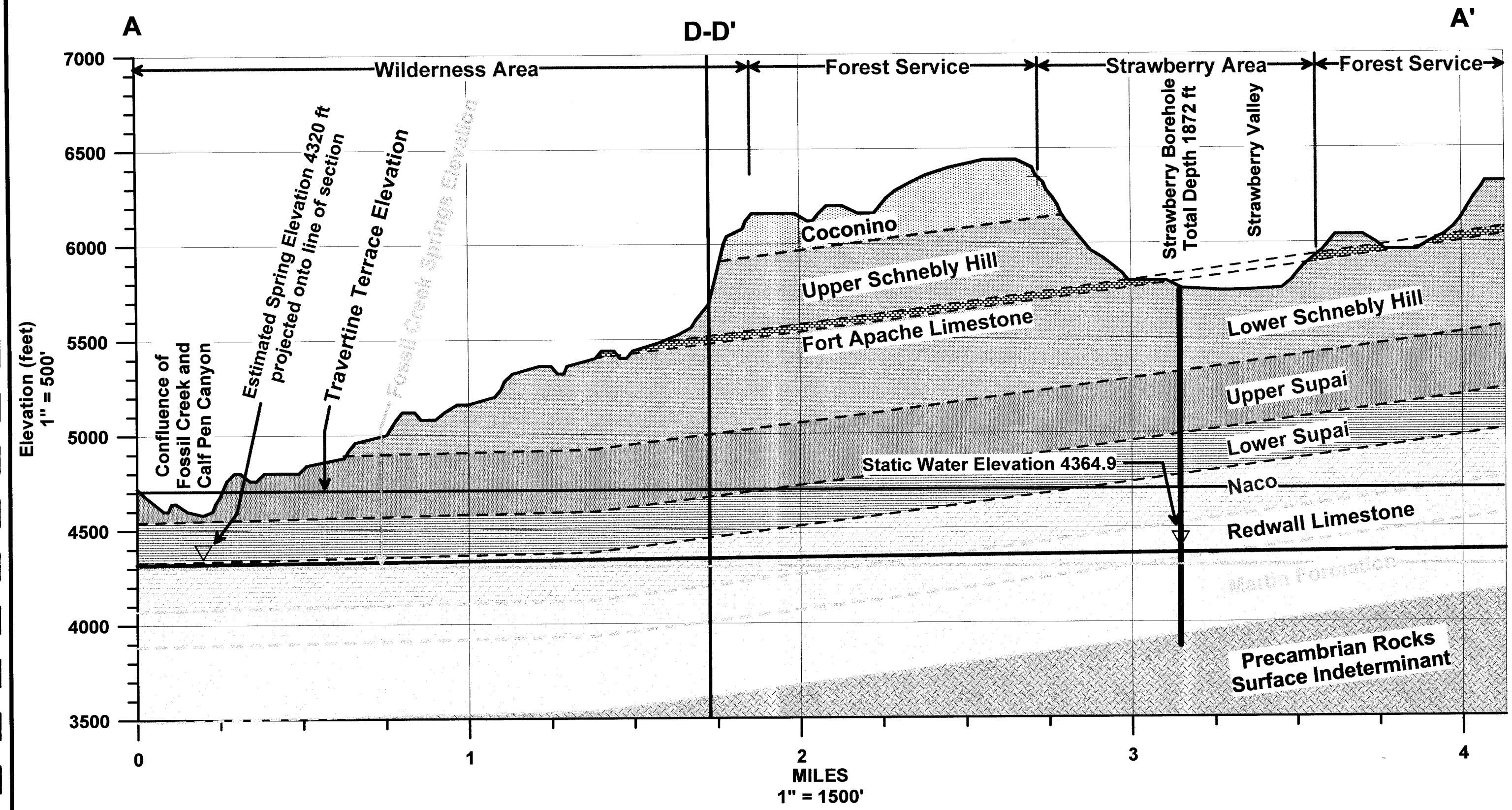


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Figure 6-7
6-8
&
6-9

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(EXHIBIT CABINET)

three on Strawberry Mountain, one along the highway in the pass at the head of Strawberry Hollow, and the Strawberry Borehole. The data suggest the presence of a north northwest- by south southeast-aligned fault along the northern third of the east side of Strawberry Mountain. The suggested fault is not shown on Figure 6-4; however, the change in the alignment of the structural contours is pronounced and indicates a vertical offset of about 50 feet along an unrecognized and unmapped fault between the toe of the east flank of Strawberry Mountain and Strawberry Hollow.

Weisman and Weir (1990) show a fault near the above location, projected out of a shear zone with 20 feet of offset, identified by Weisman (1984); however, the data control point at the northeast side of Strawberry Mountain shows that the fault alignment of Weisman and Weir (1990) is too far east to explain the structure defined by the structural elevation contours. The fault alignment shown on the map by Weisman and Weir (1990) is very tenuous to identify in the field, with the only observed exposure being that identified by Weisman (1984) and exhibiting about 20 feet of downward displacement on its south side. Weisman (1984; p. 75) states that an earlier thesis map (Jackson, 1951) identified a high-angle normal fault in Strawberry Hollow that Weisman (1984) could not identify. Weisman (1984) limited the fault to the recognized shear zone south of Strawberry Hollow and Weisman and Weir (1990) extended the shear zone northwesterly across the north-easternmost part of Strawberry, based on projection of structural elevations. Although the fault has come and gone with different investigators, the structural elevation contours show that Weisman and Weir (1990) were correct to include a fault in the area; however, their alignment anchored to the small shear zone may not identify the main fault, or there may be several parallel or en echelon faults somewhere between the Fort Apache outcrop on the east side of Strawberry Mountain and Strawberry Hollow. In any event, the structural elevations suggest the down-dropped block is too far south to have any impact on the availability of groundwater in the Redwall Limestone and deeper strata.

6.3. Groundwater Elevation in the Redwall

Figure 6-5 shows the locations and alignments of four geologic cross sections for the PSWID area. Figures 6-6, 6-7, and 6-8 are geologic cross sections showing the relationship of the Redwall structure to the topographic surface in the PSWID area. Figure 6-9 is a geologic cross section showing the relationship between the Redwall structure and the terrain between the East Verde River and Fossil Springs, including the northern ends of Pine and Strawberry Canyons. All of the cross sections assume a conformable contact between the two limestone strata and the older basement rocks, simply because there are no data to indicate where islands of Precambrian rock may protrude into or through the Redwall and Martin strata. The cross sections assume a thickness of 189 feet for the Redwall, based on the measured Section 2 in Huddle and Dobrovolny (1952; p.

94), and 395 feet for the Martin Formation, based on the general description and several measured sections in Huddle and Dobrovolny (1952).

The parts of the Redwall/Martin strata where the groundwater head is confined by overlying strata are the most desirable locations for production wells. As shown by Cross Sections A-A', B-B", and C-C' (Figures 6-6, 6-7, and 6-8), the estimated groundwater head in the Redwall/Martin strata is too low in elevation to present confined conditions under private land or under most of the Forest Service land in most of the areas potentially accessible to drilling, i.e., on private land or Forest Service land outside of Wilderness areas. This is particularly true considering that the Naco Formation, overlying the Redwall Limestone, may not be a good confining bed and may instead be hydraulically connected with the Redwall and Martin. If the latter situation is the case, the estimated thickness of about 255 feet of Naco Formation will cause the top of the combined Naco-Redwall-Martin sequence to be above the water table essentially throughout any area potentially accessible for well drilling, outside the Wilderness Area.

Unfortunately, the elevation of the groundwater surface in the Redwall/Martin strata is known at only one location within the PSWID area and that is at the Strawberry Borehole where the depth to water was measured at 1,382 feet on January 17, 2003, using a downhole TV camera as well as several types of geophysical logging tools. A precision survey of the elevation on the top of the well casing provided an elevation of 5749.65 feet based on the 1983 NAVD vertical datum currently in use. Conversion of this elevation to the vertical datum for the Strawberry 7.5-minute topographic quadrangle, 1929 NVGD, provides an elevation of 5746.91 feet for use with the U.S. Geologic Survey 7.5-minute topographic map. The January 17, 2003 depth to water subtracted from the top of casing elevation of 5746.9 ft provides a water table elevation of 4364.9 feet. An earlier measurement of the static water level conducted by ADWR personnel on June 16, 2000 provided a depth to water of 1,377 feet. The difference of 5 feet between the two measurements probably reflects some differences in how the measurements were made; however, the difference is large enough to indicate the groundwater level in the Redwall/Martin strata has probably declined at this location by about 5 feet between 2000 and 2003. This is consistent with the other data provided in this report showing below average precipitation conditions and associated groundwater level recession in other wells in the PSWID area.

The only other elevation data used to evaluate the groundwater head in the Redwall/Martin strata is Fossil Springs. The elevation of Fossil Springs is estimated to be 4320 feet, based on interpolation between 40-foot contours. The flow from the spring indicates that the unknown potentiometric surface at the springs is more than the estimated elevation 4320 feet. The difference between the groundwater elevation of 4364.9 feet in the Strawberry Borehole and the estimated land surface elevation of 4320 feet at the springs indicates the potentiometric surface elevation at the springs cannot be much higher than the

land surface and the pressure driving the springs cannot exceed the approximately 45 foot difference between the surveyed borehole elevations and the estimated elevation at Fossil Springs.

Based on the foregoing considerations, the groundwater level in the Redwall/Martin strata is depicted on each of the geologic cross sections as a line through the land surface elevation of 4320 feet at Fossil Springs and through the groundwater elevation of 4364.9 feet at the Strawberry Borehole, projected onto the line of section for each cross section. Thus, the estimated water table in the Redwall/Martin is depicted with a generally east-southeast to west-northwest gradient, at the same elevations on each cross section.

The cross sections show that the saturated thickness of the Redwall/Martin strata increases north and northwest from the PSWID area. The saturated thickness of the Redwall/Martin strata decreases to the south. The Strawberry Borehole was drilled near the southernmost limit of groundwater in the Redwall Limestone, as shown by Cross Section A-A' (Figure 6-6). Up gradient from the Strawberry Borehole, the Redwall strata rise above the estimated groundwater level. Similarly, the Redwall and Martin are both above the estimated groundwater elevation in the southern part of Pine, as shown by Cross Section B-B" (Figure 6-7). These relationships are consistent with the historic experience at Pine where wells penetrating the Redwall Limestone have encountered drained fractures and voids.

6.4. Potential Redwall/Martin Drilling Sites

Based on the foregoing considerations, it is desirable to drill into the lowest elevation of Redwall/Martin strata available in the PSWID area, in order to seek the maximum saturated thickness of potential aquifer material. Figure 6-10 shows the structural contours on the top of the Redwall Limestone superimposed on the geologic map from Figure 4-2. Figure 6-10 shows that the lowest structural elevation on the top of the Redwall, within the PSWID boundaries and on private land, is along the northern boundary of the private land in the Strawberry Valley where the elevation on the top of the Redwall is 4350 feet or lower just east of the northwest corner of the private property.

Accordingly, that portion of the north half of the north half of the southwest quarter of Section 20, T12N, R8E where the structural elevation of the Redwall is 4350 feet or less, as shown on Figure 6-10, offers the most favorable conditions within the boundaries of private lands in the PSWID area for completion of a well or wells into the Redwall/Martin strata. The northern boundary of the private land, from the quarter corner on the mid-point of the western boundary of Section 20 to about 0.75 miles east along the northern boundary of the private property, is all aligned on favorable conditions for drilling a Redwall/Martin well. The

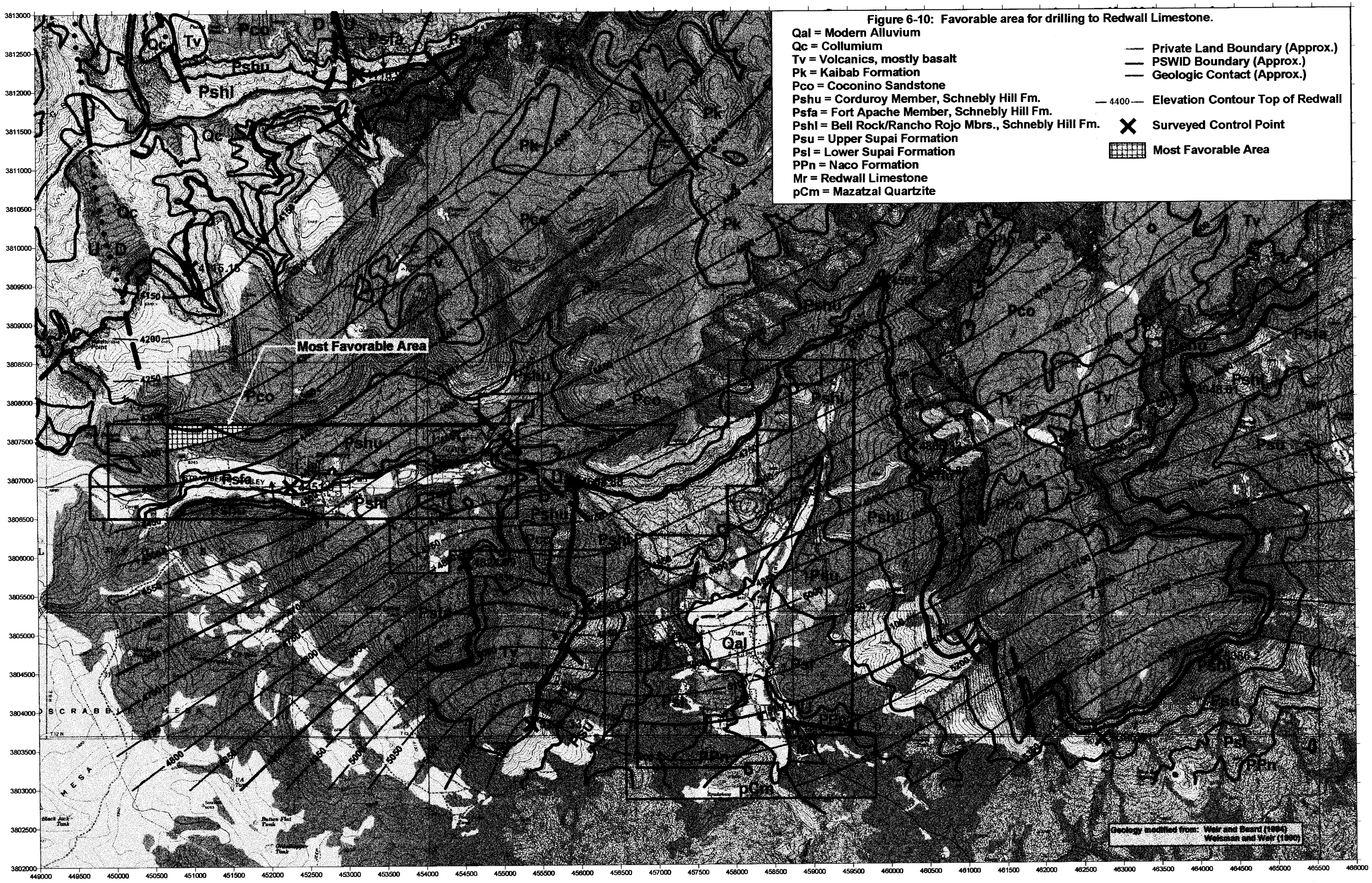


Figure 6-10: Favorable area for drilling to Redwall Limestone.

foregoing line is fairly high on the slope below the Mogollon Rim and practical considerations might dictate wells sited somewhat lower on the slope, south of the private property boundary.

6.4.1. Drilling Depth

Figure 6-11 shows contours of the depth from the land surface to the top of the Redwall Limestone. The depth contours on Figure 6-11 were obtained by subtracting the structural elevations on the top of the Redwall from topographic elevations in the form of a Digital Elevation Model (DEM) file obtained from the Arizona Regional Image Archive (ARIA). The original DEM data, obtained at a 30-meter grid spacing, was processed by first order Kriging to provide a 25-meter grid spacing of topographic elevations to match a 25-meter grid spacing of structural elevations on the top of the Redwall Limestone, all within the boundaries of Figure 6-11. The structural grid data were then subtracted from the topographic grid data to provide a third grid file containing depths to the top of the Redwall at 25-meter intervals. The depth values were then contoured to provide the depth map shown on Figure 6-11.

It must be recognized that the depths shown on Figure 6-11 are only to the estimated top of the Redwall Limestone. Use of Figure 6-11 to estimate the total depth required to drill a well into the Limestone Aquifer must include addition of the desired depth of penetration into the Limestone Aquifer to the depth to the top of the Redwall. For example, if it is assumed that the Redwall Limestone is 265 feet thick and a well is to fully penetrate the unit, then 265 feet must be added to the depth to the top of the Redwall to estimate the total drilling depth required at a given location.

Assuming a potential thickness of 190 feet for the Redwall Limestone and 360 feet for the Martin Formation, 550 feet must be added to the depth to the top of the Redwall to estimate the drilling depth necessary to penetrate fully through the Limestone Aquifer strata in the PSWID area. Figure 6-11 shows the structural elevation contours on the top of the Redwall in addition to the depth contours. The area bounded by the 4350-foot elevation contour and the northwestern property boundary of the PSWID area exhibits depths to the top of the Redwall ranging from 1,420 feet in the southwest corner to 2,000 feet in the northeast corner where the 4350-foot contour crosses the property line. Accordingly, maximum potential drilling depths range from 1,970 to 2,550 feet. The top of the Redwall offers less than 50 feet of structural relief within the described area; accordingly, most of the range of drilling depth is due to topographic relief.

It is desirable to drill as far north as possible, in order to obtain the greatest saturated thickness in the Redwall. However, drilling depth increases rapidly to the north and the terrain becomes very steep, requiring extensive site preparation to establish a work platform for a drill rig and accessory equipment.

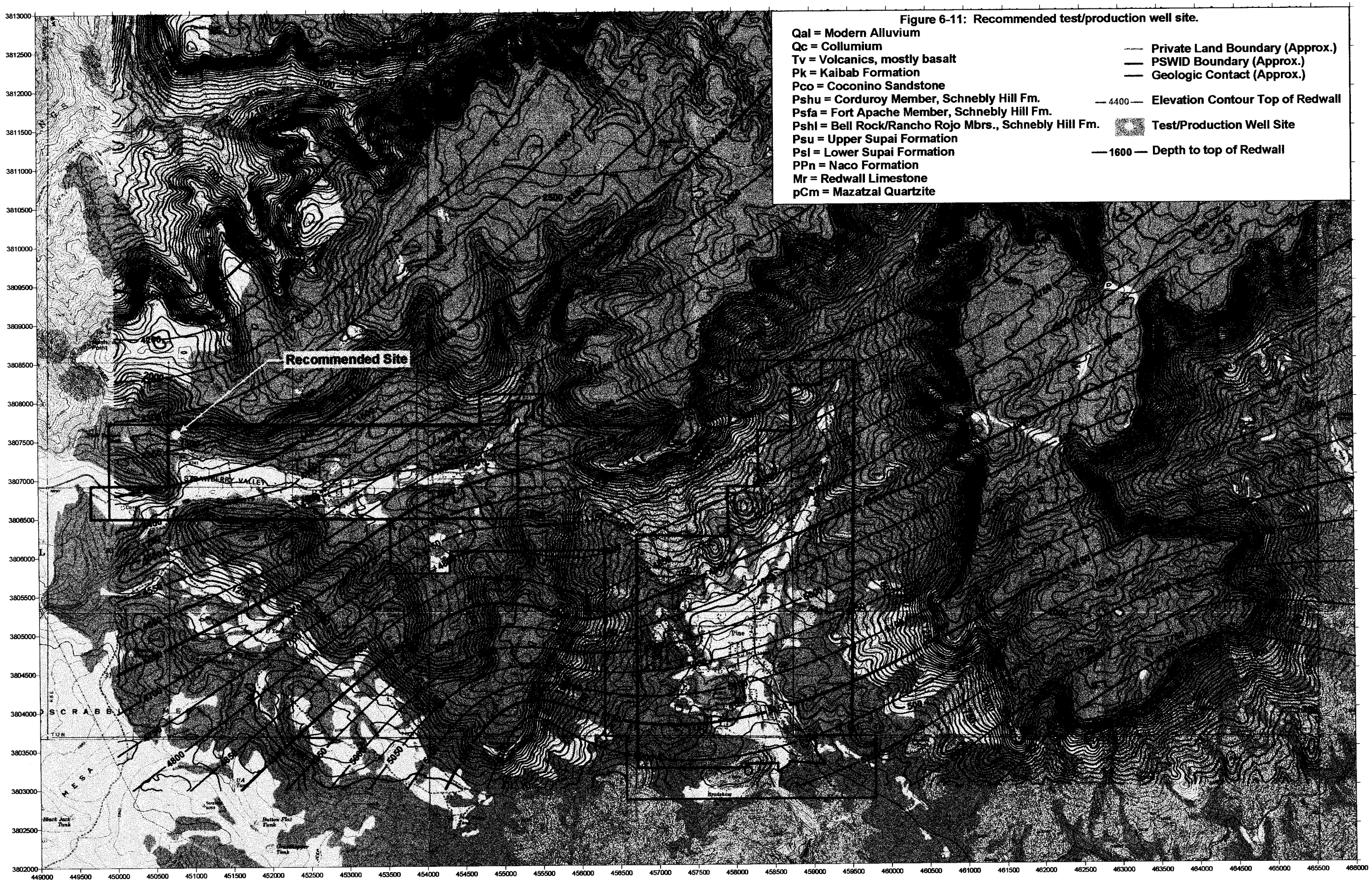


Figure 6-11: Recommended test/production well site.

Qal = Modern Alluvium
Qc = Collumium
Tv = Volcanics, mostly basalt
Pk = Kaibab Formation
Pco = Coconino Sandstone
Pshu = Corduroy Member, Schnebly Hill Fm.
Psfa = Fort Apache Member, Schnebly Hill Fm.
Pshl = Bell Rock/Rancho Rojo Mbrs., Schnebly Hill Fm.
Psu = Upper Supai Formation
Psl = Lower Supai Formation
PPn = Naco Formation
Mr = Redwall Limestone
pCm = Mazatzal Quartzite

Therefore, an initial test well site will probably be a compromise between drilling as far north as possible while staying on reasonable terrain. A good compromise appears to be at a land surface elevation of 5,870 feet and a depth to the top of the Redwall of 1,560 feet, shown on Figure 6-11 as the recommended site for a test well. The potential drilling depth at the site, including penetration of 550 feet of Redwall and Martin strata, is 2,110 feet.

The recommended site potentially offers 125 feet more of saturated thickness in the Redwall Limestone than did the Strawberry Borehole. The estimated elevation at the top of the Redwall at the recommended drilling site is 4,325 feet or about 40 feet below the groundwater elevation measured in the Strawberry Borehole, suggesting 40 feet of confined head in the Limestone Aquifer at this location. However, the possibility that the 255-feet thick Naco may contain solution openings in hydraulic communication with those in the Redwall makes it impossible to conclude whether or not the Redwall Limestone (and Limestone Aquifer strata) is confined at the recommended drilling location.

It is important to note that the structural elevation contour on the statistically projected Redwall surface at the recommended drilling site is elevation 4325 whereas subtraction of the depth contour of 1,560 feet from the published topographic map land surface elevation of 5,870 feet provides an estimated Redwall elevation of 4310 feet. The 15-foot difference between the structural contour elevation and the Redwall elevation estimated from the depth map appears to be the difference between statistical reproduction of the land surface elevation from the DEM data and the land surface elevation on the published U.S. Geological Survey 7.5-minute topographic map. Therefore, the potential vertical error from the statistical treatment of the DEM data is at least plus or minus 15 feet, relative to the published topographic map and relative to the precision survey.

6.4.2. Well Design Considerations

The static water level depth in the Redwall/Martin strata at the recommended test well drilling site is estimated to be 1,505 feet, based on the elevation of the static water level in the Strawberry Borehole. Assuming pumping of a well in this formation might result in as much as 200 feet of drawdown, the pumping lift is potentially 1,500 to 1,700 feet, depending on the amount of drawdown generated at a given pumping rate. Judicious selection of a pump column diameter to reduce pump column friction loss should keep pump column losses to less than 50 feet. For example, 4-inch pump column at 150 gpm would provide a friction loss of 34 feet and 5-inch pump column at 300 gpm would provide a friction loss of 41 feet. Smaller diameter pump column at the latter pumping rates would result in a significant increase in pump column friction loss with 1,700 feet of pump column. Based on the foregoing considerations, total pumping lift out of a

well at the recommended test well site, based on 150 to 300 gpm production, is potentially in the range of 1,550 to 1,750 feet Total Dynamic Head (TDH).

A range of 1,550 to 1,750 feet of TDH will require a minimum of 75 horsepower at 150 gpm. Accordingly, the smallest diameter submersible pump motor available for conventional water well pumping equipment that will provide 75 horsepower is an 8-inch motor. Thus, the smallest diameter well casing required for a test well or production well must accommodate an 8-inch submersible motor.

Due to the relatively low head above the Redwall Limestone, it may be necessary to set the pump inlet and motor below the production zone in the well. In this case, there will not be a flow of water past the pump motor, which hangs below the pump inlet, and the motor will not receive sufficient cooling. In order to provide sufficient cooling of the pump motor, it is necessary to direct the flow of water to the pump inlet past the pump motor with a pump shroud. An 8-inch pump motor will require a minimum diameter 10-inch pump shroud.

Taking these factors into consideration, the minimum diameter casing for a well completed into the Redwall/Martin strata, with the anticipation of producing at least 150 gpm, is a 12-inch nominal diameter casing to accommodate an 8-inch pump motor with a 10-inch pump shroud.

A 12-inch casing offers a great deal of flexibility in selecting a pumping system for a deep well into the Redwall/Martin strata. For example, 12-inch casing will allow installation of up to an 8-inch diameter pump and 8-inch motors up to 200 horsepower. Although conventional water well pump manufacturers do not make 8-inch pumps that will operate under more than about 1,200 feet of TDH, specialty oil-field and mine dewatering pump manufacturers such as Reda and Centriflow Pumps manufacture 8-inch pumps that will deliver more than 1,000 gpm at TDH in the range of 1,550 to 1,750 feet when equipped with adequate horsepower. Accordingly, installation of 12-inch casing in a test/production well will allow the full potential of the potentially cavernous, high-capacity Redwall strata to be developed by not imposing a limitation on the pumping equipment that can be installed.

An additional consideration is protection of the pump motor wire during installation of the pump. The pump motor wire is clamped to the pump column as the pump and motor are lowered into the well therefore is installed between the pump column and the inside of the well casing. The pump motor wire must pass between the pump housing and the inside of the well casing because submersible pump motors are attached to the bottom of submersible pumps. It is therefore necessary that the space between the pump housing and the inside of the well casing be sufficiently large for installation of the pump wire.

Since deep wells are seldom perfectly straight or plumb, it is almost certain the pump will rub against the inside of the well casing during installation. This creates the opportunity for the pump motor wire to be caught between the pump and casing where friction during deep-set installations may rub a hole through the insulation on the motor cable. This also may be a problem higher up on the pump column, if a section of the well casing offers too much deviation from a straight alignment, resulting in the pump column rubbing on a part of the well casing during pump installation.

Typical submersible pump cable is a flat cable with the conductor wires laid flat and encapsulated side-by-side in insulation and a protective jacket. This type of cable is adequate for most types of pump installation; however, it is vulnerable to damage by rubbing and friction on deep-set pumps. Where damage to the pump motor cable by rubbing is likely, it is necessary to use an armored cable. Armored cable is typically a round cable with the four conductor wires encapsulated in insulation and fillers which are in turn armored with aluminum or galvanized steel interlocked armor which is in turn covered with a PVC jacket.

Assuming availability of 460-volt, three-phase power, a 75-horsepower motor (for 150 gpm) hanging at about 1,700 feet will require 4/0 AWG copper wire. A pump capable of delivering 300 gpm with 1,750 feet of TDH will require a 175-horsepower motor (at 76 percent efficiency). A 175-horsepower motor hanging at about 1,700 feet will require 350 MCM copper wire. The dimensions of 4/0 AWG submersible pump flat cable are 2.82 inches wide by 0.80 inches thick. The dimensions of 350 MCM flat cable are 3.550 inches wide by 1.20 inches thick. The 4/0 AWG and 350 MCM flat cables are not armored. The diameter of 4/0 AWG armored round cable is approximately 1.93 inches and the diameter of 350 MCM armored round cable is approximately 2.380 inches. High horsepower applications for as much as 1000 gpm will require pump motor cables up to 750 MCM copper wire size which in a round, armored cable has an approximate diameter of 3.260 inches.

Considering the diameters of the various pump motor cables, it is evident that a 12-inch casing offers the opportunity to install armored cable past 7-inch and 8-inch diameter pumps for up to 175 horsepower or 350 MCM copper wire size without unduly pushing the pump off-center in the 12-inch casing. In other words, the annulus around an 8-inch pump in a 12-inch casing is a 2-inch annulus. Installation of an electrical motor cable larger than 2-inches in diameter will therefore push the pump to one side in the casing and result in constant rubbing of the wire against the casing as the pump is installed. Thus, 350 MCM armored cable for a 300 gpm pump and 175 horsepower motor slightly exceeds the 2-inch annulus for an 8-inch pump; however, a pump capable of 300 gpm can probably be obtained with a diameter of 7.0 to 7.5 inches.

Based on all the foregoing considerations, the minimum diameter required for a test/production well into the Redwall/Martin strata in the PSWID is 12-inches; two

nominal casing diameters larger than an 8-inch pump motor, as required to provide room for a pump shroud for motor cooling and to allow armored electrical cable to pass between the pump and the casing.

If the results of the test/production well indicate yields of more than 300 gpm are possible from the Redwall/Martin strata and it is desirable to produce larger yields, an appropriate well casing diameter must be selected for future wells to accommodate the necessary pumping equipment. However, preliminary indications are that a 12-inch casing will allow installation of pumping equipment capable of more than 300 gpm, with appropriate design of a fabricated flat conduit attached to the side of the pump, for passage of the larger electrical cable sizes past the pump by removal of the armor and side-by-side installation of the four conductor wires through the flat conduit along the side of the pump.

The requirement for a pump shroud can be satisfied by selection of specialty electrical motors, manufactured by Reda and Centriflow Pumps, that will fit inside the shroud. These motors can be less than 6-inches in diameter for more than 250 horsepower and therefore can be shrouded. Individual motors are accordingly quite large in length to provide the motor windings lost to reduced diameter. The additional length of such motors, sometimes over 100 feet in length, must be taken into consideration in designing the final well depth. A drawback to these types of motors is that the electrical power to such motors must exceed 480 volts to compensate for the longer wire windings in the long-bodied motors. In oilfield applications, the power company may supply 5,600-volt power to a well field using these types of motors. However, this would be an additional cost consideration at a PSWID well field using specialty motors.

Based on the foregoing considerations, installation of a 12-inch casing is not only necessary for smaller pumping equipment beginning at a minimum of 75 horsepower and 150 gpm, but it is adequate for installation of a wide range of larger pumping equipment, with proper design measures.

6.4.3. Structural Considerations

Figure 6-10 shows the structural contours on the top of the Redwall Limestone superimposed on the geologic map from Figure 4-2. Geologic information transferred from the Weir and Beard (1984) map includes two large faults extending into the northern side of Figure 6-10.

The west fault is aligned between Tin Can Draw and Sandrock Canyons, crosses the confluence of Fossil Creek and Calf Pen Canyon, and ends on Nash Point. The fault is referred to herein as the "Nash Point" fault (Figure 6-10). The Nash Point fault displaces Tertiary volcanics and older rocks with the block on the east side of the fault offset downward. The displacement of the admittedly poorly exposed fault on the north face of Fossil Creek canyon at Nash Point is about 160 feet.

The east fault extends from north of Sandrock Canyon, across that canyon, and generally north to south across the middle of a bench called "The Pocket" before crossing Calf Pen Canyon. The fault disappears into the south side of Calf Pen Canyon in an unnamed tributary draw slightly less than a mile northwest of Five Mile Lake. This fault is referred to herein as the Calf Pen Canyon Fault (Figure 6-10). The block on the west side of the Calf Pen Canyon fault is displaced downward an estimated 200 feet, as observed on the north wall of Calf Pen Canyon. The fault offsets the Coconino Sandstone at least 200 feet on The Pocket, resulting in a topographic change of 200 feet between the eastern and western benches. A photograph on Figure 6-12 shows the Calf Pen Canyon fault exposed in the north wall of Calf Pen Canyon.

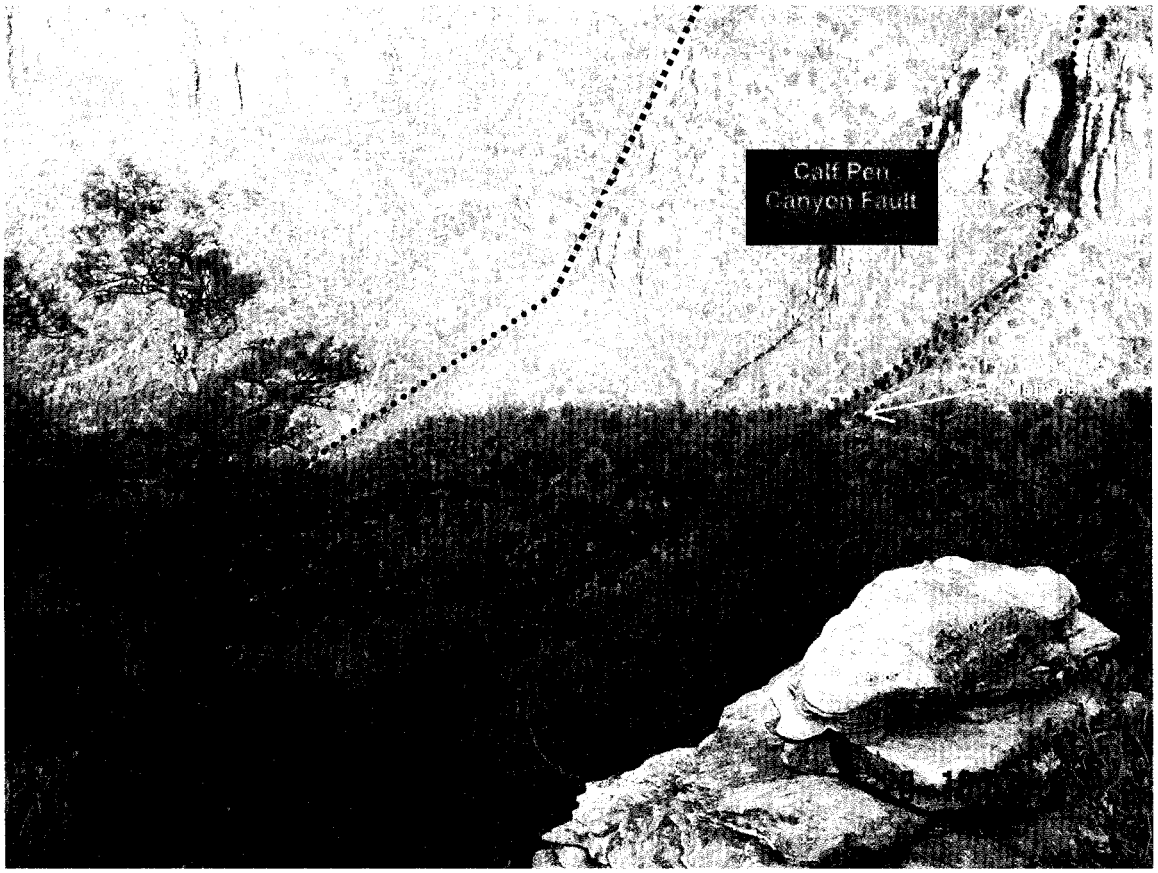


Figure 6-12: View of bifurcated Calf Pen Canyon fault on north face of canyon. Offset of Fort Apache Member shows fault displacement of 200 ft.

The Nash Point and Calf Pen Canyon faults bound the west and east sides of a down-faulted block. Geologists refer to an elongate down-faulted block, such as that bounded by the Nash Point and Calf Pen Canyon faults, as a "graben" and this particular graben is referred to herein as the Calf Pen Canyon graben.

The Calf Pen Canyon graben has a significant effect on interpretation of both the structural geology and how that geology affects movement and availability of groundwater in the PSWID and nearby area. The Calf Pen Canyon graben is structurally aligned with the anomalous low in the Redwall structure under Strawberry Mountain. The Calf Pen Canyon fault is in reasonable alignment with the sudden northwesterly bend in the structural contours along the east side of Strawberry Mountain (Figure 6-10). The alignment of the Calf Pen Canyon fault and the change in structural elevations does not coincide with the alignment of the fault shown on the Weisman and Weir (1990) map; however, as previously discussed, the surveyed structural control point south of the highway through Strawberry Hollow shows the Weisman and Weir (1990) alignment to be faulty.

In addition to the alignment of the Calf Pen Canyon fault with the east side of the structural low under Strawberry Mountain, the ridge of Coconino Sandstone between Calf Pen Canyon and Strawberry Canyon exhibits a 200-foot step in elevation, similar to that along the fault on The Pocket. The topographic step on the ridge between Calf Pen and Strawberry Canyons is not as obvious as the step on The Pocket because it is partly obscured by overlying basalt. An additional noteworthy terrain feature is the hill at the west end of Strawberry Valley in the southeast quarter of Section 19, T12N, R8E. Although this hill is capped with basalt, it is supported mostly by Schnebly Hill Formation and might be interpreted as another topographic expression of a "step" in the terrain with the hill on the west side of the Nash Point fault.

The foregoing considerations strongly suggest that the Strawberry Mountain structural low is a southern extension of the Calf Pen Canyon graben and might well be called the Strawberry graben. Recognition of the Strawberry area as part of a graben is consistent with the presence of the Schnebly Hill Formation in this area, on the down-dropped fault block, as compared to the absence of the Schnebly Hill Formation in Pine on the structurally higher area. It is also consistent with the fact that groundwater is present in the Redwall beneath Strawberry whereas the Redwall at Pine, outside the down-dropped fault block, is above the water table.

If this interpretation is correct, it is significant to how the surveyed structural control points must be used to construct the structural contour map. This is because three of the precision surveyed elevations on the structure, plus the Strawberry Borehole, are included in the hypothesized graben, and are therefore offset downward with respect to the surveyed control points on the structure east of the graben.

Figure 6-13 shows an alternate interpretation of the structural contours on the surface of the Redwall Limestone, using a fault offset of 160 feet for the Nash Point fault and 200 feet for the Calf Pen Canyon fault and projecting the faults

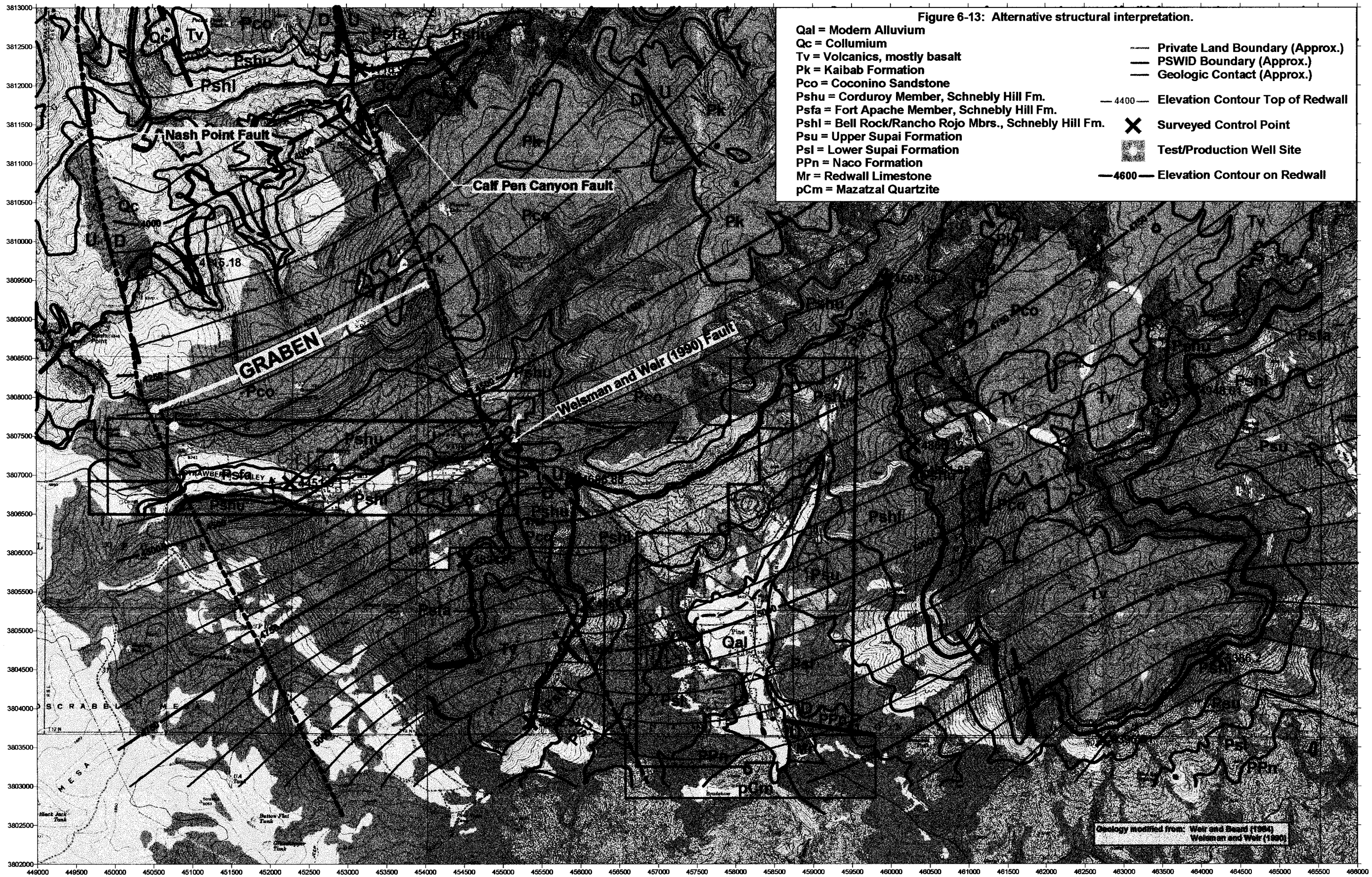


Figure 6-13: Alternative structural interpretation.

through the entire PSWID area. The structural contours within the graben are based on Kriging of the data points within the graben, independently of the other data points. The analysis shows little to no difference in the structural elevations across the Nash Point fault on the southwest side of the graben because there are no surveyed data points on the west side of the fault. Therefore, the statistically Kriged projection of the contours is the same whether the entire data set is analyzed or only the data in the graben are analyzed, because the only data in the Strawberry area are all in the graben.

6.4.4. Hydrogeologic Considerations

The structural contours in the hypothesized graben show the greatest offset from those outside the graben near surveyed data points. Where few surveyed data points are available, the statistical projections of contours inside and outside the graben become similar in elevation. This suggests the absence of large offsets near the north to south center of the graben, as shown on Figure 6-13, is the result of an absence of data rather than an absence of actual offset. In other words, the approximately 160 feet of offset on the Nash Point fault and the 200 feet of offset on the Calf Pen Canyon fault may persist along the entire graben, contrary to the lesser amounts of offset shown by statistical projection of structural elevations on Figure 6-13. This is suggested by the fact the offsets are relatively large where they can be observed and where surveyed data are available.

Considering the thickness of the Redwall Limestone is only 189 feet at the measured section south of Pine and is known to be less in some areas, depending on the nature of basement rock topography, potential fault offsets of 160 to 200 feet along the boundaries of the fault block comprising the graben raise the question of how the fault block and the faults affect the movement of groundwater through the Redwall/Martin strata, presumably towards Fossil Springs. Do the faults block groundwater flow or do they transmit groundwater? How much groundwater does the Martin Formation transmit? Does the Naco Formation transmit groundwater? These questions bear upon whether or not groundwater flows across the graben structure and whether or not groundwater penetrated in the graben by a well at the recommended drilling area in Strawberry is flowing to Fossil Springs.

Cross Section D-D' (Figure 6-9) shows the structure of the Redwall Limestone and associated units is higher in elevation at the East Verde River than at Pine and Strawberry or at Fossil Springs. The distance along the cross section from the East Verde River to Fossil Springs is about 18 miles. The other cross sections show the Redwall Limestone and associated strata dip north or northwest back under the Mogollon Rim from outcrops in the vicinity of the Control Road. The structural dip indicates recharge water entering the outcrops along Control Road, south of the Mogollon Rim, can potentially follow the dip of the strata back under the rim, and contribute to the flow through the Redwall and

associated strata towards Fossil Springs. Feth and Hem (1963) described the recharge as follows:

> "***During most of the year, the flow in Webber Canyon, Bray Creek, Chase Creek, and the East Verde River decreases to zero along a line roughly parallel to and about 3 miles south of the Mogollon Rim. This line is believed to coincide with a fault zone that brings the Redwall limestone to or near the surface. The cavernous nature of the Redwall has already been described . . .***" (Feth and Hem, 1963; p. H33)

We know now that the line parallel the Mogollon Rim where the various streams flowing off the rim lose water to the Redwall is the outcrop of the Redwall exposed on an erosion surface eroded back from the Little Diamond Rim fault as the Mogollon Rim retreated northward to its present location. Thus, the loss of water into the Redwall does not occur along a fault line, but simply where the limestone outcrops at the land surface. However, the recharge of water into the Redwall Limestone at these locations is significant, in view of the structural relationships indicating much of the flow should be back towards the north, under the Mogollon Rim, into the flow system to Fossil Springs, although some of the recharge discharges south through springs such as Indian Garden Spring on Tonto Creek near Kohls Ranch.

Accordingly, the likely presence of the structural graben hypothesized from this analysis raises questions about how recharge and groundwater flow in the Redwall Limestone and/or in the Limestone Aquifer strata collectively are affected by the graben. The extensive travertine deposits at Fossil Springs may provide an answer to these questions.

Figures 6-14 and 6-15 show the travertine deposits at Fossil Springs viewed from the road to the Irving Power Plant. The photographs show that the upper level of the travertine deposits is at an elevation much higher than the present outlet elevation for Fossil Springs. The U.S. Geological Survey 7.5-minute topographic map with 40-foot contour intervals indicates the elevation at the top of the travertine deposits is more than 4700 feet. This shows that in order for discharge from the spring to deposit travertine at this elevation, the groundwater level in the aquifer had to be at least at this elevation in the geologic past.

The estimated top of the travertine deposit is projected through the geologic cross sections on Figures 6-6 through 6-9 at an elevation of 4700 feet to show the minimum level of groundwater in the geologic past, necessary to support groundwater discharge to the top of the travertine deposits. Cross Section A-A' shows the ancestral groundwater level would have been well above the top of the Redwall Limestone and nearly to the top of the Naco Formation at the location of the Strawberry Borehole. Cross Section D-D' (Figure 6-9) shows the Redwall

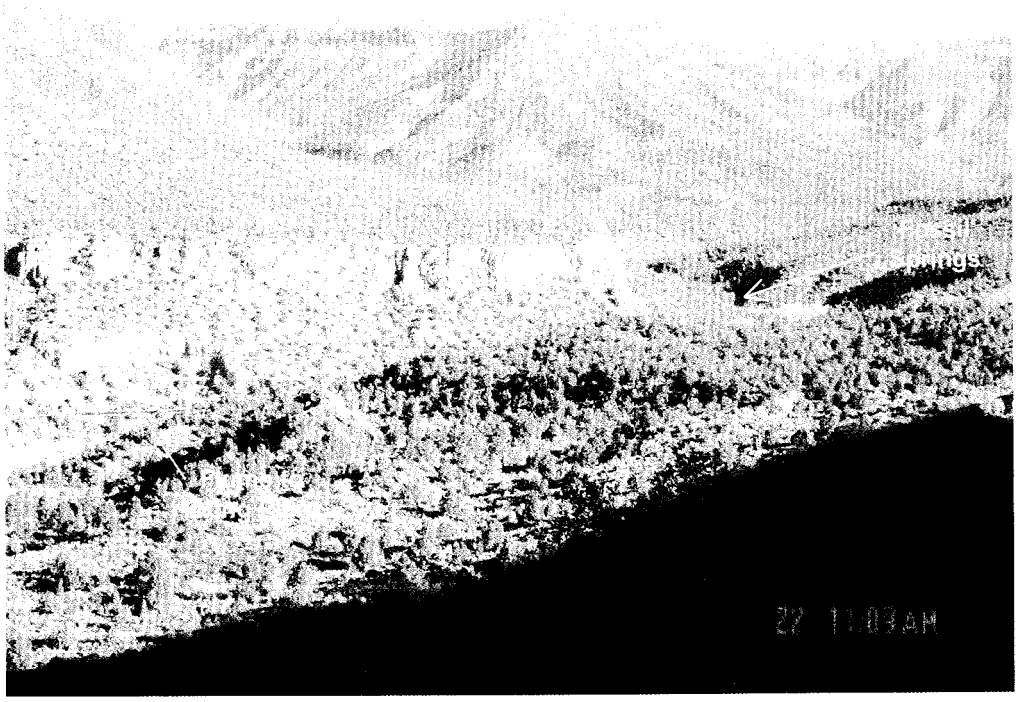


Figure 6-14: View of travertine terrace at Fossil Springs.

Figure 6-15: Fossil Springs with mouth of Calf Pen Canyon in background.

Limestone would have been fully saturated at the ancestral groundwater level as far east of Fossil Springs as the west side of Milk Ranch Point.

The travertine terrace deposits above the modern outlet to Fossil Springs therefore document the fact that the Redwall Limestone and/or the collective strata comprising the Limestone Aquifer system have been significantly drained over a period of geologic time, resulting in modern groundwater levels more than 335 feet lower in the PSWID than at some time in the geologic past. The volume of the travertine terrace deposits, including a large amount of travertine that has likely been removed by erosion, represents the volume of limestone dissolved from the Naco, Redwall, and Martin strata over geologic time and deposited as travertine downstream from the ancestral Fossil Springs. This process continues today, as evidenced by the deposits of calcium carbonate around the flume and penstock where the water from Fossil Springs is diverted to the Irving Power Plant.

The evidence of removal of limestone from the strata of the Limestone Aquifer by solution and transport in the groundwater system, combined with observations of solution caverns and solution enlarged fractures in the Redwall Limestone, is a strong argument that the voids penetrated in the Naco Formation by the Strawberry Borehole are solution-enlarged openings. If the Naco Formation contains solution conduits, it follows that it is in hydraulic communication with the Redwall Limestone and must be considered part of the Limestone Aquifer system. Including the Naco in the Limestone Aquifer system has the effect of greatly increasing the thickness of the aquifer system and reducing the possibility that fault offsets of 160 to 200 feet along the margins of the hypothesized graben could block the flow of groundwater through the system.

Taking all of the foregoing considerations into account, it is necessary to conclude that if the faults bounding the graben are blocking the flow of groundwater to Fossil Springs significantly, the groundwater level in the Redwall in the graben, as measured at the Strawberry Borehole, should be at some elevation considerably higher than the modern groundwater elevation, potentially up to 335 feet higher. The fact that the groundwater level measured in the Redwall in the graben is only slightly higher than the elevation of Fossil Springs and is essentially 335 feet lower than the ancestral groundwater level indicates the graben and its boundary faults do not block or restrict groundwater flow through the Limestone Aquifer across the graben. The modern groundwater level at the Strawberry Borehole indicates the groundwater level in the graben was drained by the same geologic processes that drained the Limestone Aquifer to its current groundwater level, well below the top of the travertine terrace, both in and out of the hypothesized graben.

All of these factors indicate the groundwater in the Redwall Limestone, penetrated by the Strawberry Borehole and underlying the recommended drilling sites along the northwestern boundary of the PSWID area, is hydraulically

connected to the same large body of groundwater storage necessary to support the long-term groundwater discharge rates observed at Fossil Springs. Therefore, a water well penetrating these strata at Strawberry, and operated within its long-term hydraulic capacity, should enjoy the benefit of a reliable source of groundwater by virtue of the available groundwater storage.

6.4.5. Source of Recharge

Planning of the investigation reported herein was based partly on the perception that the loss of water into the Redwall outcrop east of Milk Ranch point from Weber Creek, Bray Creek and the East Verde River was the principal source of recharge to the body of groundwater discharging through Fossil Springs. This perception was based in part on the fact that springs discharging from the Redwall Limestone east of the PSWID, along the Salt River, are highly mineralized with total dissolved solids concentrations ranging from 2,200 to more than 6,000 mg/l. The source of the mineral content is apparently dissolution of gypsum and anhydrite by recharge water percolating into the Redwall north of the Salt River through the Supai beds. The absence of strong mineral concentration in the water from Fossil Springs therefore argued that it had a different source of recharge than the Redwall springs to the east and, apparently, that the recharge could not have percolated through the overlying Supai beds as interformational leakage. Therefore, the loss of fresh water into the formation from surface flows east of Milk Ranch point seemed to be a good explanation for the absence of strong mineral concentrations in the Fossil Springs water.

The latter notion was abandoned in view of geologic Cross Sections A-A' through D-D' that show the PSWID area is on the very southernmost fringe of the saturated Redwall/Martin strata with the groundwater level under the PSWID area barely above the level of the outlet at Fossil Springs. These relationships suggest the groundwater storage required to support the long-term discharge rate at Fossil Springs is not explained by the volume above the springs on the four cross sections. Likewise, the cross sections suggest that, in the absence of adequate storage volume, the long-term discharge rate from Fossil Springs cannot be explained solely by leakage from the surface water streams east of Milk Ranch Point.

In view of the conclusion that recharge in the area east of Milk Ranch Point does not fully explain the volume and reliability of discharge from the Redwall Limestone at Fossil Springs, it was clear that the other possibilities all required infiltration of recharge water through the Supai beds for recharge to enter the Redwall. This meant that contrary to the experience with groundwater percolating through the Supai into the Redwall east of the PSWID, where highly mineralized water in the Redwall resulted, groundwater percolating through the Supai in the PSWID area and in the area north of Fossil Springs, must not become highly mineralized.

The latter realization is verified by the investigations of the Regional Aquifer (Bills et al., 2000) underlying the Colorado Plateau north of the PSWID area, including part of the area between Flagstaff and the PSWID. Water chemistry data collected from the Lake Mary group of wells, reported in Bills et al. (2000), show the major cation-anion chemistry of groundwater in the Regional Aquifer to be essentially the same as that in the Redwall Limestone in the PSWID as well as that in the wells completed in the Schnebly Hill and Supai strata in the PSWID area. The data from the Regional Aquifer north of the PSWID show the evaporite beds present in the Supai between Holbrook and the Salt River are not present in the Supai south of Flagstaff.

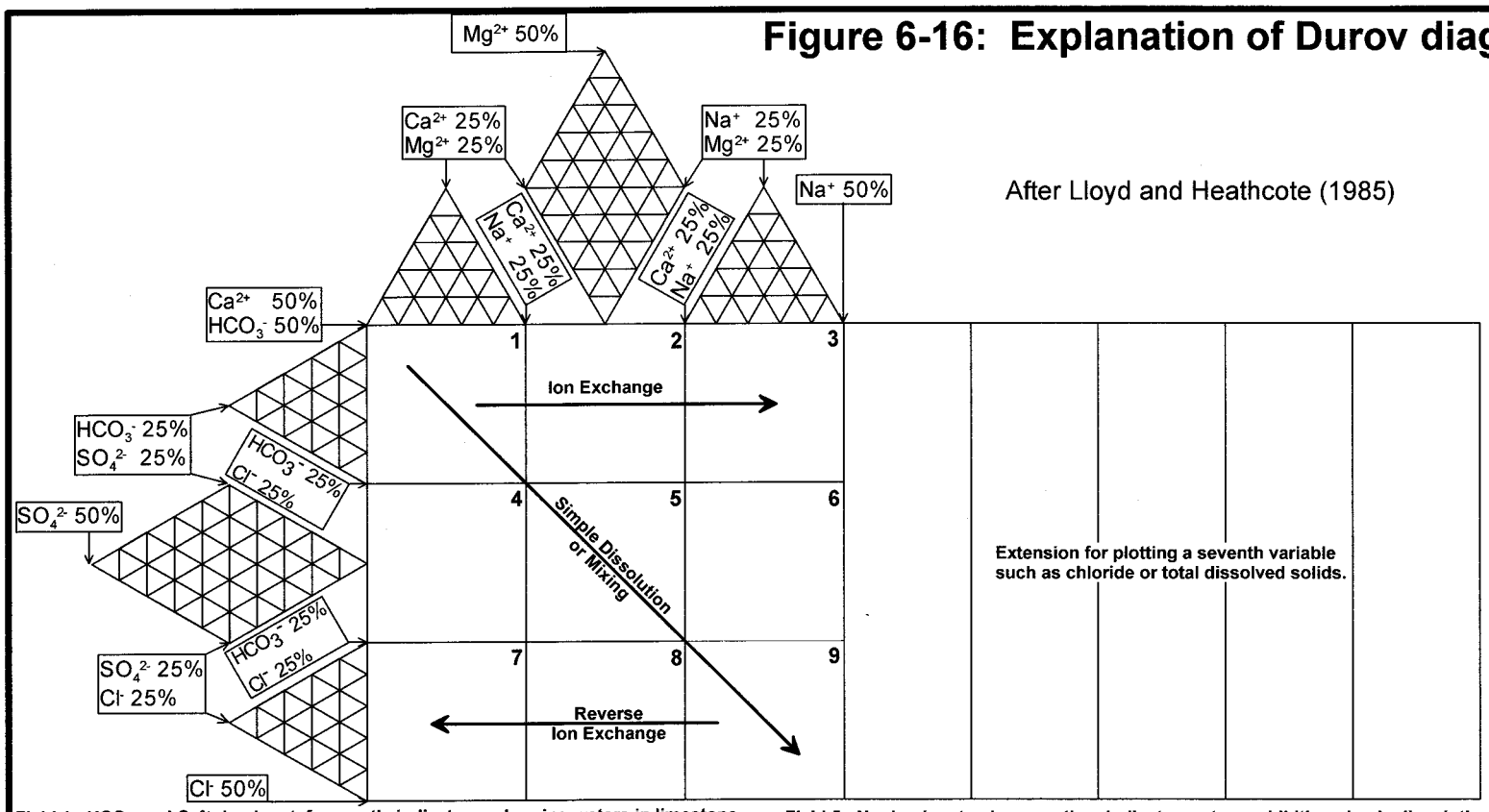
The conclusion drawn from comparison of the Regional Aquifer water chemistry to that of the water discharged through Fossil Springs is that one major source of groundwater storage supporting the flow at Fossil Springs is probably groundwater stored in the Regional Aquifer system that is draining into the Limestone Aquifer through interformational leakage and ultimately discharging through the Redwall Limestone at Fossil Springs.

The latter interpretation appears to be supported by the trends of the potentiometric surface in the Regional Aquifer as shown by Bills et al. (2000; Plate 2). The Regional Aquifer potentiometric surface exhibits a groundwater mound in the vicinity of the Mormon Mountain Anticline. Although the data are not extended south into area on the Mogollon Rim immediately north of the PSWID area, the implication of groundwater elevations as high as 6,800 feet at the Mormon Mountain Anticline is that groundwater flows south from the mound toward Fossil Creek and the PSWID. These relationships suggest a major source of groundwater storage supporting the discharge of water from Fossil Springs is the southerly flow of groundwater out of the Regional Aquifer.

The method used to compare the water chemistry of the Regional Aquifer to that of Fossil Springs and of the Schnebly Hill and Supai strata supporting wells in the PSWID is the Durov diagram (Figure 6-16). The Durov diagram provides a better display of hydrochemical types than the conventional Piper trilinear plot and is related to a greater extent to hydrochemical processes. The example Durov diagram on Figure 6-16 is expanded to separate the cation and anion triangles along the 25 percent axes so that the main field is divided accordingly. A field for a seventh parameter is added to the right side of the diagram. Figure 6-16 provides an explanation of the significance of the nine fields on the expanded Durov diagram; however, it must be recognized that other processes may also result in the cation-anion species defined in the nine Durov diagram fields.

Figure 6-17 shows water chemistry data for the Lake Mary group of wells in the Regional Aquifer (Bills et al., 2000; Table 2 and Figure 47) compared to water chemistry from the Strawberry Borehole, water chemistry from Fossil Springs at

Figure 6-16: Explanation of Durov diagram.



Field 1: HCO_3^- and Ca^{2+} dominant, frequently indicates recharging waters in limestone, sandstone and many other aquifers.

Field 2: HCO_3^- dominant and eight Mg^{2+} dominant or cations indiscriminant, with Mg^{2+} dominant or Ca^{2+} and Mg^{2+} important, indicates waters often associated with dolomites; where Ca^{2+} and Na^+ are important, partial ion exchange may be indicated.

Field 3: HCO_3^- and Na^+ dominant, normally indicates ion-exchanged waters although the generation of CO_2 at depth can produce HCO_3^- where Na^+ is dominant, under some circumstances.

Field 4: SO_4^{2-} dominant or anions indiscriminant and Ca^{2+} dominant, Ca^{2+} and SO_4^{2-} dominant frequently indicates a recharge water in lavas and gypsiferous deposits; otherwise a mixed water or a water exhibiting simple dissolution may be indicated.

Field 5: No dominant anion or cation, indicates waters exhibiting simple dissolution or mixing.

Field 6: SO_4^{2-} dominant or anions indiscriminant and Na^+ dominant, is a water type not frequently encountered and indicates probable mixing influences.

Field 7: Cl^- and Ca@+ dominant, is infrequently encountered unless cement pollution is present in a well; otherwise the waters may result from reverse ion exchange of Na^+ - Cl^- waters.

Field 8: Cl^- dominant and no dominant cation indicates that the groundwaters may be related to reverse ion exchange of Na^+ - Cl^- waters.

Field 9: Cl^- and Na^+ dominant frequently indicates end-point waters. The Durov diagram does not permit much distinction between Na^+ - Cl^- waters.

Figure 6-16: Explanation of Durov diagram.

Figure 6-17: Regional aquifer data, including other Redwall springs with TDS.

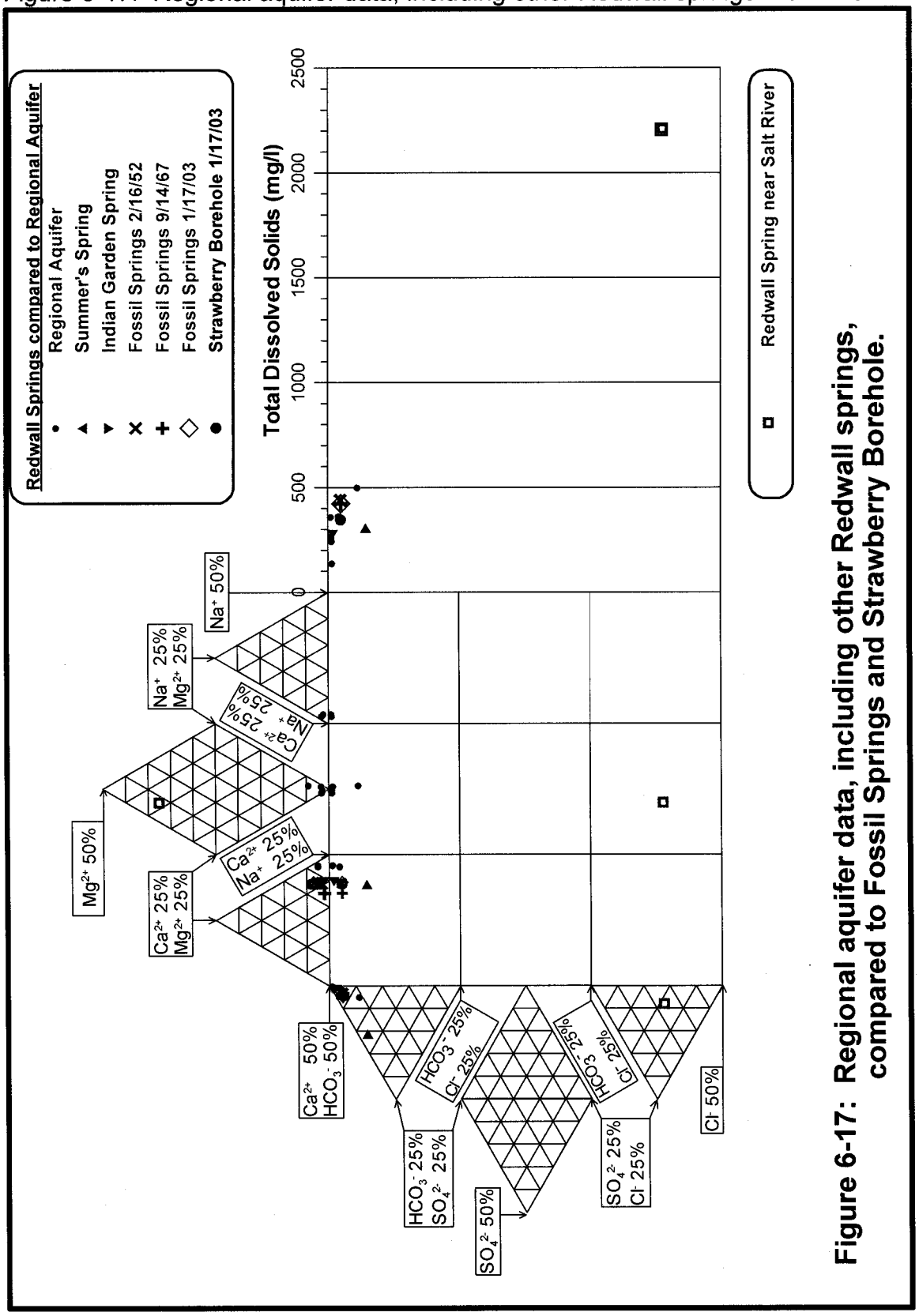


Figure 6-17: Regional aquifer data, including other Redwall springs, compared to Fossil Springs and Strawberry Borehole.

several different times, and water chemistry from two other Redwall springs along the Mogollon Rim north of the PSWID area. Summer's Spring is located in section 5, T17N, R3E in Sycamore Canyon tributary to the Verde River north of Cottonwood. Indian Gardens spring is located in section 20, T11N, R12E, near the Kohls Ranch on Tonto Creek. Also shown are data from one of the mineralized springs on the north side of the Salt River, far east of the PSWID area.

The data for water from Fossil Springs, the Strawberry Borehole, and the two fresh-water springs from the Redwall all plot in field 1 of the Durov plot indicating relatively unmineralized water. Data from the Lake Mary group of wells in the Regional Aquifer system plot across Durov fields 1, 2, and 3; suggesting potential cation exchange of sodium for calcium in the aquifer. However, it is not known to what extent dissolution of minerals within the volcanic deposits overlying the sedimentary rocks in the recharge area of the Regional Aquifer may contribute sodium to the water. Accordingly, the scatter of the regional aquifer data across fields 1 through 3 on the Durvo plot may reflect the influence of minerals in the volcanic rocks overlying the recharge area rather than cation exchange.

All of the Redwall Limestone waters plot in field 1. This initially appears contrary to the scatter of the data from the overlying Schnebly Hill and Supai groundwater of the Regional Aquifer across fields 1 through 3. However, recalling that the Durov plot is based on percentages, not absolute values, addition of calcium to the water by dissolution of the limestone when water from the Regional Aquifer enters the Limestone aquifer can shift the plot back into field 1 of the Durov diagram by increasing the relative proportion of calcium with respect to sodium. Therefore, there appears to be an explanation for field 2 and 3 water reverting back to field 1 water when it flows from the Regional Aquifer into the Limestone Aquifer.

Figure 6-18 shows the same data as Figure 6-17, but with chloride plotted as the seventh parameter instead of total dissolved solids. In the absence of contamination, increasing chloride concentrations in groundwater may be taken as an indication of increasing mineralization due to dissolution of chloride from the rocks through which the groundwater is moving. Generally, chloride concentrations increase with increasing distance from recharge areas and with increasing residence time of water in the aquifer. In shallow aquifers, evapotranspiration may also play a role in concentrating chloride, again with increasing chloride indicating increasing distance from the recharge area and increased residence time of groundwater in the aquifer.

On both Figure 6-17 and 6-18, all the samples shown exhibit low total dissolved solids and low chloride concentrations with the exception of the sample from a Redwall Spring near the Salt River. The spring near the Salt River plots in field 8

Figure 6-18: Regional aquifer data, including other Redwall springs with chloride.

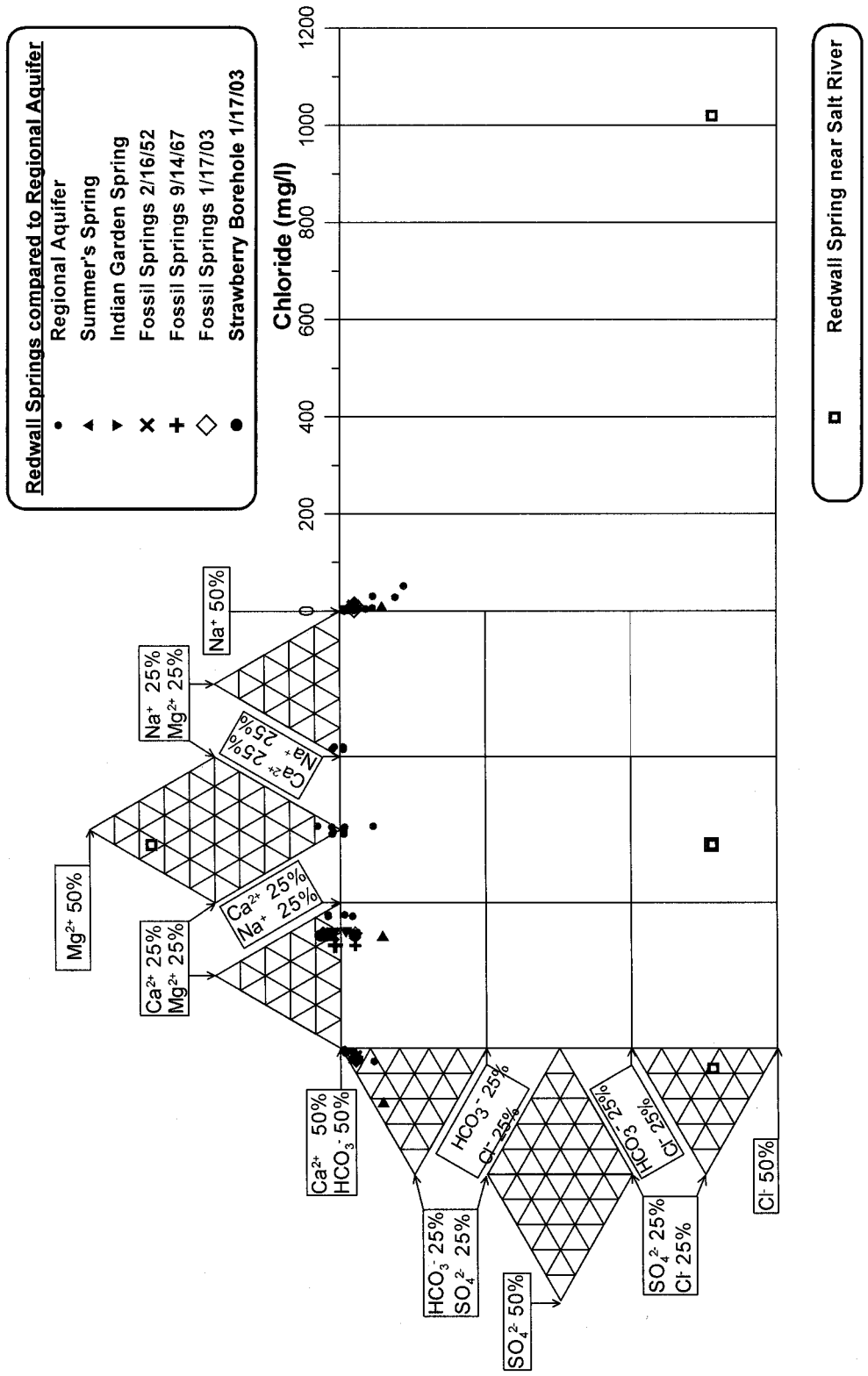


Figure 6-18: Regional aquifer data, including other Redwall springs, compared to Fossil Springs and Strawberry Borehole.

Figure 6-19: Local aquifer data compared to Strawberry Borehole with TDS.

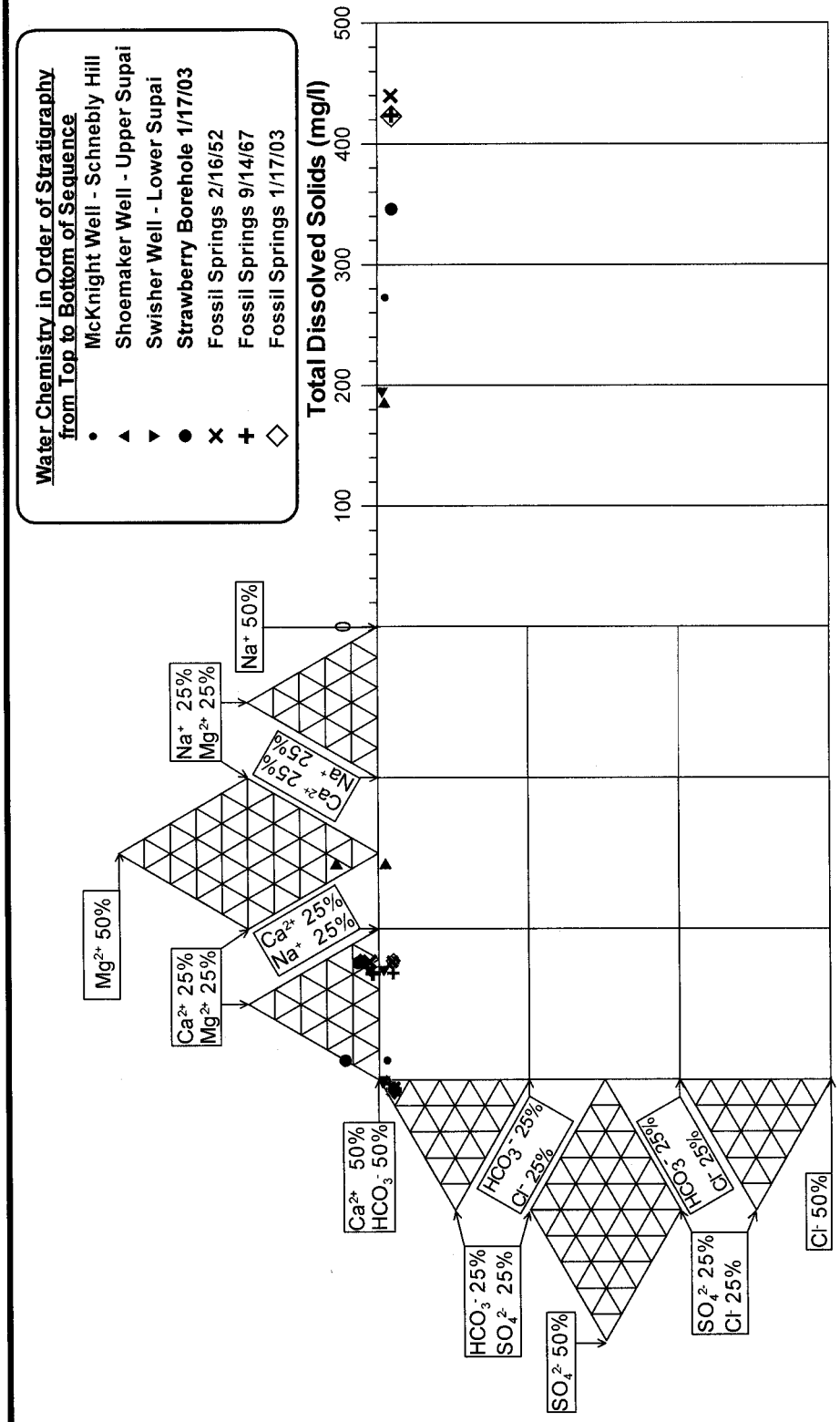


Figure 6-19: Local aquifer data compared to Strawberry Borehole and Fossil Springs .

Figure 6-20: Local aquifer data compared to Strawberry Borehole with chloride.

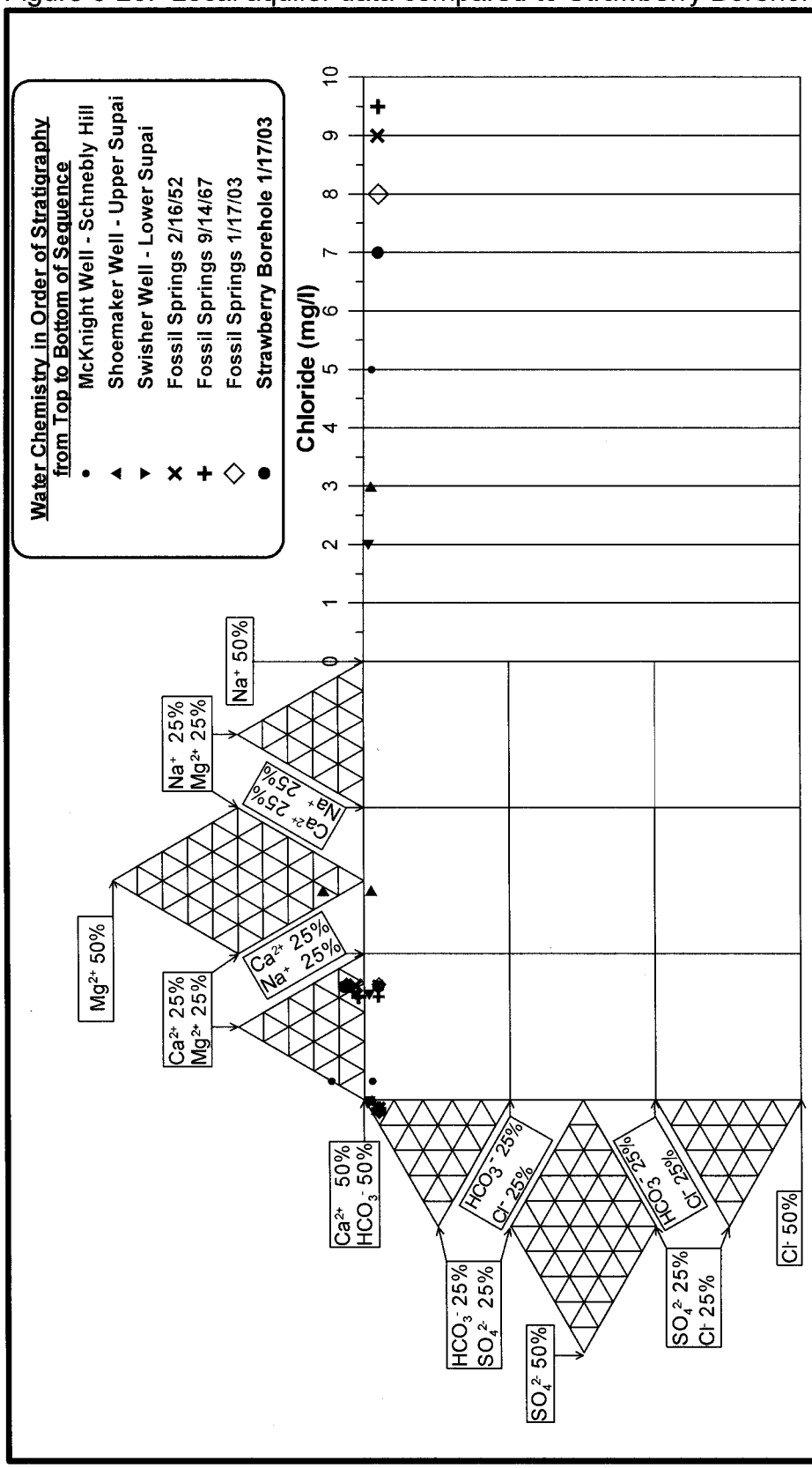


Figure 6-20: Local aquifer data compared to Strawberry Borehole and Fossil Springs .

of the Durov diagram and exhibits relatively high total dissolved solids and chloride concentrations. This water is not a result of reverse ion exchange as suggested by the Durov process concepts shown on Figure 6-16 for field 8, but is rather the result of dissolution of evaporates in the Supai Group north of the spring where the Supai is known to contain salt (halite), gypsum and anhydrite (calcium sulfate). Likewise, the dominance of chloride in the dissolved cations is the result of dissolution of evaporite minerals in the Supai.

Figures 6-19 and 6-20 show Durov plots for water samples taken from three wells in the Pine and Strawberry area and compare the chemistry of those samples to the chemistry of the samples from Fossil Springs and the Strawberry Borehole. The samples from the three wells are shown with respect to the order of the geologic formations they penetrate with the McKnight Well completed in the Schnebly Hill, the Shoemaker Well in the upper Supai, and the Swisher Well starting in the lower Supai with a reported depth exceeding the thickness of the unit, but the completion unknown. The laboratory analytical reports for the water samples from the local wells, Strawberry Borehole, and Fossil Springs are shown in Appendix B.

The wells all exhibit good water quality and plot in field 1 of the Durov diagram except the Shoemaker well that shows slightly more sodium percentage that the other wells. The Shoemaker well is at the bottom of a flow path through all of the strata from the top of the Mogollon Rim, starting with the Coconino and ending in the upper Supai. This might provide some opportunity for cation exchange or introduction of recharge water containing sodium; otherwise, the reason for the higher percentage of sodium is not clear. The total dissolved solids and chloride distributions; however, both exhibit similar patterns. The pattern is one of relatively low chloride and total dissolved solids in the wells completed in the Supai strata whereas the McKnight Well completed in the Schnebly Hill strata exhibits slightly higher chloride and total dissolved solids concentrations than the other two wells. Chloride and total dissolved solids are progressively greater in the Strawberry Borehole followed by Fossil Springs.

The likely cause of the difference between the chemistry of groundwater from the Schnebly Hill and Supai strata is residence time. As previously described, groundwater flows through the Supai strata in fracture zones with little or no groundwater storage in the rock hosting the fractures. This promotes local recharge, short residence time, and distribution of the recharge water across long distances related to the fracture geometry. By comparison, the Schnebly Hill strata contain groundwater in both the fractures and the materials surrounding the fractures, thus providing more opportunity for groundwater residence time and dissolution of minerals from the rock matrix. This probably explains the chemistry of the water in the McKnight well compared to the other two wells. If this interpretation is correct, based as it is on sparse data, comparison of the Schnebly Hill and Supai groundwater on the Durov plot indicates the Supai groundwater does not consist of interformational leakage from the Schnebly Hill,

as suggested conceptually elsewhere in this report, but consists of water recharged into the fractures from sources other than the Schnebly Hill, most likely local recharge from runoff infiltrating into the fractures.

The Durov plots show total dissolved solids and chloride concentrations are least at the Strawberry Borehole, as compared to three analyses of water from Fossil Springs. However, the total dissolved solids and chloride concentrations in the groundwater from the Strawberry Borehole (Redwall or Limestone Aquifer water) are greater than those in the local Schnebly Hill and Supai groundwater. These observations are consistent with the concept of increasing dissolution of minerals from the aquifer rocks with increasing groundwater flow path distance and residency time.

In summary, the dominant cation-anion species of the groundwater chemistry for the Regional Aquifer and Fossil Springs are the same. The major water chemistry parameters indicate interformational leakage from the Regional Aquifer into the Redwall/Martin strata north of Fossil Creek is potentially a major source of groundwater storage supporting the flow from Fossil Springs and therefore may be a major source of groundwater storage supporting the availability of groundwater in the Redwall/Martin strata underlying the northern edge of the PSWID area, depending on the as yet undefined local hydraulic gradients.

There is undoubtedly a need for considerable additional study of the hydrochemistry of the Regional Aquifer and of the Limestone Aquifer discharging water out of the Redwall Limestone at Fossil Springs. Moreover, there is the opportunity for application of tremendously more sophisticated isotopic analyses and other types of hydrochemical analyses than the Durov diagrams presented herein. Future investigations may provide considerable more insight as to how much the groundwater storage supporting the flow from Fossil Springs is supported by recharge on the Naco/Redwall/Martin outcrops south of the Mogollon Rim and east of Milk Ranch Point and how much the flow is supported by interformational leakage out of the Regional Aquifer to the north. However, recognition of the strong likelihood that the flow from Fossil Springs is supported in part by groundwater storage in the Regional Aquifer has significant implications regarding the reliability of the groundwater source in the Redwall/Martin strata, i.e., the Limestone Aquifer, in the PSWID. Interformational leakage out of the Regional Aquifer to the north would greatly increase the reliability of the Limestone Aquifer in the PSWID area and significantly reduce the potential for abstraction of groundwater from the Redwall/Martin strata in the PSWID to have a measurable effect on flow from Fossil Springs.

7. LOCAL OBSERVATIONS

A document titled, "***PS 2002 Perceptions of Water Supply in the Pine-Strawberry area***, prepared by PSWID Board Member John O. Breninger, July 1, 2002, revised August 10, 2002, and accepted by PSWID Board action of August

17, 2002, summarizes many of the local perceptions prevalent at the start of the investigation reported herein. The PSWID Board and their agent for this contract requested that a number of the local perceptions be addressed as the result of these investigations. Most of the local perceptions are addressed, directly or indirectly, by this report. However, three of the local perceptions deserve special comment. These perceptions include stories about the Sam Swisher well, speculation about the significance of Strawberry Hollow to local hydrology, and the observation that a part of Strawberry called "The Cove" is particularly productive of groundwater.

7.1. Sam Swisher Well

The local perception of the Sam Swisher domestic well is that it produces soft water whereas all the other wells in the area produce hard water. Therefore the Swisher well is regarded as a puzzling anomaly that probably represents some hydrogeologic factor of local significance, particularly because the well is reportedly 748 feet deep (Sam Swisher, personal communication, January 22, 2003). A search of the ADWR water well database identifies the well as 55-643372, completed March 8, 1971 at a recorded depth of 734 feet with a static water level of 651 feet and a yield of 13 gpm. No information is given about the depth of the steel casing or perforated intervals. The ADWR file provides UTM coordinates for the well consisting of an easting of 457,934.1 meters and a northing of 3,804,462.9 meters.

The ADWR coordinate location of the well indicates it starts in the lower Supai strata and is at an approximate elevation of 5360 feet, estimated from the 40-foot contours on the published 7.5 minute Pine Quadrangle. This indicates the well depth of 748 feet potentially penetrates entirely through the Redwall Limestone and into Martin strata. The projected depth of the top of the Redwall Limestone (Figure 6-11) at the ADWR coordinate location for the Swisher well is 300 feet. Assuming the Redwall is 180 to 190 feet thick, the base of the Redwall is at an approximate depth of 480-490 feet and the well potentially penetrates the full thickness of the Martin Formation.

The static water level of 651 feet reported at the time of well completion is well below the estimated bottom of the Redwall Limestone, indicating yield is from the Martin Formation or older strata, depending on the nature of the basement rock topography. The static water level elevation, estimated to be elevation 4709 feet, is 364 feet higher than the static water level elevation of 4364.9 feet in the Strawberry Borehole in January 2003, although some allowance must be made for error in estimating the wellhead elevation. This indicates the static water level is a function of the structural elevation at the lower boundary of the water-bearing zone and has nothing to do with a regional water table or potentiometric surface. In view of the latter fact, there did not appear to be any merit to collecting new information from the well to verify the reported values, as the information would

not extend the regional potentiometric surface in the Redwall/Martin strata as far as selecting a site for drilling of a deep test/production well is concerned.

Analysis of water samples collected from the McKnight well in Strawberry and the Swisher and Shoemaker wells in Pine provided hardness values of 248, 186 and 143 mg/l hardness as $CaCO_3$, respectively. Thus, with a hardness of 186 mg/l, the groundwater from the Swisher well falls within the range of hardness for other wells in the area and certainly is not soft water. The plot of the major cation-anion species in groundwater from the Swisher well, shown on Figures 6-19 and 6-20, indicate the chemistry of the water is essentially the same as that in other wells in Pine and Strawberry.

7.2. Strawberry Hollow

It is interesting that laymen residents reviewing the water situation in Pine and Strawberry, local well drillers, operators of some of the public water supply systems, and geologists mapping the Pine and Strawberry quadrangles all perceive Strawberry Hollow as having a special significance to either the availability of groundwater, the geologic structure, or both. However, the significance of Strawberry Hollow has remained elusive in the context of the local perceptions through August 10, 2002.

Jackson (1951) evidently mapped a high angle normal fault through Strawberry Hollow, as referred to by Weisman (1984). Weisman (1984) did not show a fault in Strawberry Hollow but mapped and described a small shear zone in the Fort Apache limestone on the south side of Strawberry Hollow that exhibits about 20 feet of offset. Weisman and Weir (1990) extend the shear zone of Weisman (1984) to the northwest, across the east end of Strawberry, but do not extend it into Strawberry Hollow. Accordingly, the fault zone referred to by Breninger (2002; p. 7) as the "Strawberry Hollow fault line", separating Strawberry Hollow and Strawberry Mountain from the Mogollon Rim, has been peripatetic, coming and going with each new investigation, sometimes with the same investigator, and never exhibiting more than 20 feet of observable offset.

Inspection of Strawberry Hollow during this investigation did not reveal observable evidence of a fault, other than the small shear zone described by Weisman (1984). A geologic structure control point surveyed on the east flank of Strawberry Mountain, west of Strawberry Hollow, indicates that a significant fault does not exist in direct alignment with the topographic expression of Strawberry Hollow and that the fault alignment shown by Weisman and Weir (1990) is unlikely. Based on these latter two observations, it appears likely that Jackson (1951) and Weisman and Weir (1990) put high angle fault alignments on their maps based more on interpretation of structural trends then on actual observation of a fault, however, they were correct in concluding that the structure undergoes a change in the vicinity of Strawberry Hollow.

As shown by this investigation, the structural elevation contours of the Strawberry Mountain mass abruptly bend just west of Strawberry Hollow (Figure 6-4), strongly suggesting an obscure fault boundary or series of small fault offsets must exist along the east side of Strawberry Mountain, somewhere between the eastern toe of the mountain and Strawberry Hollow, as a boundary to the hypothesized graben structure (Figure 6-13) extending southward from the Nash Point and Calf Pen Canyon faults mapped by Weisman and Weir (1990), and with a total offset of at least 50 to 100 feet. The projected graben alignment (Figure 6-13), based in part on surveyed structural elevations, indicates the shear zone described by Weisman (1984), is probably a small secondary feature parallel or sub-parallel to and east of a larger fault. An alternate interpretation is that the southern extension of the Calf Pen Canyon fault degenerates into a series of parallel or sub-parallel shear zones, each with 20 feet or less of offset, but which collectively lower the Strawberry Mountain mass by 50 to 100 feet relative to the geologic structure east of Strawberry Hollow. In this latter interpretation, the shear zone of Weisman (1984) is just one of a number of small shear zones which collectively provide the total offset of 50 to 100 feet in the structure.

Essentially all geologic investigators have recognized that the geologic structure changes in the vicinity of Strawberry Hollow or between Strawberry Hollow and the east flank of Strawberry Mountain; however, no one has been able to recognize the exact location of the fault or flexure where the change occurs. The most precise identification of the structure is on Figure 6-13 where it is evident the structure must be aligned between the three surveyed structural control points on Strawberry Mountain and is likely closest to the easternmost surveyed point. Based on the theory advanced from the results of this investigation, the structural change occurs just west of Strawberry Hollow and is a fault or local flexure that drops the structural elevation of the Strawberry Mountain mass 50 to 100 feet lower than the geologic structure immediately to the east, as part of a fault-related graben.

In the course of the fieldwork for this investigation, another factor was discovered that has no doubt complicated interpretation of the geologic structure in the vicinity of Strawberry Hollow. The geologic map in Weisman (1984) was very useful in guiding this investigation through the effort to survey structural control on the Fort Apache limestone. This is because the map in Weisman (1984) identifies locations where the Fort Apache limestone is exposed at the land surface in an outcrop that can be inspected. This was very useful to the survey effort because the Weisman (1984) map directed the work immediately to locations where the base of the unit could be examined and surveyed; therefore, it was not necessary to search all along the potential outcrop area for such locations.

However, the Weisman (1984) map indicates the top and bottom of the Fort Apache limestone are exposed in an outcrop in the northwest quarter of Section

25, T12N, R8E. Field inspection revealed the outcrop to be poorly exposed with the basal contact covered. When the basal contact was excavated, it had the same appearance as the basal contact of the Fort Apache limestone and it was surveyed. However, the elevation provided by the precision survey is tremendously out of place on the geologic structure indicated by the other outcrops and precision surveyed elevations, being about 200 feet lower in elevation than a reasonable elevation projected for the Fort Apache limestone at that location from the other surveyed points. It is concluded from this interpretation that the outcrop initially thought to be the Fort Apache limestone is in fact one of the other carbonate units in the Bell Rock Member of the Schnebly Hill that is easily mistaken for the Fort Apache limestone. When the latter fact is recognized, the geologic structure along Strawberry Hollow makes a lot more sense.

If the outcrop mapped by Weisman (1984) and Weisman and Weir (1990) is in fact correctly identified as the Fort Apache limestone by those efforts, it is low with respect to the surrounding trends, including Strawberry Mountain, and opposite to the direction of displacement of the Strawberry Hollow fault mapped by Weisman and Weir (1990). These considerations suggest the outcrop was simply misidentified by all concerned; a fact that did not emerge until Kriging was used to project the structural surface based on the other surveyed elevations on the base of the Fort Apache outcrops.

The terrain along the west side of Pine Canyon includes a number of knobs, evidently supported by resistant limestone corresponding to the unit mapped by Weisman (1984) and Weisman and Weir (1990) as Fort Apache Limestone. Weisman (1984) projected the Fort Apache limestone along the west side of Pine Canyon, from the outcrop where it is crossed by Pine Creek, into the limestone unit supporting the knobs on the terrain. Weisman and Weir (1990) show this same projection, which includes a covered interval of about half to three-fourths of a mile from the crossing at Pine Creek.

The knobs on the terrain and their poorly exposed limestone outcrops are seductive and it is very logical to conclude they represent the extension of the Fort Apache limestone to the west side of Pine Canyon. However, this interpretation does not fit the projection of the rest of the geologic structure across the area and the difference of 200 feet between the structural projection and these outcrops suggests the wrong limestone ledge was identified as Fort Apache limestone by Weisman (1984) and by Weisman and Weir (1990) on the west side of Pine Creek. Certainly, without the surveyed structural control points, this investigation would have likely mapped the Fort Apache limestone in exactly the same way as done by Weisman (1984) and Weisman and Weir (1990).

However, the outcrop of Fort Apache Limestone can be traced northeasterly out of Strawberry Hollow and across the pipeline road where it disappears under colluvial debris. At the point where the outcrop becomes buried along the

pipeline road in Strawberry hollow, it is well above the elevation of the outcrop mapped by Weisman (1984) and Weisman and Weir (1990) as Fort Apache Limestone along the west side of Pine Creek canyon. Unfortunately, the thick cover of debris along the west side of the canyon makes it impossible to trace the outcrop back to where Pine Creek crosses the unit; however, the elevation differences leave little doubt that the limestone ledge mapped as Fort Apache Limestone along the west side of the canyon by the previous investigators is not Fort Apache Limestone, but instead a unit in the Schnebly Hill or, possibly, in the uppermost part of the upper Supai.

The west side of Pine Canyon should be re-examined very carefully to look for evidence of covered Fort Apache limestone outcrop at a higher elevation than mapped by Weisman (1984) and Weisman and Weir (1990) and to carefully identify the base of the Coconino Sandstone as a potential horizon from which the average thickness of the Corduroy Member of the Schnebly Hill can be projected downward to estimate the approximate elevation at which the Fort Apache should be present. Verification that the Fort Apache limestone is at the higher elevation shown by the structural projection on Figures 4-2 and 6-10 would confirm the structural interpretations set forth herein. If further field investigation shows that the projection of the Fort Apache limestone along the west side of Pine Canyon as shown by Weisman (1984) and Weisman and Weir (1990) is correct, a new interpretation of the structural geology in the vicinity of Strawberry Hollow will be necessary and would require that the east side of the structure be offset downward with respect to Strawberry Hollow, an interpretation that is inconsistent with any of the other information about the area.

7.3. The Cove

The topographic valley tributary to the south side of the Strawberry Valley is referred to as "The Cove" and is perceived by local residents to be an area of greater groundwater flow and availability than other parts of Strawberry. In describing the local perception, Breninger (2002) states:

> "***Groundwater seems to flow most reliably from the southeast wall of the valley out of a formation designated "The Cove," as evident by the performance of the well field and growth pattern of Ponderosa Pines in that area. The western valley floor well and ranch fields exhibit less moisture from groundwater, except for a band of Ponderosa Pines along the entire southern wall of the valley."*** (Breninger, 2002; p. 7)

Not stated in the above citation is the local perception that wells drilled in Strawberry Valley near the mouth of the Cove are better producers and more reliable than those drilled to the west in Strawberry Valley.

The investigations performed for this report suggest that there are, in fact, geologic reasons for the above stated perceptions. The first geologic factor is that the Strawberry Valley is underlain by the Bell Rock Member of the Schnebly Hill formation that offers somewhat greater well yields and certainly more reliable yields to wells than the Supai strata in the nearby community of Pine. The presence of the Schnebly Hill strata is therefore the most obvious factor in the performance of wells near the mouth of the Cove.

However, a different explanation is required for the observation that well yields become progressively smaller and less reliable away from the mouth of the Cove and towards the west along the axis of the Strawberry Valley. The explanation for this local observation may have roots in the observation by Twenter (1962) that more than 2,000 feet of volcanics, mostly basalt flows, are deposited against the ancestral Mogollon Rim in Fossil Creek and at the west end of the Strawberry Valley. It is very possible that the groundwater contained in the Schnebly Hill formation in the west half of the Strawberry Valley drains towards the ancestral Mogollon Rim at the west end of the valley, and out through the basalt layers which are highly jointed and receptive to infiltration of water. If this is the case, the Schnebly Hill strata in west end of the Strawberry Valley are simply dewatered by gravity drainage into the volcanic rocks at the west end of the valley and an east to west gradient probably exists in the potentiometric surface with static water levels in wells becoming progressively deeper toward the west end of the valley.

Another geologic relationship may be the source of the moisture for the band of Ponderosa pines along the southern edge of the Strawberry Valley west of the mouth of the Cove. The south wall of the Strawberry Valley west of the Cove cuts through the Fort Apache limestone immediately above the band of Ponderosa pines, as shown on Figures 4-2 and 6-10. Although the truncated end of the limestone layer is not well exposed along the valley wall, it is present in the subsurface. The Strawberry Valley wall cuts through the limestone layer at the down-gradient end of the sheet of limestone underlying the Strawberry Mountain mass and dipping northward into the Strawberry Valley. Accordingly, the Fort Apache limestone layer in Strawberry Mountain is in a position to collect groundwater seeping down through the mountain from all of the overlying materials, including basalt flows that cap the mountain and provide a receptive surface for infiltration of recharge water.

Since the Fort Apache limestone is probably the most permeable layer in the mountain and it dips down gradient into the south wall of the Strawberry Valley, it is in a perfect position to intercept all of the recharge into that part of Strawberry Mountain and drain it out into the subsurface of the valley wall right along the band of Ponderosa pine on the south edge of the valley, west of the Cove. Therefore, the most likely explanation for the wetter conditions observed along that part of the southern wall of Strawberry Valley is probably drainage of groundwater out of the truncated end of the Fort Apache Limestone.

7.4. Strawberry Valley

A final local observation is not based on any local perception, but is based on a local desire to understand the reason why the Strawberry Valley exists. This question is addressed at the end of section 5.6.1 of this report and is addressed again here.

Strawberry Mountain is a remnant of the surface that existed north of the ancestral Mogollon Rim at some point in the geologic past. That surface sloped from north to south, draining off of the ancestral rim. At some point in time, a portion of the south-sloping surface was covered by a deposit of basalt in the form of a lava flow or multiple flows. Remnants of the basalt cap the modern Strawberry Mountain.

The most likely reason for the present location of Strawberry Valley, in this author's opinion, is that water formerly flowing down the south-sloping surface above the ancestral Mogollon Rim was blocked by the basalt deposits, causing water to flow along the northern edge of the basalt, draining west towards the ancestral Mogollon Rim above Fossil Creek. Eventually, the diverted water cut the Strawberry Valley along the north side of the basalt flow.

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APPENDIX A

Summary of coordinates for surveyed structural control points

Summary of control points on basal contact of Fort Apache Limestone.
Arizona East 201
NAD83
International Feet

Point No.	Easting	Northing	Elevation	Description
50	317035.3297	1249868.0154	5876.97	Base of Fort Apache
51	318387.3327	1241822.6208	6163.67	Base of Fort Apache
52	318130.6616	1242861.6784	6148.13	Base of Fort Apache
54	303766.7047	1241554.2330	5970.63	Base of Fort Apache
55	304299.6372	1236283.6692	6143.58	Base of Fort Apache
56	301823.3450	1231337.9050	6504.05	Base of Fort Apache
57	326023.9813	1230404.9466	6678.06	Base of Fort Apache
58	330873.6769	1233781.1588	6667.99	Base of Fort Apache
59	329902.6934	1245052.1694	6229.96	Base of Fort Apache
61	291797.9923	1241513.7565	5749.65	Strawberry Borehole
65	299149.4037	1238213.3244	6106.74	Base of Fort Apache
67	287679.2392	1250852.1701	5396.89	Base of Fort Apache
68	294889.8587	1258925.69	5400.800	Base of Fort Apache

PINE CONTROL POINTS ARIZONA EAST-201-NAD83 INTERNATIONAL FEET

GRID:

CP#1 N-1241399.2421
E-312087.5492
EL-5842.78
REBAR SET AT TOP OF HILLTOP DR. The point overlooks pine from the north.

CP#2 N-1233827.2376
E-311130.3004
EL-5371.61
REBAR SET @ HARDSCRABBLE RD (downtown pine)

CP#4 N-1241367.3458
E-281444.7441
EL-5852.82
FOUND FOREST SERVICE BOUNDARY BC 57A. At north end of strawberry from sr87 turn west on fossil creek rd, continue 3 miles, BC on s. side of rd.

CP#5 N-1250201.7053
E-311274.9318
EL-7088.10

REBAR SET ON RIM. South from seven-mile tank trail, to end of jeep trail. Point in clearing.

CP#6 N-1251716.6798
E-296170.4331
EL-6744.60
REBAR SET. Rebar set +/- 50' west of SR87, +/- 50' east of barbed wire fence with gate. Small rd to 5 mile tank on the east side of SR87.

CP#7 N-1262201.1483
E-308634.3334
EL-6862.97
REBAR SET @ CALFPEN CANYON. From SR87 north of strawberry to jct. Sr260(zane gray hwy) north to east/west dirt road(twentynine mile lake rd). Head west +/- 2 miles, take left at fork in road and continue to small clearing just past pond. Point is west of trail 20' west of fallen tree.

CP#20 N-1224835.2658
E-323282.5591
EL-5578.52
REBAR SET NORTH OF CONTROL RD. +/-1500 ft of sr87

CP#21 N-1221224.9147
E-320279.8327
EL-5635.38
SPIKE SET SOUTH OF CONTROL ROAD. The point is +\-40 feet east of sr87 just past end of the northbound safety lane.

CP#30 N-1240508.3104
E-337054.5374
EL-5483.47
SET SPIKE IN FIELD @ CAMP GERONIMO. Point is in the north field E. of the basketball court.

CP#31 N-1226144.4980
E-332423.1693
EL-5401.21
X @ CATTLE GUARD ON CONTROL RD. Point is on a cattle guard east on control rd. +/- 3 miles.

POINTS ON GEOLOGIC STRUCTURE:

CP#50	N-1249868.0154 E-317035.3297 EL-5876.97	Base of Fort Apache Limestone
CP#51	N-1241822.6208 E-318387.3327 EL-6163.67	Base of Fort Apache Limestone
CP#52	N-1242861.6784 E-318130.6616 EL-6148.13	Base of Fort Apache Limestone
CP#53	N-1240377.8867 E-308717.1297 EL-5909.89	Stray limestone unit mistakenly identified as Fort Apache Limestone – point not used.
CP#54	N-1241554.2330 E-303766.7047 EL-5970.63	Base of Fort Apache Limestone
CP#55	N-1236283.6692 E-304299.6372 EL-6143.58	Base of Fort Apache Limestone
CP#56	N-1231337.9050 E-301823.3450 EL-6504.05	Base of Fort Apache Limestone
CP#57	N-1230404.9466 E-326023.9813 EL-6678.06	Base of Fort Apache Limestone
CP#58	N-1233781.1588 E-330873.6769 EL-6667.99	Base of Fort Apache Limestone
CP#59	N-1245052.1694 E-329902.6934 EL-6229.96	Base of Fort Apache Limestone
CP#60	N-1235992.6628 E-307417.4837 EL-5503.38	Top of casing, Strawberry Hollow Well

CP#61 N-1241513.7565 Top of casing without cap, Strawberry Borehole
E-291797.9923
EL-5749.65

CP#65 N-1238213.3244 Base of Fort Apache Limestone
E-299149.4037
EL-6106.74

CP#67 N-1250852.1701 Base of Fort Apache Limestone
E-287679.2392
EL-5396.89

CP#68 N-1258925.69 Base of Fort Apache Limestone
E-294889.8587
EL-5400.80

BENCH MARKS AT PINE/STRAWBERRY

#1 The bench mark is a brass cap flush in rock. C-496.
Located .7miles southeast along sr87 from the post office in pine. .05miles southeast of milepost 267, in top of a rock outcropping at southeast end of turn area. 46 feet west of highway centerline.
N-1230927.7308
E-313071.3146
EL-5389.63

#2 The bench mark is a brass cap flush in concrete. L-29.
Located 105 feet west of sr87@ intersection of hardscrabble rd. The point is south of hardscrabble rd in the yard of the house on the corner, 9 feet north of centerline of old cabin.
N-1233755.6585
E-311297.4150
EL-5364.20

#3 The bench mark is a point on top of wellhead. Rick's Lane.
Located from sr87 and hardscrabble rd. West .85miles on hardscrabble rd, left on dirt road with house address 6732, point is S.E.of E. end of home.
N-1232429.4450
E-307665.0164
EL-5539.63

#4 The bench mark is a brass cap flush in rock outcrop. Y-494.
Located .3 miles north on sr87 from the post office in pine on east side of the highway. East of Texaco station, 50 feet north of Art gallery sign.
N-1236044.6902
E-311320.6915
EL-5437.72

#5 The bench mark is a small pin on a concrete post.
To get to point travel north on sr87 from pine to top of pass. The point is north side of road at the west end of the passing lane at top of pass. The point is just south of fence line.
N-1241907.4692
E-302841.2497
EL-6024.67

#6 The bench mark is a brass cap flush. P-29.
Located 3 miles northwest along sr87 from the post office in pine. 2.5 miles west along fossil creek rd, in a group of pine trees at the top of a low cut, .05 miles west of end of pavement, 48 feet north of road centerline, 177 feet east of a cattle guard.
N-1242494.3404
E-287394.9368
EL-5744.01

#7 The bench mark is a brass cap flush in rock outcrop. D-495.
Located 3 miles northwest along sr87 from the post office in pine. The point is just north of fossil creek road and 24 feet west of sr87 centerline.
N-1242605.3473
E-299887.6923
EL-5898.57

#8 The bench mark is a forest service brass cap and section line.
USFS brass cap west 1/16 corner of section 27.
N-1238897.6705
E-298593.2639
EL-5945.08

APPENDIX B

Analytical reports for water samples

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Morrison Maierle
Project: Pine/Strawberry WID
Lab ID: B03010996-001
Client Sample ID: Strawberry Borehole

Report Date: 01/31/03
Collection Date: 01/17/03
Date Received: 01/23/03
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	01/23/03 14:13 / jb
Conductivity	568	umhos/cm		1		A2510 B	01/23/03 14:09 / jb
Langelier Index	0.2					A203	01/29/03 12:29 / lab
Solids, Total Dissolved TDS @ 180 C	346	mg/L		10		A2540 C	01/24/03 11:17 / qed
INORGANICS							
Alkalinity, Total as CaCO3	313	mg/L		2		A2320 B	01/27/03 15:44 / car
Bicarbonate as HCO3	382	mg/L	D	3		A2320 B	01/27/03 15:44 / car
Carbonate as CO3	ND	mg/L		1		A2320 B	01/27/03 15:44 / car
Chloride	7	mg/L		1		E300.0	01/24/03 18:00 / car
Sulfate	12	mg/L		1		E300.0	01/24/03 18:00 / car
Fluoride	0.17	mg/L		0.10		A4500-F C	01/30/03 16:30 / ddb
Hardness as CaCO3	307	mg/L		1		A2340 B	01/27/03 09:54 / rlh
NUTRIENTS							
Nitrogen, Nitrate+Nitrite as N	0.21	mg/L		0.05		E353.2	01/27/03 12:32 / bls
METALS, DISSOLVED							
Calcium	76	mg/L		1		E200.7	01/24/03 21:44 / rlh
Iron	ND	mg/L		0.03		E200.7	01/24/03 21:44 / rlh
Magnesium	28	mg/L		1		E200.7	01/24/03 21:44 / rlh
Manganese	0.10	mg/L		0.01		E200.7	01/24/03 21:44 / rlh
Potassium	2	mg/L		1		E200.7	01/24/03 21:44 / rlh
Sodium	11	mg/L		1		E200.7	01/24/03 21:44 / rlh
METALS, TOTAL							
Antimony	ND	mg/L		0.003	0.006	E200.8	01/28/03 16:15 / jjw
Arsenic	ND	mg/L		0.005	0.01	E200.8	01/28/03 16:15 / jjw
Barium	0.2	mg/L		0.1	2	E200.7	01/25/03 01:06 / rlh
Beryllium	ND	mg/L		0.001	0.004	E200.7	01/25/03 01:06 / rlh
Cadmium	ND	mg/L		0.001	0.005	E200.8	01/28/03 16:15 / jjw
Chromium	ND	mg/L		0.01	0.1	E200.8	01/29/03 18:32 / jjw
Mercury	ND	mg/L		0.0002	0.002	E200.8	01/28/03 16:15 / jjw
Nickel	ND	mg/L		0.01	0.1	E200.7	01/25/03 01:06 / rlh
Selenium	ND	mg/L		0.005	0.05	E200.8	01/28/03 16:15 / jjw
Thallium	ND	mg/L		0.001	0.002	E200.8	01/28/03 16:15 / jjw

Report Definitions:
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QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Morrison Maierle
Project: Pine/Strawberry WID
Lab ID: B03010996-005
Client Sample ID: Fossil Creek Springs

Report Date: 01/31/03
Collection Date: 01/22/03 09:00
Date Received: 01/23/03
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	01/23/03 14:18 / jb
Conductivity	710	umhos/cm		1		A2510 B	01/23/03 14:10 / jb
Langelier Index	0.0					A203	01/29/03 12:30 / lab
Solids, Total Dissolved TDS @ 180 C	423	mg/L		10		A2540 C	01/24/03 17:09 / qed
INORGANICS							
Alkalinity, Total as CaCO3	399	mg/L		2		A2320 B	01/27/03 16:16 / car
Bicarbonate as HCO3	486	mg/L	D	3		A2320 B	01/27/03 16:16 / car
Carbonate as CO3	ND	mg/L		1		A2320 B	01/27/03 16:16 / car
Chloride	8	mg/L		1		E300.0	01/24/03 19:42 / car
Sulfate	19	mg/L		1		E300.0	01/24/03 19:42 / car
Fluoride	0.17	mg/L		0.10		A4500-F C	01/30/03 16:30 / ddb
Hardness as CaCO3	382	mg/L		1		A2340 B	01/27/03 09:54 / rlh
NUTRIENTS							
Nitrogen, Nitrate+Nitrite as N	0.14	mg/L		0.05		E353.2	01/27/03 12:37 / bls
METALS, DISSOLVED							
Calcium	94	mg/L		1		E200.7	01/24/03 22:08 / rlh
Iron	ND	mg/L		0.03		E200.7	01/24/03 22:08 / rlh
Magnesium	36	mg/L		1		E200.7	01/24/03 22:08 / rlh
Manganese	ND	mg/L		0.01		E200.7	01/24/03 22:08 / rlh
Potassium	2	mg/L		1		E200.7	01/24/03 22:08 / rlh
Sodium	12	mg/L		1		E200.7	01/24/03 22:08 / rlh
METALS, TOTAL							
Antimony	ND	mg/L		0.003	0.006	E200.8	01/28/03 16:53 / jjw
Arsenic	0.005	mg/L		0.005	0.01	E200.8	01/28/03 16:53 / jjw
Barium	0.2	mg/L		0.1	2	E200.7	01/25/03 01:42 / rlh
Beryllium	ND	mg/L		0.001	0.004	E200.7	01/25/03 01:42 / rlh
Cadmium	ND	mg/L		0.001	0.005	E200.7	01/25/03 01:42 / rlh
Chromium	ND	mg/L		0.01	0.1	E200.8	01/29/03 19:27 / jjw
Mercury	ND	mg/L		0.0002	0.002	E200.8	01/28/03 16:53 / jjw
Nickel	ND	mg/L		0.01	0.1	E200.7	01/25/03 01:42 / rlh
Selenium	ND	mg/L		0.005	0.05	E200.8	01/28/03 16:53 / jjw
Thallium	ND	mg/L		0.001	0.002	E200.8	01/28/03 16:53 / jjw

Report Definitions:
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D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Morrison Maierle
Project: Pine/Strawberry WID
Lab ID: B03010996-004
Client Sample ID: McKnight Well

Report Date: 01/31/03
Collection Date: 01/22/03 10:30
Date Received: 01/23/03
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.4	s.u.		0.1		E150.1	01/23/03 14:16 / jb
Conductivity	465	umhos/cm		1		A2510 B	01/23/03 14:10 / jb
Langelier Index	0.2					A203	01/29/03 12:30 / lab
Solids, Total Dissolved TDS @ 180 C	273	mg/L		10		A2540 C	01/24/03 11:23 / qed
INORGANICS							
Alkalinity, Total as CaCO3	268	mg/L		2		A2320 B	01/27/03 16:08 / car
Bicarbonate as HCO3	327	mg/L	D	3		A2320 B	01/27/03 16:08 / car
Carbonate as CO3	ND	mg/L		1		A2320 B	01/27/03 16:08 / car
Chloride	5	mg/L		1		E300.0	01/24/03 19:29 / car
Sulfate	1	mg/L		1		E300.0	01/24/03 19:29 / car
Fluoride	0.16	mg/L		0.10		A4500-F C	01/30/03 16:30 / ddb
Hardness as CaCO3	248	mg/L		1		A2340 B	01/27/03 09:54 / rlh
NUTRIENTS							
Nitrogen, Nitrate+Nitrite as N	0.32	mg/L		0.05		E353.2	01/27/03 12:36 / bls
METALS, DISSOLVED							
Calcium	59	mg/L		1		E200.7	01/24/03 22:04 / rlh
Iron	ND	mg/L		0.03		E200.7	01/24/03 22:04 / rlh
Magnesium	24	mg/L		1		E200.7	01/24/03 22:04 / rlh
Manganese	ND	mg/L		0.01		E200.7	01/24/03 22:04 / rlh
Potassium	ND	mg/L		1		E200.7	01/24/03 22:04 / rlh
Sodium	10	mg/L		1		E200.7	01/24/03 22:04 / rlh
METALS, TOTAL							
Antimony	ND	mg/L		0.003	0.006	E200.8	01/28/03 16:47 / jjw
Arsenic	ND	mg/L		0.005	0.01	E200.8	01/28/03 16:47 / jjw
Barium	0.2	mg/L		0.1	2	E200.7	01/25/03 01:38 / rlh
Beryllium	ND	mg/L		0.001	0.004	E200.7	01/25/03 01:38 / rlh
Cadmium	ND	mg/L		0.001	0.005	E200.7	01/25/03 01:38 / rlh
Chromium	ND	mg/L		0.01	0.1	E200.8	01/29/03 19:21 / jjw
Mercury	ND	mg/L		0.0002	0.002	E200.8	01/28/03 16:47 / jjw
Nickel	ND	mg/L		0.01	0.1	E200.7	01/25/03 01:38 / rlh
Selenium	ND	mg/L		0.005	0.05	E200.8	01/28/03 16:47 / jjw
Thallium	ND	mg/L		0.001	0.002	E200.8	01/28/03 16:47 / jjw

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D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Morrison Maierle
Project: Pine/Strawberry WID
Lab ID: B03010996-003
Client Sample ID: Sam Swisher Well

Report Date: 01/31/03
Collection Date: 01/22/03 12:30
Date Received: 01/23/03
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.6	s.u.		0.1		E150.1	01/23/03 14:16 / jb
Conductivity	336	umhos/cm		1		A2510 B	01/23/03 14:09 / jb
Langelier Index	0.2					A203	01/29/03 12:29 / lab
Solids, Total Dissolved TDS @ 180 C	194	mg/L		10		A2540 C	01/24/03 11:22 / qed
INORGANICS							
Alkalinity, Total as CaCO3	199	mg/L		2		A2320 B	01/27/03 16:01 / car
Bicarbonate as HCO3	242	mg/L	D	3		A2320 B	01/27/03 16:01 / car
Carbonate as CO3	ND	mg/L		1		A2320 B	01/27/03 16:01 / car
Chloride	2	mg/L		1		E300.0	01/24/03 19:16 / car
Sulfate	1	mg/L		1		E300.0	01/24/03 19:16 / car
Fluoride	0.11	mg/L		0.10		A4500-F C	01/30/03 16:30 / ddb
Hardness as CaCO3	186	mg/L		1		A2340 B	01/27/03 09:54 / rlh
NUTRIENTS							
Nitrogen, Nitrate+Nitrite as N	0.31	mg/L		0.05		E353.2	01/27/03 12:35 / bls
METALS, DISSOLVED							
Calcium	48	mg/L		1		E200.7	01/24/03 21:52 / rlh
Iron	ND	mg/L		0.03		E200.7	01/24/03 21:52 / rlh
Magnesium	16	mg/L		1		E200.7	01/24/03 21:52 / rlh
Manganese	ND	mg/L		0.01		E200.7	01/24/03 21:52 / rlh
Potassium	ND	mg/L		1		E200.7	01/24/03 21:52 / rlh
Sodium	3	mg/L		1		E200.7	01/24/03 21:52 / rlh
METALS, TOTAL							
Antimony	ND	mg/L		0.003	0.006	E200.8	01/28/03 16:42 / jjw
Arsenic	ND	mg/L		0.005	0.01	E200.8	01/28/03 16:42 / jjw
Barium	ND	mg/L		0.1	2	E200.7	01/25/03 01:34 / rlh
Beryllium	ND	mg/L		0.001	0.004	E200.7	01/25/03 01:34 / rlh
Cadmium	ND	mg/L		0.001	0.005	E200.7	01/25/03 01:34 / rlh
Chromium	ND	mg/L		0.01	0.1	E200.8	01/29/03 19:16 / jjw
Mercury	ND	mg/L		0.0002	0.002	E200.8	01/28/03 16:42 / jjw
Nickel	ND	mg/L		0.01	0.1	E200.7	01/25/03 01:34 / rlh
Selenium	ND	mg/L		0.005	0.05	E200.8	01/28/03 16:42 / jjw
Thallium	ND	mg/L		0.001	0.002	E200.8	01/28/03 16:42 / jjw

Report Definitions:
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QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Morrison Maierle
Project: Pine/Strawberry WID
Lab ID: B03010996-002
Client Sample ID: Shoemaker Well

Report Date: 01/31/03
Collection Date: 01/22/03 12:00
Date Received: 01/23/03
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.4	s.u.		0.1		E150.1	01/23/03 14:14 / jb
Conductivity	294	umhos/cm		1		A2510 B	01/23/03 14:09 / jb
Langelier Index	-0.3					A203	01/29/03 12:29 / lab
Solids, Total Dissolved TDS @ 180 C	186	mg/L		10		A2540 C	01/24/03 11:20 / qed
INORGANICS							
Alkalinity, Total as CaCO3	166	mg/L		2		A2320 B	01/27/03 15:53 / car
Bicarbonate as HCO3	203	mg/L	D	3		A2320 B	01/27/03 15:53 / car
Carbonate as CO3	ND	mg/L		1		A2320 B	01/27/03 15:53 / car
Chloride	3	mg/L		1		E300.0	01/24/03 18:13 / car
Sulfate	ND	mg/L		1		E300.0	01/24/03 18:13 / car
Fluoride	0.12	mg/L		0.10		A4500-F C	01/30/03 16:30 / ddb
Hardness as CaCO3	143	mg/L		1		A2340 B	01/27/03 09:54 / rlh
NUTRIENTS							
Nitrogen, Nitrate+Nitrite as N	0.05	mg/L		0.05		E353.2	01/27/03 12:35 / bls
METALS, DISSOLVED							
Calcium	31	mg/L		1		E200.7	01/24/03 21:48 / rlh
Iron	ND	mg/L		0.03		E200.7	01/24/03 21:48 / rlh
Magnesium	16	mg/L		1		E200.7	01/24/03 21:48 / rlh
Manganese	ND	mg/L		0.01		E200.7	01/24/03 21:48 / rlh
Potassium	1	mg/L		1		E200.7	01/24/03 21:48 / rlh
Sodium	12	mg/L		1		E200.7	01/24/03 21:48 / rlh
METALS, TOTAL							
Antimony	ND	mg/L		0.003	0.006	E200.8	01/28/03 16:20 / jjw
Arsenic	ND	mg/L		0.005	0.01	E200.8	01/28/03 16:20 / jjw
Barium	0.2	mg/L		0.1	2	E200.7	01/25/03 01:26 / rlh
Beryllium	ND	mg/L		0.001	0.004	E200.7	01/25/03 01:26 / rlh
Cadmium	ND	mg/L		0.001	0.005	E200.7	01/25/03 01:26 / rlh
Chromium	ND	mg/L		0.01	0.1	E200.8	01/29/03 19:11 / jjw
Mercury	ND	mg/L		0.0002	0.002	E200.8	01/28/03 16:20 / jjw
Nickel	ND	mg/L		0.01	0.1	E200.7	01/25/03 01:26 / rlh
Selenium	ND	mg/L		0.005	0.05	E200.8	01/28/03 16:20 / jjw
Thallium	ND	mg/L		0.001	0.002	E200.8	01/28/03 16:20 / jjw

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ND - Not detected at the reporting limit.

APPENDIX C

Summary of estimated costs to drill and pump test well

DRILLING COST CONSIDERATIONS

The cost to drill the test/production well will depend on the level of difficulty experienced during drilling. The biggest problem will be loss of circulation into voids and fractures, i.e., loss of the drilling fluid and loss of ability to sample the formation and determine what part of the stratigraphic sequence is penetrated at a specific depth. These problems were experienced during drilling of the Strawberry Borehole and prevented installation of casing to the total depth of the hole, resulting in the hole presently plugged and caved at about 1,420 feet, at the end of the casing. The caved material has blocked off the open borehole from 1,420 to 1,872 feet.

The problems posed by the type of severe lost circulation problems experienced with drilling deep boreholes in this area can be addressed in two ways – well design and selection of appropriate drilling methods. The opinion of potential drilling costs provided herein is based on the assumption that the well drilling specifications will require the contractor to provide the type of drilling equipment and drilling technology required to appropriately deal with the anticipated problems. The specifications will require the contractor to provide equipment that can use dual wall drill pipe capable of flooded reverse circulation, conventional mud rotary, or reverse circulation air drilling (inverse drilling) in borehole with a minimum diameter of 17-1/2 inches.

Likewise, the opinion of potential drilling costs assumes the well will be designed and constructed in a way that maximum flexibility is provided to deal with problems. Specifically, the well will be designed with a large enough surface casing that the hole can be reamed to a larger diameter several times, as needed, to install intermediate casings to seal off lost circulation zones and stabilize caving areas.

In the above approach, a wide range of drilling costs may result, depending on how many times it is necessary to ream the hole and telescope in a new size of casing. Accordingly, the opinion of potential costs to drill a well under these conditions is structured for three levels of difficulty, ranging from straight forward installation of one casing size to the top of the Redwall Limestone to a worst case with four different diameters of casing in the well, including the surface casing.

All three levels of difficultly assume installation of a 34-inch diameter surface casing to a depth of 50 feet, cemented into a 38-inch borehole. A 34-inch diameter surface casing is necessary to preserve the possibility of reaming the hole to a larger diameter later in the drilling, if it becomes necessary to do so.

In the best-case scenario, 12-inch diameter casing and well screen are set in a 17-1/2 inch hole from surface to the estimated total depth of 2,110 feet. With a mobilization cost of $140,000 and a cost to drill and case the well of $407,230, the total cost to drill the well is estimated to be about $547,230.

In the intermediate cost scenario, 20-inch diameter casing is installed into 24-inch borehole to the top of the Redwall Limestone at an estimated depth of 1,560 feet. A 12-inch casing and screen is telescoped through the 20-inch casing into 17-1/2 inch borehole from 1,560 to 2,110 feet. The mobilization cost of $140,000 and the drilling and casing cost of $563,370 total $703,370 to drill the well with this design.

In the worst-case scenario, it is necessary to install 26-inch casing into 31-inch borehole from the surface to 50 feet followed by 20-inch diameter casing in 24-inch borehole from 350 to 1,560 feet and 12-inch casing and screen in 17-1/2 inch borehole from 1,560 to 2,110 feet. The mobilization cost of $140,000 and the drilling and casing cost of $670,980 total $810,980 to drill the well with this design.

It is estimated that test pumping equipment capable of delivering up to 300 gpm will cost about $38,000 with the total pumping lift associated with an estimated static water level of 1,505 feet and 1,900 feet of pump column. It is estimated that development of the well with a combination of air-lift pumping and direct pumping followed by pumping tests of the well will cost about $21,600. Accordingly, the total cost for provision of test/production pumping equipment and the accomplishment of the well and aquifer performance tests is $59,600 for each of the above cost scenarios.

The above opinions of costs to drill the test/production well under a range of assumptions is summarized as follows:

	Low Cost	Intermediate Cost	High Cost
Mobilize/Demobilize Equipment	$140,000	$140,000	$140,000
Construct Well	$407,230	$563,370	$670,980
Test/Production Pump Package	$38,000	$38,000	$38,000
Development and testing	$21,600	$21,600	$21,600
Total Costs:	$606,830	$762,970	$870,580

Special recognition is offered to Mr. Mark List, P.E. and Contracts Engineer, and his associates at Lang Exploratory Drilling in Elko, Nevada for providing the details of the above opinion of costs to drill a well for the PSWID, based on their extensive experience in using drilling technology calculated to overcome the type of lost circulation problems known to existing in the subsurface of the PSWID area.

PSWID Agent, John Breninger
PINE / STRAWBERRY WATER IMPROVEMENT DISTRICT
P.O. Box 134
Pine, Arizona 85544

October 1, 2003

PSWID PROJECT PS 2002-01 REPORT

POSTSCRIPT to PSWID Project PS 2002-01 Final Report

Comments and Dialog between Brooke Utilities, Inc. President, Robert T. Hardcastle (RTH), and PSWID Agent, John Breninger (JB)

RTH - I have finished reading the Investigative report. I found it well done and interesting. I think it is a very technical affirmation of much of what BUI has been saying for years with some exceptions. Sometime when we have additional time there is a lot about its contents that I would like to discuss further with you as I think it needs some strengthening in several areas.

JB - Thanks for your comments. It would be a good thing to examine the report with you and look at the areas needing some reinforcement. To this end, I have copied Mike Kaczmarek, Morrison-Maierle Inc. (M-M). Because of the critical comments on the works of others in this report, Mike (M-M) had taken a somewhat delicate approach in which he framed his comments. He is awaiting the full release of the report documents to the public by the PSWID Board, when he expects some sharp responses to his findings and analysis from sources that may feel they were wounded. The full value of this report is what we can learn from matching it to the conditions and performance in operating the well field.

RTH - I think the biggest thing missing in the report is affirmation of his conclusions. With regard to radial versus linear flow he has formed a conclusion that is contrary to 30-40 years worth of examination by numerous previous experts. That is a substantial difference. His reasoning as to why prior conclusions are inaccurate is fine but, by itself, is hollow and unsupported. In has the air of "just another opinion" and is available for attack from different fronts. I think that position desperately needs professional support from, probably, more than one unrelated professional. It would be ideal if one or more of the authors of previous reports joined his conclusions.

What do you think?

JB - Point well taken!

However, the issue here is that the prior assessments were similar and consistent in mis-applying the methodology to the circumstances, and then making the generality a rule from which a detailed assumption was applied as reality. Just lining up the list of opinions and taking a vote doesn't balance the facts in reality. That may be the legal approach to resolving differences of opinion in court, but it has very little effect on how much, and which, water will reach the wells doing the pumping. Ergo, we still don't get the projected water that those analyses have projected.

Mike (M-M) recognized the nature and consequences of having to take issue with other recognized experts putting forth their opinions to support the justifications that their employers were addressing. What the PSWID contract required was a realistic evaluation of these reports and to provide a valid baseline of interpretation, so that the District doesn't get entangled into a balancing act of diverse opinions as it proceeds into the business of becoming a water supplier (wholesale, or whatever). The presentation and description of these findings, that Mike (M-M) chose to employ, aimed primarily at meeting the PSWID requirement, and secondarily at minimizing a confrontation among the professionals and recipients of these prior works. As a result, the language and references may appear to be too thin, but are still rock solid in the technology.

[By my observation, Mike (M-M) wished to avoid conducting elementary hydrology school lessons publicly to the other hydrologists involved. Also, I believe that the interpretation Mike (M-M) provided is broadly supported among the professional community - notwithstanding that some hydrologists have taken the courses that they have.] As the PSWID Agent, I knowingly chose not to apply the project funding into making a bullet-proof documentation of the merits, or lack thereof, of the prior works.

Consequently, the District has invested in the GIS/Database Management System (GIS/DMS) of a Wells Database that will enable the collection and evaluation of data to realistically test the hydraulic truth of the groundwater behavior in the various strata. The District will proceed on the assumption that the Kaczmarek (M-M) opinion is valid, but ultimately, the results of the data collection, analysis and evaluation will depict the reality for us. This GIS/DMS tool is capable of portraying this scenario in very understandable and practical means. If the water fails to show up as predicted, it will be considered absent. If more water shows up than predicted, or we can learn how to manage its migratory paths better, that is good and we will continue to study and enhance those improvements. Either way, we grow away from analytical speculation toward a more proven way of dealing with our sources of water.

Respectfully,
John Breninger
PSWID Agent

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