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BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, TO EXEND ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY IN THE CITY OF CASA GRANDE AND IN PINAL COUNTY, ARIZONA	Docket No. W-01445A-06-0199
IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	Docket No. SW-03575A-05-0926
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	Docket No. W-03576A-05-0926

Palo Verde Utilities Company and Santa Cruz Water Company hereby file the Direct Testimony of Trevor T. Hill, Rita Maguire, Philip Briggs, Graham Symmonds, and Cindy Liles in the above-mentioned docket.

RESPECTFULLY SUBMITTED this 26th day of January 2007.

ROSHKA DEWULF & PATTEN, PLC

By [signature]

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Arizona Corporation Commission
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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
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Direct Testimony of

Trevor T. Hill

on behalf of

Santa Cruz Water Company
and Palo Verde Utility Company

January 26, 2007

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I. INTRODUCTION.

Q. Please state your name and business address.

A. My name is Trevor T. Hill. My business address is 21410 North 19th Avenue, Suite 201, Phoenix, Arizona 85027.

Q. By whom are you employed and what is your position?

A. I am President and Chief Executive Officer of Global Water Resources, LLC ("Global Water") and Global Water Management, LLC. I also serve as the President of all of Global Water's regulated subsidiaries.

Q. Please provide a brief summary of your educational and work experience.

A. I graduated in 1987 from Royal Military College with a Bachelor of Engineering in Mechanical Engineering. I attended the Royal Naval Engineering College in Plymouth, England where I completed my post-graduate studies in 1988. I served with the Canadian Navy as an Engineering Officer retiring in 1994 after serving as Deputy Engineering officer in HMCS Huron in the Gulf War 1991 where I was decorated with the Gulf Kuwait Medal.

In 1994 I co-founded Hill, Murray & Associates, a design-build-operate firm specializing in the construction and operation of water reclamation facilities in British Columbia and the Canadian Arctic. I was instrumental in developing water reclamation codes, rules and regulations for the Province of British Columbia. In 2000, I co-founded Algonquin Water Resources of America, a division of the Algonquin Power Income Fund. In my role of Director of Operations for AWRA, I led the acquisition team, acquiring 6 utilities in three years and amassing 37,000 customers in Arizona and Texas.

In 2003, I co-founded Global Water Resources, a company established to acquire regulated water and wastewater utilities in the Southwestern states and to advance the cause of water reclamation and reuse as a conservation methodology in the State of Arizona. As President & CEO of Global Water, I am responsible for acquisition activities and the overall operations of Global Water. In addition, I provides leadership and policy direction with respect to water reclamation and re-use, water use efficiency and the economics of water reclamation. I am a registered Professional Engineer licensed in British Columbia.

Q. Please summarize your work history, awards and affiliations.

OCCUPATIONAL SUMMARY

- 2003 – Co-Founder, President & CEO, Member of the Board of Directors, Global Water Resources
- 2001 – Co-Founder, Director of Operations, Algonquin Water Resources of America
- 2000 – General Manager, Water Division, Conor Pacific Environmental
- 1992 – Founder, President and CEO, Hill, Murray & Associates Inc.
- 1991 Marine Systems Engineering Officer, Naval Engineering Unit Pacific
- 1988 – Deputy Engineering Officer, HMCS Huron

CREDENTIALS, AFFILIATIONS

- 2007 – Board Member, Pinal Partnership
- 2006 – Advisor Board Member, Arizona Water Institute External Advisory Board
- 2006 – Member, Pinal County Drought Impact Task Force
- 2006 – Board Member, Investor Owned Water Utilities Association
- 1989 – Registered Professional Engineer, British Columbia
- 1988 – Post Graduate Studies, Royal Naval Engineering College, Manadon, UK
- 1987 – B.Eng. - Mechanical Engineering, Royal Military College, Kingston

AWARDS/HONORS

- 1999 – Top 40 Under 40 Award, Business in Vancouver, January 1999
- 1998 – ZENON Merit Award for Design, October 1998
- 1998 – Finalist, Entrepreneur of the Year Award, Pacific Region, Canada, October 1998
- 1997 – BC Ministry of Environment, Lands and Parks, Minister's Environmental Award, Business/Industry Category
- 1997 – Nominated, Entrepreneur of the Year Award, Pacific Region, Canada
- 1996 – ZENON Merit Award for Design
- 1991 –Decorated, Gulf Kuwait Medal

Q. Please describe Global Water.

A. Under my direction, Global Water is one of the state's largest and fastest growing water, wastewater and reclaimed water operations. Global Water is a recognized leader in groundwater conservation and sustainable utility planning in Arizona. Our service areas are in some of the fastest growing areas of the state – Western Maricopa County and Western Pinal County. Our mission is reconciling that extraordinary growth with environmental concerns. Together, Global Water's regulated subsidiaries serve more than 35,000 customers. In just five years, we expect to be serving 100,000 customers.

Q. Why did you found Global Water?

A. I saw that there was a critical need for integrated, conservation-focused utility service in this state. I knew that an explosion of growth was going to impact areas controlled by small, fringe utilities, or by no utilities at all. Private water companies will therefore play an ever more important role as growth continues in their areas. I also knew that Arizona faced serious groundwater issues. A lot of people were talking about solutions like reclamation and recharge, but no one was taking action on a large scale. [Explosive-growth with scarce groundwater could be a recipe for disaster.] But it also represented a unique opportunity to create from scratch a large utility enterprise that could meet these unprecedented challenges.

I also saw that there were hundreds of small, poorly run, under-capitalized water companies. These need to be consolidated in order to secure reliable and efficient service.

With my background in reclamation, and in acquiring utilities at Algonquin Water, I was uniquely positioned to take advantage of the need for consolidation. So I formed Global Water to consolidate small utilities in fringe, high-growth areas. My time at Algonquin Water taught me many things, some of which I learned the hard way. In founding Global

Water, I have tried to put those lessons to good use.

Q. Who are the investors in Global Water?

A. Our investors are shown on Exhibit 1. They include our senior management team, as well as well-known and respected local investors like Bill Levine and Dan Cracchiolo. All of our investors live in Arizona.

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

A. I testify in support of the Applications for Certificate of Convenience and Necessity ("CC&N") extension in this case of two of our regulated subsidiaries, Palo Verde Utilities Company ("Palo Verde") and Santa Cruz Water Company ("Santa Cruz"). I also testify in opposition to the CC&N extension Application filed by Arizona Water Company ("AWC") that is also a subject of this proceeding.

Q. What are the two most important factors in this case?

A. Groundwater conservation and landowner rights are the two key factors in this case. In Arizona, we have limited groundwater resources, but we are also the fastest growing state in the country. Groundwater conservation is therefore essential if our rapid growth is to be sustainable. This case presents a stark choice – between a company that has water conservation at the core of its mission, and one that fights it at every turn. Global Water leads the state in water conservation measures, such as the use of reclaimed water. In contrast, Arizona Water is notorious for its opposition to such measures.

At Global Water, we also believe in landowner rights. That's why we don't ask for a monopoly over someone's land without their approval. We obtained requests for service for 100% of the extension area we request in this case. In other words, we have a request for every square inch. In contrast, AWC has requests for only 175 of the 70,494 acres it

seeks. That's less than 1% - indeed, it's less than 0.3%. As a matter of principle, we believe that property rights should be respected, and that Commission should therefore strongly consider the views of landowners in CC&N cases. And as a matter of practicality, landowner support is important for a number of reasons.

Q. What topics do you address in your testimony?

A. In addressing the key factors of groundwater conservation and landowner rights, I discuss the following topics:

- I discuss the importance of groundwater conservation, and I explain our "triad of conservation" strategy. I also show the dramatic results of putting this strategy into action, and I explain what additional steps we will take in the future.
- I explain why integrated utilities that provide water, wastewater, and reclaimed water services are essential to effective groundwater conservation. I also explain the other benefits that integrated utilities provide.
- I explain why landowner rights should be respected.
- I explain the benefits of consolidation of small utilities. I also announce the acquisition of two utilities that will have a direct impact on this case.
- I respond to the Staff Reports filed in this case.
- I comment on the regulatory policy issues involved in this case.
- I describe Global Water's policy of being a good citizen.

Q. Will Global Water present other witnesses in this case?

A. Yes. We view this as watershed case that will impact water policy – and the future of our State – for decades to come. I have no doubt that this is the most important CC&N case in Arizona history. A case of unprecedented importance demands an unprecedented collection of witnesses. So we have assembled a "dream team" of experts to share their views with the Commission:

Rita Maguire is the former Director of the Arizona Department of Water Resources ("ADWR") and the former President of the Arizona Center for Public Policy. She will describe the history of water regulation in Arizona, and she will explain the challenges facing Arizona today and in the future. She will also offer her perspective on the policy choices the Commission faces in this case.

Philip Briggs was the Chief Hydrologist of ADWR, and later served as ADWR's Deputy Director. He describes the hydrology of the Pinal Active Management Area (which includes the areas requested in this case). He also analyzes the groundwater impact of granting our application verses granting AWC's application.

Graham Symmonds, our Senior Vice President of Operations and Compliance, is a leading expert on reclamation and reuse of water. He shows the results of our triad of conservation strategy, and explains how we carry out the triad. He discusses the benefits of regional planning. He explains our engineering plans for our extension area, and he critiques AWC's plans. He also gives testimony to the future of reclamation and reuse and how other states have successfully deployed water reclamation strategies that have had demonstrated extremely significant conservation impacts. **Rita Maguire** is the former Director of the Arizona Department of Water Resources ("ADWR") and the former President of the Arizona Center for Public Policy. She will describe the history of water regulation in Arizona, and she will explain the challenges facing Arizona today and in the future. She will also offer her perspective on the policy choices the Commission faces in this case.

Cindy Liles, our Senior Vice President for Growth Management and Chief Financial Officer, is a Certified Public Accountant with more than a decade of experience in senior management of public companies. She analyzes the financial condition of Santa Cruz,

Palo Verde, and AWC. She also testifies about landowner requests for service and provides our response to the Staff Reports filed in this case.

II. GROUNDWATER CONSERVATION AND THE TRIAD OF CONSERVATION.

Q. Why is groundwater conservation important?

A. We live in the fastest growing state, yet we have a limited supply of groundwater. As Mr. Briggs explains, groundwater use in the Pinal AMA already exceeds the renewable supply, and this "overdraft" condition causes subsidence, harms the recharge capability of the aquifer, and limits future uses. If we act carelessly, we could: (1) bring growth – the engine of our economy – to a rapid stop; (2) cause severe environmental damage; or (3) both. But if we act wisely, we can enjoy sustainable growth.

Q. You mentioned "sustainable growth." What do you mean?

A. I mean that we must ensure that development will have sufficient groundwater for the foreseeable future. In many areas today, you can get decent production from a well if you dig deep enough. That's what some utilities and developers mean when they say "we have plenty of water." But it's not enough to find that you have enough water today – you must ensure that the well won't run dry next year, or 10 years from now, or 100 years from now.

Q. Please elaborate.

A. Using more groundwater than is renewed is called "groundwater mining." That's an apt term, because like traditional mining, it involves extracting a natural resource from the ground. When you take copper out of the ground, it's depleted forever. Likewise, groundwater mining depletes a natural resource. When a mine depletes the available resources, it closes. But as a utility, we can't.

As Mr. Briggs explains, for many years groundwater mining has occurred, and will continue to occur, in the Pinal AMA. This "resource extraction" model was the way utilities like AWC operated for years. Perhaps there wasn't much choice in the past. But today we can – and must – do something different. By making use of reclaimed water, renewable surface water, and taking advantage of recharge opportunities, we can move to a new, sustainable model. That's the only sensible choice.

Q. Why is action today important?

A. The choice of utility provider will have lasting effects. Both Global and AWC have explained their radically different visions and engineering plans. Global's plans involve integrated water, wastewater, and reclaimed water service; AWC's do not. Once a provider is selected, the recipient's plans will be put into effect. Plants will be built, mains will be buried and paved over. Customers will build structures and design irrigation systems. The decision will be reflected in concrete and steel.

In practical terms, there is no "do-over" once this happens. If reclaimed water infrastructure is not put in place now, it would be hugely expensive to go back and rip up the streets to put it in later. Golf courses, homeowner's associations and others that need irrigation services would be stuck using potable water – or using their own wells, if they have them. Likewise, once a building has plumbing installed and is in use, it is expensive to "re-plumb" the building to take advantage of reclaimed water for non-potable uses.

Moreover, I believe that this case is being closely watched by other utilities and by other agencies. The decision in this case will send a strong signal concerning the direction this Commission will take on groundwater issues. The decision in this case will be discussed and cited for years to come.

Q. Please describe Global Water's "triad of conservation" strategy.

A. The triad of conservation involves (1) maximizing use of reclaimed water; (2) using renewable surface water; and (3) recharging the aquifer with excess reclaimed water and surface water. By using the triad, we can reduce excessive groundwater use.

Q. Is Global Water putting the triad into effect?

A. Yes we are putting it into effect in and around the City of Maricopa. As Mr. Symmonds shows, we have remarkable reductions in groundwater use compared to traditional providers.

Q. Please discuss reclaimed water.

A. Reclaimed water is a critical and underused resource. Today in Maricopa we are meeting up to 40% of our water needs with reclaimed water.

Traditionally, reclaimed water was viewed as undesirable. But with modern technology, wastewater can be treated to a very high standard. It can now be used for many purposes. It is simply irresponsible to use groundwater to irrigate golf courses, parks, common areas or other landscaping when reclaimed water is available. As Mr. Symmonds explains, we are already using reclaimed water on a wide scale in Maricopa, and we will do even more in the future.

Q. Why do you not use the term "effluent" for reclaimed water?

A. I don't like "effluent" because it represents the old way of thinking. "Reclaimed water" is a more accurate way of describing water which as been treated to A+ levels. It has been reclaimed and is ready to be used for new beneficial purposes.

Q. What about surface water?

A. It is another key component. Thanks to the foresight of earlier leaders, as a state we have resources like the CAP available to us. Where it is available, it should be used. That's why Global Water is rapidly moving forward with securing surface water supplies and deploying surface water facilities, as Mr. Symmonds explains.

Q. What about recharge?

A. It is critical as well. Our preference is to reuse reclaimed water where possible, rather than recharging it. That's why we are building extensive reclaimed water infrastructure. But demand for reclaimed water is highly seasonal, because so much of it is used for irrigation. So there will be times when there is excess reclaimed water available. Likewise, there will be times when surface water is available to us beyond what we can immediately use. Excess reclaimed and surface water can be stored for later use through recharge. By using as much reclaimed water and surface water as possible, and by recharging any excess, reliance on groundwater can be reduced to safe and sustainable levels.

Q. What else does Global Water do to promote conservation?

A. Global Water leads the State as far as education on water reclamation and reuse is concerned and continues to lead outreach sessions for all manner of stakeholders and our customers on the relevance and benefits of water reuse. Global has an ongoing public awareness campaign about water reclamation. The message of conservation through reclamation and reuse is getting through, and we have the results of repeated polling in our service areas to prove it.

III. THE SUPERIORITY OF INTEGRATED UTILITIES.

Q. What is an integrated utility?

A. An integrated utility provides water, wastewater, and reclaimed water in a coordinated manner to the same service area. Our subsidiaries in this case – Santa Cruz and Palo Verde offer integrated service. AWC is not integrated.

Q. Why are integrated utilities superior?

A. Only integrated utilities can effectively implement the triad of conservation or similar conservation measures.

Q. Why is that?

A. There are economic and operational obstacles to non-integrated utilities using triad-type strategies.

Q. What are the economic obstacles?

A. A water-only utility makes money by selling water. Its incentive is to sell more of its product. It wants its customers to use more water, not less. But an integrated utility makes money from selling a portfolio of products and services, not just one. We are just as happy to make money selling reclaimed water as potable water. That allows us to wholeheartedly adopt conservation as part of our corporate culture. So at our Christmas party, when I announced that we set a new mark for low water usage per customer, our employees all applauded and cheered. There aren't many companies that cheer their customers buying less, but we are one because we don't rely on one product.

Q. What are the practical obstacles?

A. Providing the triad requires close coordination. All three services – water, wastewater, and reclaimed water – are closely connected and they directly impact each other. Information must be shared quickly, and planning must be done with all three services in mind. For example, the operator of a recharge facility must know when excess reclaimed water and surface water is available. That's easy if everyone is under common management. It would be much more difficult under separate companies with separate management.

Q. How do you know for sure that the triad can only be implemented by integrated companies?

A. When forming new utilities or entering new areas, we insist on using the integrated approach. But as a result of acquisitions, Global Water has some non-integrated subsidiaries. For example, one of our companies is Valencia Water Company in Buckeye. We would very much like to put the triad in place for our non-integrated subsidiaries, but integration has to be considered at the very beginning of the planning process. Retro-fitting the triad is complicated, expensive and never yields the same conservation results..

Q. Do integrated utilities have economic advantages?

A. Yes. The can achieve economies of scale and scope.[1] For example, integrated utilities can share the same billing system and the same customer service personnel. Likewise, field personnel can be cross-trained in both water and wastewater, thus reducing the number of personnel needed. In addition, integrated utilities can pool financial resources, allowing greater financial stability. For example, a water utility that faced a major unexpected expense could get into trouble quickly. But an integrated utility would have funds from all three services available to meet the emergency.

[1] See Global Response to LJ 1.1 for a more in depth explanation.

Q. Do integrated utilities have other advantages?

A. Yes. A wastewater-only provider faces several additional challenges. Because wastewater service is not metered, it is difficult to know when a customer has started or stopped using service. It is not uncommon to end up not knowing who is receiving service i.e. customers not being reflected in the billing system. And it is difficult to terminate service – there's no way to turn the service off without digging up the service line (which is not practical). I learned these problems first hand when Algonquin Water acquired some wastewater-only utilities when I was there.

Q. Is Global Water willing to offer wastewater-only service in the proposed extension area?

A. No. For all the reasons listed above, wastewater-only service is not an attractive model and we are not willing to enter that business. However, we have made a limited exception for certain areas noted in our application where AWC already as the water CC&N. Frankly, I wish we had not agreed to do that. We are not willing to offer wastewater-only service outside of the limited areas noted in our application. We will not consent to providing wastewater service to any areas where AWC extending its CC&N.

IV. <u>LANDOWNER RIGHTS.</u>

Q. What is Global Water's policy on landowner rights?

A. We will not request an extension for a parcel unless we receive a request from the owner of the parcel.

Q. Why did Global Water adopt this policy?

A. For several reasons. First, we believe in property rights. Second, we understand that the Commission expected requests for the entire extension area. Third, we have heard some

Commissioners express strong concerns when other utilities attempted to deviate from this policy. Fourth, it is better to cooperate with landowners for a whole host of reasons. Fifth, many landowners own other lands, and we may want to do business with them in the future.

Q. What do other companies do?

A. AWC does not follow this policy. However, every other major water utility in the state appears to follow the same policy. In particular, Arizona-American Water Company, Johnson Utilities Company, Algonquin Water, Robson, and Chaparral City Water Company all seem to use the same policy as Global Water.

Q. What has the Commission done in the past?

A. My understanding was that the Commission would normally not approve an extension without requests for service for the entire extension area.

Q. Do Santa Cruz and Palo Verde have requests for their entire extension areas?

A. Yes, they requests for 100% of their extension areas.

Q. Does AWC have request for their entire extension area?

A. No, they have requests for only 0.3%.

Q. Have landowners expressed their views in other ways?

A. Yes, many landowners have filed letters in this docket opposing AWC. I am not aware of any letters supporting AWC.

Q. Are there other reasons landowner support is useful?

A. Yes. The utility must cooperate and coordinate in a number of ways with the landowner. For example, information about the planed development is needed to plan appropriate infrastructure to serve the land. In addition, communication is needed about the timing of development. If infrastructure is put in too soon, it represents unproductive investment. If it goes in too late, the developer's schedule is disrupted.

Q. How does landowner support impact conservation?

A. We negotiate with landowners to have them turn over their wells to us. That kind of agreement is not likely to happen when the relationship is not voluntary. Many landowner wells are "exempt wells" which are not subject to regulation. They may continue to use there wells for irrigation – even for new uses like golf courses. Moreover, there is no reporting requirement for the amount pumped by exempt wells. So we don't even know how much they are impacting the aquifer.

Q. What do you recommend regarding landowner rights?

A. I recommend that the Commission only grant a CC&N extension where there are requests for service for the entire extension area directed to the extending utility.

V. CONSOLIDATION.

Q. Are there benefits to the consolidation of utilities?

A. Yes there are many benefits. Small utilities are typically inefficient, poorly managed and undercapitalized. They sometimes fail in spectacular fashion. The list of such failed small utilities in recent years is far too long: Sabrosa, the McLain Water Companies, Desert Hills, AUSS, APSCO / Casitas Bonitas; and Diamond Valley, to name a few.

Consolidation can solve these problems. By becoming part of a larger operation, the utility benefits from economies of scale and scope. Consolidated utilities often have experienced managers and engineers. They also have much better access to capital.

Q. What is the impact of consolidation on groundwater conservation?

A. The capacity for conservation is greatly increased. Small utilities simply lack the financial and technical resources to implement a triad strategy. All three parts of the triad – reclaimed water, surface water, and recharged water – require capital-intensive infrastructure. Small utilities typically can afford only the bare minimum investment to keep water flowing day to day. Operating on the edge of crisis, they can't afford to worry about sustainability or conservation. They lack the financial capability to commit the triad strategy. And even if they had the money, they lack the technical expertise to carry out the triad.

Q. Has Global Water consolidated any companies recently?

A. Yes. We recently acquired Francisco Grande Utility Company ("Francisco Grande") and CP Water Company ("CP"). Francisco Grande and CP are adjacent to our requested extension areas in this case. Our extension areas are essentially sandwiched between our existing service areas to the north and the Francisco Grande and CP certificate areas to the south.

Q. What benefits of these acquisitions?

A. We will be able to implement our triad of conservation strategy with Francisco Grande and CP. And if we receive our requested extension areas, we will be able to deploy infrastructure on a regional scale encompassing our existing service areas, the extension areas, Francisco Grande, and CP. That should result in a highly robust and efficient system.

Q. What capabilities did Francisco Grande and CP have before their acquisition by Global Water?

A. They had no employees, no wells, and essentially no facilities of any kind.

VI. REGULATORY POLICY ISSUES.

Q. Please discuss the "public interest test" as it applies to this case.

A. Well, I'm not a legal expert, but I can tell you what I think the public interest is. I certainly think that protecting our groundwater supplies and ensuring sustainable growth is in the public interest. And the public interest should include protecting the property rights of landowners and respecting their views concerning who gets a monopoly over their land.

Q. But isn't the triad approach more expensive?

A. Well, how expensive is it when you run out of water? Doing the right thing is more difficult, and more expensive, at first. But it would be much more expensive to fix the problem later. Certainly, tearing up the streets to put in reclaimed water system years after development would be very expensive indeed.

Moreover, few people realize the many savings involved in the triad over the long run. For example, because water use is less, potable water lines can ultimately be smaller. Likewise, there is less need for treatment of water because less water is used. With ever increasing federal mandates like arsenic, it makes sense to limit the amount of water that is treated potable water standards. We don't use Perrier for irrigation – for the same reason it doesn't make sense to use potable water for irrigation. Your cactus, Palo Verde tree or the grass on the golf course certainly won't know the difference. Similarly, construction water, commercial and industrial process water, cooling water, fire hydrant water and even water for flushing toilets can ultimately be served with reclaimed water. Few people

realize the many allowed uses of reclaimed water. Attached as Exhibit 2 to my testimony is a list of the allowable uses of reclaimed water under current regulations.

Q. Please discuss the "first in the field doctrine."

A. Again, I am no legal expert. But I understand that AWC argues that they have some sort of right to the extension due to the closeness of their existing certificate area. Whatever the merits of that idea, our acquisition of Francisco Grande and CP deflates its force. Our current Francisco Grande and CP certificate areas are closer to much of the disputed areas than AWC.

Q. What about the "managerial, technical, and financial capability" standard?

A. We are very qualified in all these areas. I already introduced our senior management team and our investors. Mr. Symmonds shows our technical capability by giving an overview of our talented engineering and operational staff. Ms. Liles shows the financial strength of Palo Verde and Santa Cruz.

Q. Can you discuss the "Woodruff" decision?

A. This case has both similarities and differences with Woodruff. In that case, a new entity called Woodruff and AWC fought a similar battle a year ago, and the Commission ultimately sided with Woodruff. Both Woodruff and Global Water use an integrated approach. And both Woodruff and Global Water had landowner support. From what I understand, those were key factors in the Commission's decision.

On the other hand, there are also some key differences. For example, Woodruff was a "start up" company with no customers. In contrast, Global Water has more than 35,000 customers and a strong track record of performance. In addition, Woodruff was owned by a developer. Some developer owned companies are very good, such as the ones run by

Robson. But others have had problems, because the owner's focus was on other things. For Global Water, providing quality, sustainable service is the core of what we do – it is no sidelight. So for these reasons I think our cases are even more compelling than Woodruff.

VII. RESPONSE TO STAFF REPORT.

Q. Do you have a response to the two Staff Reports filed in this case?

A. Yes. Ms. Liles provides a detailed response. But I will add a few thoughts. I applaud Staff for emphasizing conservation. I am glad that they point out our efforts in using reclaimed water. They also point to a small amount of reclaimed water use by AWC. I would only note that AWC's minimal use of reclaimed water is in Apache Junction – they have never implemented any use of reclaimed water in Casa Grande, Stanfield or Maricopa. Moreover, the reclaimed water used in Apache junction is not produced by AWC but rather is actually treated and produced by Gold Canyon Sewer Company. AWC merely wheels the reclaimed water for delivery, but is not truly in the business of creating the resources

Staff also notes that we do not have an inverted, three tiered rate design, which Staff recommends to encourage conservation by charging more to higher users. We have no objection to such a design, and we would be happy to adopt it in our next rate case.

Q. What about Staff's approach to landowner rights?

A. Staff is right to say that no utility should get areas were there are no requests to anyone. But I feel that recognition of landowner rights should go further and that the Commission should also confirm that AWC should not be permitted to use landowner requests for service from Global Water to support AWC's extension. This is particularly inappropriate because AWC has taken the landowner's requests for integrated water, wastewater and

reclaimed water service and submitted them as though they were requests for just water service. The landowners in our areas chose a specific provider – Global Water – and a specific service – integrated water, wastewater and reclaimed water. They should not be forced to buy a different service from a different company.

VIII. COMMUNITY INVOLVEMENT.

Q. How has Global Water shown that it is a good corporate citizen?

A. Working with regulatory agencies like the Commission, ADWR and ADEQ we stepped in to rescue the failing 387 Districts. We also quickly built facilities to provide extra emergency water to Desert Hills Water Company when Desert Hills was in crisis, with water outages every morning. We also stepped in as interim operator of Sabrosa Water Company when another company quit.

Q. What is Global Water's view of regulators?

A. We believe that we must work closely with our regulators at the Commission, ADWR and ADEQ. We all want to see the public interest served, and that can be done by working together. In contrast, AWC is known for its epic fights against ADWR, as explained by Ms. Maguire.

Q. What is Global Water's view of local government?

A. The same – we must work closely with them. Cities are very concerned about sustainable growth, and that's something we can address together. That's why we have entered into path-breaking "public private partnership" agreements with the Cities of Maricopa and Casa Grande These agreements provide for cooperation in a host of areas, such as sharing data from our GIS system. The agreements are very careful to avoid interfering with the Commission's authority to set rates and grant CC&Ns.

Q. What about tribal governments?

A. They are our neighbors, and neighbors should be on good terms. When the Ak-Chin Indian Community came to us with concerns about reclaimed water discharges into culturally significant washes, we immediately responded with consultation and months of talks intended to help both sides understand the core issues. The ultimate conclusion was that Global and the Ak-Chin both valued water and water related issues deeply and as a result we were able to enter into an historic accord that provides for a "zero discharge" plan from our water reclamation plants to protect those valued washes. This means that Global will either reuse or recharge 100% of the reclaimed water that we generate. To my knowledge, no other private utility in Arizona has made such an important commitment.

Q. Please describe the recent amendment of your 208 plan.

A. This process showcased our ability to work with the cities we serve and with the Ak-Chin. The Consolidated 208 Area-wide Water Quality Plan sought and received the support of the City of Maricopa, the City of Casa Grande, Pinal County, the Ak-Chin Indian Community and the ADEQ. It took literally dozens of public meetings and consultation with all stakeholders in the region and ultimately emerged as one of the largest and most comprehensive water quality management documents ever completed in the State of Arizona. It is entirely based on the triad of groundwater conservation and groundwater quality preservation. The plan approaches 100% reuse through reclamation and recharge.

Q. What about community involvement?

A. We are active members of our community and have active and current relationships with the Mayor and City Councilmen, local HOA leadership and the Chamber of Commerce. We are active members of or support a number of community groups such as the City of Maricopa Chamber of Commerce, lead sponsor of Founders Day, Lead sponsor of Seeds of Change Gala designed to raise money for abused women. The company sponsors local

teams, local schools, and later in 2007 we will open our new customer service facility for community groups and as meeting spaces organized community and local government activities.

IX. CONCLUSION.

Q. Please summarize your testimony.

A. Arizona faces a historic choice between a new sustainable way of doing business or the old, resource extraction model. The effects of this choice will be felt for generations to come. We are the only provider in this case with a proven track record of implementing water conservation measures like the triad on a wide scale.

In addition, our applications have the support of 100% of the landowners, and I strongly believe their views should be respected.

Q. Where do you see Arizona's water future going?

A. We are the fastest growing state in the nation and for good reason. Arizona is a great place to live. We have plenty of affordable housing and Arizona is a wonderful place to raise children. Because of these and many other factors, businesses will continue to relocate here and Arizona is sure to see strong, continued growth and development into the foreseeable future.

But let's face it, we live in the desert. Our water supplies are measurable today and finite. As Ms. Maguire points out, experts believe that the resources of the Colorado River are limited and have probably been over-allocated. As Mr. Briggs points out, ground water mining in Pinal County is already well underway and in 2007 the DWR will permanently change the groundwater rules to limit the volumes of groundwater available support new

development. My guess is this won't be the last regulatory change that will be needed to address water resource limitations in the future. My colleague Cindy Liles has explained that the age of expecting developer driven utilities to simply do the right things and have expertise and ability to tackle the nation's most complicated water issues is long over. One can only conclude that the future demands on our water resources will dramatically increase over time and that as a result the complexity of the business will increase.

Mr. Symmonds explained the measurable benefits of water reclamation and reuse and ultimately how this will build new and potentially perpetual water supplies through reclamation and reuse. It seemed obvious to me 18 years ago during my service in the middle east that dramatic and far reaching water issues face the entire world and that the southwestern portion of the United States is not immune. The writing is on the wall in Arizona, and yet today, as a state we don't lead the nation in water conservation technology, discipline or policy. Despite years of dialogue on the matter, the measurable results are sub-standard.

Reclaimed water use saved Florida's orange-growing economy. There are countless buildings in California that flush all internal toilets with reclaimed water. Certain sub-divisions in Australia now require conservation through toilet flushing with reclaimed water in residential communities.

Let us not wait until the crisis is upon us. There are no technological barriers to long-term water sustainability. It is a question of the will to do so.

There is no secret recipe to the triad of conservation. There is no intellectual property associated with our plan, and yet the impact of our decision making today will inure to generations of Arizonians.

Q **How can Global help this cause?**

A I intend to have a role in the leadership of accomplishing this mission, and to a great extent, we have already started. Arizona should and will lead the nation in conservation policy, water reclamation and reuse and should push the envelope wherever possible. Global has developed "Codes of Practice" for developers and we spend a great amount of time educating developers and home-builders on sustainability and the safe use of reclaimed water.

Last week Global commissioned the largest private water recharge facility in the State. Our recharge facility in the Hassayampa river basin will expand this year from 25,000 acft/year to 50,000 acft/year. This facility is part of our strategic master plan to bank water rights for the region and further perpetuate our goal of self-sustainability. In addition to providing recharge services to others, we will use this facility to store water for the use of our regulated utilities. We have already begun the process of acquiring surface water for that purpose.

In 2007 we will commission the first commercial building in the State of Arizona that flushes its toilets with reclaimed water, and in so doing, permanently decrease the groundwater utilization of that building by 90% forever. Our new customer service center in Maricopa will be an icon of conservation and a first for a private utility in this state. We intend to lead by example.

In 2008 Global will serve the first residential subdivisions with two water mains, one for potable water and the other for non-potable water for exterior irrigation. We are going to make conservation trendy and fashionable in modern communities – bragging rights for the residents and local government.

In 2008 Global will commission the first surface water plants in Pinal County and voluntarily begin to introduce renewable resources for residential and commercial consumption. These facilities are already at 75% design.

These ground-breaking initiatives are complicated and expensive. But Global's commitment to the state and this mission is unwavering. I can only hope that the Commission can appreciate the necessity for immediate and decisive action in its role in shaping Arizona's water future. It will take courage and conviction to re-examine the traditional mind-sets of the past. I am confident that the infrastructure deployment modalities that have been repetitively implemented since the 1950s will not meet the needs of the 21st century. I applaud the rule-making process that has begun and hope it yields the revolutionary policy that is now required.

Q. Does that conclude your testimony?

A. Yes.

EXHIBIT

"1"

GLOBAL WATER COMPANY OWNERS

NAME	PERCENTAGE
Bill Levine	42.44%
Dan Cracchiolo	6.13%
Andrew Cohn	12.5%
Trevor Hill	23.29%
Leo Commandeur	11.65%
Graham Symmonds	2.5%
Cindy Liles	1.5%

EXHIBIT

"2"

ARTICLE 3. RECLAIMED WATER QUALITY STANDARDS

R18-11-301. Definitions

The terms in this Article have the following meanings:

"Direct reuse" has the meaning prescribed in R18-9-701(1).

"Disinfection" means a treatment process that uses oxidants, ultraviolet light, or other agents to kill or inactivate pathogenic organisms in wastewater.

"Filtration" means a treatment process that removes particulate matter from wastewater by passage through porous media.

"Gray water" means wastewater, collected separately from a sewage flow, that originates from a clothes washer, bathtub, shower, or sink, but it does not include wastewater from a kitchen sink, dishwasher, or a toilet.

"Industrial wastewater" means wastewater generated from an industrial process.

"Landscape impoundment" means a manmade lake, pond, or impoundment of reclaimed water where swimming, wading, boating, fishing, and other water-based recreational activities are prohibited. A landscape impoundment is created for storage, landscaping, or for aesthetic purposes only.

"NTU" means nepholometric turbidity unit.

"On-site wastewater treatment facility" has the meaning prescribed in A.R.S. § 49-201(24).

"Open access" means that access to reclaimed water by the general public is uncontrolled.

"Reclaimed water" has the meaning prescribed in A.R.S. § 49-201(31).

"Recreational impoundment" means a manmade lake, pond, or impoundment of reclaimed water where boating or fishing is an intended use of the impoundment. Swimming and other full-body recreation activities (for example, water-skiing) are prohibited in a recreational impoundment.

"Restricted access" means that access to reclaimed water by the general public is controlled.

"Secondary treatment" means a biological treatment process that achieves the minimum level of effluent quality defined by the federal secondary treatment regulation at 40 CFR § 133.102.

"Sewage" means untreated wastes from toilets, baths, sinks, lavatories, laundries, and other plumbing fixtures in places of human habitation, employment, or recreation.

Historical Note

Adopted effective July 9, 1981 (Supp. 81-4). Former Section R9-21-301 renumbered without change as Section R18-11-301 (Supp. 87-3). Section repealed effective February 18, 1992 (Supp. 92-1). New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-302. Applicability

This Article applies to the direct reuse of reclaimed water, except for:

1. The direct reuse of gray water, or
2. The direct reuse of reclaimed water from an onsite wastewater treatment facility regulated by a general Aquifer Protection Permit under 18 A.A.C. 9, Article 3.

Historical Note

Adopted effective June 8, 1981 (Supp. 81-3). Amended effective January 7, 1985 (Supp. 85-1). Former Section R9-21-302 renumbered without change as Section R18-11-302 (Supp. 87-3). Section repealed effective February 18, 1992 (Supp. 92-1). New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-303. Class A+ Reclaimed Water

A. Class A+ reclaimed water is wastewater that has undergone secondary treatment, filtration, nitrogen removal treatment, and disinfection. Chemical feed facilities to add coagulants or polymers are required to ensure that filtered effluent before disinfection complies with the 24-hour average turbidity criterion prescribed in subsection (B)(1). Chemical feed facilities may remain idle if the 24-hour average turbidity criterion in (B)(1) is achieved without chemical addition.

B. An owner of a facility shall ensure that:

1. The turbidity of Class A+ reclaimed water at a point in the wastewater treatment process after filtration and immediately before disinfection complies with the following:
   a. The 24-hour average turbidity of filtered effluent is two NTUs or less, and
   b. The turbidity of filtered effluent does not exceed five NTUs at any time.
2. Class A+ reclaimed water meets the following criteria after disinfection treatment and before discharge to a reclaimed water distribution system:
   a. There are no detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken, and
   b. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23 / 100 ml.

c. If alternative treatment processes or alternative turbidity criteria are used, or reclaimed water is blended with other water to produce Class A+ reclaimed water under subsection (C), there are no detectable enteric virus in four of the last seven monthly reclaimed water samples taken.

3. The 5-sample geometric mean concentration of total nitrogen in a reclaimed water sample is less than 10 mg / L.

C. An owner of a facility may use alternative treatment methods other than those required by subsection (A), or comply with alternative turbidity criteria other than those required by subsection (B)(1), or blend reclaimed water with other water to produce Class A+ reclaimed water provided the owner demonstrates through pilot plant testing, existing water quality data, or other means that the alternative treatment methods, alternative turbidity criteria, or blending reliably produces a reclaimed water that meets the disinfection criteria in subsection (B)(2) and the total nitrogen criteria in subsection (B)(3) before discharge to a reclaimed water distribution system.

D. Class A+ reclaimed water is not required for any type of direct reuse. A person may use Class A+ reclaimed water for any type of direct reuse listed in Table A.

Historical Note

Adopted effective January 7, 1985 (Supp. 85-1). Amended effective August 12, 1986 (Supp. 86-4). Former Section R9-21-303 renumbered without change as Section R18-11-303 (Supp. 87-3). Section repealed effective February 18, 1992 (Supp. 92-1). New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-304. Class A Reclaimed Water

A. Class A reclaimed water is wastewater that has undergone secondary treatment, filtration, and disinfection. Chemical feed facilities to add coagulants or polymers are required to ensure that filtered effluent before disinfection complies with the 24-hour average turbidity criterion prescribed in subsection (B)(1). Chemical feed facilities may remain idle if the 24-hour average turbidity criterion in subsection (B)(1) is achieved without chemical addition.

B. An owner of a facility shall ensure that:

1. The turbidity of Class A reclaimed water at a point in the wastewater treatment process after filtration and immediately before disinfection complies with the following:
   a. The 24-hour average turbidity of filtered effluent is two NTUs or less, and
   b. The turbidity of filtered effluent does not exceed five NTUs at any time.
2. Class A reclaimed water meets the following criteria after disinfection treatment and before discharge to a reclaimed water distribution system:
   a. There are no detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken, and
   b. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23 / 100 ml.
   c. If alternative treatment processes or alternative turbidity criteria are used, or reclaimed water is blended with other water to produce Class A reclaimed water under subsection (C), there are no detectable enteric virus in four of the last seven monthly reclaimed water samples taken.

C. An owner of a facility may use alternative treatment methods other than those required by subsection (A), or comply with alternative turbidity criteria other than those required by subsection (B)(1), or blend reclaimed water with other water to produce Class A reclaimed water provided the owner demonstrates through pilot plant testing, existing water quality data, or other means that the alternative treatment methods, alternative turbidity criteria, or blending reliably produces a reclaimed water that meets the disinfection criteria in subsection (B)(2) before discharge to a reclaimed water distribution system.

D. A person shall use Class A reclaimed water for a type of direct reuse listed as Class A in Table A. A person may use Class A reclaimed water for a type of direct reuse listed as Class B or Class C in Table A.

Historical Note

Adopted effective January 7, 1985 (Supp. 85-1). Amended effective August 12, 1986 (Supp. 86-4). Former Section R9-21-304 renumbered without change as Section R18-11-304 (Supp. 87-3). Section repealed effective February 18, 1992 (Supp. 92-1). New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-305. Class B+ Reclaimed Water

A. Class B+ reclaimed water is wastewater that has undergone secondary treatment, nitrogen removal treatment, and disinfection.

B. An owner of a facility shall ensure that:

1. Class B+ reclaimed water meets the following criteria after disinfection treatment and before discharge to a reclaimed water distribution system:
   a. The concentration of fecal coliform organisms in four of the last seven daily reclaimed water samples is less than 200 / 100 ml.

b. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 800 / 100 ml.

2. The 5-sample geometric mean concentration of total nitrogen in a reclaimed water sample is less than 10 mg / L.

C. Class B+ reclaimed water is not required for a type of direct reuse. A person may use Class B+ reclaimed water for a type of direct reuse listed as Class B or Class C in Table A. A person shall not use Class B+ reclaimed water for a type of direct reuse listed as Class A in Table A.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-306. Class B Reclaimed Water

A. Class B reclaimed water is wastewater that has undergone secondary treatment and disinfection.

B. An owner of a facility shall ensure that Class B reclaimed water meets the following criteria after disinfection treatment and before discharge to a reclaimed water distribution system:

1. The concentration of fecal coliform organisms in four of the last seven daily reclaimed water samples is less than 200 / 100 ml.
2. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 800 / 100 ml.

C. A person shall use a minimum of Class B reclaimed water for a type of direct reuse listed as Class B in Table A. A person may use Class B reclaimed water for a type of direct reuse listed as Class C in Table A. A person shall not use Class B reclaimed water for a type of direct reuse listed as Class A in Table A.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-307. Class C Reclaimed Water

A. Class C reclaimed water is wastewater that has undergone secondary treatment in a series of wastewater stabilization ponds, including aeration, with or without disinfection.

B. The owner of a facility shall ensure that:

1. The total retention time of Class C reclaimed water in wastewater stabilization ponds is at least 20 days.
2. Class C reclaimed water meets the following criteria after treatment and before discharge to a reclaimed water distribution system:
   a. The concentration of fecal coliform organisms in four of the last seven reclaimed water samples taken is less than 1000 / 100 ml.
   b. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 4000 / 100 ml.

C. A person shall use a minimum of Class C reclaimed water for a type of direct reuse listed as Class C in Table A. A person shall not use Class C reclaimed water for a type of direct reuse listed as Class A or Class B in Table A.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-308. Industrial Reuse

A. The reclaimed water quality requirements for the following direct reuse applications are industry-specific and shall be determined by the Department on a case-by-case basis in a reclaimed water permit issued by the Department under 18 A.A.C. 9, Article 7:

1. Direct reuse of industrial wastewater containing sewage.
2. Direct reuse of industrial wastewater for the production or processing of any crop used as human or animal food.

B. The Department shall use best professional judgment to determine the reclaimed water quality requirements needed to protect public health and the environment for a type of direct reuse specified in subsection (A).

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

R18-11-309. Reclaimed Water Quality Standards for an Unlisted Type of Direct Reuse

A. The Department may prescribe in an individual reclaimed water permit issued under 18 A.A.C. 9, Article 7, reclaimed water quality requirements for a type of direct reuse not listed in Table A. Before permitting a direct reuse of reclaimed water not listed in Table A, the Department shall, using its best professional judgment, determine and require compliance with reclaimed water quality requirements needed to protect public health and the environment.

B. Department may determine that Class A+, A, B+, B, or C reclaimed water is appropriate for a new type of direct reuse.

C. The Department shall consider the following factors when prescribing reclaimed water quality requirements for a new type of direct reuse:

1. The risk to public health;
2. The degree of public access to the site where the reclaimed water is reused and human exposure to the reclaimed water;
3. The level of treatment necessary to ensure that the reclaimed water is aesthetically acceptable;
4. The level of treatment necessary to prevent nuisance conditions;
5. Specific water quality requirements for the intended type of direct reuse;
6. The means of application of the reclaimed water;
7. The degree of treatment necessary to avoid a violation of surface water quality standards or aquifer water quality standards;
8. The potential for improper or unintended use of the reclaimed water;
9. The reuse guidelines, criteria, or standards adopted or recommended by the U.S. Environmental Protection Agency or other federal or state agencies that apply to the new type of direct reuse; and
10. Similar wastewater reclamation experience of reclaimed water providers in the United States.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 870, effective January 22, 2001 (Supp. 01-1).

Table A. Minimum Reclaimed Water Quality Requirements for Direct Reuse

Type of Direct Reuse	Minimum Class of Reclaimed Water Required
Irrigation of food crops	A
Recreational impoundments	A
Residential landscape irrigation	A
Schoolground landscape irrigation	A
Open access landscape irrigation	A
Toilet and urinal flushing	A
Fire protection systems	A
Spray irrigation of an orchard or vineyard	A
Commercial closed loop air conditioning systems	A
Vehicle and equipment washing (does not include self-service vehicle washes)	A
Snowmaking	A
Surface irrigation of an orchard or vineyard	B
Golf course irrigation	B
Restricted access landscape irrigation	B
Landscape impoundment	B
Dust control	B
Soil compaction and similar construction activities	B
Pasture for milking animals	B
Livestock watering (dairy animals)	B
Concrete and cement mixing	B
Materials washing and sieving	B
Street cleaning	B
Pasture for non-dairy animals	C
Livestock watering (non-dairy animals)	C
Irrigation of sod farms	C
Irrigation of fiber, seed, forage, and similar crops	C
Silviculture	C

Note: Nothing in this Article prevents a wastewater treatment plant from using a higher quality reclaimed water for a type of direct reuse than the minimum class of reclaimed water listed in Table A. For example, a wastewater treatment plant may provide Class A reclaimed water for a type of direct reuse where Class B or Class C reclaimed water is acceptable.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
JEFF HATCH-MILLER- CHAIRMAN
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	)	DOCKET NO. W-01445A-06-0199
IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. SW-03575A-05-0926
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. W-03576A-05-0926

Direct Testimony of

Rita Maguire
Maguire & Pearce, PLLC

on Behalf of

Palo Verde Utilities Company and
Santa Cruz Water Company

January 26, 2007

Q. Please state your name and employer.

A. My name is Rita Maguire. I am a Member of the law firm of Maguire & Pearce, PLLC.

Q. Please state your business address.

A. 2999 North 44th Street, Suite 630, Phoenix, Arizona 85018.

Q. Please describe your educational background and work experience.

A. I am a graduate of Arizona State University with a Bachelor of Science Degree (1977), a Master of Business Administration (1979) and a Juris Doctorate (1988). From 1993 through 2001, I served as the Director of the Arizona Department of Water Resources ("ADWR"). I was responsible for all final administrative actions of the agency including those taken pursuant to the Arizona Groundwater Management Act. This included review and approval of any Designations or Certificates of Assured Water Supply. During my tenure as Director, ADWR promulgated the Assured Water Supply Rules ("AWS Rules"). In addition, the Third Management Plan was developed and adopted under my direction which is in effect until 2010. I also served a Co-Chair of Governor Hull's Water Management Commission which made a number of recommendations concerning the operation of the Assured Water Supply Rules in the Pinal Active Management Area.

Before serving as ADWR's Director, I was the Environmental Policy Advisor to Governor Symington. Among my responsibilities in that position was to work with the state legislature, stakeholders and the general public regarding the operations of the state's ten natural resource agencies. I also have extensive professional experience drafting state legislation having served as a Committee Research Analyst in the Arizona Legislature during four legislative sessions. My private sector experience includes working as a licensed attorney in the areas of environmental, water, utilities and administrative law. I am also the founding President of the Arizona Center for Public Policy, a non-partisan

research organization that publishes objective research on major public policy issues in Arizona. As the author of numerous studies and publications on surface water and groundwater management, I am a recognized expert in water policy in the Southwest. My 20 plus years of experience in public policy development and application, as well as management positions in both the private and public sectors, and as a licensed attorney, all provide a demonstrated level of expertise in natural resources policy at the state, regional and national levels of government.

Q. On whose behalf are you testifying in this case?

A. I have been retained by Global Water Resources, LLC ("Global") to testify on behalf of Santa Cruz Water Company and Palo Verde Utilities Company.

Q. Have you previously testified before the Arizona Corporation Commission?

A. Yes.

Q. What is the purpose of your direct testimony in this case?

A. The purpose of my testimony is to provide the Commission with insight into the driving principals behind the Arizona Groundwater Management Act ("GMA") and the key regulatory programs ADWR promulgated pursuant to the GMA. My testimony will include a brief history of the state's water laws, the state's water budget and projected water needs in the future. I will also discuss the major challenges facing the state, particularly in the Pinal County Active Management Area ("Pinal AMA"), to ensure the long-term availability of high quality, reliable and affordable water supplies for its residents.

Q. Would you briefly describe the history of water management in Arizona?

A. Arizona's regulation of water dates back to 1919 when the legislature adopted the state's Public Water Code (A.R.S. § 45-151 et. seq.) providing that surface water could only be appropriated upon the filing of an application with the state's water commission. Over time, the state's regulation of water has evolved to recognize four distinct categories of water: (1) appropriable surface water[1]; (2) percolating groundwater; (3) Colorado River water; and, (4) effluent. Different laws apply to each type of water and how it is to be used, delivered and managed in Arizona.

Q. Would you briefly describe Arizona's water budget, specifically, how much water is used annually and what are the primary sources of water?

A. Arizona's annual demand is approximately 7.2 million acre feet ("a-f"). The major surface water supplies come from the Colorado River system (2.8 million a-f) and the Gila River system (less than 2.0 million a-f). The ADWR estimates that effluent accounts for about 4% of the state's total water budget. The rest is pumped groundwater.[2]

Q. Could you describe the concerns about groundwater management in Arizona?

A. When it comes to groundwater, Arizona has long been at the forefront of its management and conservation. Despite its arid climate, Arizona has vast supplies of groundwater. But it took many centuries to store the quantities of groundwater located in the state's aquifers. For this reason, groundwater is not considered a renewable source of water. Furthermore, groundwater pumping far exceeds natural recharge rates in Arizona's most populated areas. Overdrafting of aquifers leads to aquifer compaction which permanently reduces an

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[1] Some surface water rights in the state have been determined through judicial action in state and federal courts. They are known as decreed rights. Surface water rights have been decreed along the Gila River in Pinal County in the Benson v. Allison Decree (1917) which includes parts of the Gila River Indian Community (GRIC) and the Globe Equity No. 59 (1935) which takes in part of the GRIC, San Carlos Apache Reservation and non-Indian land above and below Coolidge Dam.

[2] ADWR Water Atlas, Vol. 1, p. 21, June 2006.

aquifer's storage capacity and leads to earth fissures and subsidence on the land surface above the aquifer. In addition, as the water table declines, groundwater becomes more expensive to extract and diminishes in quality. Most importantly, when groundwater supplies are over utilized, they are no longer available when drought conditions diminish surface water supplies, a frequent occurrence in Arizona.

Q. Was it these concerns that lead to state leaders adopting the GMA?

A. Yes. Concern about the local impacts of groundwater overdraft led state leaders to adopt the GMA in 1980 (A.R.S. § 45-401 et. seq.). The GMA put most of the state's highly populated areas on the path of sustainable groundwater supplies by requiring the "safe yield" of the aquifers in designated Active Management Areas ("AMAs") by 2025. The GMA defines safe yield as a "groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an AMA and the annual amount of natural and artificial recharge in the AMA."[3] Four of the state's five AMAs use safe yield as the principal means for determining how groundwater is managed within their boundaries.[4]

Q. What happens to the state's water supplies when droughts occur?

A. Dendrohydrologists at the University of Arizona and elsewhere have concluded that extended dry/wet cycles of approximately 20-30 years may be a normal climatic condition in the southwest.[5] The Colorado Basin, which includes most of Arizona, currently is in the ninth year of a severe drought. Lake Mead has dropped 70 feet since the drought began in 2000, reducing the water in storage by nearly 50%.[6] Consequently, the seven states that

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[3] A.R.S. § 45-561.12.

[4] The Groundwater Management Act established four AMAs, in Phoenix, Prescott, Tucson, and in Pinal County. In 1994, the Santa Cruz AMA was created. The Pinal AMA is the only AMA that is not managed for the safe yield of its aquifer.

[5] Jenna McPhee, Andrew Comrie, and Gregg Garfin, *Drought and Climate in Arizona: Top Ten Questions and Answers* 20 (Climate Assessment for the Southwest 2004), *available at* http://www.ispe.arizona.edu/climas/learn/drought/DroughtQ&A.pdf.

[6] See attached Exhibit 1.

share the Colorado River[7] are negotiating an agreement that would allocate shortages among the water providers in these states should storage within the system's reservoirs continue to decline.

The risk of drought is only one of several threats to the security of Arizona's water supplies from the Colorado River. It is widely acknowledged today that the River was over allocated when it was divided among the seven states and Mexico in the 1920's. Back then, hydrologists believed that average annual flows in the Colorado River were between 16 to 18 million a-f. We now believe that the River's annual average flows are closer to 13 to 15 million a-f. Unfortunately, the combined rights to the River equal 16.5 million a-f annually, exceeding the River's normal flows by about 2 million a-f.

This over-allocation of the River creates an inherent threat to the security of the River's supplies. Another threat to Arizona's Colorado River allocation is the junior priority status of the 1.5 million a-f of Colorado River water delivered through the Central Arizona Project ("CAP"). When drought conditions reduce deliveries to the three Lower Basin states (Arizona, California and Nevada), Arizona's CAP supplies are the first to be cut back. When this happens, groundwater recovery wells within the CAP service area (Maricopa, Pinal and Pima counties) must pump groundwater to replace lost surface water.

Q. Is Arizona's other source of surface water, the Gila River system, immune from drought?

A. Arizona's second major source of surface water comes from the Gila River system which includes the Salt, Verde and Gila Rivers. It is generally believed that the state's two major surface water systems do not experience droughts at the same time. But both the Colorado River system and the Gila River system experienced severe drought conditions from 2000

[7] Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming.

to 2003. This caused the Salt River Project ("SRP") to substantially reduce its deliveries to the Phoenix metropolitan area and to rely heavily on groundwater wells to replace some of its surface water supplies to its municipal customers. SRP became the largest purchaser of excess CAP water during two of those years. The drought has also caused a number of cities in the area to initiate early drought response programs.

Q. How have water providers generally dealt with drought conditions?

A. As the population increases throughout the Southwest, the impacts of drought conditions are felt more quickly. In order to mitigate the impacts, water providers are actively engaged in developing alternative supplies to replace surface water reduced by droughts. They also seek to reduce the demand for potable drinking water by utilizing reclaimed water and effluent wherever possible. For example, Southern Nevada Water Authority is able to use almost twice its annual allocation of Colorado River water by returning highly treated wastewater to the Colorado River via the Las Vegas Wash which flows into Lake Mead. By treating Colorado River water after it is used, and returning it to the lake, Las Vegas receives return-flow credits that enable the city to sustain a much larger population than would otherwise be possible. This water is later delivered downstream to Colorado River contractors in California and Arizona, including CAP water.

Q. Would you briefly describe groundwater management in the Pinal AMA?

A. The Pinal AMA is the only AMA in which the safe yield goal does not apply. But an effort is underway to apply that goal to municipal and industrial uses of groundwater in recognition of the rapid pace of growth in the AMA.[8] If the safe yield goal is adopted, every proposed subdivision will be limited in the amount of groundwater in its water budget, and access to groundwater will be limited to a depth of 1,100 feet below land

[8] The modified Pinal AMA Assured Water Supply Rules were originally anticipated to be adopted by January 1, 2007. However, they have been delayed due to extensive comments received during the public comment period. The Pinal AMA staff is now hoping to have the Rules in place sometime during the fall of 2007.

surface.[9] The ADWR will use these criteria when determining whether a proposed subdivision meets the requirements of the state's Assured Water Supply ("AWS") Program, before the local governing authority may approve the development to go forward to construction. These requirements are intended to preserve groundwater in the basin, maximize the efficient use of water and promote its long-term water availability.

Q. What is the expected municipal growth potential in the Pinal AMA?

A. Economic forecasters are projecting that the Phoenix and Tucson metropolitan areas will continue to grow along Interstate 10, merging in Pinal County within a decade.[10] Referred to as the "Arizona Sun Corridor" this regional metropolitan area is expected to have a population of more than 10 million by 2040.

Q. Because of this growth, are you concerned about the ability to manage groundwater within the Pinal AMA?

A. Yes. Unlike the Phoenix and Tucson AMAs, the Pinal AMA aquifer is not currently managed for safe yield. Instead, its management goal is to "allow development of non-irrigation uses and to preserve existing agricultural economies for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.[11] The result is that access to groundwater is relatively unrestricted for municipal and industrial uses, and little or no groundwater replenishment is required for new subdivisions in the AMA. Consequently, ADWR predicts that groundwater demands in the Pinal AMA will exceed the AMA's renewable groundwater supplies within the next two to three years

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[9] Proposed A.C.C. R12-15-716 (B)(2)(b), submitted to the Governors Regulatory Review Council or "G.R.R.C." on August 16, 2006. Note, the AWS Rules in the Phoenix, Tucson and Prescott AMA limit access to groundwater to a maximum depth of 1,000 feet.

[10] Marshall Vest, Director, Economic and Business Research Center, University of Arizona's Eller College of Management, Forecast Update, 3rd Quarter 2006 (Aug. 30, 2006).

[11] A.R.S. § 45-562 (B).

unless the new safe yield requirements are adopted.[12] This dire forecast prompted elected officials, community leaders and regulators to work towards adoption of a revised management goal in the Pinal AMA for municipal and industrial development. Concerns about the basin's potential overdraft prompted the Gila River Indian Community ("GRIC") to call for a buffer zone adjacent to the reservation that would impose additional groundwater pumping restrictions on non-Indian development as part of the Arizona Water Settlements Act.[13]

Q. How will the future development in the Pinal AMA impact its groundwater supplies?

A. Perhaps more so than any other AMA, the Pinal AMA's water needs are the most difficult to predict. In addition to the booming residential development occurring along I-10, the AMA is the principal location for the accumulation of long-term storage credits by the Arizona Water Bank Authority ("AWBA"). More than one million acre-feet of long-term storage credits are available to the AWBA for recovery in the future. These credits will be recovered from the AMA's aquifer on behalf of the state's municipalities with CAP subcontracts, as well as California's and Nevada's major municipal providers with Colorado River contracts. Pinal County is also home to three Native American communities whose use of water is unregulated by the state. Both the GRIC and the Ak Chin Tribe actively farm their lands and have indicated their intentions to continue to do so indefinitely.

Q. Please explain how the Assured Water Supply Program and its rules work.

A. The AWS provisions of the GMA, and the related AWS Rules promulgated by ADWR in 1995, require all new subdivisions in an AMA to demonstrate that sufficient water supplies of adequate quality are legally, physically, and continuously available for 100 years. In

[12] Pinal AMA Groundwater Users Advisory Committee Final Subcommittee Report, *Assured Water Supply Rules Modification Concepts* 3 (Feb. 2006).

[13] Public Law 108-451, December 10, 2004.

addition to these consumer protections, the AWS Rules require substantial use of renewable supplies, such as CAP water and effluent, and permit only minimal use of mined groundwater in order to achieve safe yield. This program has often been referred to as the state's insurance policy against drought conditions. Minimizing the use of finite groundwater supplies and emphasizing the use of renewable surface water, reclaimed water and effluent promotes efficient use of scarce resources and provides greater assurance that water will be available even when drought conditions substantially reduce the state's surface water supplies.

Two types of permits are issued to municipal water providers under the AWS Rules, and there are two significant differences between them. First, Certificates of Assured Water Supply ("CAWS") only cover the demands of subdivided land, which may not include ancillary commercial growth. ADWR typically issues a CAWS to a developer or builder who must demonstrate a 100-year assured water supply before plats can be recorded or parcels sold. Second, once the CAWS is issued and lots sold, it is irrevocable regardless of changes in the available water supply. The Arizona Corporation Commission has recently confronted the crisis of private water providers without water supplies in the Desert Hills Water Company case. Although the subdivisions served by Desert Hills have lacked water over the past year, they still retain their Certificates of Assured Water Supply. [14]

Designations of Assured Water Supply ("DAWS") encompass a water provider's entire service area demand and are typically issued to cities. Unlike certificated providers, designated providers are subject to a rolling review of their water budgets. In other words, ADWR reviews the designated provider's needs over the next 100-year period every three to fifteen years depending on the requirements of the individual DAWS. This allows ADWR to check on the viability of the designated provider's long-term water budget and

[14] *See Desert Hills Water Company, Decision No. 68780 (June 19, 2006).*

provides an important protection to the water provider's customers. Designated providers must also submit an annual report to ADWR to maintain their DAWS. If, at any time during the projected life of a DAWS, demand outstrips supply, ADWR may suspend or revoke it.[15]

Q. What are the risks associated with Certificates of Assured Water Supply?

A. When the AWS Rules were enacted, it was envisioned that as a city's service area expanded, designated providers would eventually serve the subdivision development initially served under certificates. This would result in most municipal demand being met with renewable supplies that were regularly reviewed by ADWR, thereby ensuring that adequate supplies were always available. However, due to the significant and haphazard "leapfrog" residential development in the Phoenix AMA,[16] large residential areas will probably never be served by a designated water provider.[17] Instead, individual CAWS have been issued and the economies of scale and consumer protections that result from DAWS are lost.

Q. What other differences exist between Certificates versus Designations of Assured Water Supply?

A. The extraordinary amount and rapid pace of municipal development in the Pinal AMA make the distinctions between CAWS and DAWS more significant. It is important to remember that applications for CAWS are done on a subdivision by subdivision basis, preventing ADWR from evaluating the actual demand at progressive stages of build-out. The larger the size of a water provider's service area covered by multiple CAWS, the more difficult it will be for ADWR to address the cumulative impacts of growth because they are

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[15] See the Assured Water Supply Rule at R12-15-709.

[16] Tucson's situation is different because almost 90% of the AMA's residents are served by a single designated provider.

[17] Interview with Doug Dunham, Office Manager, Office of Assured/Adequate Water Supply, in Phoenix, Ariz. (June 30, 2006).

only able to look at projected rather than actual demand, and the two are seldom the same. More importantly, CAWS give the responsibility for assessing the available groundwater supplies, and forecasting demands, to the developer, not the water provider, who will ultimately be obligated to serve the area.

Q. Can CAWS' constrain ADWR's ability to monitor impacts of development on water supplies?

Yes. The CAWS' approach limits ADWR's review to a single snapshot of the water supplies available to a planned subdivision. This means ADWR cannot monitor the impacts of continued development in the surrounding area on the subdivision. In north Phoenix, for example, construction of unregulated "wildcat" subdivisions will likely reduce the amount of groundwater available to CAWS subdivisions in the area because groundwater pumping by these "wildcat" subdivisions reduces the supplies of all the nearby communities.[18] Unfortunately, current law provides no protection from these unregulated pumpers and no mechanism for reevaluating the available water supplies for a subdivision under a CAWS, as was the case with Desert Hills Water Company recently. The ACC was forced to issue an Order to Show Cause against Desert Hills Water Company due to its inability to provide water service throughout its entire CC&N.[19]

In contrast, applications for DAWS include the water provider's entire service area, thereby giving ADWR an opportunity to conduct a comprehensive analysis of the adequacy of the water supply for all development within the water provider's CC&N. The rolling review of DAWS also allows the Department to consider any changes in

[18] Interview with Doug Dunham, Office Manager, Office of Assured/Adequate Water Supply, in Phoenix, Ariz. (June 30, 2006).

[19] *See Desert Hills Water Company, Decision No. 68780 (June 19, 2006).*

groundwater availability due to new development in the vicinity of the provider's service area.

It is very hard to predict the future 100 years out. The CAWS attempts to do so with a one-time snapshot. The DAWS is preferable because it provides for ongoing review and supervision by ADWR to ensure that the water will be available.

Q. If groundwater is the only source of water available for residential development, and the safe yield goal of the GMA restricts access to groundwater, will municipal growth be prevented in the future?

A. As the population continues to grow within the AMAs, there is increasing pressure to modify the safe yield goal, or to create new programs that balance the pressure to develop with the need to protect our limited groundwater supplies. The Central Arizona Groundwater Replenishment District ("CAGRD") was created in 1993 in response to developers' concerns that access to renewable surface water supplies, as well as affordability, would limit future residential growth in Maricopa, Pinal and Pima counties. The CAGRD is a state authorized program, managed by the Central Arizona Water Conservation District ("CAWCD"), which allows developers/builders to build subdivisions dependent on excess groundwater pumping as long as they enroll the subdivision's lands (known as Member Lands) in the CAGRD. The CAGRD places water planning responsibility on developers rather than water providers which results in a piecemeal approach to infrastructure development and operation when separate water companies are used.[20]

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[20] Id.

Q. Has the CAGRD fulfilled it mission to facilitate residential development in areas lacking access to renewable water supplies?

A. Yes. The success of the CAGRD has exceeded everyone's expectations, but not necessarily in a good way. In addition to developers and builders joining the CAGRD, so have a number of cities and towns, including Scottsdale, Tucson, and Peoria. In the Pinal AMA, Eloy, Florence and Casa Grande are looking to the CAGRD to meet their recharge obligations.[21] Each of these cities and towns enrolled in the CAGRD because they lack sufficient renewable water supplies to meet their current and future water needs requiring them to pump groundwater in excess of the AMA's AWS Rules.

The enrollment of these Member Service Areas has dramatically increased the future replenishment obligations of the District. This set off alarm bells at ADWR and the CAP due to concerns that in the future, the CAGRD may not have access to the amount of renewable water supplies it is contractually obligated to provide its members. The CAGRD is required to replenish in perpetuity all groundwater that is pumped by its members in excess of the groundwater allowance set by the AWS Rules.[22] The Governor's Water Management Commission included a recommendation in its Final Report that the CAGRD establish a replenishment reserve to help ensure that sufficient supplies are available the CAGRD to meet the long-term demands of its members.[23] This is because ADWR projects that CAP supplies will be fully utilized by 2030, leaving little or no excess water available for purchase by the CAGRD and others in search of renewable water supplies.[24]

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[21] www.cagrd.com/pdft.

[22] Governor's Water Management Commission, Final Report, p.13, December 2001.

[23] Id.

[24] Final Report of the Governor's Water Management Commission, p. 13, December, 2001.

There is also a concern that the rising cost of renewable surface water supplies will result in financial hardships for homeowners in subdivisions enrolled in the CAGRD. This is because the replenishment costs incurred by the District will be included in each homeowner's annual county property tax bill. The cost of replenishment is based on the cost of the replenished water and the replenishment services provided by the District, divided by the amount of water each home consumes annually. Because replenishment is mandated by state law, it must be done regardless of the cost. The assessment will increase over time as the cost of water and replenishment services increases. The CAGRD may impose a lien on the homeowner's property if the annual assessment is not paid. Unfortunately, although it is expected that the price of water will increase in the future, there is no way to predict how much or how fast it will increase. The price of water is a function of a number of different factors, many of which are simply out of our control.

Groundwater replenishment must occur within the same basin where the excess groundwater pumping occurred, although not necessarily within the same sub-basin.[25] The disconnect between where groundwater is pumped and where recharge can occur has contributed to the concern about the activities of the CAGRD. The Staff at ADWR argues that recharge of overdrafted groundwater should take place within the area of hydrologic impact. But cost considerations have prevented the adoption of this requirement. This means that in the Pinal AMA, which is made up of five sub-basins, recharge of the aquifer can fail to mitigate the direct impacts of overdraft if it does not occur in the same sub-basin as the withdrawals.

While the benefits of the CAGRD are many, there are reasons to be cautious about the District's ability to meet its long-term obligations. For this reason, it is always preferable

[25] A.R.S. § 48-3771(B).

to develop a water budget on renewable resources and minimal groundwater withdrawals, foregoing the need to join the CAGRD.

Q. Will the proposed revisions to the AWS Program in the Pinal AMA provide sufficient protections to its residents now and in the future?

A. The current management goal of the Pinal AMA seeks to preserve existing agricultural economies for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.[26] According to the ADWR, "[i]f substantial subdivision development continues as expected in the Pinal AMA, the AWS Program could play a significant role in support of the management goal to preserve future waters supplied for non-irrigation purposes."[27] But because the safe yield goal has not yet been adopted, new subdivisions in the AMA are permitted to rely almost exclusively on groundwater to meet their long-term needs. In fact, the CAGRD, which meets the replenishment obligations of enrolled subdivisions that pump excess groundwater, only provided 212 a-f of replenishment in the Pinal AMA in 2003, compared to 52,588 a-f replenished by the CAGRD in the Phoenix AMA that year.[28] The groundwater allowance in the Pinal AMA is even greater when a subdivision is located on land with an appurtenant irrigation grandfathered right ("IGR"). Unfortunately, the result of an extraordinarily generous groundwater allowance is less interest in developing on farmland. If raw desert is cheaper, and there is no need to obtain an IGR in order to pump groundwater in the AMA, there is a very real risk that both municipal development *and* farming will continue in the AMA. This will drain the aquifer at an even faster and more alarming rate.

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[26] A.R.S. §45-562(B).

[27] ADWR Notice of Proposed Rulemaking, Title 12, Chapter 15 filed with the Governor's Regulatory Review Commission, July, 2006.

[28] www.cap-az.com/recharge

Q. Would your concerns about the Pinal AMA remain even if safe yield is adopted?

A. Yes. Even if the safe yield goal is adopted, the modified AWS Rules under consideration for the Pinal AMA still permit a greater percentage of a subdivision's water budget to be made up of groundwater than in other AMAs. For example, the mined groundwater allowance in the Phoenix AMA is 4% and in the Tucson AMA it is 8%, but under the proposed municipal AWS Rules in the Pinal AMA, the mined groundwater allowance is calculated by multiplying the build-out population of the subdivision by an initial allocation factor of 10%. This formula will continue to make substantially more groundwater pumping possible in the Pinal AMA. In addition, extinguishment credits granted pursuant to the retirement of IGRs in the AMA will decrease at a much slower rate than in other AMAs. The ADWR has estimated that the average annual renewable groundwater supply in the Pinal AMA is 82,500 a-f/year.[29] This is the amount of water that can be withdrawn each year without depleting the aquifer. However, more than 272,000 acres of land have IGRs in the AMA. With an extinguishment rate of 1.5 a-f/year, these rights to pump the aquifer have the potential to overdraft the basin. These liberal guidelines are cause for concern. As previously mentioned, substantial amounts of groundwater are expected to continue to be pumped in the future by new subdivisions, the AWBA, Native American communities, and residual non-Indian agricultural users.

Furthermore, the AWS Rules in the Phoenix and Tucson AMAs provide an initial allocation of groundwater based on a very small percentage of estimated demand for CAWS, or historical demand for DAWS. The Pinal AMA AWS Rules, however, allocate groundwater based on 125 gpcd. This means municipal water providers serving water at the time of the effective date of the proposed rules will be allowed to pump groundwater under the prior allocation system. These water providers will also receive a "transition volume" of groundwater which is a permanent, annual allocation applicable to residential

[29] See Testimony of Phil Briggs, submitted January 26, 2007 in this docket..

lots within plats recorded as of the effective date of the revised rules and served before January 1, 2010.[30] In the other AMAs, the allocation of allowable groundwater use decreases over time. But in the Pinal AMA, the allocation actually increases for certain providers as their customer base grows.[31] Each of these provisions seriously undermines the consumer protections built into the AWS Program.

Q. What about the impacts of non-Indian agriculture on the Pinal AMA, even with safe yield?

A. Even though the Pinal AMA is likely to adopt a safe yield goal for its municipal sector, non-Indian agriculture will still be allowed to pump significant quantities of groundwater without the limitations of safe yield. Today, non-Indian agriculture in the AMA is largely dependent upon renewable CAP water to irrigate their lands. However, in exchange for receiving CAP water at subsidized rates through 2030, irrigation districts holding CAP non-Indian agricultural subcontracts relinquished their subcontract rights. After 2030, there is no guarantee that CAP water will be available at subsidized rates. It is expected that these CAP supplies will be used in the future to meet municipal demands within the CAP service area.[32] As this surface water supply is removed, the agricultural sector may shift to even greater reliance on groundwater. Because agriculture is not covered by the safe yield goal in the Pinal AMA, this is a cause for substantial concern. There is little doubt that the combination of rapid urban development, future recovery of groundwater by the AWBA, and continued agricultural activity on Indian and non-Indian land will place a significant strain on the groundwater supplies in the AMA.

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[30] ADWR proposed rule modification of Pinal AMA AWS Rules, submitted to the Secretary of State on November 22, 2006.

[31] ADWR proposed rule modification of Pinal AMA AWS Rules, Chapter 5, p. 5.

[32] Maricopa, Pinal and Pima counties.

Q. Generally, what is the status of development within the Pinal AMA at present?

A. Today, approximately 1.5 million homes are at some stage of the entitlement process in the Pinal AMA.[33] The vast majority of homes will be located in master planned subdivisions. Generally, master planned communities are developed in phases. If a master planned community is located within the service area of an undesignated provider, ADWR recommends that an Analysis of Assured Water Supply be obtained for each phase of development. An Analysis is an official determination by the ADWR verifying one or more requirements necessary to obtain a CAWS.[34] If an Analysis of Assured Water Supply proves physical availability, then ADWR reserves that volume of water for the proposed subdivision. That water is consequently unavailable to other water providers.

In order to obtain an Analysis, the applicant must be the owner of the land subject to the application or have the written consent of the owner.[35] Without the consent of the landowners within the application area, ADWR will not perform the Analysis. While designated providers cannot obtain an Analysis, they can apply to the ADWR for a modification of their designation.[36] Once ADWR has approved a provider's designation, the current, committed, and projected water demands of the provider that will be met with groundwater are similarly reserved by ADWR to meet the future needs of the provider's customers.[37]

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[33] Statement made by Eric Anderson, Transportation Manager, Maricopa Association of Governments, during a panel discussion before Valley Leadership, January 5, 2007.

[34] A.A.C. R12-15-703(E).

[35] A.A.C. R12-15-703(A).

[36] Id.

[37] A.A.C. R14-15-716(B)(3)(c)(ii).

Q. How does a determination of physical availability differ from an Analysis?

A. In contrast, a Physical Availability Determination ("PAD") evaluates an area solely for the physical availability of water. PAD's do not reserve water for future development.[38] They are simply an analysis of hydrologic conditions in a local area, typically based upon the needs of a particular water provider. In fact, any person applying for a CAWS determination may use an existing physical availability determination to meet its physical availability requirement.

Q. Should the Commission rely on a PAD to demonstrate that a utility will have water?

A. No. Because the PAD does not reserve water, it does not provide an assurance that the water will be available to the utility. A PAD is simply not a substitute for an assured water supply.

Q. What is the role of conservation within the GMA?

A. An axiom of water management is that conservation is the surest, cheapest way to ensure that water is available to meet future needs. Many cities in the Southwest offer incentives to encourage homeowners and businesses to conserve water. For example, in Albuquerque New Mexico, that City's water conservation department offers customer rebates for xeriscape plantings, installation of low flow plumbing fixtures, even purchases of rainwater harvesting barrels. Since 1994, the City has actively promoted water conservation. As a result, Albuquerque experienced a 30% reduction in per capita usage with per person usage dropping from 250 gpcd to 174 gpcd in ten years.[39] The City has recently declared a goal of reducing water usage another 40% by 2014. Similarly, the Southern Nevada Water Authority ("SNWA"), the water provider for Las Vegas and other communities in Clark County, Nevada, pays homeowners $2 for every foot of turf

[38] A.A.C. R12-15-702(F).

[39] GPCD means Gallons Per Capita Per Day.

removed from their home's landscaping. Last year alone, SNWA spent $10 million on the program.[40] Both cities have drought restrictions in place that limit times for watering at home, even washing cars. These programs are no longer temporary responses to drought conditions, but are a permanent commitment by these cities to stretch every drop of water available to them.

Q. When did Arizona begin to adopt water-conservation measures?

A. Arizona's adoption of the GMA in 1980 was the first state-level effort to formalize the conservation of surface and groundwater supplies. Many citizens do not realize that water conservation is an intrinsic part of the deliveries to their homes and businesses. This is because the regulatory programs governing water conservation are enforced at the water provider's level. Every ten years, ADWR adopts a new Management Plan for each AMA which requires increasingly efficient utilization of the water they deliver or use. This authority was challenged by Arizona Water Company ("AWC") who argued that conservation measures should be imposed on the end user.

Fortunately, the Arizona Supreme Court disagreed and held that "the principal burden of achieving reductions in groundwater use [is] on water providers, who are charged in ADWR's management plans with reducing their total GPCD during each management period."[41] In the same challenge to ADWR's authority, AWC also attempted to limit the imposition of conservation measures to groundwater, excluding the delivery and use of Colorado River water from any requirements to conserve. Again, Arizona's Supreme Court disagreed, recognizing the importance of conserving all water, regardless of its source.

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[40] Statement made by Pat Mulroy, General Manager, SNWA during her speech at the Colorado River Water Users Annual Conference, December 14, 2006.

[41] Arizona Water Company v. Arizona Department of Water Resources, 91 P3d 990, 992 (Ariz. 2004), 208 Ariz. 147.

Q. Do you believe water conservation is a vital part of ensuring that Arizona has a sustainable future?

A. Most definitely. Water conservation is a critical part of stretching Arizona's scarce water supplies. State agencies and local governments, as well as the private sector, run a number of voluntary conservation programs intended to raise public awareness of the value of water, but more importantly, to maximize efficient water use. These programs are designed to cut waste without sacrificing function and often have an added bonus of reducing water bills. ADWR encourages household-scale conservation practices such as low-flow plumbing, water-saving technology, and xeriscaping for desert-friendly yards. These tools are a critical part of ADWR's Management Plans adopted pursuant to the GMA.

Q. How important is the use of reclaimed water and effluent to ensuring we have adequate water supplies in the future?

A. Using reclaimed water is critical. This is because the future development and use of the state's water resources will create additional wastewater. Reclaiming or reusing this wastewater has the potential to significantly increase the amount of water available for potable use. Consider that a typical residential home uses two-thirds of its potable water supply for outdoor landscaping, and up to 90% in the summertime.[42] Applying reclaimed water to these exterior household uses and interior non-potable uses dramatically reduces the residential demand for potable supplies. Hence, potable water supplies are more available for potable uses (drinking and bathing, for example).

[42] www.snwa.com.

Q. Has there been a movement towards exploring and implementing uses for reclaimed water and effluent?

A. Yes. Growth, uncertain demands for water, and drought conditions are three reasons why the state's water leaders are placing more and more emphasis on the use of reclaimed water and effluent to reduce the demand on potable drinking water supplies. The majority of the wastewater produced in the metropolitan areas has been treated in centralized wastewater treatment plants and then made available as reclaimed water. Today, regional estimates of the water supply assume between 30% and 70% of the reclaimed water produced will be put to use. As the scarcity and cost of water increases, water providers will find it cost-effective to invest in integrated water and wastewater systems that can utilize up to 100% of the reclaimed water produced. This water can reduce groundwater usage by substituting reclaimed water for use in public parks, cemeteries, golf courses, and other public areas. [43] The sooner water providers and state policies promote the use of reclaimed water and wastewater, our ability to meet the water needs of the state's communities will be more secure.

Q. Please summarize your conclusions

A. Growth in Pinal County, as well as growth in the greater Southwest, presents some very serious challenges to Arizona's ability to provide long-term, sustainable water supplies in the Pinal AMA. There is no doubt in my mind that water conservation is a vital part of ensuring a sustainable water budget that meets this state's needs. And the use of reclaimed water is a critical part of water conservation.

From a regulatory standpoint, Designations or Assured Water Supply are preferable to Certificates for a number of reasons. Designations encompass the entire demand of the water provider's service area and are subject to a rolling review by ADWR which ensures

[43] See, e.g. Global Water *at* www.gwresources.com.

the long-term security of the water supply. Certificates are based on a "one-time" look at the projected demand of a proposed subdivision. This demand is prepared by the subdivision's developer, not the water provider that will ultimately be responsible for delivering the subdivision's water.

While the CAGRD provides an opportunity for growth in areas with limited access to renewable surface water, the unanticipated popularity of the program has caused many to be concerned about the CAGRD's ability to meet its long-term replenishment obligations. A water provider's self-sustainability will not only enhance the security of the supplies of its customers, but will reduce the demands on the CAGRD.

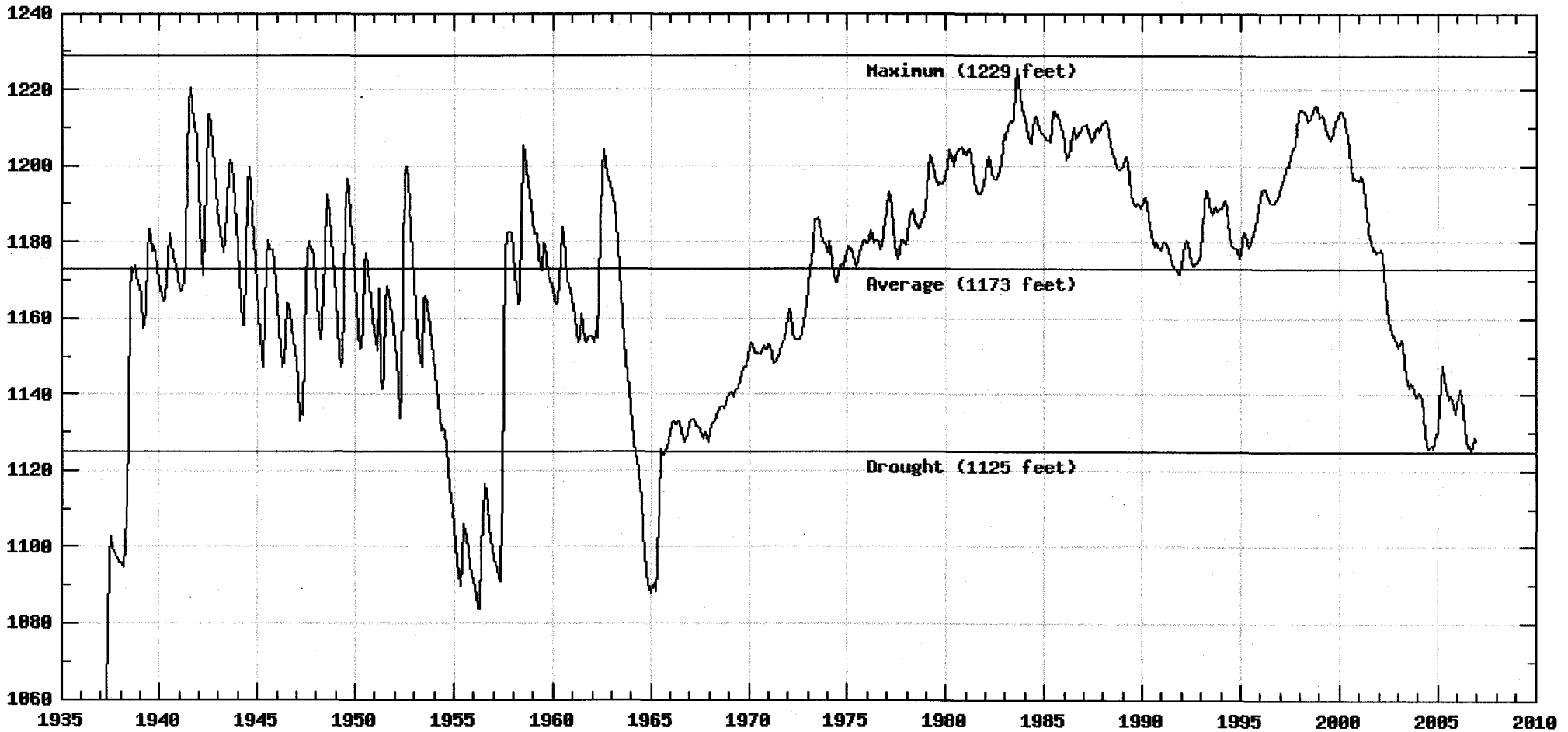
The time is now to adopt water management policies that will promote the most efficient utilization of the state's scarce water supplies. Every generation of Arizonans has left its mark on the stewardship of this precious resource, starting with the construction of SRP's reservoirs, to securing the state's rights to the Colorado River, to the completion of the CAP and the adoption of the GMA. All of the surface water in the state has been appropriated, and a substantial amount of groundwater is allocated, what remains is greater use and investment in water reclamation.

Q. Does this conclude your testimony?

A. Yes.

EXHIBIT

"1"


Maximum (1229 feet)
Average (1173 feet)
Drought (1125 feet)
1240
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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
JEFF HATCH-MILLER- CHAIRMAN
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	)	DOCKET NO. W-01445A-06-0199
IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. SW-03575A-05-0926
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. W-03576A-05-0926

Direct Testimony of

Philip Briggs
Water Resources Consulting SW, LLC

on Behalf of

Palo Verde Utilities Company and
Santa Cruz Water Company

January 26, 2007

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I. INTRODUCTION.

Q. Please state your name and employer

A. Philip Briggs. I am the manager of Water Resources Consulting Southwest, LLC.

Q. Please state your business address

A. 7509 North 13th Avenue, Phoenix, AZ 85021.

Q. On whose behalf are you testifying in this case?

A. I have been retained by Global Water Resources, LLC ("Global") to testify on behalf of both Santa Cruz Water Company ("SCWC") and Palo Verde Utilities Company ("PVUC")

Q. Have you previously testified before the Arizona Corporation Commission?

A. No. However, I have testified as an expert on hydrology and water issues on many occasions in other venues.

Q. Please describe your professional background and work experience.

A. I served as the Chief Hydrologist for the Arizona Department of Water Resources ("ADWR") from 1973 to 1980. As Chief Hydrologist, my duties included management of the hydrology section, which included technical support for several programs including review of water supplies for developments, basic data collection, hydrologic investigations, including groundwater modeling studies. Later, I served as Deputy Director of ADWR from 1980 to 1987. My duties as Deputy Director included management of the agencies Hydrology Division (which included the Basic Data Unit), Dam Safety Division, Flood Control Programs, and the Remedial Action Division. During 1984 and 1985, I was also responsible for the Administration and Electronic Data Processing Divisions. Overall, my professional experience includes 19 years of service with ADWR.

Q. There has been considerable discussion by other witnesses in this case about the Assured Water Supply ("AWS") Program. Were you involved in the AWS program while at ADWR?

A. Yes. In fact, the AWS program is based on a predecessor program, the Adequacy of Water Supply program, which was created by legislation in 1973. This legislation was developed to deal with a rampant land fraud problem, where lands in Arizona that were without a hope of developing an "adequate" water supply were being sold throughout the world by scam artists. I developed and managed the adequacy of water supply program after passage of the legislation. I was Chief Hydrologist of the Arizona Water Commission then, and was given the responsibility for the technical and regulatory aspects of program. Understand that there was no program within the agency, and that we created it as we went. We knew what "adequate" meant – enough water to meet the needs of the new development for 100 years – considering existing demands, but the nature of the physical demonstration and even the applications had to be cut from whole cloth. Understand also, that on the effective date of the legislation, every developer and water provider in Arizona had a new hoop to jump through. And I held that hoop. The phone began to ring and did not stop. The only mitigating factor, and it was significant, was that water providers that had applied for a CAP contract were "deemed" under the legislation to have an adequate water supply. The drafters had that right, as it exempted the major cities from our requirements.

The Groundwater Management Code, enacted in 1980, continued the adequacy of water supply program, and revised it for lands within the new Active Management Areas, ("AMA") creating the AWS program. Screws were tightened, and the designations became a requirement for development within the AMAs. I had responsibility for the expanded program, including technical reviews and approval of designations. I held that

responsibility for another seven years and supervised changes and revisions, until I left the agency in 1987.

Q. Did you become familiar with the Central Arizona Project or "CAP" at this time?

A. Yes. I was hired in 1968 by the Arizona Interstate Stream Commission to help in the evaluation of contract applications for CAP water, and to provide hydrological support for the allocation of CAP water to potential contractors. And that term – allocation – was the term used than to describe this apportionment or sharing, because even then it was clear that there was not sufficient firm CAP water supplies to meet the needs of all applicants.

My responsibility was to evaluate groundwater impacts of potential allocations of CAP water within the service areas of applicants for CAP contracts. Our analysis used a digital groundwater model of the three county CAP service area to estimate future water level changes associated with various demand and allocation scenarios within the applicant's service areas. Our objective was to minimize costs of water supply to the applicants, which meant minimizing groundwater impacts relative to CAP water costs.

Water demands were derived from population projections from responsible agencies and were the basis for our allocations. This was 1969 to 1970. Back then, Peoria, Surprise, Buckeye, Casa Grande, and Eloy were sleepy farm towns and Maricopa was a road junction. Looking back, who would have thought these communities would explode into a panoply of master-planned communities and development? The resulting CAP contracts for these towns – that are now cities – were intended to meet future demands based on these projections and their applications. Now it is clear that none of the contract amounts are adequate to meet what we see now as their current and future demands. Everyone involved did the best we could – and it wasn't enough. The new cities were not even included.

To frame this for the case at hand, the Arizona Water Company has an allocation of CAP water for their Casa Grande service area of 8,884 acre-feet, based on the information on the CAP web site. I don't remember anymore (it's been 34 years), but I expect that the allocation we made that resulted in this contract amount was intended to meet all of the future water needs in that service area, as that was our approach at the time. They have recently filed a hydrologic study with the ADWR that projects the demands for new developments within their existing Casa Grande service area at 57,507 acre-feet.

Unfortunately, nothing I have seen indicates that they have any better idea of the potential future demands in their requested CC&N expansion area. And this time there isn't any apparent CAP supply to meet those undefined needs.

Q. What advice would you give now based on your 45 years of experience dealing with Arizona's water issues.

A. Take less risk. Our last water hole, the Colorado River, is over committed. Long-term water plans are likely to be inadequate given the growth in Arizona. You need to define development within the near term, and secure the water supplies from the available resources for the future. For municipal demands, develop sustainable supplies. As the future presents itself, repeat the plan. Planning approaches that seemed to work in the past – didn't. There are ample examples of those failures. Don't repeat them.

Q. What else about your background and experience makes you qualified to discuss hydrology and water issues?

A. I have a Bachelor of Science and a Master of Science and in Civil Engineering from Arizona State University, in 1963 and 1970 respectively. I am a Registered Civil Engineer, in Arizona. I have over forty years of experience in water resource issues in Arizona and the southwest. My overall experience includes water resource investigations,

water resource planning and management, and groundwater modeling to support management decisions. I have extensive experience in hydrologic environments in Arizona and have conducted numerous assessments of availability of water supplies, developed projections of impacts of development on water resources, prepared state and municipal water resource plans, and provided successful litigation support. My experience includes both technical and management positions in both the private and public sectors and demonstrates a level of expertise in water resource investigations, development, and use. I have attached a brief resume to this testimony

Q. What is the purpose of your direct testimony in this case?

A. The purpose of my testimony is to demonstrate that SCWC and PVUC as integrated utilities will provide the best potential for ensuring a long-term, reliable supply of water for current and future municipal and industrial uses for their requested service area. To provide a frame of reference for the importance of considering water resources management in this case I will first describe groundwater resources, conditions, and management within the Pinal Active Management Area ("Pinal AMA"). I will show that the groundwater resources in the Pinal AMA have been and will continue to be vastly overcommitted. Further, there must be changes to the existing approaches to water use and management to ensure the long-term, reliable supply of water for current and future municipal and industrial uses within the Pinal AMA. I will analyze potential future supplies and uses in the contested area.

Q. Can you summarize your conclusions?

A. Yes. The Pinal AMA has historically used far more groundwater than was replenished. This is called "overdraft". Further, under current management, the overdraft in the Pinal AMA is likely to continue. Projected municipal groundwater use far exceeds the available renewable supply. Municipal providers must rely on reuse of effluent, recharge, and

surface water to stabilize the groundwater supply. Failure to do so could result in a continued acceleration of the overdraft.

Q. What do you mean by the term "municipal"?

A. Consistent with ADWR usage, I mean any provider of water utility service for non-farming irrigation purposes, regardless of whether the entity is a governmental unit or is privately owned.

II. GROUNDWATER MANAGEMENT WITHIN THE PINAL AMA.

Q. Would you briefly describe current groundwater management within the Pinal AMA.

A. Yes. In 1980, the Arizona changed the way groundwater supplies were used and managed through the passage of the Groundwater Code. The Code's goals are to eliminate severe overdraft in the major developed areas and provide a means of allocating and managing Arizona's limited groundwater resources to most effectively meet the state's changing water needs. Ms. Maguire's testimony will discuss the Code and groundwater management approaches in considerable detail, so I will focus my testimony on the Pinal AMA and the management issues associated with ensuring the provision of a long-term, reliable supply of water for current and future municipal and industrial uses in the Pinal AMA. I have attached Exhibit 1 to my testimony that shows the Pinal AMA.

Q. How does the Pinal AMA differ from other AMAs?

A. Unlike the other AMAs which are regulated to achieve "safe-yield" where groundwater withdrawal and recharge are balanced, ADWR regulations allow for continued overdraft in the Pinal AMA in order to extend the life of the agricultural economy as long as possible. In addition, the Pinal AMA regulations also consider the change in future water uses as

development of non-irrigation uses occurs, as well as preservation of water supplies for future non-irrigation uses.

Q. What tools does the Groundwater Code employ to manage groundwater use?

A. In general, the Code contains a number of management tools to address the problem of groundwater overdraft within AMAs. These tools include a system of groundwater rights and permits, water conservation requirements, the Assured Water Supply ("AWS") program, water quality management (matching water quality and uses), augmentation with renewable resources, and recharge.

Specifically, the ADWR's Pinal AMA management staff has developed a brief list of major water management issues, attached as Exhibit 2. This exhibit was downloaded directly from the ADWR Pinal AMA Web page. Preserving future water supplies for non-irrigation uses is at the top of the list. The Pinal AMA Staff noted the "need for regional recharge and recovery planning in the Pinal AMA to minimize the impacts of critical area programs that may develop in the future, including lack of physical availability of groundwater, excessive water level decline rates, land subsidence, and earth fissuring."

The AWS rule-modification efforts – as it relates to the preservation of water supplies for future non-irrigation uses – are especially pertinent to the Pinal AMA. The Arizona Department of Resources ("ADWR") developed a new rulemaking package for the AWS program issued in March 2006. This rulemaking was initiated to implement the recommendations of the Pinal AMA Groundwater Users Advisory Council ("GUAC") dated February 23, 2006[1]. I will discuss these modifications later in my testimony.

[1] Much of the following testimony comes directly from the ADWR rulemaking package, issued in March 2006.

Q. What is the Assured Water Supply or AWS program?

A. The AWS program is a management tool that requires an applicant to demonstrate that there is a 100 year water supply of adequate quality that is physically, legally and continuously available to the meet the needs of new development. In addition, the AWS regulations require that any projected groundwater use is consistent with the AMA's management goal and management plan. In order to prove a physical groundwater supplies the applicant has to demonstrate that – in the Pinal AMA – the 100 year water level decline projected for the proposed development, when added to the existing or expected rates of decline will not exceed a depth to water of 1,100 feet or the bottom of the aquifer, whichever comes first.

Q. What is physical availability?

Physical availability is defined in A.C.C. R12-15-716) as is the method of analysis to be used in preparing a demonstration of physical availability (commonly referred to as a Physical Availability Demonstration or "PAD"). Briefly, the applicant has to demonstrate that – in the Pinal AMA – the 100 year water level decline projected for the proposed development, when added to the existing or expected rates of decline will not exceed a depth to water of 1,100 feet or the bottom of the aquifer, whichever comes first. To aid in evaluating the potential for development to take place in either of these two competing proposals, I have made a simple analysis of potential groundwater impacts of each of the filings, which I present at the end of my testimony.

Q. How do the rule modifications affect the AWS program?

A. The rule modifications deal with the groundwater allowance for developments provided in the current rule. Under the current rule, subdivisions could be allowed to develop on 100% un-replenished groundwater. The GUAC's biggest concern with this was that the existing groundwater allowance was not at all consistent with the achievement of the AMA's

management goal to preserve water supplies for future non-irrigation uses. The ADWR sums this up as follows: "This lack of replenishment means that once existing and approved municipal groundwater demands in the Pinal AMA exceed the AMA's renewable groundwater supplies (i.e., net natural recharge) groundwater will be mined to meet these demands"[2].

The ADWR provided some measurement of the problem. Since 1999, existing and approved municipal groundwater demands in the Pinal AMA have increased 250%, from about 17,000a-f/year to over 60,000 a-f/year. The information in the rule making package indicates that about 300,000 lots had been zoned but not platted by March 2005. Using available use factors, ADWR calculated that these 300,000 lots had a potential demand of 120,000 a-f/year at build out. The potential municipal groundwater demands of 180,000 a-f/year far exceeds the ADWR's estimated renewable groundwater supply of 82,500 a-f/year, hence the concern and the rule changes to limit future demands by developments by requiring replenishment of groundwater uses.

Q: How do the proposed rule changes address this situation?

A: Generally, the proposed rules will limit the groundwater allowance that ADWR grants in the Pinal AMA for new developments in the AWS Program. This change is likely to mean that there will be a need to increase the utilization of renewable supplies such as surface water and/or reclaimed water in the AMA. Alternatively, if renewable supplies are not used, new developments that use groundwater in the Pinal AMA will be required to replenish excess groundwater use via the Central Arizona Groundwater Replenishment District ("CAGRD").

Q. Please summarize your findings about current groundwater management within the Pinal AMA.

A. My findings are as follows about current groundwater management.

- That the Pinal AMA finds a need for regional recharge and recovery planning in the Pinal AMA (See Exhibit 2).
- ADWR is modifying the AWS rules to address the increased municipal groundwater demands.
- The Pinal AMA is relying on an estimate of renewable groundwater supplies of 82,500 a-f/year to meet a portion of future municipal demands.

III. WATER SOURCES AND USES WITHIN THE PINAL AMA.

Q. Would you briefly describe water use characteristics within the Pinal AMA?

A. Yes. Water use in the Pinal AMA has historically been dominated by the agricultural sector of the local economy. The ADWR Third Management Plan ("TMP") for the Pinal AMA indicates that since the 1980's, water use by non-Indian agriculture, Indian agriculture, and canal losses associated with these uses combined accounted for about 95 to 98 per cent of the Pinal AMA total water use. For example Exhibit 3 shows that ADWR estimated that non-Indian agriculture accounted for 81% of the total Pinal AMA water use in 1998 – over 1,026,000 a-f/year. Municipal and industrial uses combined accounted for only about 3%.

Several exhibits attached to my testimony demonstrate the extent of water use within the Pinal AMA. For example, Exhibit 4 shows lands with a history of irrigation within the Pinal AMA – both non-Indian and Indian irrigation acreage – in 1998. Further, Exhibit 5 shows selected agricultural characteristics for non-Indian lands. This summary shows that about 275,000 acres of irrigated farmland with 70 to 80% in irrigation each year, with the

average water use of about 778,000 a-f/year. The trends in agricultural water use are shown in Exhibit 6. As this exhibit shows, Central Arizona Project ("CAP") water became available for use in the Pinal AMA starting in 1987. While there was a resulting increase in total water use for most of the years shown, there was a decrease in groundwater use. These and several other exhibits are copies of Power Point slides from a "Virtual Tour" posted on the Pinal AMA web site.

Exhibit 7 shows the municipal characteristics for water use within the Pinal AMA. Municipal water uses are nearly two orders of magnitude smaller that agricultural uses and are concentrated in the four major communities in the Pinal AMA. As shown in Exhibit 8 entitled "Municipal Water Use," the trends in municipal water use indicate a continued growth in use for the four communities in existence than – Casa Grande, Coolidge, Eloy, and Florence – Maricopa was a gleam in no ones eye than. Municipal supplies had almost total reliance on groundwater.

Finally, Exhibit 9 shows the industrial water-use characteristics for the Pinal AMA. The amount of industrial water use is less than for municipal use. But the trends in industrial water use shown in Exhibit 10 indicate a continued growth in use, with almost total reliance on groundwater. The effluent uses shown are for irrigating golf courses.

Q. **Would you provide an overview of water resources in the Pinal AMA?**

A. Certainly. Water resources in the Pinal AMA include groundwater, surface water, effluent, and precipitation. Groundwater resources include both the water stored in the aquifers underlying the basins in the Pinal AMA as well as underflow from adjacent basins and natural and incidental recharge from surface flows and water uses. Surface water resources include the stored and diverted flows in the Gila River, the ephemeral flows in the Santa Cruz River and in the Gila River below the Ashurst-Hayden Dam, and the imported water

from the Colorado River through the CAP. Treated effluent is available from municipal wastewater plants. Precipitation in the basins provides limited resources through mountain front and ephemeral stream channel recharge.

Further, the Pinal AMA is comprised of five sub-basins. As Exhibit 11 shows, the Eloy and Maricopa-Stanfield sub-basins are the principal sub-basins and the focus of the Pinal AMA. The requested certificate areas in this case are located in the Maricopa-Stanfield sub-basin. Exhibit 12 shows that there is some natural recharge that occurs in the aquifer. ADWR estimated that underflow from adjacent basins and natural and incidental recharge from surface flows and water uses as 339,600 a-f/year. ADWR estimated, however, that outflow and withdrawals from the aquifer totals 442,500 a-f/year (See Exhibit 13).

ADWR also calculated the water balance – the balance of inflows and outflows to the aquifers within the Pinal AMA – which is shown in Exhibit 14. This exhibit is the Pinal AMA Water Budget. As Exhibit 14 shows, pumping groundwater is the largest outflow by far. As previously noted, 95 to 97% of groundwater pumping in the Pinal AMA is for agricultural uses. The two largest sources of inflow are associated with agricultural irrigation

Since 1980, groundwater pumping has decreased significantly. This is a reflection of the use of CAP water to meet agricultural water uses. Overdraft, the withdrawal of more groundwater from an aquifer than is replaced by natural and incidental recharge, has decreased from over 300,00 a-f/year before the import of CAP water, to less than 80,000 a-f/year in 2000.

Q. Please describe the sources of surface water available in this area.

A. Surface water resources include the stored and diverted flows in the Gila River, which according to ADWR as reported in the TMP, averaged 245,000 a-f/year from 1930 to 1995. These flows are available only to the San Carlos Irrigation Project. The ephemeral flows in the Santa Cruz River and in the Gila River below Ashurst-Hayden Dam, contribute to the groundwater resource through recharge, which, as shown in Exhibit 14, varies from year to year as flows in the rivers vary.

Surface water available from the CAP has varied over time in the Pinal AMA based on contract conditions. Non-Indian agriculture has a non-firm allocation of CAP water that has delivered 250,000 to 300,000 a-f/year since 1987 (See Exhibit 6). This resource will decrease over time as other (firm) demands for CAP water increase.

Q. What about reclaimed water?

As ADWR noted in the TMP, the Pinal AMA does not have a regional reclaimed water system, which constrains the availability of effluent for turf or other direct use facilities. Currently, only facilities in close proximity to municipal wastewater treatment facilities are able to use effluent for turf irrigation.

Q. Would you describe how the development of water resources has occurred over time in the Pinal AMA?

A. Yes. It is important to understand groundwater use and characteristics prior to CAP availability in relation to groundwater use and characteristics with CAP availability. Also, CAP water resources for agricultural use are limited, and are expected to not be available after 2030 due to increase in demands by other CAP contractors. Given that groundwater use has decrease substantially after 1987 – because of the availability of CAP water for agricultural uses (See Exhibit 6) – it is important to remember that groundwater use, and

its associated impacts, can be expected to increase as CAP resources available to agriculture uses decrease in the future.

The impacts of groundwater use before and after CAP diversions were made to reflect the change in demands by decreases in groundwater use and corresponding increases in CAP water use. As Exhibit 15 shows that the trends in historic pumping gradually increased in the 1930s and 1940s, followed by a substantial increase in the early 1950s. While irrigated acreage remained at or above 200,000 acres each year, uses decreased over time, and decreased substantially after CAP water became available in 1987. Consequently, water levels declined gradually until the early 1940s and then began a steep decline until pumping decreased with the availability of CAP water. Exhibit 16 shows the decreasing water levels over this time period for the Maricopa-Stanfield and Eloy sub-basins. So, water levels responded to the decreases in groundwater pumping. As groundwater pumping dropped below 600,000 a-f/year, water levels rebounded and have seemed to stabilized at an annual groundwater pumping of about 400,000 a-f/year. reflecting the natural recharge and that incidental to use by agriculture.

Q. What are your conclusions about water uses and sources within the Pinal AMA?

A. My conclusions are as follows:

- Current and committed municipal demands exceed the amount of renewable groundwater supplies (82,500 a-f/year). This means that additional municipal supplies must be drawn from other renewable sources, including effluent and CAP water.
- Municipal and industrial uses will increase, with almost total reliance on groundwater for the "wet" water without extra efforts by water providers to use renewable supplies.

- Future reductions in the use of CAP water supplies by non-Indian agriculture in the Pinal AMA are expected because of higher priority municipal and industrial CAP allocations becoming fully utilized.
- CAP water supplies for non-Indian agricultural uses will likely end in 2030.
- The Pinal AMA does not have a regional reclaimed water system, which constrains the availability of effluent for turf or other direct use facilities.

IV. IMPACTS OF GROUNDWATER PUMPING IN THE PINAL AMA.

Q. What have been the impacts of groundwater pumping in the Pinal AMA over time?

A. The impacts of pumping in the Pinal AMA have been significant. Groundwater pumping for agricultural irrigation intensified in 1948. Over the next 50-plus years over 43 million acre-feet (a-f) of groundwater had been pumped from the underlying aquifers. Much of my analysis and my discussion and exhibits in testimony are from the TMP.

The overdraft over this period lowered groundwater levels over 500 feet near the community of Stanfield and over 300 feet near the city of Eloy. Also, land surface subsidence – associated with the water level declines in much of the area – occurred. This subsidence is expected to continue. In another study, the U.S. Geological Survey ("USGS") indicated that the effects of over-pumping had caused land surface subsidence of 15 feet near Eloy in 1985.

The impacts of this 40 plus years of overdraft have been substantial with regards to water levels in the sub-basins. For instance, water levels in much of the Maricopa-Stanfield sub-basin have declined 400 to 600 feet over the period (See Exhibit 17). This overdraft has lowered groundwater levels to the extent of creating cones of depression in each sub-basin, hydrologically separating the aquifers in the two sub-basins. These cones of depression

still remain. These cones capture all groundwater flows within the sub-basin, and isolate each sub-basin from any natural, artificial, and incidental groundwater recharge in the adjacent areas. This separation makes a comprehensive recharge program more difficult for the Pinal AMA as each sub-basin affected by a cone of depression must be individually recharged, as opposed to regional recharge facility approach used in other AMAs.

Minor recoveries in water level, however, have occurred since CAP water became available and groundwater pumping decreased; water level recoveries in the Maricopa-Stanfield sub-basin range from 50 to 150 feet. (See Exhibit 18).

Q. **Would you describe the groundwater use before and after CAP availability in more detail?**

A. Sure. Groundwater use in the Pinal AMA peaked in the 1950s. Exhibit 19 shows that average annual groundwater pumping for the period 1950 to 1980 was about 809,000 a-f/year. Average annual pumping then decreased from 1980 to 1987, averaging about 707,000 a-f/year. Annual average pumping then further declined, after the start of CAP diversions, to about 418,000 a-f/year from 1988 to 2002.

Q. How was CAP water made available within the Pinal AMA?

A. Diversions of CAP water were made by the irrigation districts in the area to allow member farmers to replace a portion of their groundwater use. Total CAP water use increased rapidly after 1987 to over 400,000 a-f/year, an amount that has been equaled or exceeded in most years since 1987. (See Exhibit 20).

Q. What was the impact on recharge during this period?

A. Return flows (recharge) also declined slightly (16%) between 1987 and 2002 in response to decreased applications. But this decline in recharge was less than the overall decrease in

groundwater pumping during this time (43%). Exhibit 21 shows the agricultural return flows and their decline.

Q. Would you describe the impacts of groundwater use in the Pinal AMA?

A. Yes. The direct effect of groundwater pumping is a water level response within the affected area. This can be shown by hydrographs, which are graphs of time trends in water levels in wells in selected areas. Also, maps of water level elevations and changes in water level for selected periods in the area can show water level response. Where the water level response is a decline, as has been experienced in the Pinal AMA, land surface subsidence and earth fissures are related, and are obvious impacts of groundwater pumping.

Water level data from the ADWR registries were reviewed and data sets with the longest periods of record were selected and copied for use in preparing representative hydrographs for the two sub-basins. The locations and identifiers for the selected wells are shown on Exhibit 22. I reviewed all of these hydrographs indicated in Exhibit 22 in preparing this testimony; seven of the hydrographs within the Maricopa-Stanfield sub-basin were selected to describe groundwater impacts in the area of interest. I have attached these hydrographs for wells in the Maricopa-Stanfield sub-basin as Exhibits 23 through 30.

Water level response to pumping as measured in a well varies with well location within the aquifer, both laterally and vertically. Both well location and construction (depth, screened interval) affect the water level in the well and hence the shape of the hydrograph. It is not surprising than, that well-specific water level data are not as predictable as the general trends shown in Exhibit 16.

Further, water level trends in two of the wells (Exhibits 23 and 30) declined initially, and have not shown any recovery with the decrease in pumping. Water levels as shown in the

remaining hydrographs show declines of 100 to 400 feet prior to the availability of CAP water and substantial recoveries in water levels after the corresponding decrease in pumping, although not to the initial levels.

The water level elevations when mapped for a selected period of measurement show groundwater flow patterns in the aquifer as they exist at that time. Comparing maps from various dates indicates additional impacts from pumping. This data shows that while reduced pumping and increased recharge are beneficial, overdraft continues, and stabilizing the region's water supply will require further significant reductions in groundwater demand. Reclaiming and reusing wastewater and aggressively introducing CAP water in lieu or groundwater yield these reductions.

Q. What about the impacts of groundwater use as it relates to the availability of recharge?

A. The pre-development water levels in the two sub-basins are also shown on Exhibit 22. Groundwater flows in the aquifer from higher elevations to lower. Pre-development groundwater flows generally followed the slope of the major steams, the Santa Cruz and the Gila Rivers, from south and east to north and west. The authors of this report estimated natural recharge in pre-development conditions to be 63,000 a-f/year in the two sub-basins.

Exhibit 31 shows the most recent water level elevation map, which was produced from water levels measured by ADWR in the winter of 2002/2003. By this time, groundwater flows generally had been captured by the separate cones of depression formed in the middle of each sub-basin. This capture means, for example, that only that portion of the natural and incidental recharge that occurs in the Maricopa-Stanfield sub-basin would be available to groundwater users in the sub-basin – recharge in other parts of the Pinal AMA,

such as along the Gila River, would not be available for use in the Maricopa-Stanfield sub-basin.

Q. What have been the affects on the water level over the recent past within the Pinal AMA?

A. Recent trends in water levels across the Pinal AMA are shown in the change in water level map for the period 1998 to 2003. Exhibit 32 shows water level declines over this period. Areas of similar change over the period are shown by color, with the cool colors (blue and green) indicating rising water levels over the period, and the warm colors (red, orange and yellow) indicating declines. Water levels in much of the Maricopa-Stanfield sub-basin have risen from less than 10 feet during the period to over 50 feet. Water levels declined in the eastern portion of the sub-basin, near the city of Casa Grande.

Q. Has there been a significant and negative affect of groundwater pumping in these sub-basins?

A. Yes. For example, water levels have declined historically over 400 feet in the two sub-basins and as a result, land surface subsidence and earth fissures within the areas are extensive. Furthermore, while some may argue that the availability and use of CAP water for non-Indian agricultural uses reduced groundwater pumping and lead to a recovery in water levels for the sub-basins, this recovery is illusory. That is because the recovery does not represent the addition of storage of groundwater. Rather the recovery is merely a redistribution of groundwater already in storage in the sub-basins, as groundwater in storage under the undeveloped areas flows into the cones of depression.

Q. What is "land subsidence?"

A. The term "land subsidence" refers to the vertical downward movement of the earth's surface. Land subsidence occurs where extensive groundwater withdrawal has significantly

lowered water tables, several hundred feet in the case of the Pinal AMA (Exhibit 33). Lowering of the water table causes dewatered aquifer materials to compact, resulting in overall subsidence. This has both surface and subsurface effects. Surface effects include fissuring, damage to roads, buildings and infrastructure, and changes to stream flows. Subsurface effects include a reduction in the aquifer's ability to recharge and to retain groundwater. Depending on the underlying geology and water level responses, different areas experience greater subsidence than others. This phenomenon is known as "differential land subsidence."

Earth fissuring evolves from when land subsidence occurs. Where there is earth fissuring, large linear cracks break the land surface. At first, this fissuring may be no more than an inch or two wide, but then the fissures gradually increase to tens of feet in width and significantly altering surface flow patterns as erosion proceeds. Earth fissures tend to occur generally on the periphery of the alluvial basins, where buried ridges and fault scarps along mountain fronts act as a hinge point for the subsiding basin sediments.

Q. What land subsidence has occurred within the Pinal AMA?

A. As shown in Exhibit 34, significant subsidence has occurred in the Pinal AMA. In a series of baseline elevation surveys conducted by the U.S. Geological Survey and other agencies, documented subsidence of up to 11 feet has occurred near Picacho, with even greater subsidence observed elsewhere (up to 17 feet near Eloy). The distribution of known earth fissures in and around the Pinal AMA is shown in Exhibit 35. Fissuring has been observed along the Estrella, Sacaton, Santan, Picacho, and Tabletop Mountains.

Q. Please summarize your findings in this section.

A. My findings are as follows:

- The Pinal AMA has been severely overdrafted in the recent past, with water level declines exceeding 400 feet in portions of the five sub-basins within the Pinal AMA.
- This overdraft has lowered groundwater levels to the extent of creating cones of depression in the impacted sub-basins. These cones of depression still remain. These cones capture all groundwater flows and isolate each sub-basin from natural and incidental groundwater recharge in the adjacent areas.
- While the availability and use of CAP water for non-Indian agricultural uses reduced groundwater pumping and was followed by an apparent recovery in water levels for the sub-basins, this recovery is illusory because it does not represent the addition of groundwater that is stored. Rather, the recovery is merely a redistribution of groundwater already in storage in the sub-basins, as groundwater from under the undeveloped areas flows into the cones of depression.
- Groundwater recharge incidental to agricultural uses has remained relatively constant as CAP water has been used in agriculture to replace groundwater pumping.
- As a result of the end of renewable supply alternatives and the continuation of agricultural uses, water level declines can be expected to resume. Given that future declines will be similar to historic declines, land subsidence can be expected to continue at historic levels.
- Substantial impacts of this subsidence can be expected, especially alterations to regional streamflow patterns and flows in sewer collection systems. In addition, impacts can be expected in infrastructure installed in and upon the land surface as surface elevations decrease and earth fissures rupture portions of the infrastructure. Importantly, as incidental recharge from non-Indian agricultural activity using CAP

water disappears, the increase in groundwater mining will simultaneously increase aquifer compaction from subsidence, further limiting the area's ability to recharge.

V. CHANGES IN GROUNDWATER MANAGEMENT IN THE PINAL AMA.

Q. Would you briefly describe future management directives in the Pinal AMA?

A. Yes. The future management directives in the Pinal AMA are shaped by the Management Goal set by the Code. These directives are worth reviewing to understand probable groundwater uses and hence future groundwater conditions in the Pinal AMA.

The Management Goal has three directives:

1. To allow the development of non-irrigation uses;
2. To preserve existing agricultural economies within the Pinal AMA for as long as feasible; and consistent with;
3. The necessity to preserve future water supplies for non-irrigation purposes.

Q. How will these directives affect agricultural use in the Pinal AMA?

A. For agriculture the Management Goal means that continued substantial overdraft by agricultural uses will be allowed. Unlike the safe yield goals set by the Code for other AMAs, the Pinal AMA will meet its Goal by allowing "Managed Groundwater Use" to a prescribed depth over time for agriculture. Information from the Pinal AMA staff indicates that this level is a depth to water of 1,000 feet. So agricultural uses at or near the current level can be expected to continue, perhaps to the end of this century.

Q. How will the Management Goal affect other non-agricultural uses?

A. According to a draft report prepared by the Pinal AMA staff, water users in the Pinal AMA, through a public process facilitated by the Pinal AMA GUAC, "reached an understanding" that the Pinal AMA Goal requirement to preserve future water supplies for

non-irrigation uses should be interpreted as ensuring a long-term, reliable supply for municipal and industrial uses and that this interpretation would allow for the appropriate use of groundwater supplies by municipal and industrial sectors of the economy. Sustainable became the shorthand for long-term, reliable supply, and that is defined as naturally renewable groundwater recharge over the long-term and/or renewable supplies developed in the Pinal AMA or imported into the Pinal AMA.

Q. How do the modified AWS rules meet the objectives of the Management Goal for the Pinal AMA?

A. GUAC selected the AWS rules promulgated by the ADWR in the rule making package as a means of assuring that sustainable water supplies will be provided by future development for municipal and industrial uses. As noted previously, existing and approved municipal groundwater demands in the Pinal AMA have increased 250% since 1999 (*i.e.* from about 17,000a-f/year to over 60,000 a-f/year.) Available information indicates that about 300,000 lots have been zoned but not platted by March 2005. Using available use factors, ADWR calculated that theses 300,000 lots had a potential demand of 120,000 a-f/year at build out. The potential future municipal groundwater demand of 180,000 a-f/year far exceeds the estimated renewable groundwater supply of 82,500 a-f/year. A copy of the Pinal AMA Renewable Water Budget is attached as Exhibit 36. In summary, the currently committed municipal demand exceeds the estimated renewable groundwater supply without modifications of the AWS rules.

So, the GUAC recommended modification of the AWS Rules for the Pinal AMA. One of the objectives is to ensure the greater availability and use of renewable water supplies, including effluent, by making provision of renewable supplies a requirement of approval. These revisions were in process through a rule-making package promulgated by ADWR.

Given the current level of municipal demand, these revisions will require new developments to off-set groundwater uses by provision of renewable water supplies, including effluent, or other renewable supplies such as direct use of CAP water or by provision of CAP recharge credits.

Q. What will be the supplies of water available within the Pinal AMA for future uses?

A. Future supplies in the Pinal AMA, as in the past, are comprised of surface water (including CAP water), effluent, and groundwater. Surface water supplies are provide by storage and diversion of the Gila River flows and are restricted by rights and contracts to the San Carlos Irrigation and Drainage District. CAP water is available through contracts, and the CAP supplies for non-Indian agriculture are expected to not be available beyond about 2030. CAP contracts will provide for continuing supplies for Indian agriculture and municipal use into the future. Effluent supplies would be provided by appropriate treatment and direct use of municipal waste water. The ADWR in the TMP projects that future turf uses would be met by direct use of effluent. Groundwater supplies would be met by planned depletion for agricultural users and replenishment by natural and imported renewable supplies for municipal users.

Q. Would you describe potential future water demands and supplies in the Pinal AMA?

A. Yes. The best way to describe future water demands and supplies is by use of a water budget. The Pinal AMA has recently presented a long-term budget that contains estimates of projected water demand and supplies considering future management directions. I have attached this budget as Exhibit 37. The budget is for the period 2000 to 2099, and includes projected water supplies and demands.

In the budget, non-Indian agriculture demands are expected to decrease slightly over the period (from 773,000 to 600,000 a-f/year) while municipal and industrial demand triple

(but only from 33,000 to 90,000 a-f/year). Overall, total demand is expected to only decrease by 10% (from 1,019,000 to 920,000 a-f/year).

Per this projection, water supplies from incidental recharge from agriculture are expected to decrease, following the expected decrease in agricultural demands. CAP supplies for non-Indian agriculture stop altogether in 2030, ending CAP incidental recharge from these uses. CAP supplies for municipal and industrial supplies grow, but only from 4,000 to 37,000 a-f/year following existing contracts. Effluent supplies nearly triple, but only from 13,000 to 36,000 a-f/year – about a steady 40% of municipal and industrial demands. Overdraft of groundwater supplies would explode, from a few thousand a-f/year to about 239,000 a-f/year in 2025. At that level, the Pinal AMA would return to the levels of overdraft estimated (ADWR water budget) during the period 1980 to 1987, before CAP supplies were available. Subsidence would then likely accelerate, and wells would need to drilled to ever-lower depths to compensate for the decreasing water levels, which would decrease water quality while increasing pumping costs.

Q. Please summarize your findings in this section.

A. My findings regarding forthcoming changes to the Pinal AMA Groundwater Management and its impact on future water demand are as follows:

- The GUAC recommended modifications to the ADWR's AWS rules to increase groundwater replenishment and the use of renewable resources, including natural groundwater recharge, effluent, surface and CAP water for municipal uses and new developments.
- These modifications are in partial response to a critical need to develop water management programs to preserve future water supplies for non-irrigation uses.
- Levels of overdraft are anticipated to reach 239,000 a-f/year by 2025.

VI. AWC AND SCWC'S APPLICATIONS AND THEIR EFFECTS ON GROUNDWATER USE.

Q. Would you describe future development in the contested area and potential impacts of that development?

A. Yes. Both Arizona Water Company ("AWC") and SCWC, whose application was sponsored by Global, have filed applications for CC&Ns within the contested area. Both companies have filed with the intention of serving municipal users in the respective CC&Ns. Based on my review of materials submitted to date in this case, the AWC filing is mostly speculative; it has requests for service for only a very small percentage of its overall requested extension area. By contrast, SCWC has filed only for areas where it has directly received requests for service. The areas included in each request are shown separately in Exhibits 38 and 39 for AWC and Global, respectively.

Notably, development of subdivisions in the area and the requirement for provision of municipal water service can only occur within the restrictions and control of ADWR's AWS program, regardless of the Commission's decision here. There are several criteria that must be satisfied by the before ADWR will issue a certificate or designation of assured water supply, whether for an individual subdivision or for an a water provider's service area. Legal availability for the proposed water supply and physical availability are of particular interest in evaluating the potential for development to take place in either of these two competing proposals.

Q. Has AWC and SCWC indicated how they will achieve an AWS from ADWR?

A. Yes. Based, on information available, the AWC-indicated approach for the demonstration of an AWS for the requested CC&N is to leave the demonstrations to the individual developers to apply for approvals on a subdivision by subdivision basis. This is direct

contrast to their approach for the existing Casa Grande (including Arizona City), Coolidge, and Terra Grande CC&Ns. In these CC&Ns the AWC submitted the required hydrologic study for a PAD. The ADWR, in a letter to AWC dated April 24, 2002 advised of the PAD in the amounts of 57,507 a-f/year, 13,510 a-f/year, and 4,786 for the respective CC&Ns (totaling 75,803 a-f/year). The letter states "These quantities represent the amount of groundwater available for new demands within the service areas of each system." Notably, 75,803 a-f/year nearly exceeds the ADWR's identified renewable groundwater supply of 82,500 a-f/year – without considering the current municipal demand.

SCWC's and Global's indicated approach for the demonstration of an AWS for the requested CC&N is to prepare an application to expand their existing Designation of Assured Water Supply ("DAWS") for their existing CC&N in the area to include the projected development in the requested CC&N area. (This is described in Mr. Symmonds testimony). This would include preparation of hydrologic study as required for a PAD, as well as, proving all the other assured water supply criteria, namely, legal and continuous availability of the supplies for 100 years, adequate water, financial capability, and a showing that the supplies are consistent with the Pinal AWA Management Plan and management goal, particularly the use of renewable supplies in this case.

Q. What sources will each company likely use to provide water service to customers?

A. Based on my review of information available in this case, AWC intends to provide water supplies for its requested extension area predominantly by use of groundwater from wells distributed about the CC&N as need to meet the expected demand. . Although not precluded, I did not find any plans for reuse of effluent or other renewable supplies. AWC also intends to leave the requirement for the provision of a renewable supply of water to the developers, who will attempt to comply by enrolling their lands in the Groundwater Replenishment District ("GRD"). But the GRD has no replenishment facilities in the Pinal

AMA. So, this approach provides only the appearance of replenishment, with paper water that does not address "the impacts of critical area problems that may develop in the future, including lack of physical availability of groundwater, excessive water level decline rates, land subsidence, and earth fissuring" (See Exhibit 2). Unless and until the GRD can provide actual in-basin replenishment of renewable supplies, the burden to provide renewable supplies to individual developments will rest with municipal water providers.

SCWC intends to use multiple sources to supply its customers. SCWC will employ Global's adopted business model in serving the area. (This is described in Mr. Symmonds testimony). Briefly, that means the integrated use of groundwater (with a distributed source) to provide potable supplies, and the collection and treatment of effluent to supply turf (e.g. school grounds, parks and ball fields) and other common area water uses. Global management has also indicated their intent to treat and deliver CAP water to their service area. (This is also described in Mr. Symmonds testimony).

Q. Based on the information available to you for this case, have you developed an exhibit evaluating the projected future water demands and impacts?

A. Yes. Exhibit 40 estimates future water use in the contested areas. Evaluation of projected groundwater impacts of potential water demands for the requested areas requires estimates of future water demands in these areas. I have developed these estimates for use in this testimony using information collected in the preparation of my testimony.

The items included in the table and the values included for each item in Exhibit 40 were developed as follows:

- The acreages of the requested CC&N expansion for each company were estimated based on the areas included in Exhibits 38 and 39, respectively.

- These values should be considered approximate due to the difficulties of making accurate estimates posed by the small size of the available maps.
- Total build out water demand was calculated, as noted; this is the same water use information ADWR has used for calculating future municipal demands.
- Direct use of effluent is assigned. AWC has not indicated effluent use as part of their plan for the CC&N. Global has indicated that a 30% reduction is achievable when supplying all turf and other common area water uses, and that a 40% reduction is achievable with total reuse and recharge.
- Supplied by groundwater values are calculated as the product of columns two and three.
- Current irrigated acreage within CC&N estimated from overlaying CC&N requests with irrigated area coverages.
- Irrigation withdrawals are computed as an average value for lands with a history of irrigation and average agricultural uses. Incidental recharge is based on a 70% irrigation efficiency. Irrigation consumptive use is 70% of withdrawals. Change in water demand is the difference between total build out demand and irrigation consumptive use.

Q. Please comment on the results shown on Exhibit 40.

A. Exhibit 40 shows that if the Commission grants AWC the CCN its requests, the use of groundwater in the area will potentially increase by over 60,000 a-f/year over current uses. This is especially significant given that the total renewable groundwater supply for the entire AMA is only 82,500 a-f/year. In contrast, granting a CCN to the Global entities will have little impact on groundwater compared to existing uses. If Global achieves meets 30% of demand with effluent, the increased demand is only 1,413 a-f/year. And if Global meets 40% of demand with effluent, granting the area to Global will actually reduce groundwater demand in the area.

Q. What are your findings in relation to this section?

A. My findings are as follows:

- AWC's proposal is to provide water supplies for its requested service area through using groundwater as needed to meet expected demand. AWC does not indicate any intent to reuse effluent or other renewable supplies. AWC instead appears to leave the management goal for replenishment or use of a renewable supply of water to the developers, apparently by their enrolling their lands in the GRD.
- While developers may enroll their lands in the GRD to provide renewable supplies on paper, this will not address the impacts of critical area problems that may develop in the future, including lack of physical availability of groundwater, excessive water level decline rates, land subsidence and earth fissuring, such as what can be expected in the Maricopa-Stanfield sub-basin under future water uses.
- The GUAC noted the lack of participation of the GRD in providing renewable supplies in the Pinal AMA.
- AWC's approach is not in conformance with the current efforts and management approach of the Pinal AMA.
- AWC's proposal does not provide for sustainable management of groundwater resources.
- SCWC intends to employ Global's business model in serving the area. This means using groundwater from wells for potable supplies, but also the collection and treatment of effluent to supply turf and other common area water uses. This could reduce demand for groundwater in the developments SCWC and Global would serve by up to 30% to 40%.
- SCWC and Global intend to provide renewable supplies to meet the needs of developments in SCWC's service territory. They have demonstrated this by their intent to treat and deliver CAP water to their service area. (This is described in Mr. Symmonds testimony). SCWC and Global's proposal is less risky, in that it does

not create a long-term management problem for a large area. By contrast, their proposal focuses on near-term development needs, by including only areas where service has been requested. With 30% rate of reuse, the potential increase in demands for mined groundwater beyond what already exists for agriculture are small and can be met, at least, by proposed use of excess CAP water.

- The SCWC/Global proposal uses a water management approach that is in conformance with the current efforts and management of the Pinal AMA. Better yet, it provides the potential to realize sustainable management of our groundwater resources.

VII. CONCLUSION.

Q. Would you provide a brief summary of your testimony and the key considerations for the commission?

A. Yes. There can be no doubt that the Pinal AMA has been severely overdrafted. Water level declines have been as much as 400 feet in portions of the sub-basins within the Pinal AMA. Although CAP usage has reduced groundwater pumping, any appearance of recovery is an illusion. Higher priority municipal and industrial uses for CAP will likely lead to future increases in groundwater pumping for non-Indian agricultural uses. As a result, water level declines will resume to historic rates, leading to land subsidence and other adverse effects within the Pinal AMA.

The GUAC recommended modifications to ADWR's AWS rules to increase groundwater replenishment and the use of renewable resources, including natural groundwater recharge, effluent, surface water and CAP water for municipal uses. This is a partial response to "a critical need to develop water management programs to preserve future water supplies for non-irrigation uses in the Pinal AMA." (See Exhibit 2). Further, no one disputes the need

for regional recharge and recovery planning in the Pinal AMA so that the impacts of crucial area problems that may develop in the future are minimized. This includes the lack of physical availability for groundwater, excessive water level decline rates, and earth fissuring.

SCWC and Global seek to implement the integrated use of groundwater from wells to provide potable supplies as well as the collection and treatment of effluent to supply turf and other common area water uses. This is because their proposal focuses on near-term development needs and only including areas where they have received requests for service. With the potential for up to 30% rate of reuse, the potential increase in demands for mined groundwater beyond what already exists for agriculture are minimized and can be met by the proposed use of excess CAP water, at least in part. In short, Global carries out the goal to preserve and replenish groundwater. The same, however, cannot be said for AWC.

Q. Does that conclude your direct testimony?

A. Yes.

ATTACHMENTS

RESUME
OF
PHILIP BRIGGS

WATER
Resources Consulting Southwest

7509 North 13th Avenue
Phoenix, Arizona 85021
602-770-7805

Philip C. Briggs, P.E.
Manager

Professional Highlights

Mr. Briggs has over forty years of progressively more responsible experience in Arizona, focusing upon water resource issues. His experience includes water resource investigations, water resource planning and management, and groundwater modeling to support management decisions. Mr. Briggs has extensive experience in hydrologic environments in Arizona and in the west. Accomplishments include numerous assessments of availability of water supplies, projections of impacts of development on water resources, state and municipal water resource plans, and successful litigation support. His experience in technical and management positions in the private and public sectors provides a demonstrated level of expertise water resource investigations, development, and use.

Education/Registration

Master of Science, Civil Engineering, Arizona State University, 1970

Bachelor of Science, Civil Engineering, Arizona State University, 1963

Registered Civil Engineer, Arizona

Fields of specialization

Water supply investigations, including surface and ground-water availability

Water resource planning and management

Regulatory support for water resource development

Water resource data collection

Employment History

2000 – 2007: Manager/Member, Water Resources Consulting Southwest, LLC.; Oversaw team of consultants developing an Assured Water Supply demonstration for 1,200 acre residential development near Buckeye. Integrated hydrologic and groundwater modeling studies. Prepared application to Arizona Department of Water Resources (ADWR) and participated in meetings with client and agency staff. Unlike many such reviews, the ADWR staff had minimal comment upon technical review and issued a favorable finding in record time.

Project manager for preparation of an application to Arizona Department of Water Resources (ADWR) for a managed underground storage facility on the Santa Cruz River near Marana, Arizona. Application was prepared using available data and information to meet a very short time frame. Data from two ADWR groundwater models was used to develop a new groundwater model of the project area for use in determining area of hydrologic impact. Draft and final applications were submitted to the client for review and distribution.

Developed water supply for a new power plant in the Buckeye area. . A project specific GIS/data base was developed and used to prepare the reports and analysis required by ADWR application guidelines for new well permitting.

Prepared well construction specifications, assisted in selection of contractors, provided oversight of well drilling, testing, and installation of permanent pumping equipment.

1987 - 2000: Project Director/Associate, ARCADIS Geraghty & Miller (AG&M)

Conducted a water resources investigation for lands to be developed near Goodyear, Arizona. This project included developing a long-range water resources plan, including analyses of expected demand, sources of supply, the effects of proposed land uses on water needs, and coordination with various municipal and private entities to explore possible management alternatives. This project also explored innovative approaches in water management, including possible recharge scenarios incorporated into planned development areas, such as golf courses and parks, and the use of small-scale reverse osmosis treatment at wellheads to enable use of poor quality groundwater.

Developed a Water Management Plan for Chandler, Arizona including an analysis of legal and institutional issues concerning surface and groundwater resources and water quality constraints. The plan projects water supplies and demands to the year 2025 and proposed several scenarios to meet the water demands. A Water Conservation Plan also was developed. Both plans were adopted by the City Counsel.

1980 - 1987: Deputy Director/Engineering Arizona Department of Water Resources (ADWR), Phoenix, Arizona.

Responsible for the Hydrology Division (which included the Basic Data Unit), Dam Safety Division, Flood Control Programs, and the Remedial Action Division. During 1984 and 1985, responsible for the Administration and Electronic Data Processing Divisions.

Developed and managed assured and adequate water supply programs as part of technical support to groundwater management program, including approval (signature authority) of successful applications.

1973 - 1980: Chief Hydrologist, Arizona Water Commission, Arizona Department of Water Resources, Phoenix, Arizona.

Responsible for study to develop ground-water model to evaluate water supply adequacy for planned expansion of Fort Huachuca under contract to the Corps of Engineers. Responsible for hydrologic investigations, including modeling study to evaluate the adequacy of ground-water supply for a major (10,000 lot) development in the Carefree basin.

Developed and managed adequacy of water supply program after passage of enabling legislation in 1973. Responsible for technical and regulatory aspects of program.

1968 - 1973: Hydrologist, Arizona Interstate Stream Commission/Water Commission, Phoenix, Arizona.

Conducted ADWR's study to evaluate the adequacy of water supply for a major development in Southern Arizona. Utilized digital ground-water model to evaluate impacts of development (Empire Ranch) on the Sonoita basin (1972).

Evaluated groundwater impacts of potential allocations of Central Arizona Project (CAP) water on service areas of applicants for CAP contracts. Analysis used a digital groundwater model of the three county CAP service area to estimate future water level changes associated with various demand and allocation scenarios within the applicant's service areas.

1962 to 1968: Hydraulic Engineer, U. S. Geological Survey - Water Resources Division, Tucson and Phoenix, Arizona.

Prepared basic data report for the USGS on ground-water conditions in Ranegras Plains and McMullen Valley, Arizona. Co-investigator of study to determine recharge resulting form the first releases in over 25 years into the Salt River below the major reservoirs.

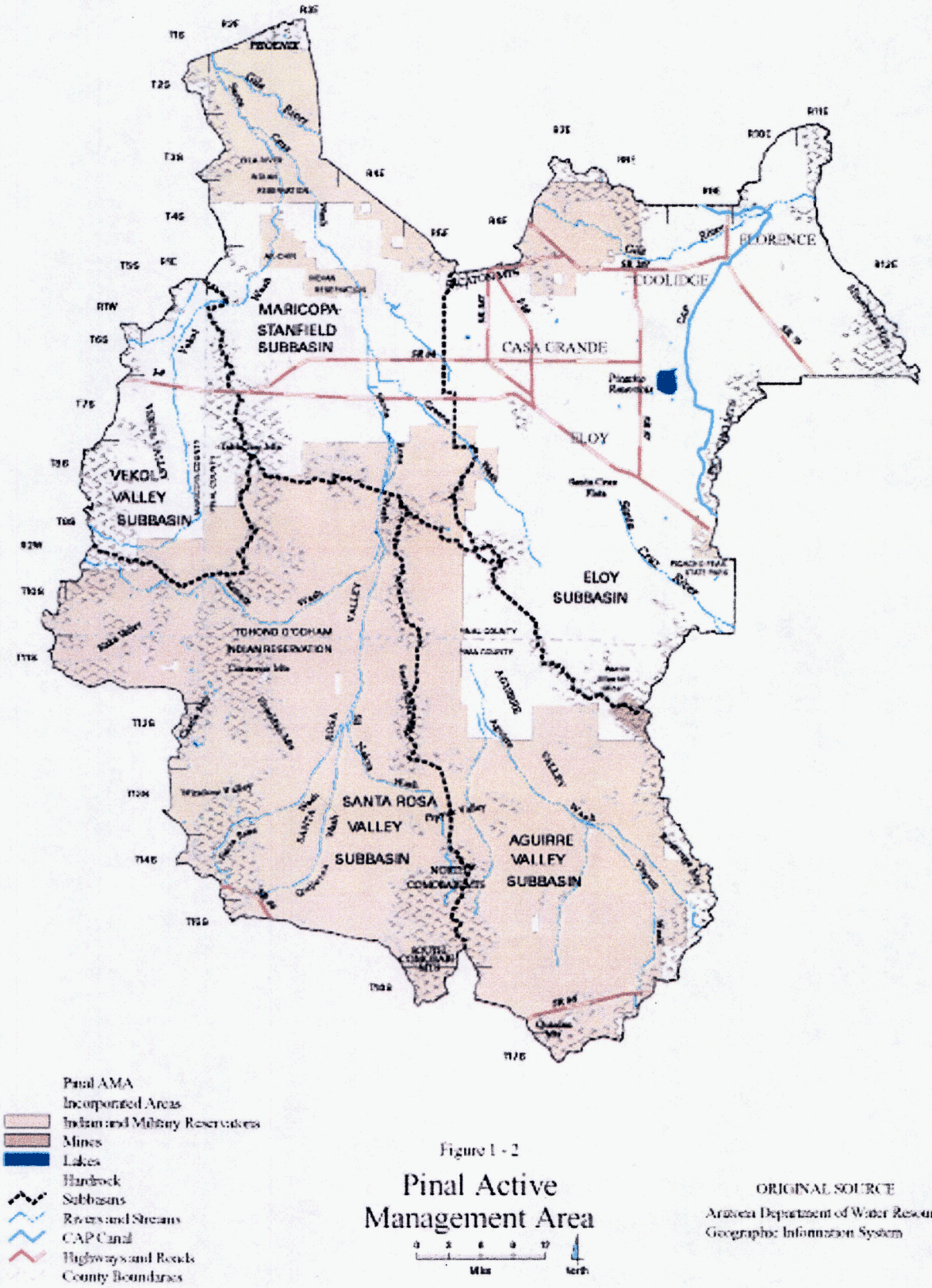


Figure 1 - 2

Pinal Active Management Area

ORIGINAL SOURCE
Arizona Department of Water Resources
Geographic Information System

Exhibit 1. Pinal Active Management Area (Source: Pinal AMA Third Management Plan).

Pinal AMA Major Water Management Issues

- There is a critical need to develop water management programs to "preserve future water supplies for non-irrigation uses" in the Pinal AMA. As recommended by the Governor's Water Management Commission, a comprehensive planning and program effort is needed to ensure a reliable and sustainable supply of water for municipal and industrial uses.
- The Assured Water Supply Rules (AWS) in the Pinal AMA, specifically the allocations of allowable groundwater pumping, allow for far more groundwater use than in the other AMAs. The AWS Rules currently allocate a volume of groundwater that is sufficient to meet all the needs of most developments. This "over-allocation" facilitates development on lands without grandfathered rights because there is little or no incentive for developers to acquire additional groundwater by purchasing and extinguishing an irrigation grandfathered right in order to receive AWS credits.
- Groundwater mining by industrial users is rapidly increasing in the Pinal AMA and needs to be limited to an annual amount that is consistent with the AMA's management goal.
- Future reductions in the use of CAP water supplies by non-Indian agriculture (NIA) in the Pinal AMA are expected as higher priority municipal and industrial CAP allocations become fully utilized in the Phoenix and Tucson AMAs. Without the continued availability of competitively priced CAP supplies, irrigation districts will have little choice but to increase use of mined groundwater supplies.
- There is a need for regional recharge and recovery planning in the Pinal AMA to minimize the impacts of critical area problems that may develop in the future, including lack of physical availability of groundwater, excessive water level decline rates, land subsidence, and earth fissuring.

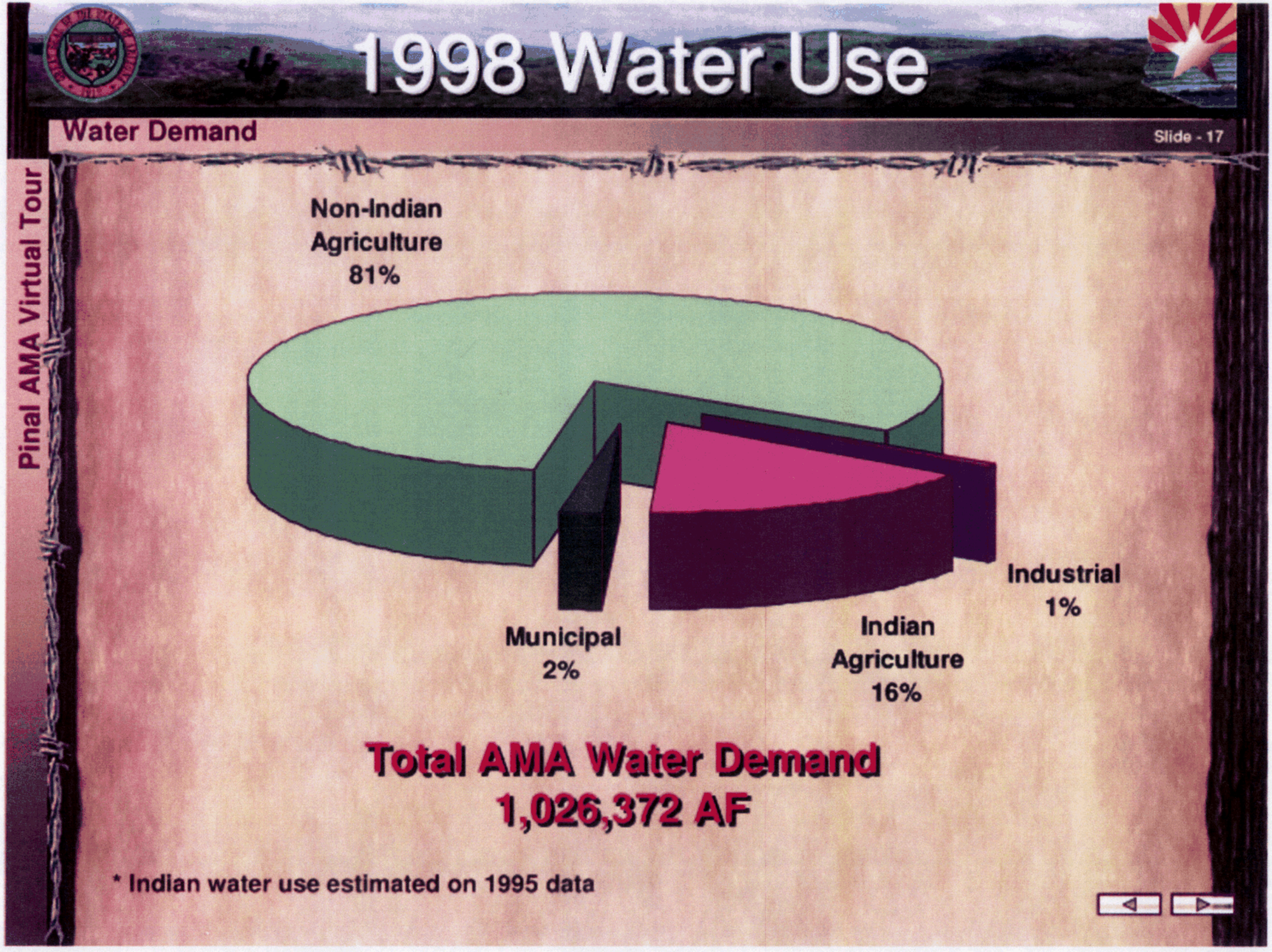


Exhibit 3. 1998 Water Use (Source: Pinal County Vitrual Tour).

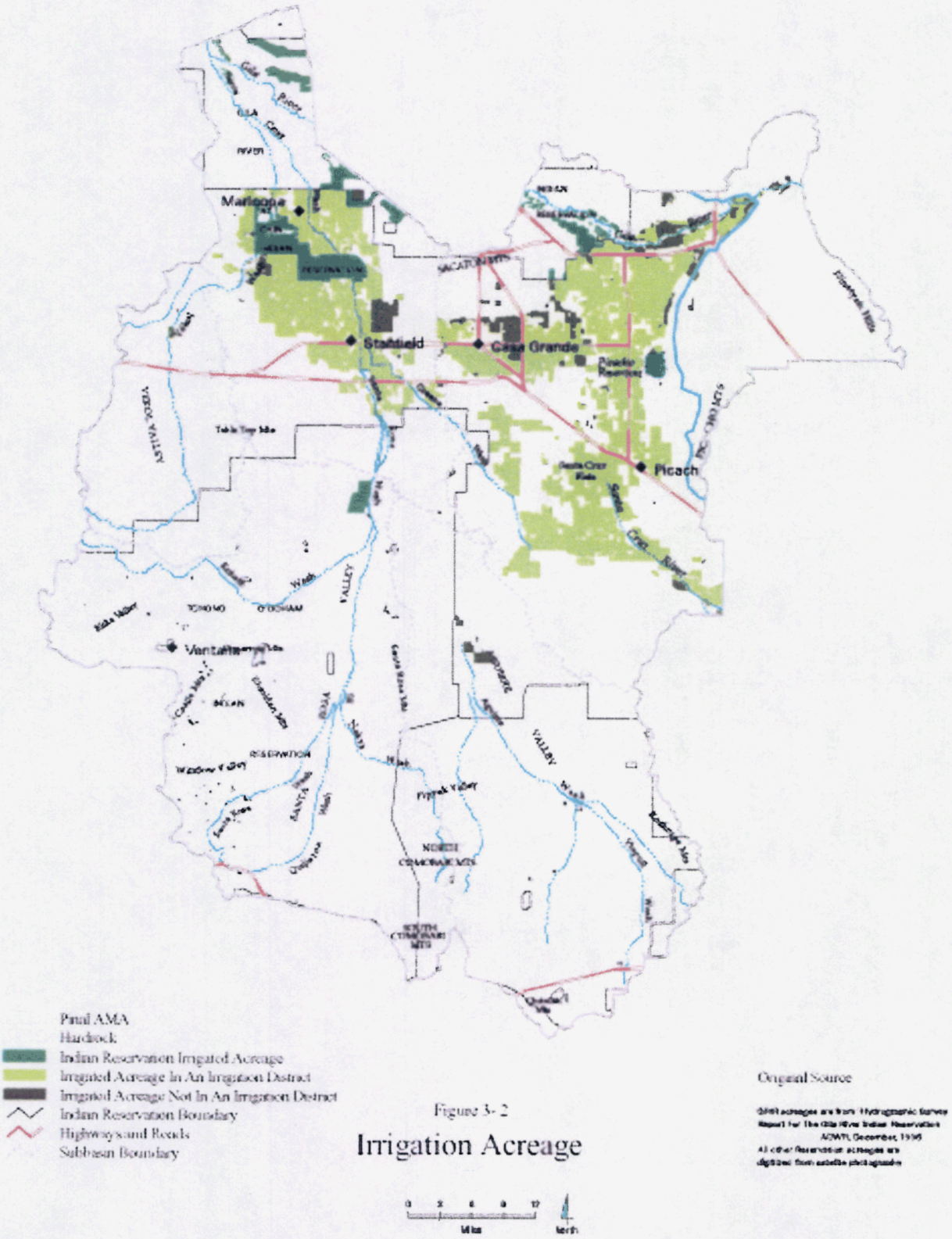


Figure 3- 2

Irrigation Acreage

Exhibit 4. Irrigation Acreage (Source: Pinal AMA Third Management Plan).

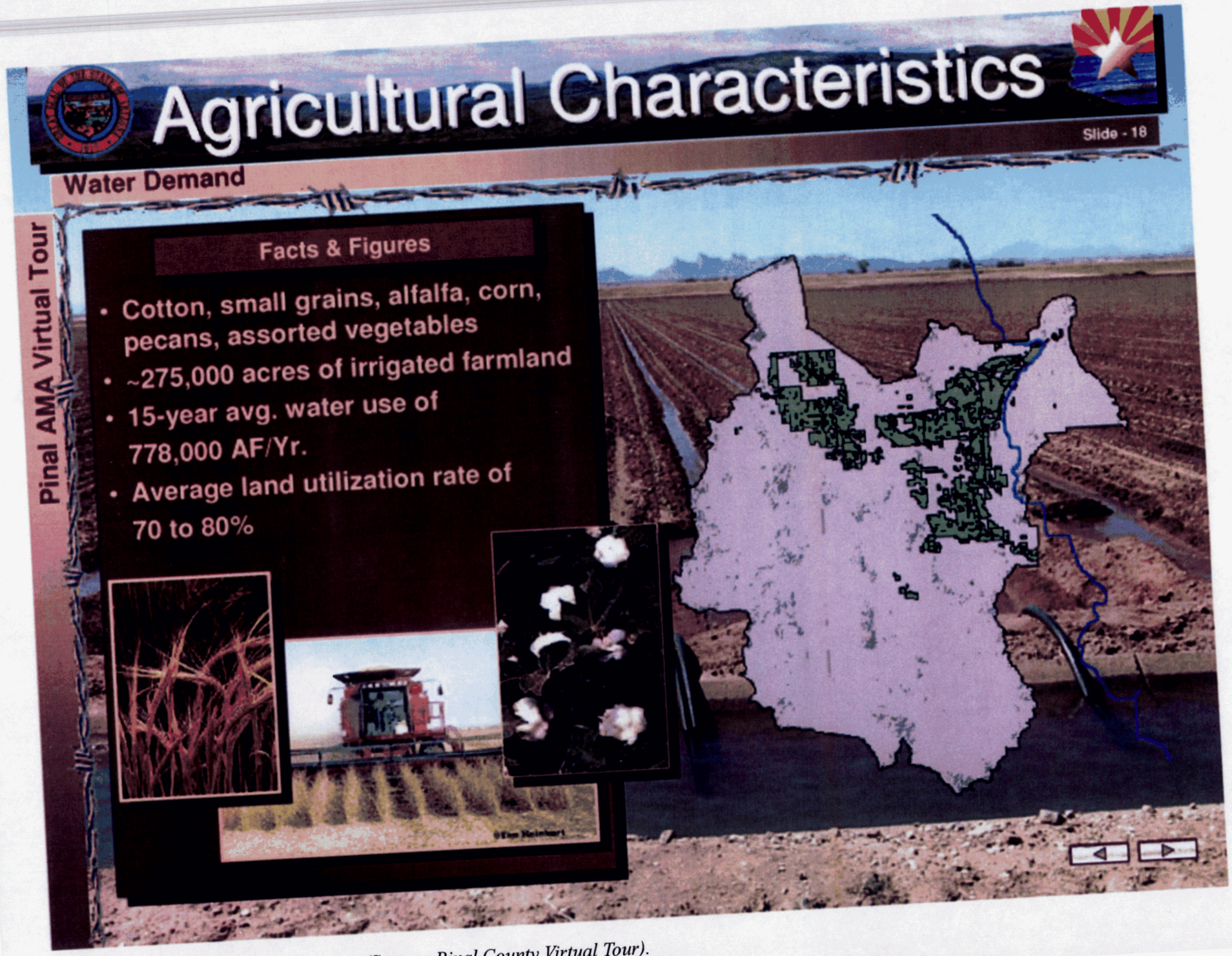


Exhibit 5. Agricultural Characteristics (Source: Pinal County Virtual Tour).

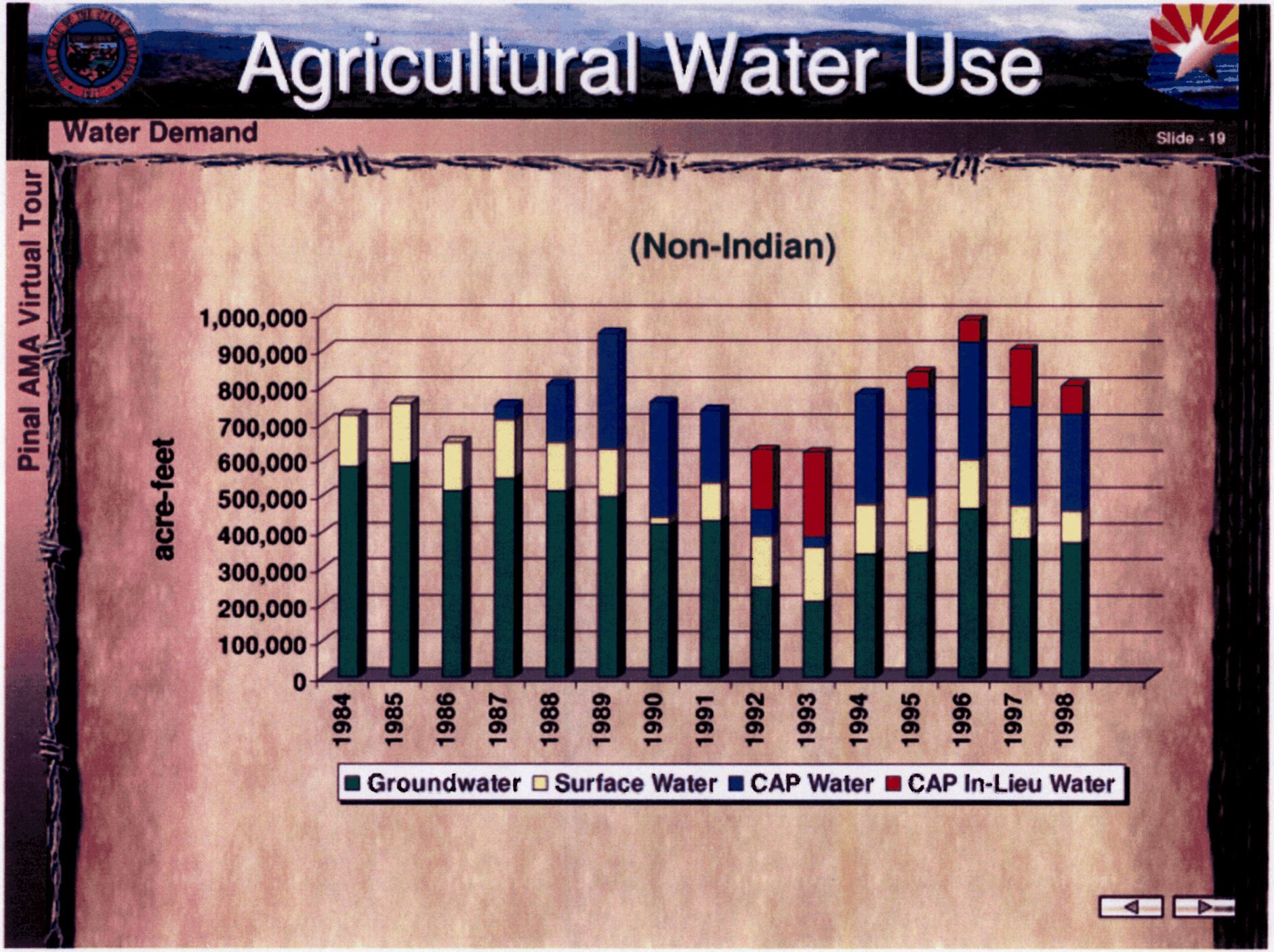


Exhibit 6. Agricultural Water Use (Source: Pinal County Virtual Tour).

Municipal Characteristics

Water Demand

Slide - 20

Pinal AMA Virtual Tour

Facts & Figures

- 4 Large Water Providers
  - AWC - Casa Grande
  - AWC - Coolidge
  - City of Eloy
  - Town of Florence
- 2 Institutional Water Providers
- 2 Untreated Water Providers
- 24 Small Water Providers
- 1998 Avg. GPCD Rate of 214
- Groundwater Supplies 94% of Municipal Demand

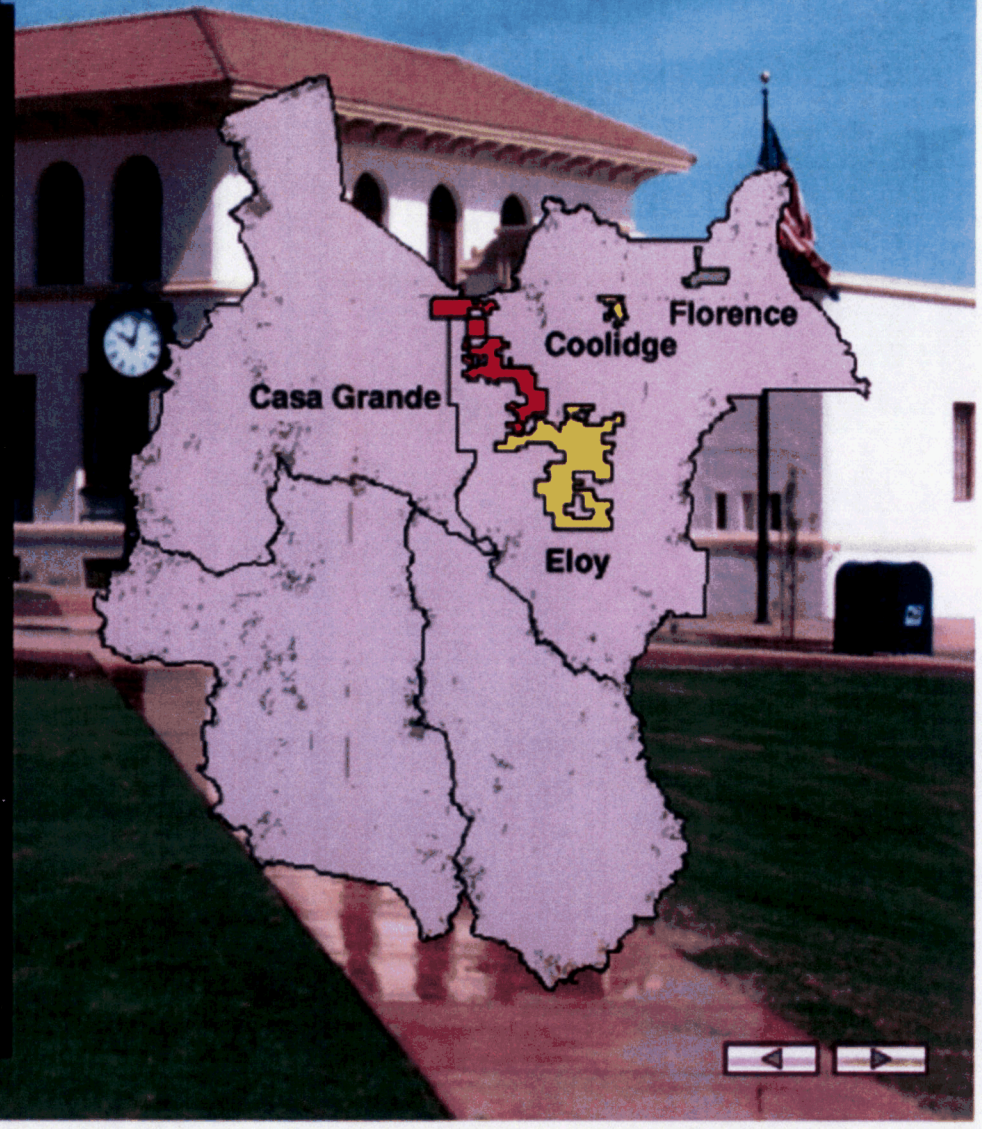


Exhibit 7. Municipal Characteristics (Source: Pinal County Virtual Tour).

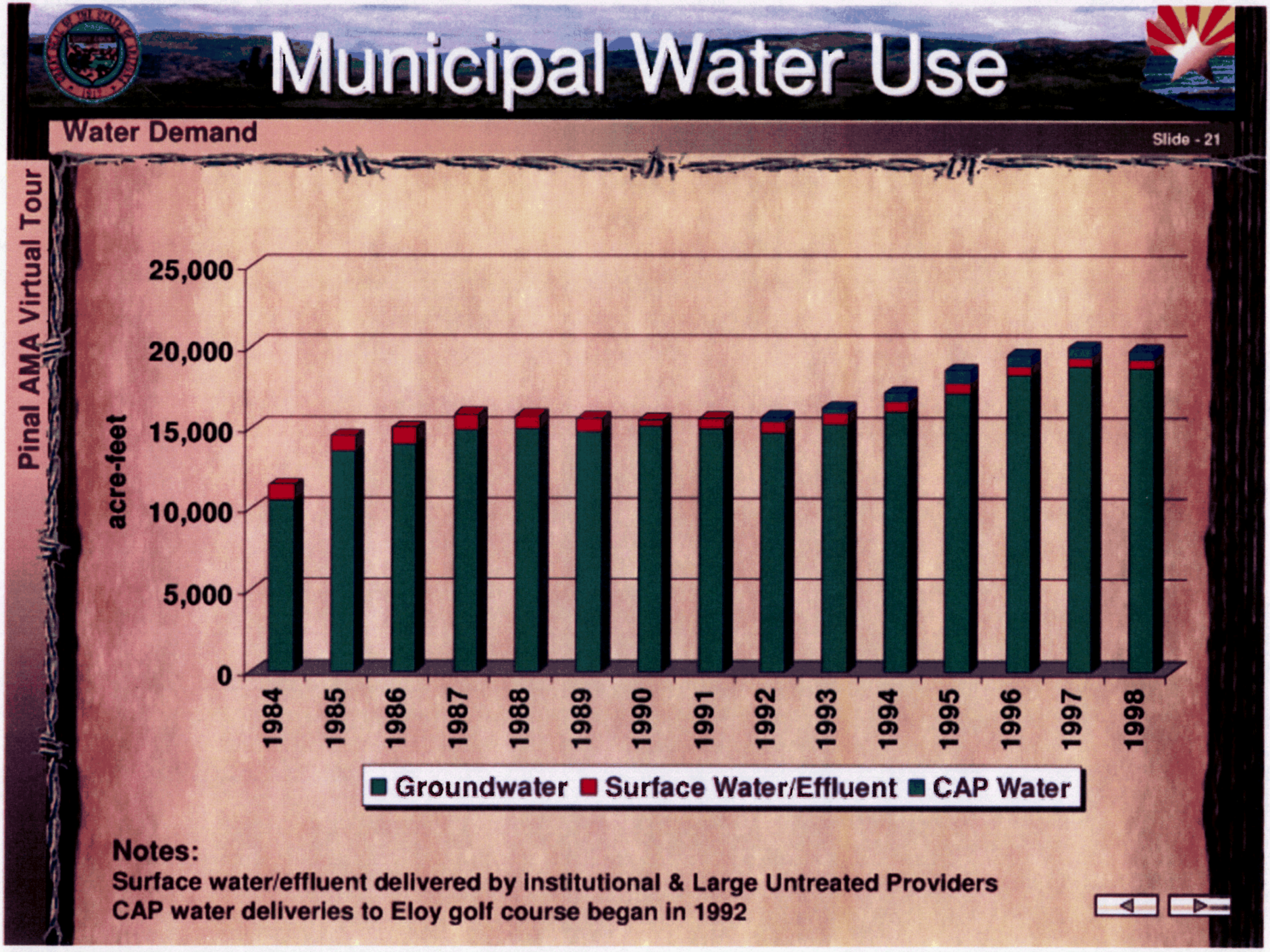


Exhibit 8. Municipal Water Use (Source: Pinal County Virtual Tour).

Industrial Characteristics

Water Demand

Slide - 22

Pinal AMA Virtual Tour

Facts & Figures

- 1998 water use approximately 8,000 AF
- Dairy water use continues to increase as dairies relocate to the Pinal AMA
- Golf courses are second largest industrial user
- Electrical power generation facilities are being constructed in the AMA
- Other electrical generation facilities under consideration
- Other Industries include feedlots and sand & gravel operations

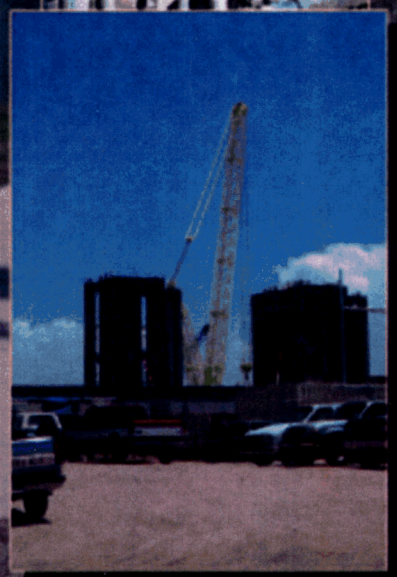


Exhibit 9. Industrial Characteristics (Source: Pinal County Virtual Tour).

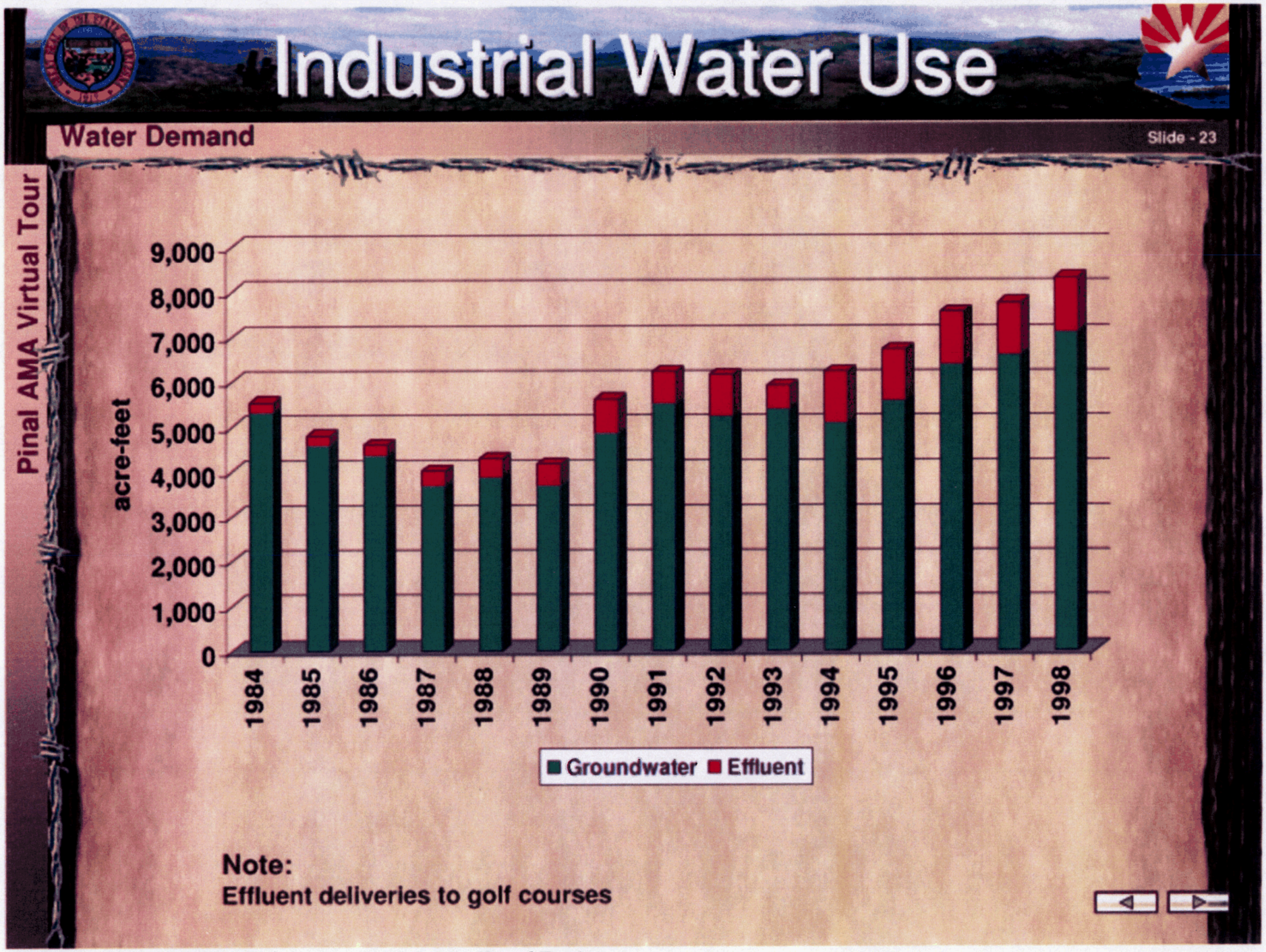


Exhibit 10. Industrial Water Use (Source: Pinal County Virtual Tour).

Physical Characteristics

Orientation

Slide - 6

Pinal AMA Virtual Tour

Facts & Figures

- Consists of 5 Sub-basins
- Elevations range from 1,000 to 4,000 feet above MSL.
- Average annual precipitation 6.5 to 8.5 inches
- Average pan evaporation rate 79 inches / Yr.

- GROUNDWATER IN STORAGE WITHIN THE TWO PRINCIPLE SUB-BASINS
  - Approx. 36 Million Acre-Feet to 1,200 Feet

Exhibit 11. Physical Characteristics (Source: Pinal County Virtual Tour).

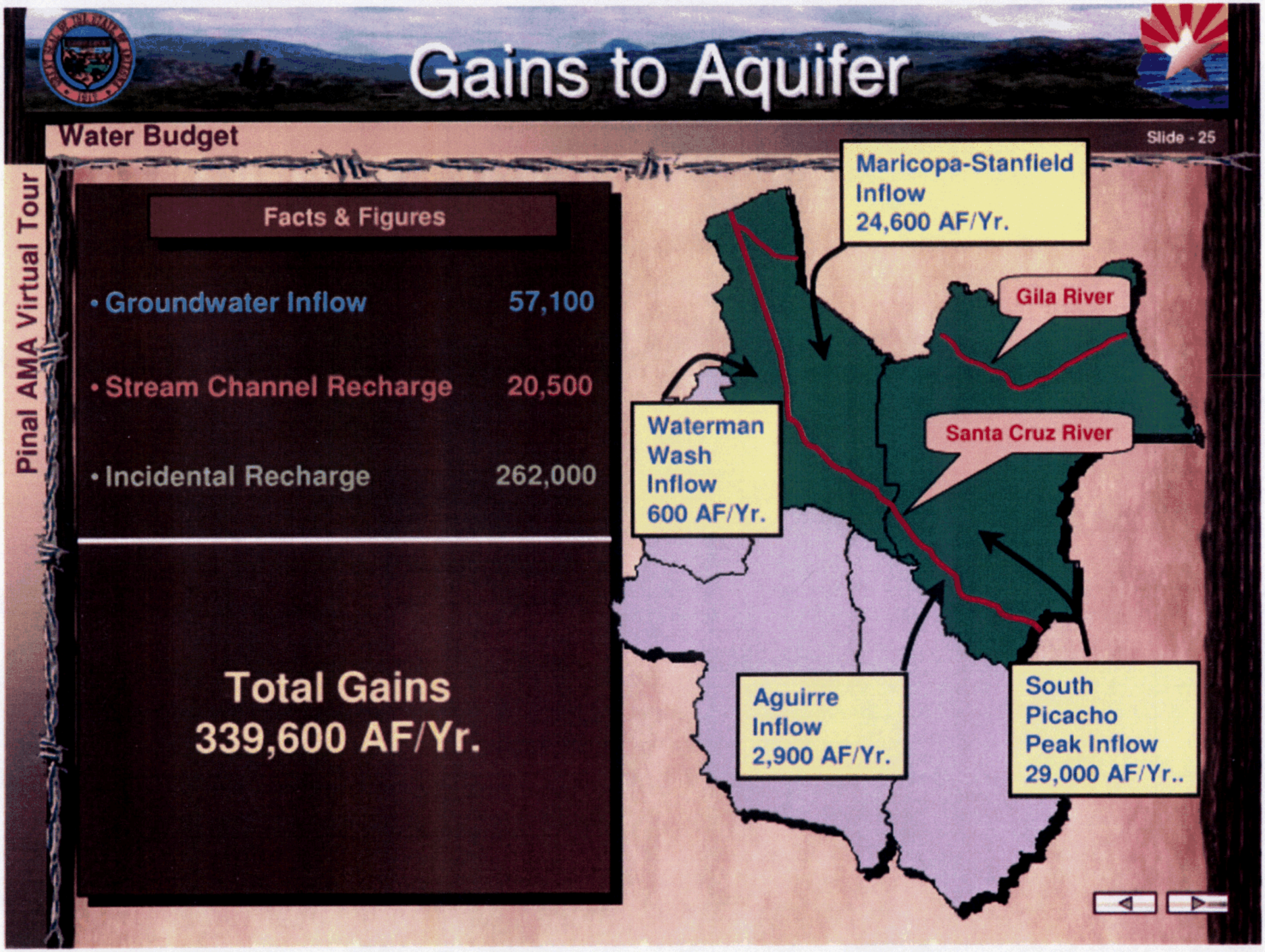


Exhibit 12. Gains to Aquifer (Source: Pinal County Virtual Tour).

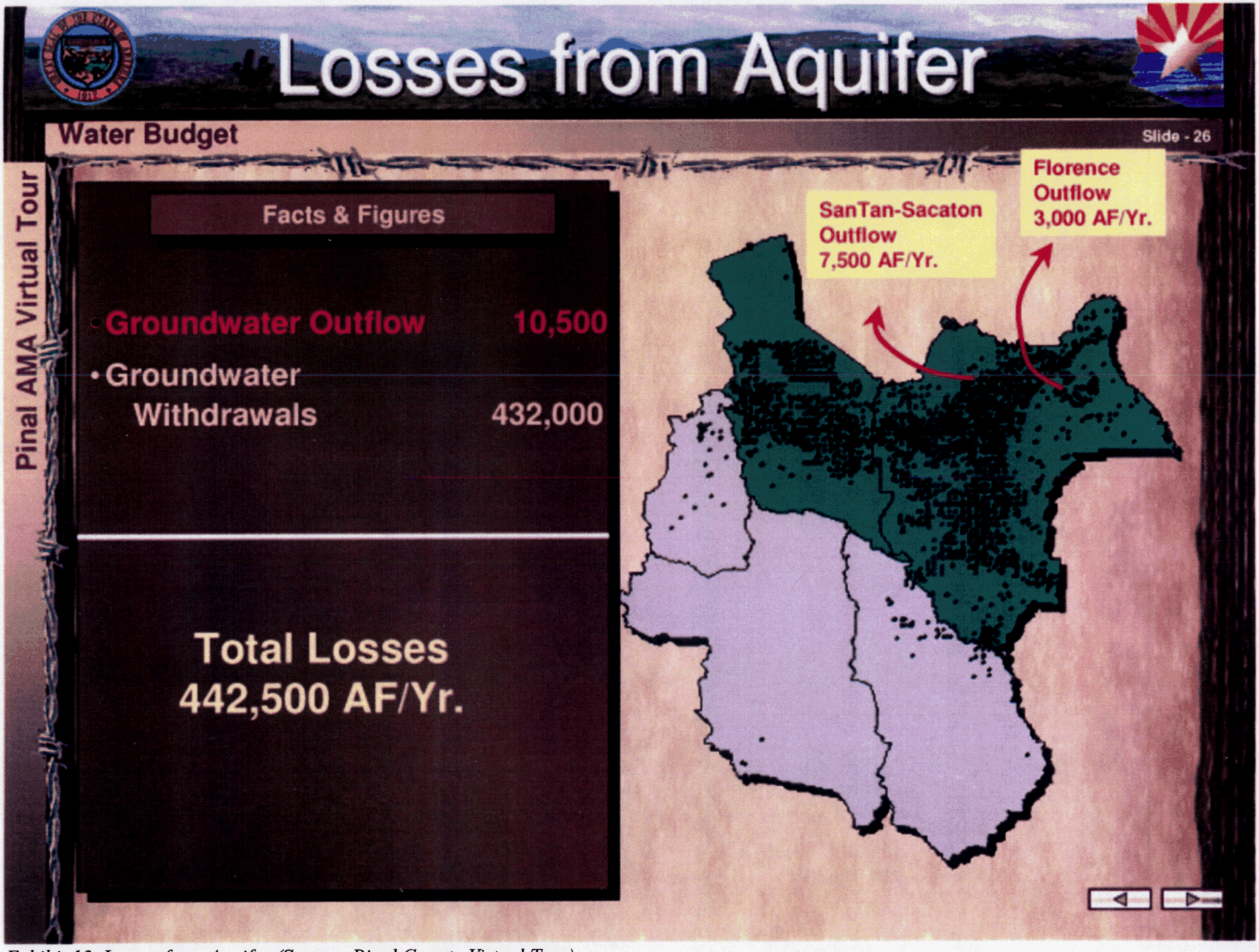


Exhibit 13. Losses from Aquifer (Source: Pinal County Virtual Tour).

PINAL AMA WATER BUDGET

The water budget shown below has been developed using pumpage, surface water diversion, stream gage, and other measured data. Long-term estimates have been used for those components where data wasn't available. All values shown are in acre-feet.

	1980	1990	1995	2000
INFLOWS				
Underflow	49,300	49,300	49,300	49,300
Agricultural Irrigation Recharge	344,361	234,796	219,312	173,724
Urban Irrigation Recharge	800	816	968	1,144
Canal Recharge[1]	141,996	39,727	120,927	45,488
Effluent Recharge	1,230	1,340	1,330	1,473
Artificial Recharge[2]	0	190	44	92
Major Drainage Recharge	78,340	40,782	86,956	55,708
Mountain Front Recharge	1,000	1,000	1,000	1,000
Basin and Ephemeral Stream Recharge[3]	5,000	5,000	5,000	5,000
Total	**622,027**	**372,951**	**484,837**	**332,929**
OUTFLOWS				
Underflow	11,800	11,800	11,800	11,800
Pumpage	898,000	459,268	388,348	383,582
Evapotranspiration	15,000	15,000	15,000	15,000
Total	**924,800**	**486,068**	**415,148**	**410,382**
NET ANNUAL CHANGE[4]	**-302,773**	**-113,117**	**69,689**	**-77,453**

[1] Largely depends on Gila River flows, which vary from year to year.
[2] Recharge resulting from underground storage projects. Recharge resulting from groundwater savings projects is included under agricultural irrigation recharge.
[3] Recharge resulting from annual precipitation.
[4] A negative value reflects a groundwater overdraft and a positive value a surplus.

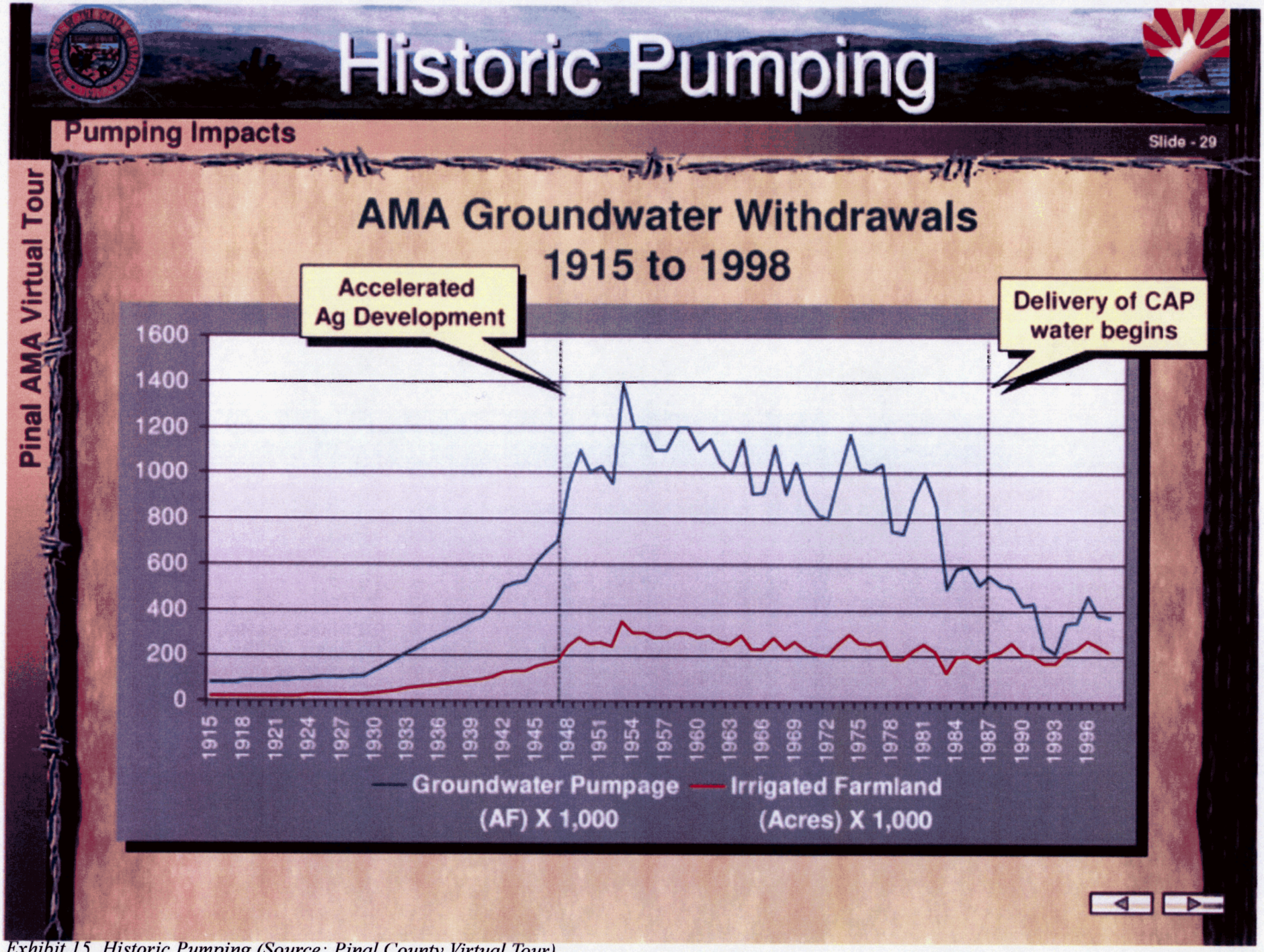


Exhibit 15. Historic Pumping (Source: Pinal County Virtual Tour).

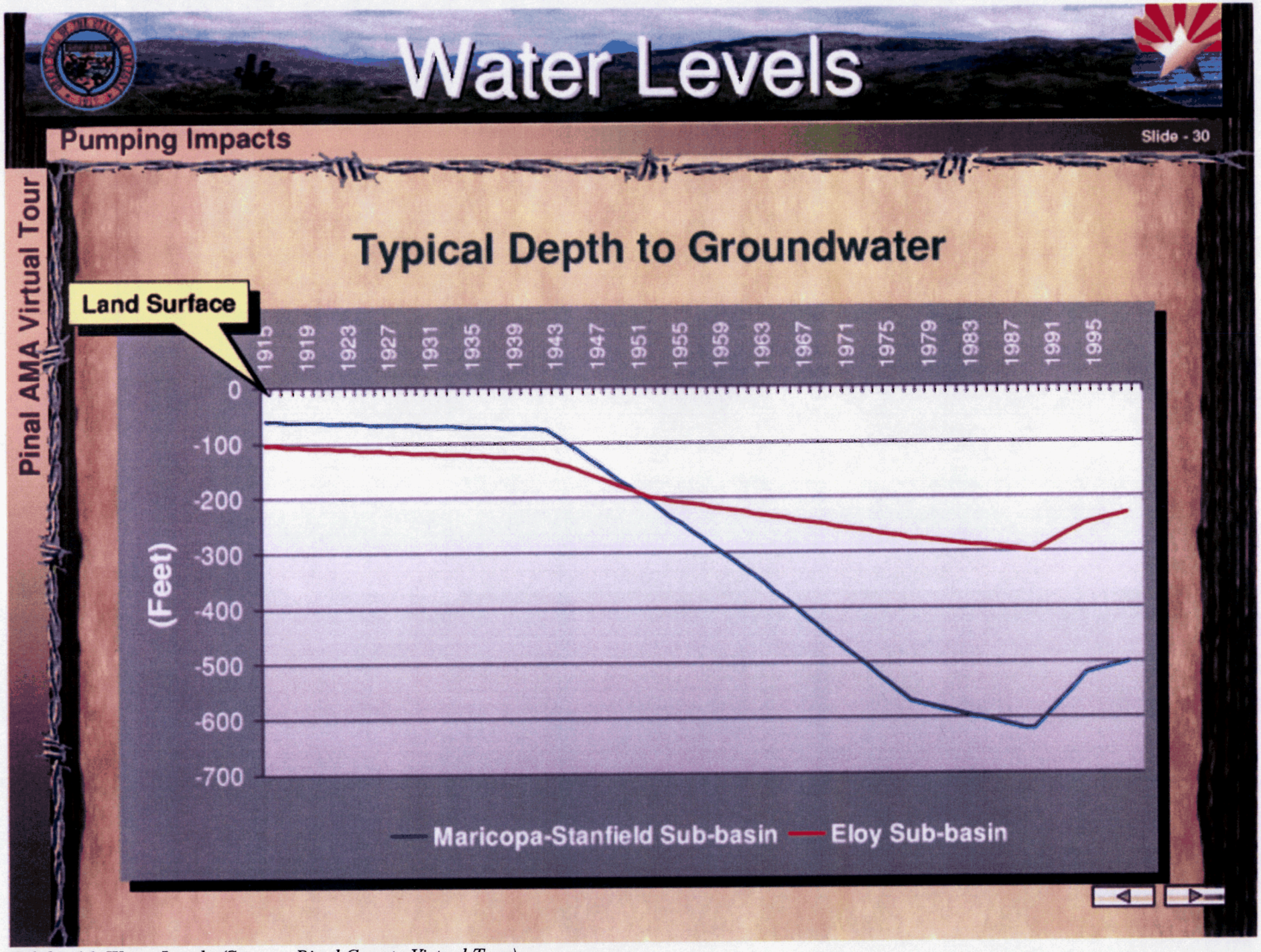


Exhibit 16. Water Levels (Source: Pinal County Virtual Tour).

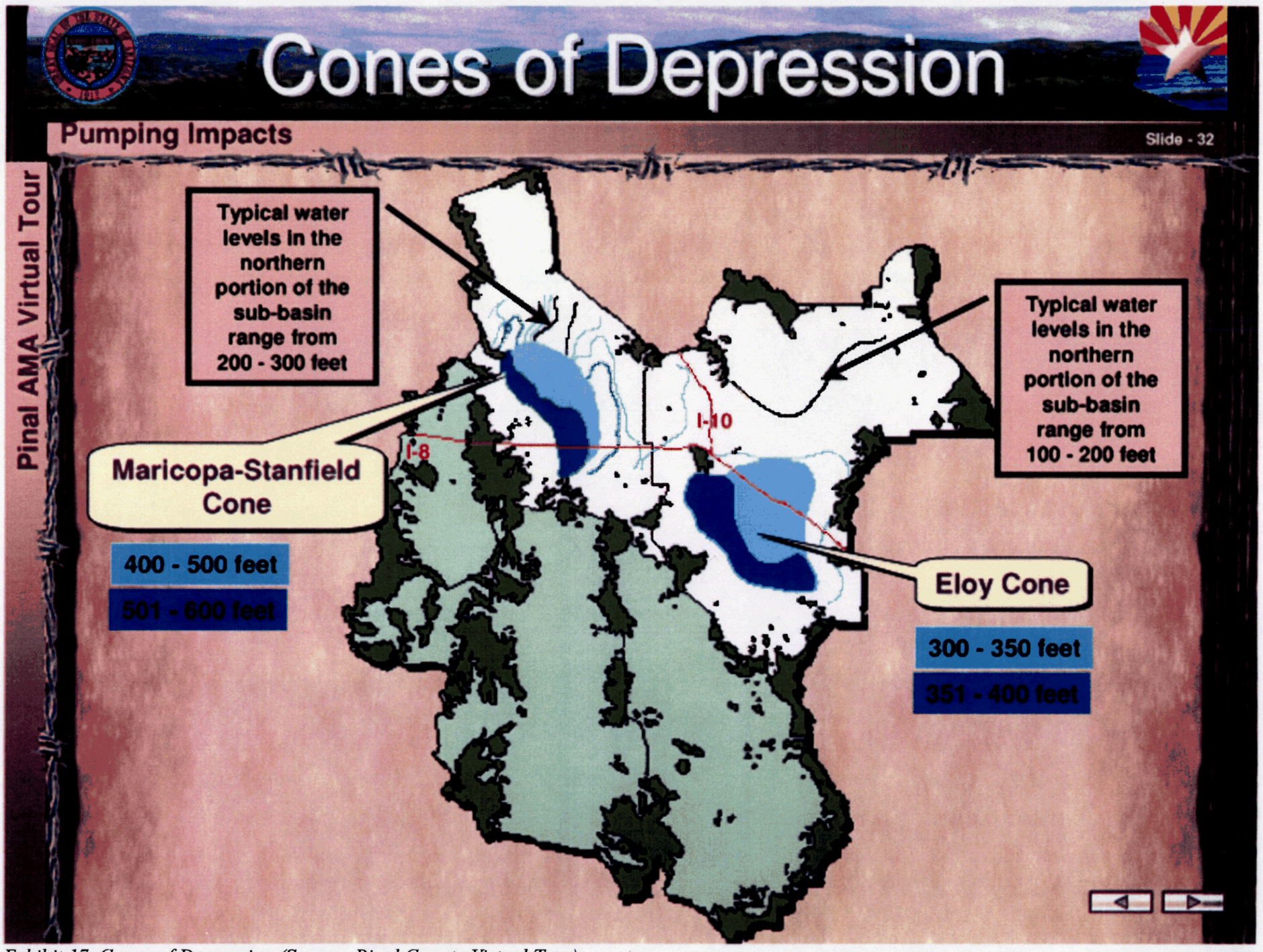


Exhibit 17. Cones of Depression (Source: Pinal County Virtual Tour).

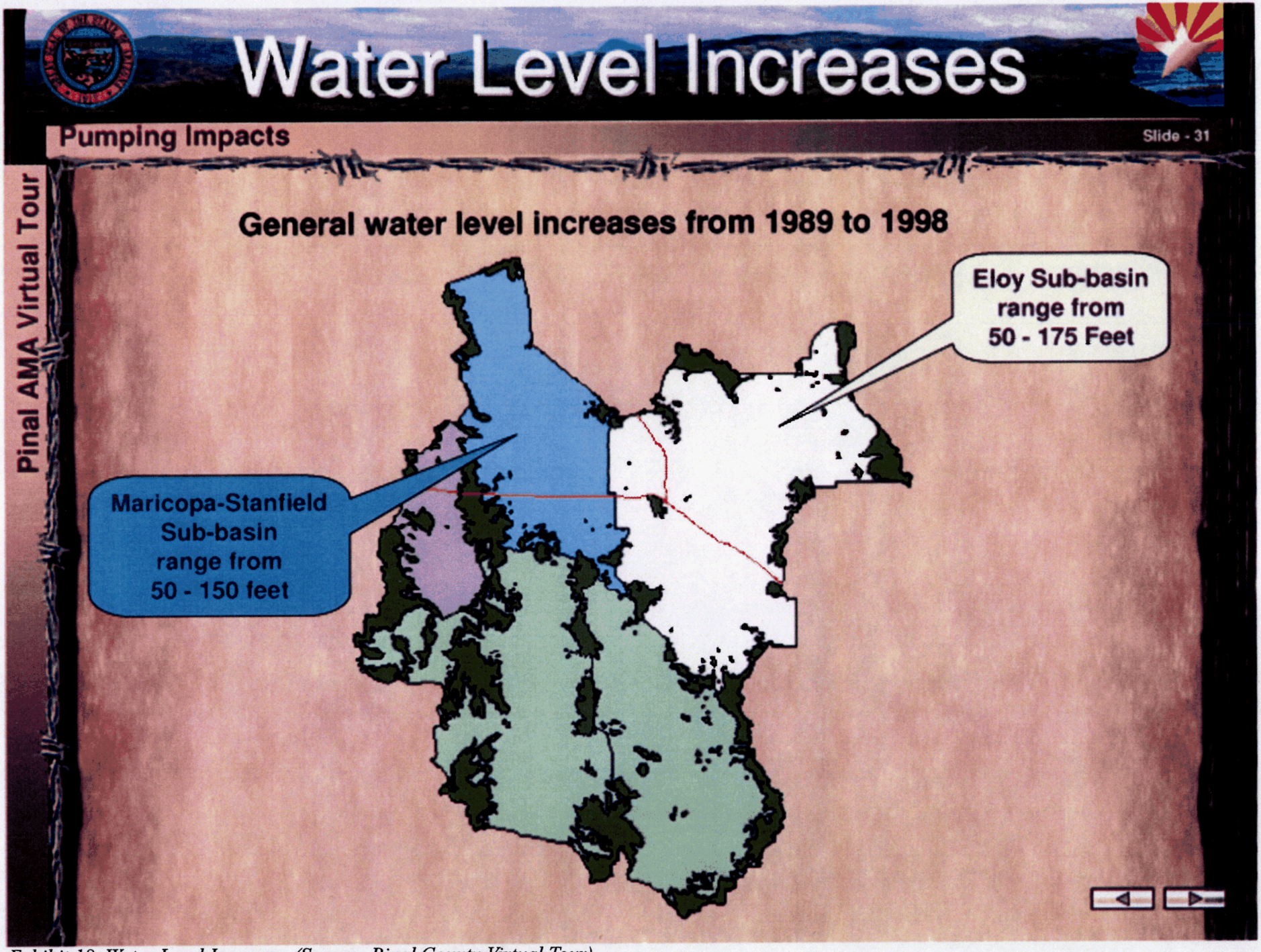
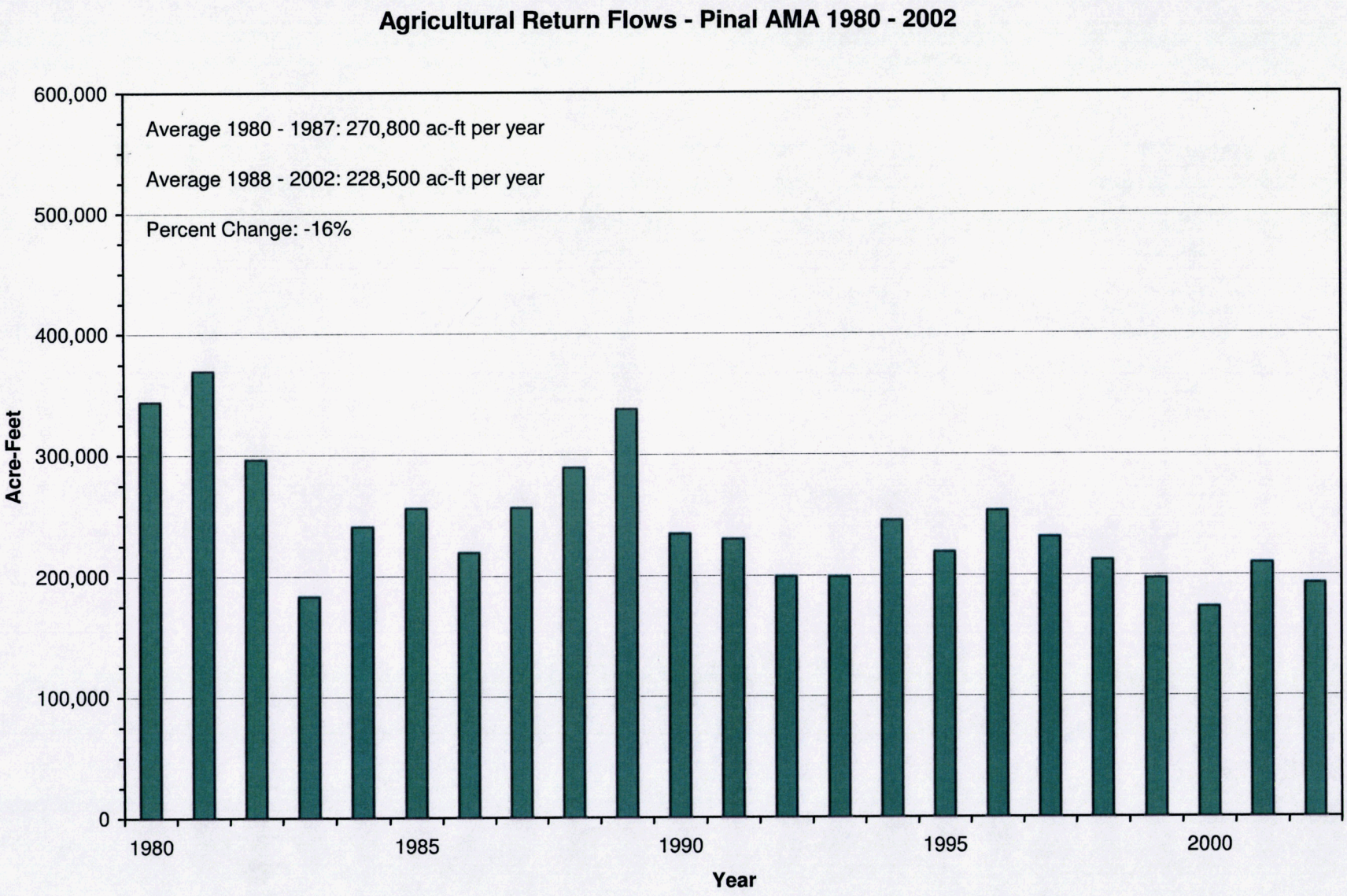
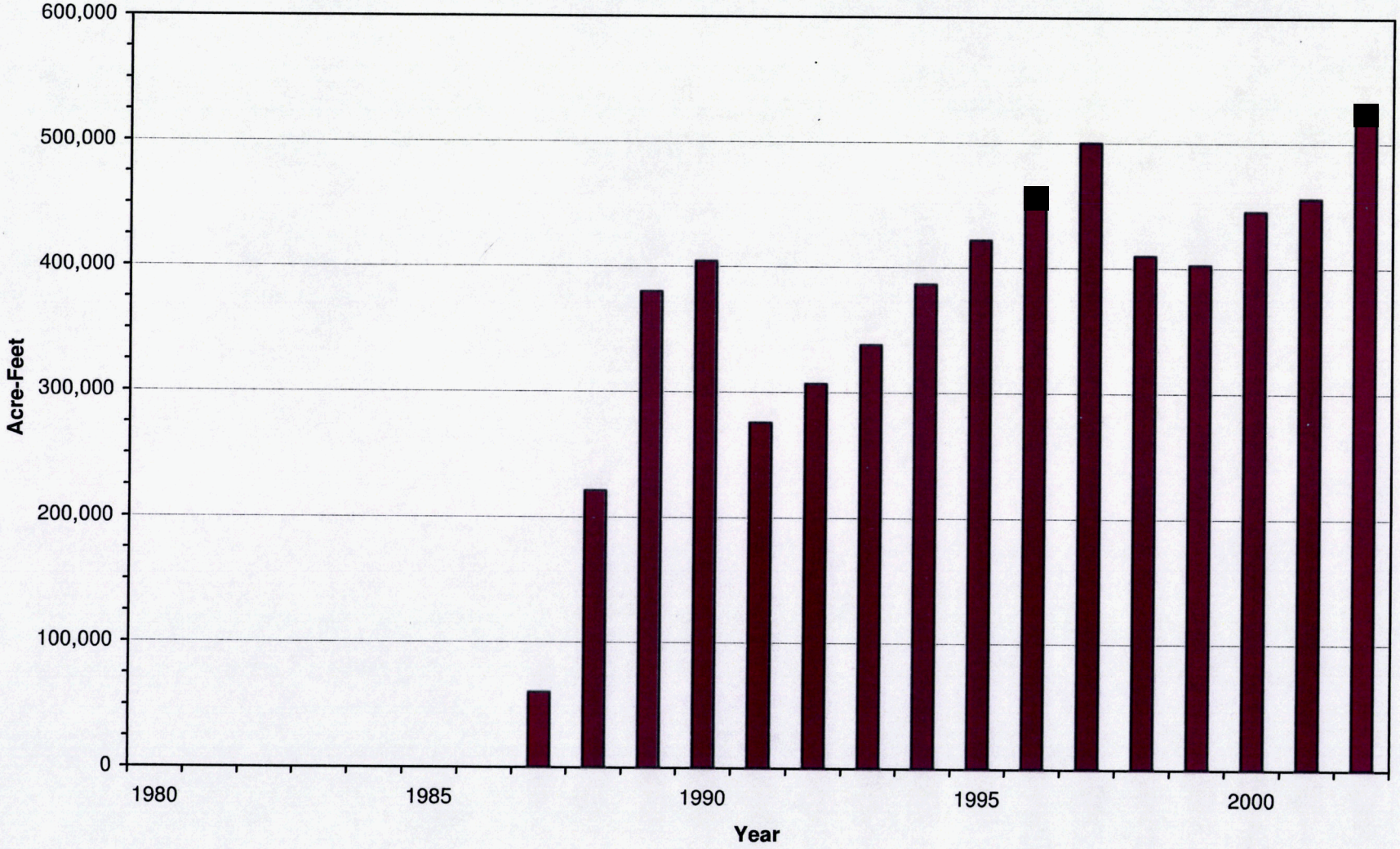


Exhibit 18. Water Level Increases (Source: Pinal County Virtual Tour).


Agricultural Return Flows - Pinal AMA 1980 - 2002
Average 1980 - 1987: 270,800 ac-ft per year
Average 1988 - 2002: 228,500 ac-ft per year
Percent Change: -16%
600,000
500,000
400,000
300,000
200,000
100,000
0
Acre-Feet
1980
1985
1990
1995
2000
Year

Total CAP Water Use - Pinal AMA 1980 - 2002



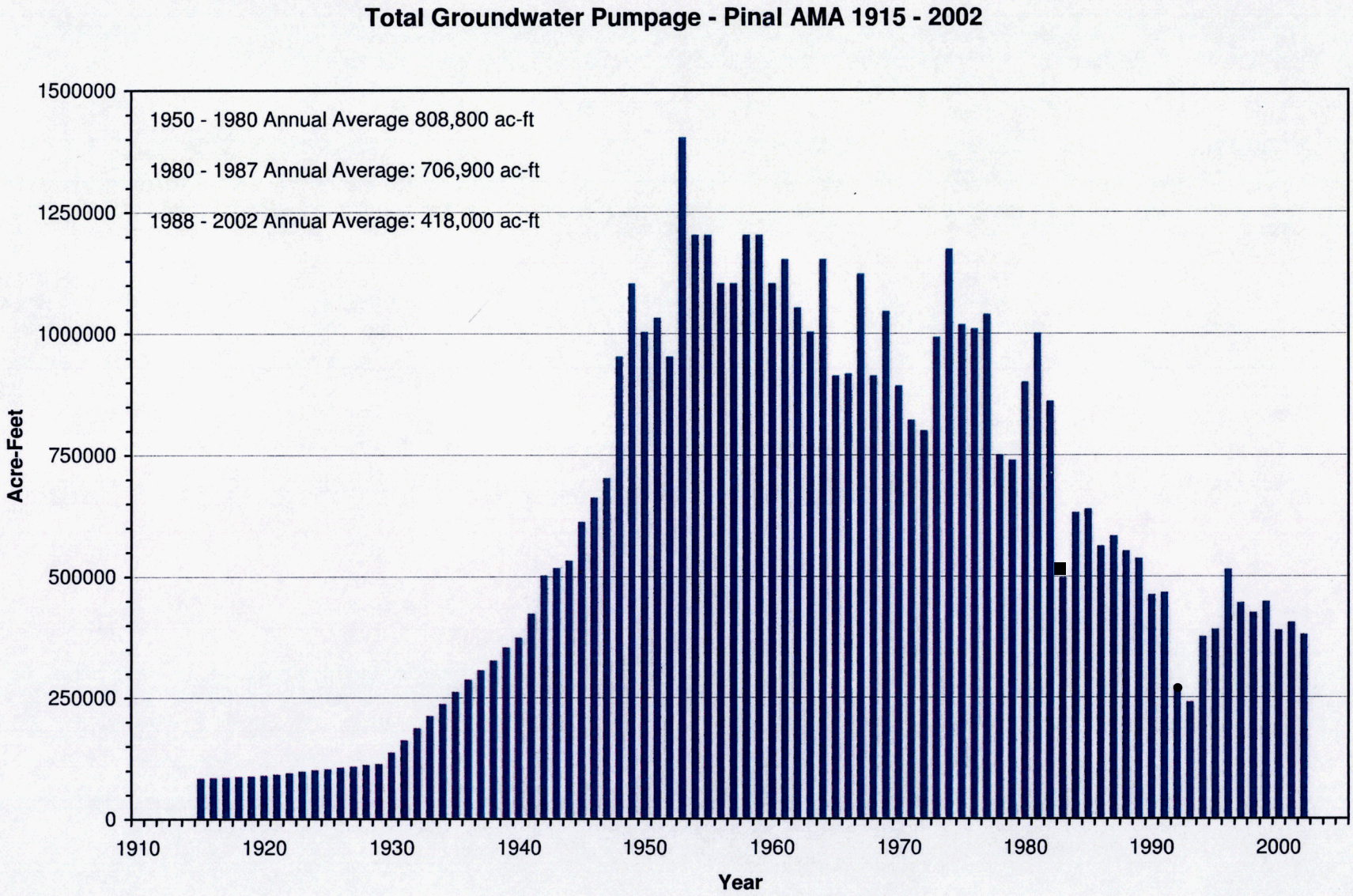


Exhibit 19. Total Groundwater Pumpage. (Source: 1915-1984 data - USGS OFR 86-422W, 1984-2002 data Pinal AMA Water Budget)

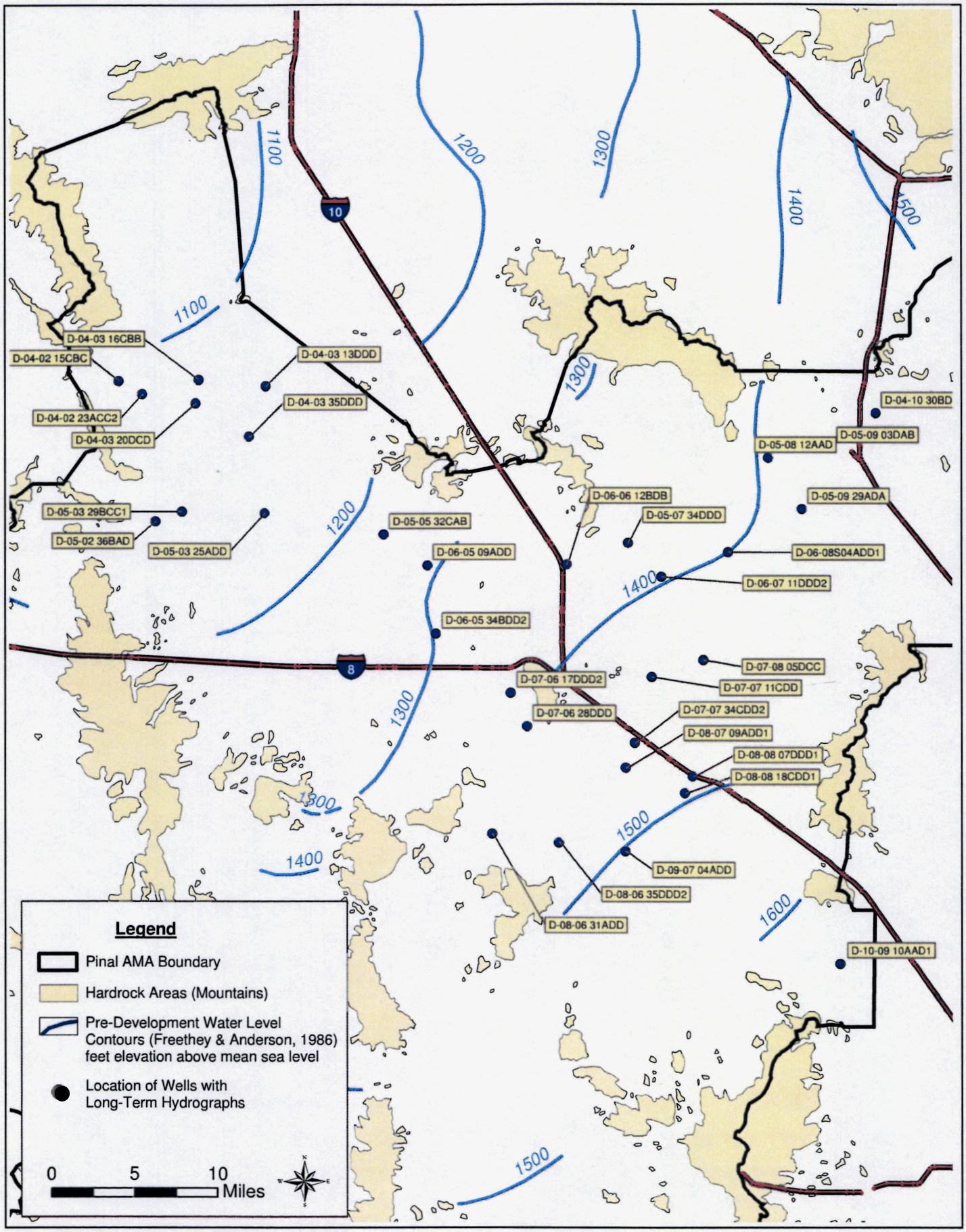
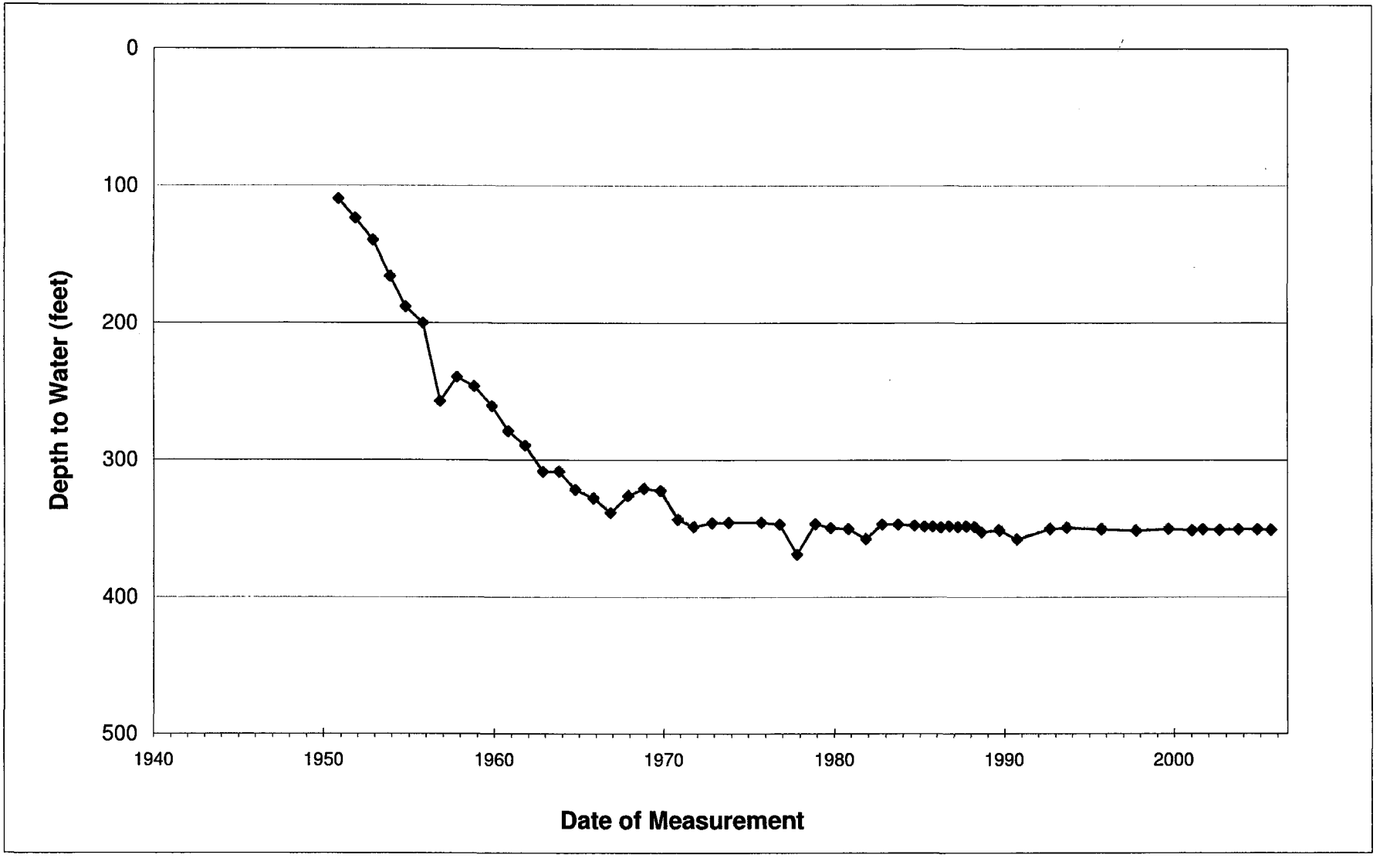


Exhibit 22. Pre-Development Water Levels (Freethey & Anderson, 1986)

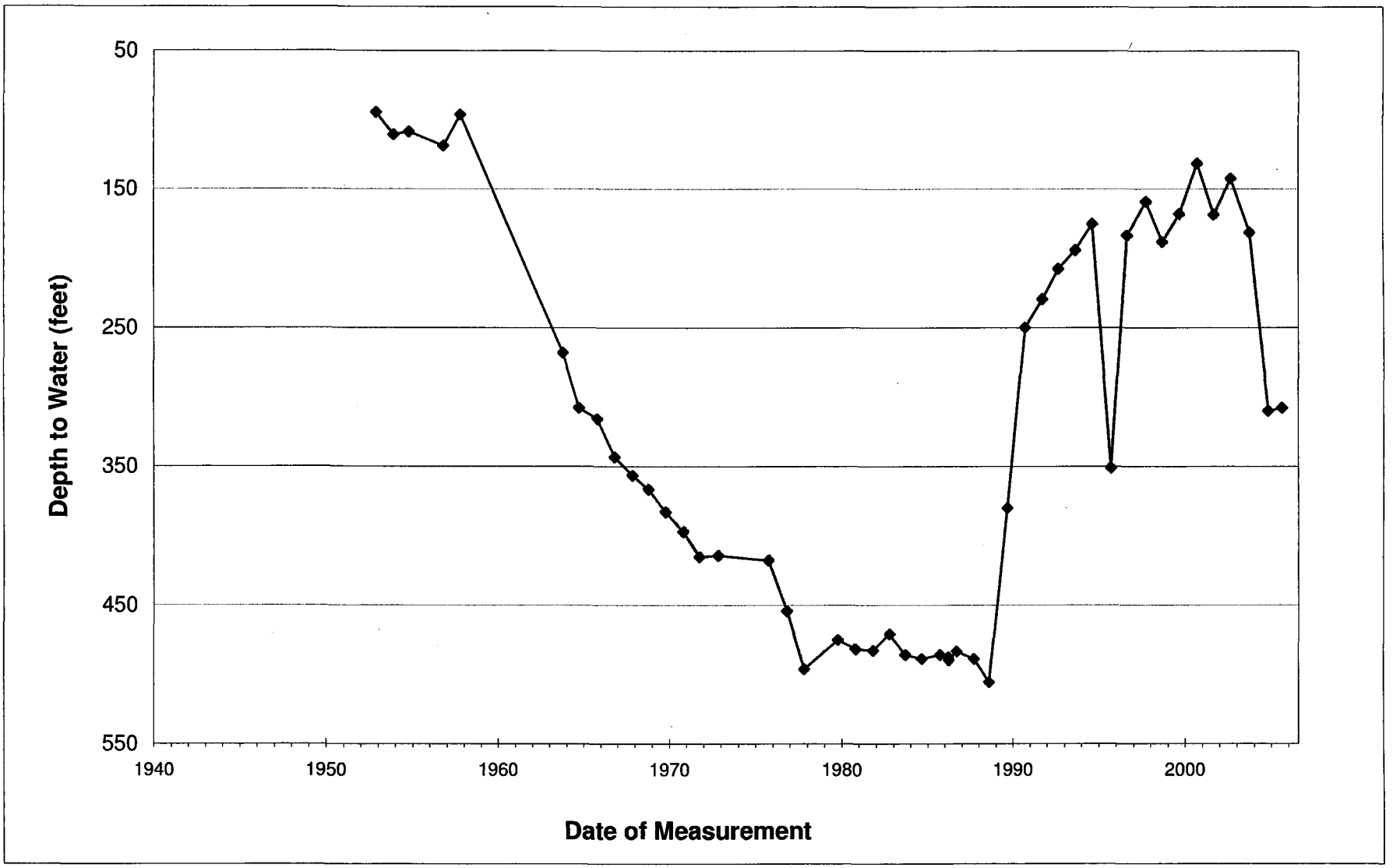


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 23. Hydrograph for Well D-04-02 15CBC

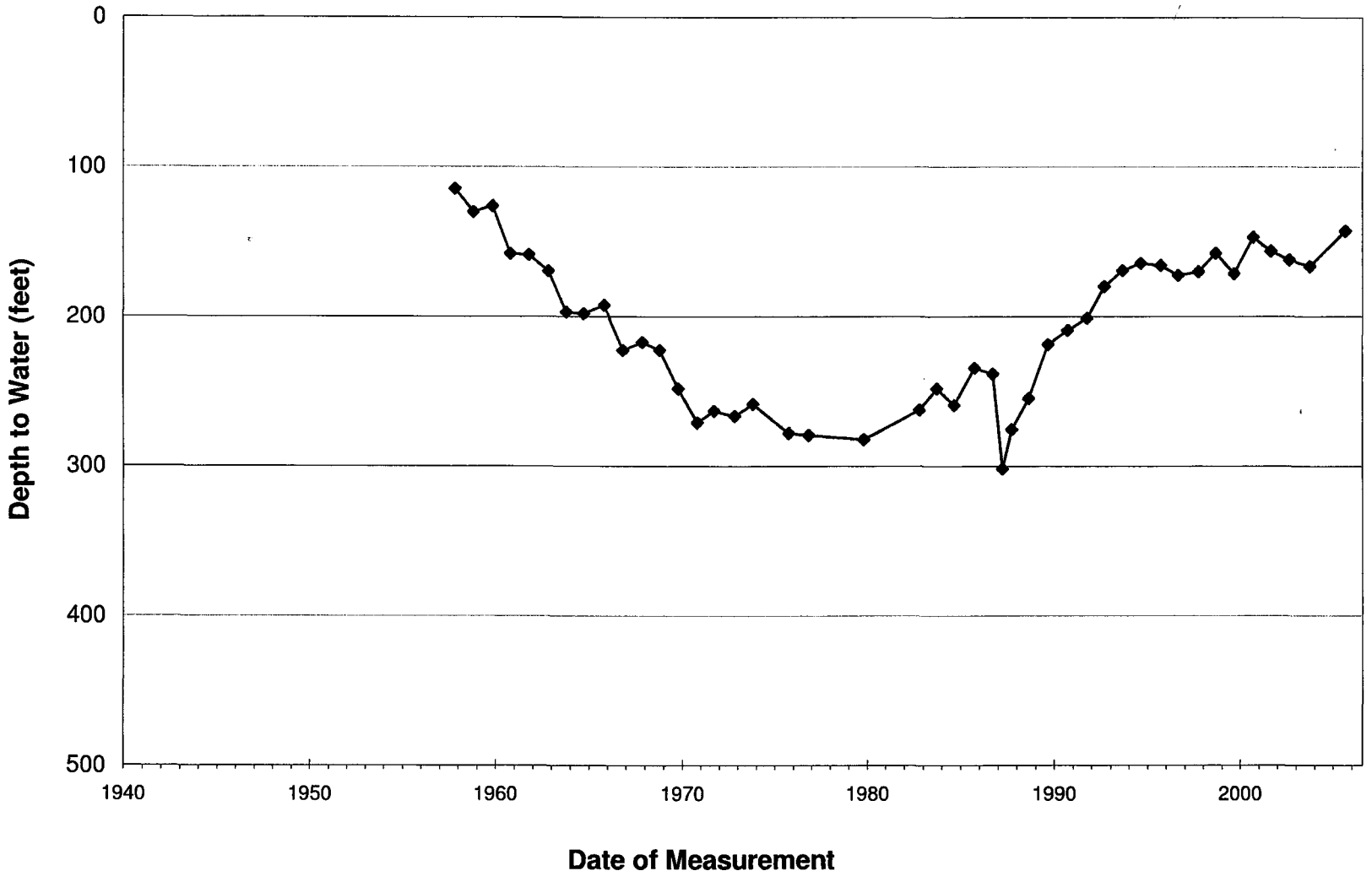


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 24. Hydrograph for Well D-04-02 23ACC2

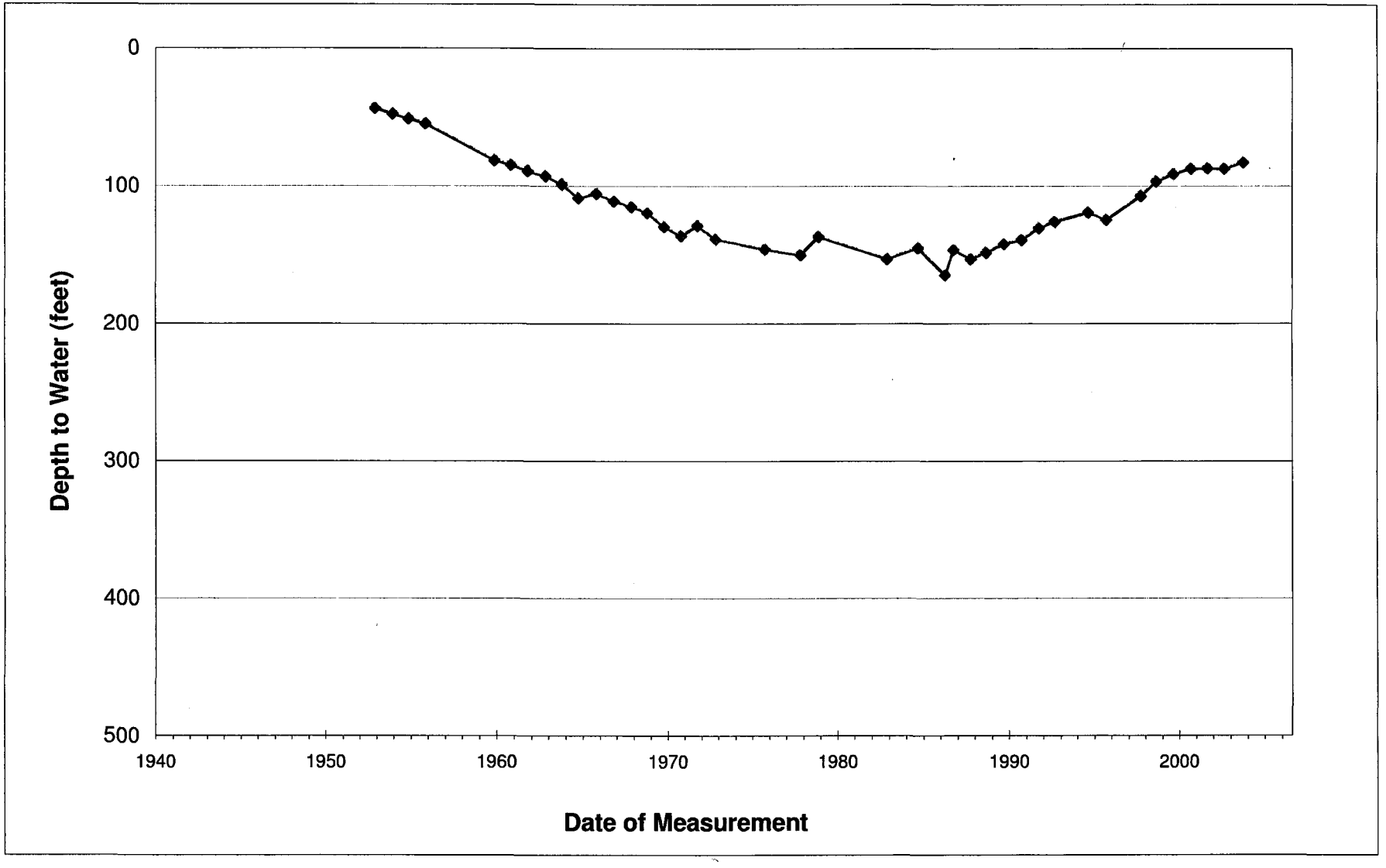


Map Source:

Waterlevel data taken from ADWR GWSI Files, June 2006

Global Water Company

Exhibit 25. Hydrograph for Well D-04-03 13DDD

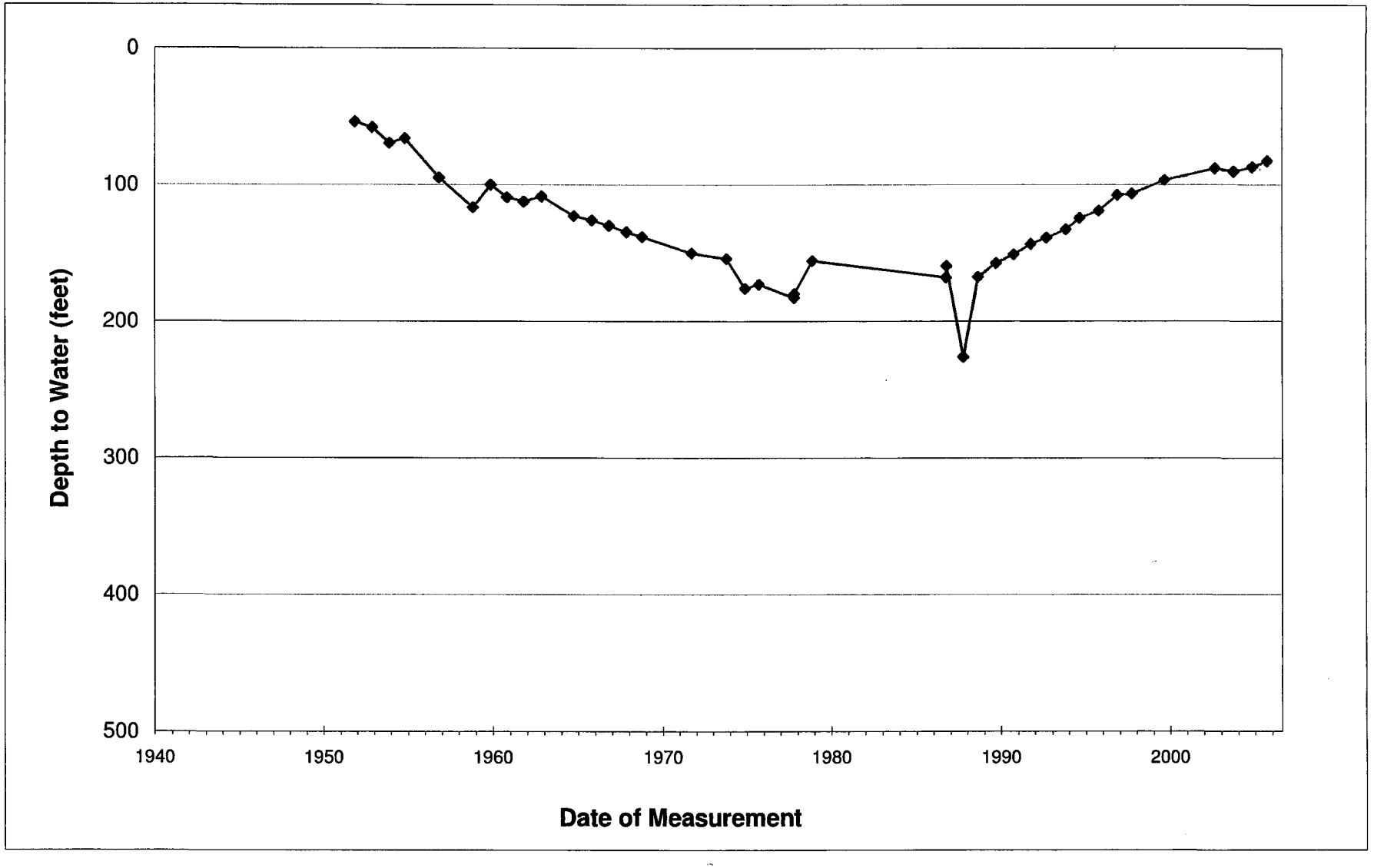


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 26. Hydrograph for Well D-04-03 16CBB

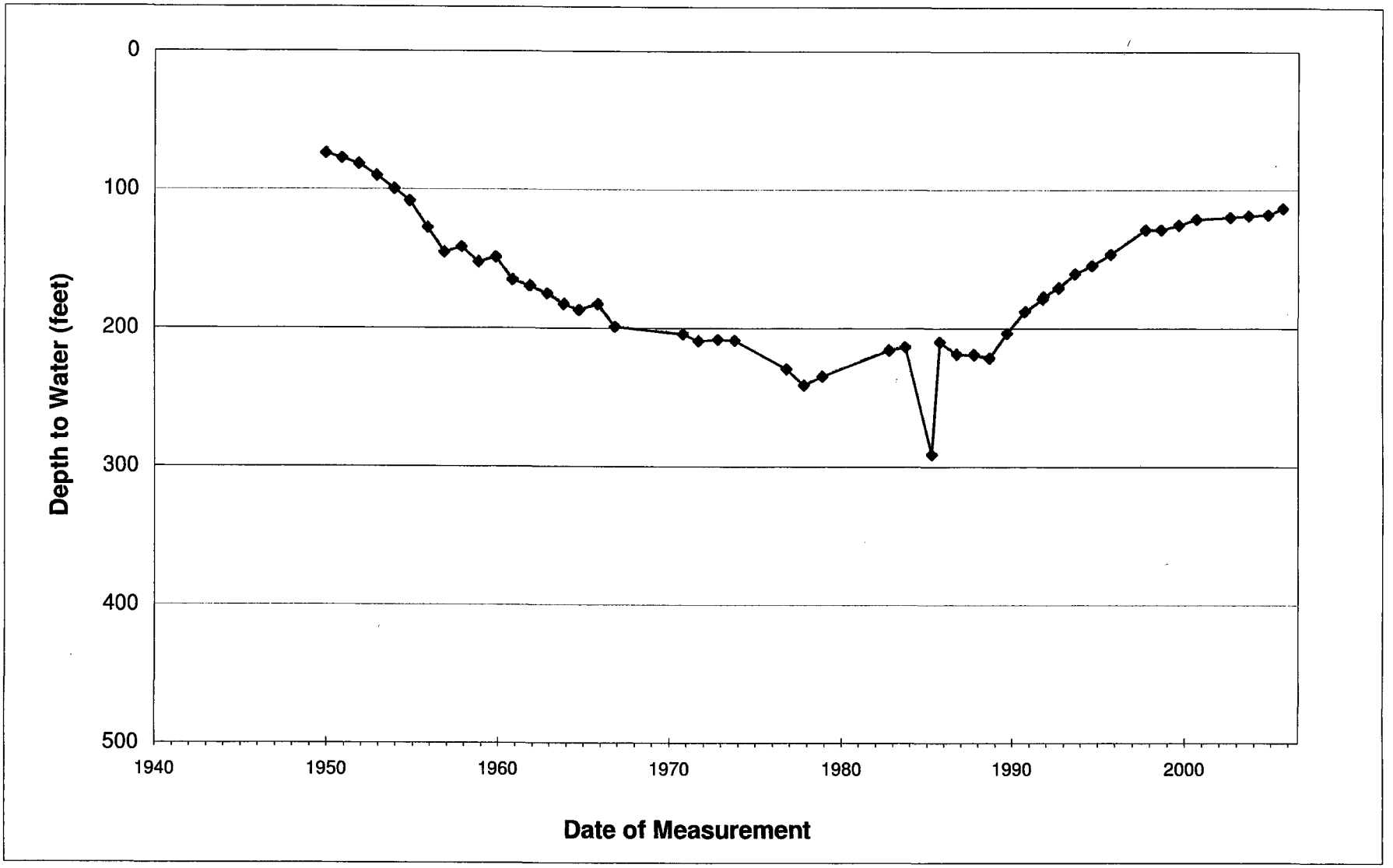


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 27. Hydrograph for Well D-04-03 20DCD

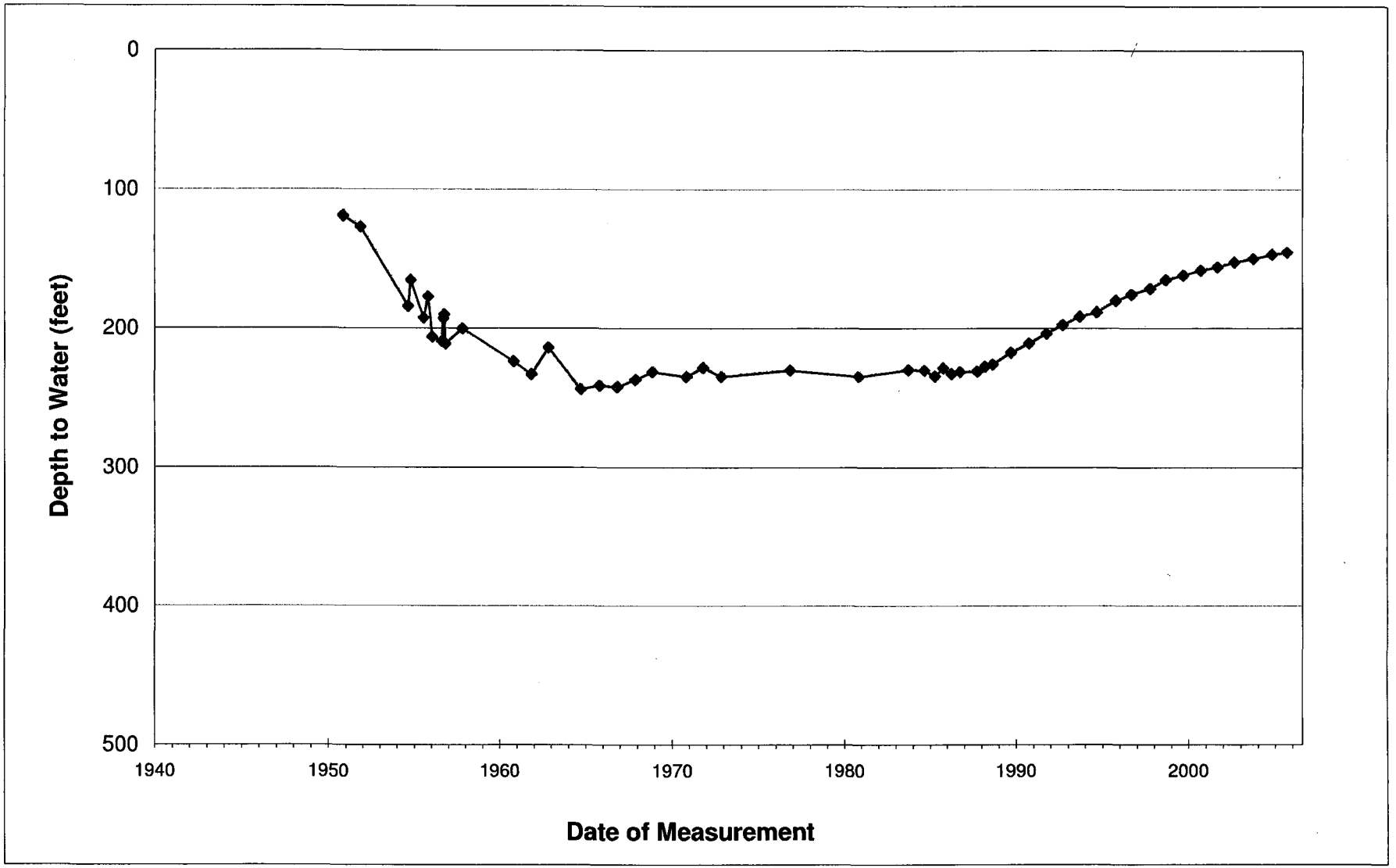


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 28. Hydrograph for Well D-04-03 35DDD

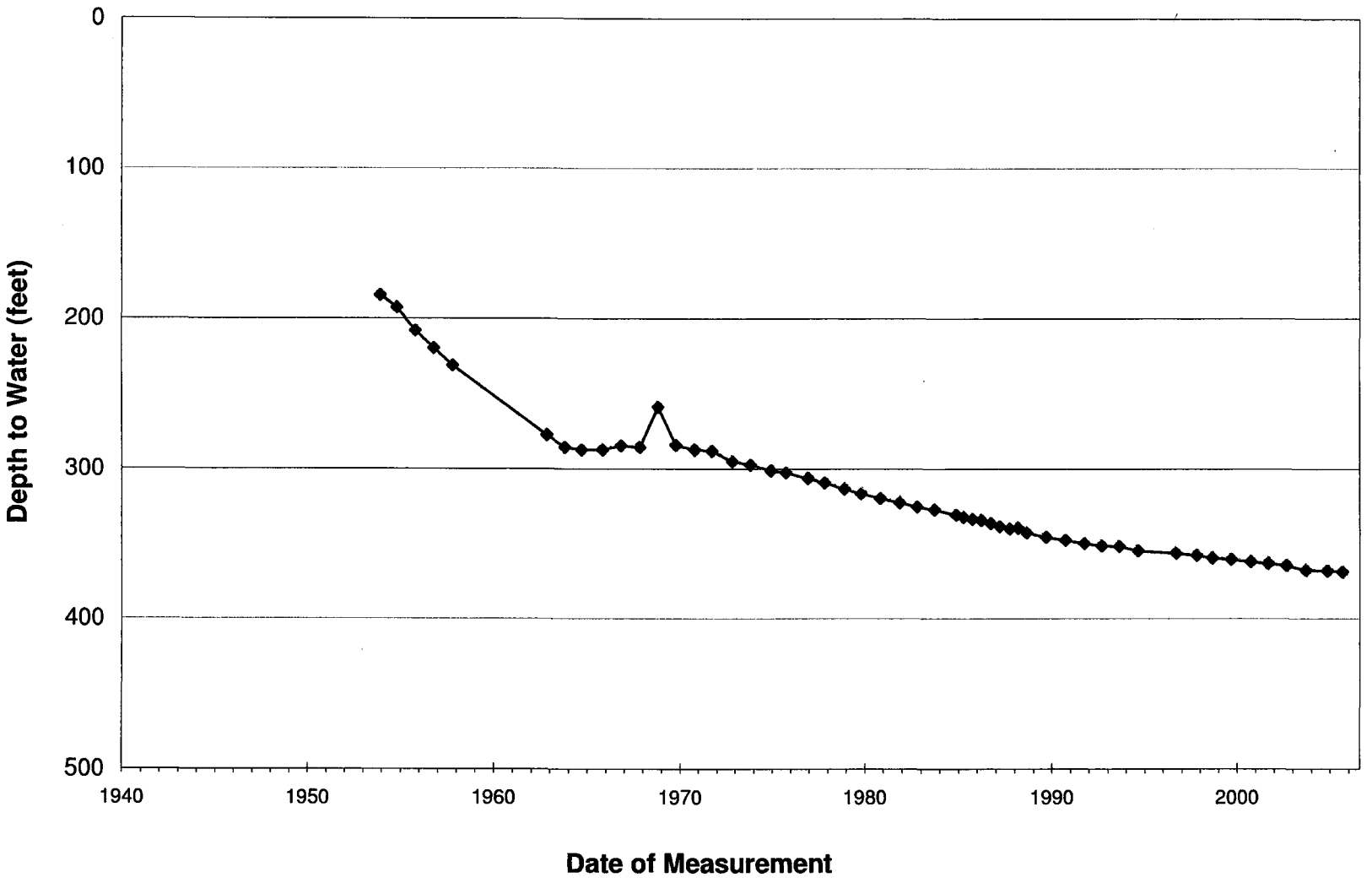


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 29. Hydrograph for Well D-05-03 25ADD

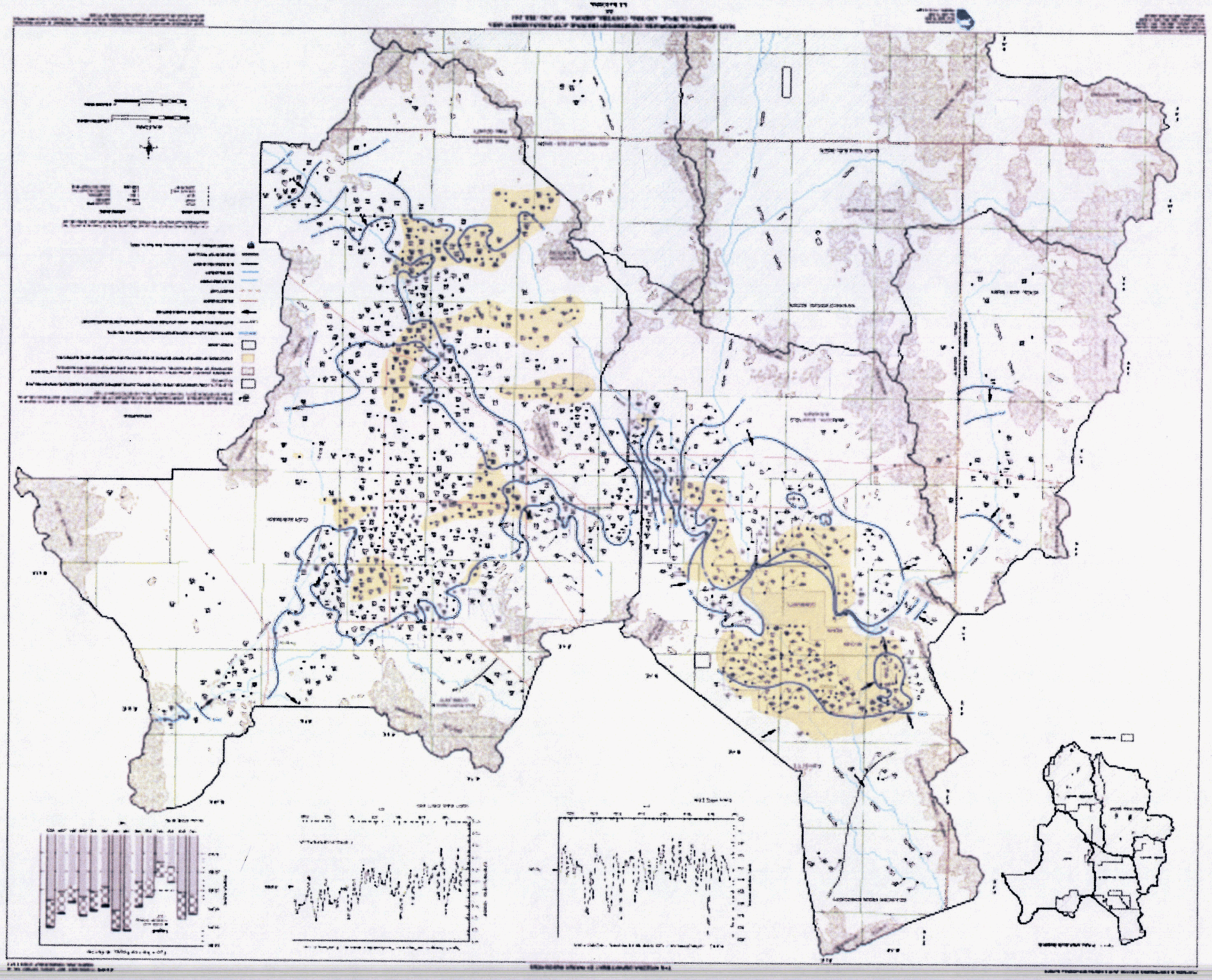


Waterlevel data taken from ADWR GWSI Files, June 2006

Map Source:

Global Water Company

Exhibit 30. Hydrograph for Well D-05-05 32CAB



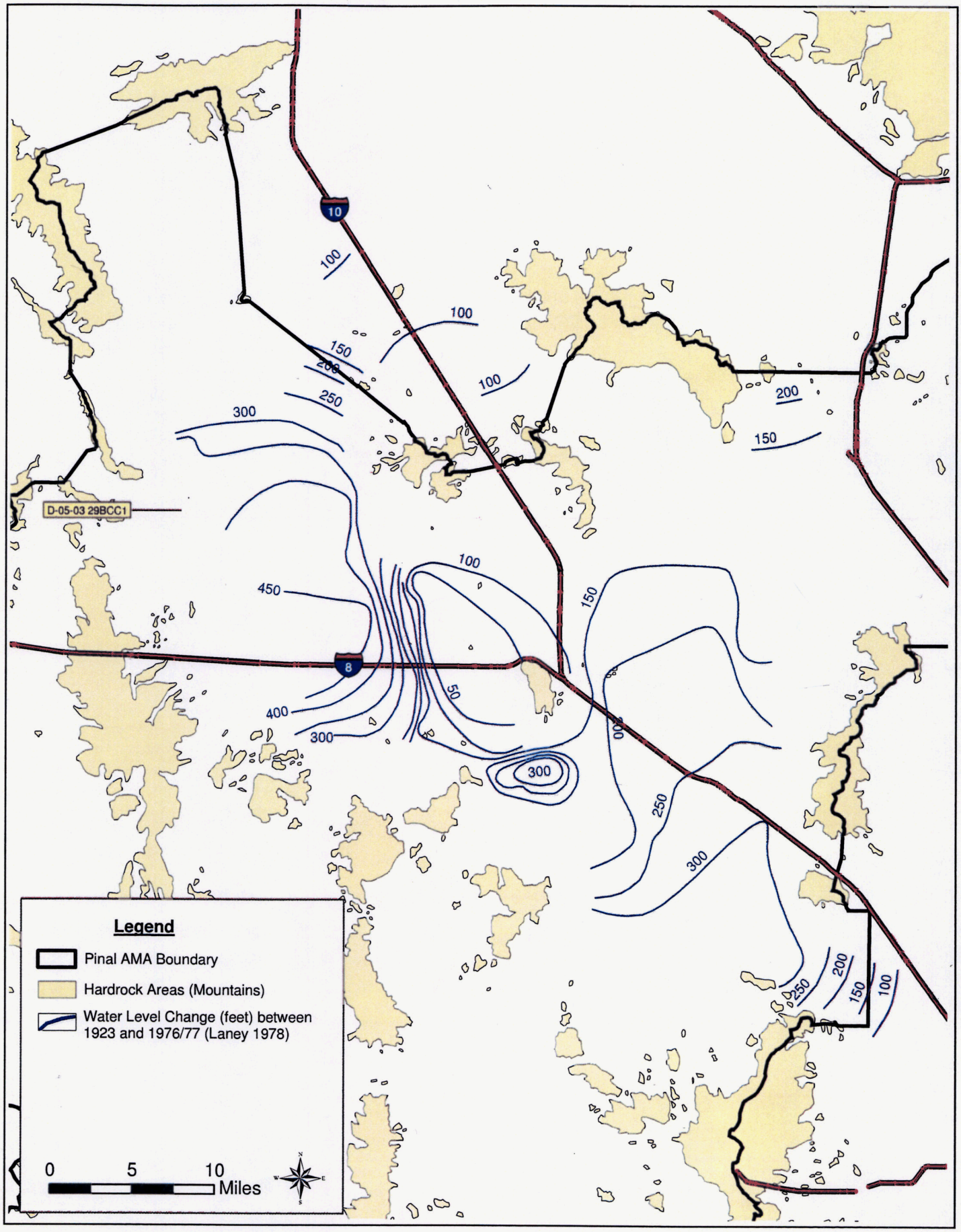
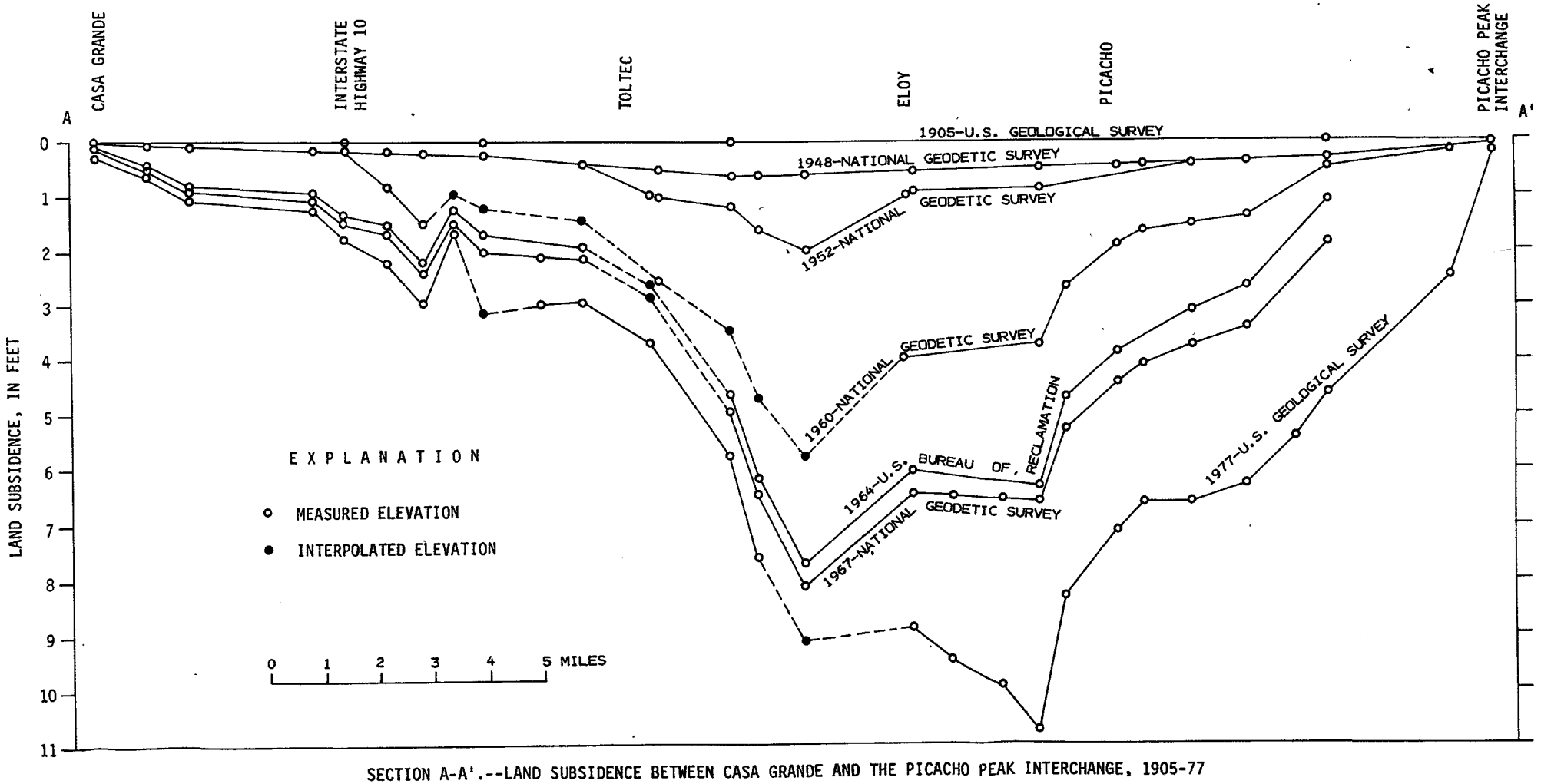


Exhibit 33. Water level change contours 1923 - 1977 (Source: Laney 1978)



SECTION A-A'.--LAND SUBSIDENCE BETWEEN CASA GRANDE AND THE PICACHO PEAK INTERCHANGE, 1905-77

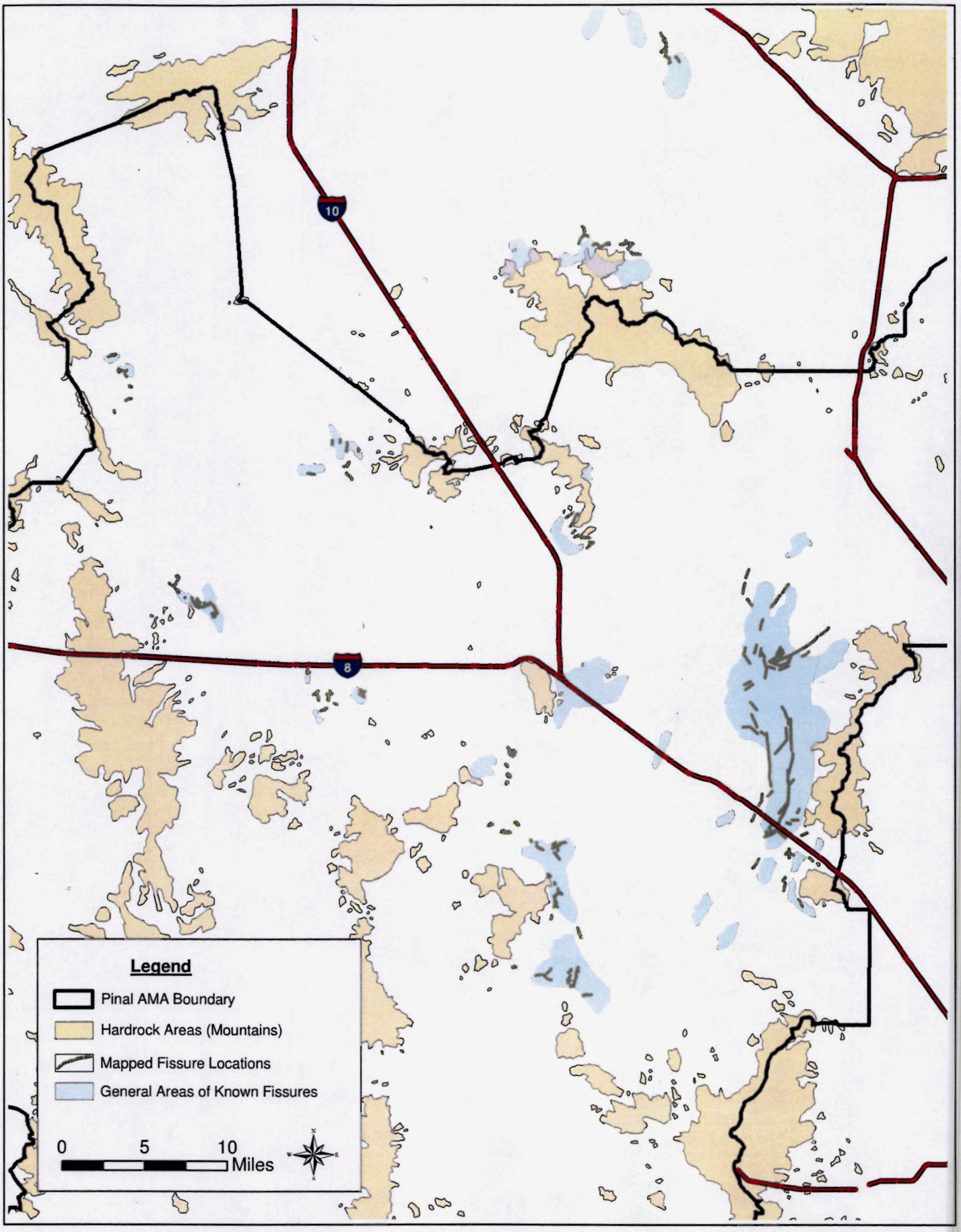


Exhibit 25. Subsidence and Fissure Locations (Source: Various)

Table 2 Comparisons of Pinal AMA Renewable Water Budget

Water Budget Components	ADWR					B&N				
	Long Term Average	Range of Values				Long Term Average	Range of Values			
Inflows (AFY)										
Underflow	***57,350***	32,700	to	81,700		***57,350***	32,700	to	81,700	
Major Drainage Recharge[1]	***28,200***	17,800	to	39,500		***28,200***	17,800	to	39,500	
Ungaged Tributary Inflow	***3,000***	750	to	5,250		***3,000***	750	to	5,250	
Mountain Front Recharge	***1,000***	1,000	to	1,000		***500***	500	to	500	
Basin and Ephemeral Stream Recharge	***5,000***	5,000	to	5,000		***5,000***	5,000	to	5,000	
TOTALS	**94,550**	57,250	to	132,450		**94,050**	56,750	to	131,950	
Outflows (AFY)										
Underflow	***(11,800)***	(6,560)	to	(17,040)		***(11,800)***	(6,560)	to	(17,040)	
Net Long-term Renewable Supplies (AFY)	**82,750**	50,690	to	115,410		**82,250**	50,190	to	114,910	

Note: AFY = acre-feet per year; GRIC = Gila River Indian Community

1. Per the recommendation of this report, ADWR modified the method for estimating the Gila River recharge within the Pinal AMA, and provided the adjusted recharge estimate on November 22, 2004. Major drainage recharge has two components: the Gila River recharge and the Santa Cruz River recharge. For the Gila River recharge component, only recharge occurred along the Gila River stream reach of approximately 19.3 miles between the Ashurst-Hayden Dam and the Pinal AMA - GRIC boundary is included. The total estimate of the Gila River recharge is distributed non-linearly along the entire stream reach, and a greater percentage of river recharge is attributed to the upstream portion of the Gila River. For the Santa Cruz River recharge, the estimate does not include the effluent component released from Tucson AMA.

Long-term Water Budget

Projected Water Demand and Supply (2000-2099)

	2000	2004	2017	2025	2030	2040	2070	2099
WATER DEMAND								
Municipal & Industrial	33	35	42	47	50	56	73	90
Non-Indian Agriculture	773	773	778	773	773	650	600	600
Indian Agriculture	166	174	204	216	216	216	216	216
Canal ET	3	3	3	3	3	3	3	3
Canal Seepage	44	36	13	14	14	12	11	11
Total Demand	1,019	1,021	1,035	1,053	1,056	937	903	920
WATER SUPPLY								
Incidental Recharge	309	311	333	259	249	234	206	195
Net Groundwater Inflow	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5
Stream Channel Recharge	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
CAP Non-Indian Agriculture	280	250	200	150	150	0	0	0
CAP Indian Agriculture	98	95	104	107	107	107	107	107
CAP Municipal & Industrial	4	11	22	29	37	37	37	37
CAP In-Lieu (AWBA)	80	80	0	0	0	0	0	0
SCIP Surface Water	159	166	175	183	183	183	183	183
Other Surface Water	10	10	10	10	10	10	10	10
Effluent	13	14	17	19	20	22	29	36
Total Supply	1,010	994	918	814	813	650	629	625
OVERDRAFT	9	27	117	239	243	277	274	295
LTS Credits Accrued	(74)	(74)	0	0	0	0	0	0
Groundwater in Storage	30,657	30,478	30,149	28,598	27,301	24,640	15,678	7,449

Values in 1,000s of AF

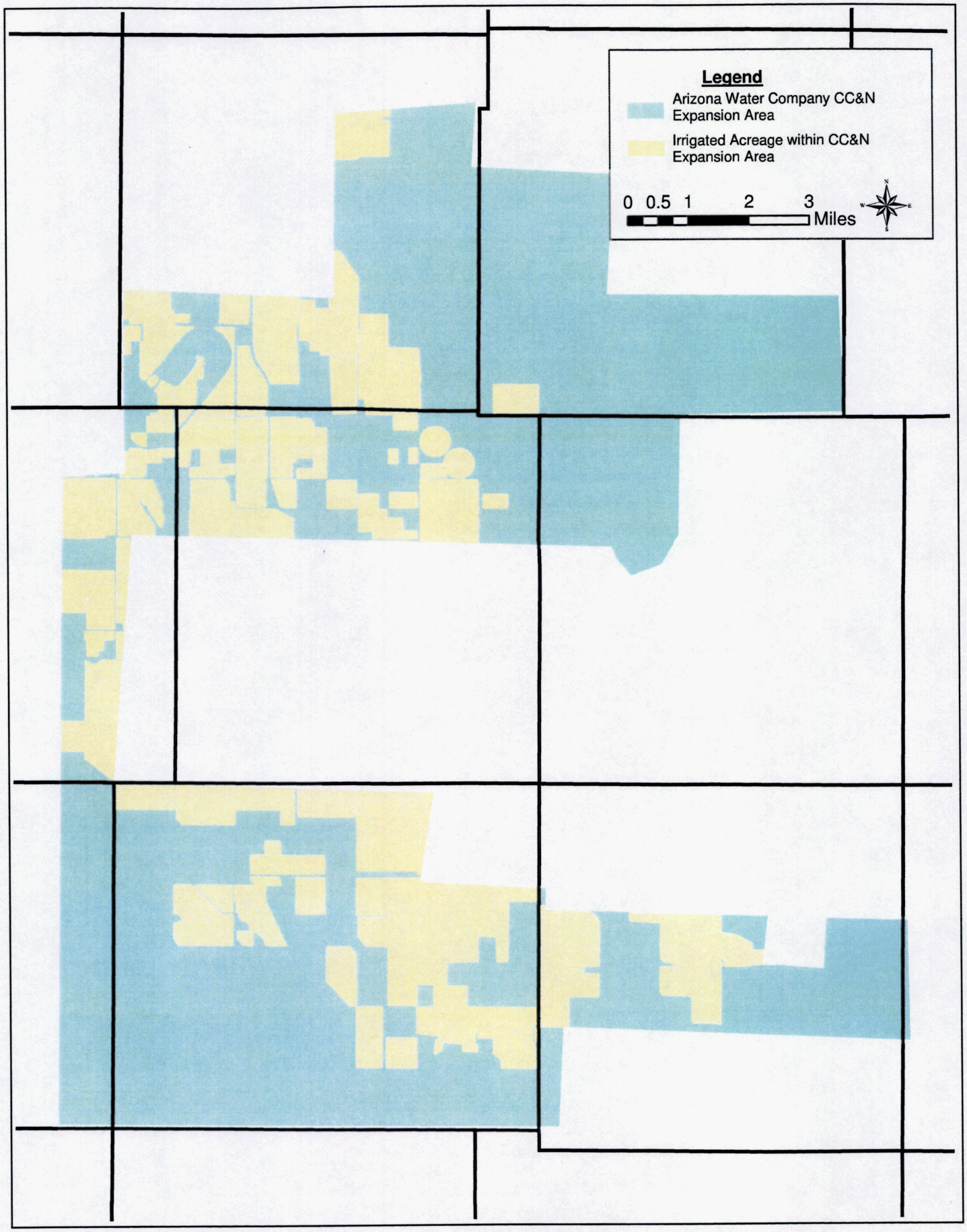


Exhibit38. Requested CC&N Designation by AWC (Source: ADWR GIS Data)

Exhibit 39. Requested CC&N Designation by Global (Source: ADWR GIS Data)

Estimate of Future Water Use for CC&N Expansion Areas

Entity	Acreage of Requested CC&N Expansion Contested Area (acres)	Total Buildout Water Demand (acre-feet)[1]	Portion of Total Demand Met by Direct Use of Effluent	Total Buildout Water Demand Potentially Supplied by Groundwater (acre-feet)	Current Irrigated Acreage within CC&N Expansion Area	Irrigation Withdrawals (2.8 a-f/acre)	Incidental Recharge (30%)	Irrigation Consumptive Use	Change in water Demand with Urbanization
Arizona Water Company	73,000	102,200	0.0	102,200	19,578	54,818	16,446	38,373	-63,827
Global Water Company	17,600	24,640	0.0	24,640	8,079	22,621	6,786	15,835	-8,805
Global Water Company	17,600	24,640	0.3	17,248	8,079	22,621	6,786	15,835	-1,413
Global Water Company	17,600	24,640	0.4	14,784	8,079	22,621	6,786	15,835	1,051

[1] Based on 3.5 du/ac, and 0.4 af/du

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
JEFF HATCH-MILLER- CHAIRMAN
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	)	DOCKET NO. W-01445A-06-0199
IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. SW-03575A-05-0926
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. W-03576A-05-0926

Direct Testimony of

Graham Symmonds

on Behalf of

Palo Verde Utilities Company and
Santa Cruz Water Company

January 26, 2007

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I. INTRODUCTION.

Q. Please state your name and business address.

A. My name is Graham Symmonds. My business address is 21410 North 19th Avenue, Suite 201, Phoenix, Arizona 85027.

Q. By whom are you employed and what is your position?

A. I am Senior Vice President of Operations and Compliance for Global Water Management, LLC ("GWM"). GWM manages both Palo Verde Utilities Company ("Palo Verde") and Santa Cruz Water Company ("Santa Cruz"). Palo Verde and Santa Cruz are ultimately owned by Global Water Resources, LLC ("Global").

Q. Please describe your education, background and experience.

A. I graduated from the University of Toronto with a Bachelors of Applied Science in Mechanical Engineering in 1985. I then joined the Canadian Navy in 1986, where I pursued post-graduate studies at the Royal Naval Engineering College in Plymouth, England. I served as the Deputy Engineering Officer in HMCS Annapolis from 1989 through 1991. Subsequent to that assignment, I became the Equipment Health Monitoring Officer for the Naval Engineering Unit Pacific, where I was responsible for condition-based maintenance assessments for all equipment used in west coast ships, as well as performing pre- and post-refit trials.

In 1995, I left the Canadian Navy and became a partner and Director of Operations for Hill, Murray & Associates, a design-build firm specializing in water reclamation facilities. In 2001, I joined Algonquin Water Resources of America as Director of Operations, responsible for the day-to-day operation of its utilities, including regulatory filings, growth management, plant operations and capital project planning and execution. Finally, I joined

Global Water Resources as a Senior Vice President of Operations and Compliance in 2003. I have been in the water, wastewater, and reclaimed water service business for over 12 years.

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

A. I will discuss the following topics in my testimony:

- I describe the proposed extension areas of Santa Cruz, Palo Verde and Arizona Water Company ("AWC").
- I explain the details of how Santa Cruz and Palo Verde intend to implement Global's triad of conservation. The triad involves (1) reclaimed water; (2) renewable surface water; and (3) recharging the aquifer with available excess water. I will provide examples of how we are already implementing the triad, and I will discuss our future plans to further implement the triad.
- I emphasize the importance of regional planning and how building regional facilities best addresses conservation goals, versus building facilities on a development by development basis. I will describe, in general, how regional planning applies to our plans for water treatment and production, distribution, collection, wastewater treatment and reclaimed water distribution.
- I describe our engineering plans for Santa Cruz's and Palo Verde's proposed extension areas.
- I demonstrate Santa Cruz's and Palo Verde's technical capabilities by introducing the engineering and operational staff that will be in charge of the day to day operations of the regulated utilities. I will also describe our compliance staff and system.
- I describe the efforts to obtain regulatory approvals for its planned facilities, including a modification to Santa Cruz's Designation of Assured Water Supply ("DAWS") from the Arizona Department of Water Resources ("ADWR") and amending the 208 Regional Water Quality Management Plan.

- I critique AWC's engineering plans for its proposed extension area.
- I comment on Staff's engineering memorandum.
- I introduce additional items that support Santa Cruz's and Palo Verde's Joint Application, such as the legal description and maps.

II. PROPOSED EXTENSION AREAS.

Q. Please describe the service area requested in Santa Cruz's and Palo Verde's Joint Application.

A. Santa Cruz is applying for an extension area of approximately 19,373 acres. Palo Verde is applying for an extension area of about 25,554 acres. Part of Palo Verde's extension area is within AWC's certificated area for water service. This is the reason Palo Verde's requested extension area is larger than Santa Cruz's requested extension area.

The map I have attached as Appendix 1 shows the areas Santa Cruz and Palo Verde are requesting, as compared to the extension area AWC is seeking. Our requested extension areas are generally to the south and east of Santa Cruz's and Palo Verde's existing certificate areas. In addition, our requested extension areas are contiguous to the existing certificate areas of our affiliates, Francisco Grande Utility Company ("Francisco Grande") and CP Water Company ("CP"). As explained in Mr. Hill's testimony, Global recently acquired Francisco Grande and CP. AWC's requested extension area includes all of Santa Cruz's requested area, as well as a very large additional area. In total, AWC requests an extension of 70,494 acres.

Q. How many customers do you expect in Palo Verde's and Santa Cruz's extension areas?

A. Growth in the Maricopa-Casa Grande area remains strong – a testament to the fact that integrated, available water and wastewater infrastructure are conduits for successful managed growth. After 5 years of operations in this service area, we anticipate that there will be 9,464 water customers[1] and 10,514 wastewater customers in our requested extension areas. We anticipate that the build out capacity for our requested extension areas is 67,804 water customers for water services and 89,437 wastewater customers.

III. IMPLEMENTING GLOBAL'S TRIAD OF CONSERVATION.

Q. Please describe how Santa Cruz and Palo Verde will implement its triad of conversation for their requested extension areas.

A. The triad of conservation involves (1) maximizing use of reclaimed water; (2) using renewable surface water where available; and (3) recharging the aquifer with any available excess water. The triad's purpose is to minimize the use of scarce groundwater, thus ensuring that development is and environmentally sustainable. Let's look at each of these in turn. Each water source has its place in today's environment, but broadly I categorize them as follows:

1. Groundwater – a depletable, dwindling resource
2. Surface Water – a depletable but renewable resource
3. Reclaimed Water – a perpetual, increasing resource

The key to sustainability is the appropriate water source for the task at hand.

[1] As used in this paragraph, "customers" means "equivalent dwelling units".

Reclaimed Water

Reclaimed water is an essential resource that has many uses. We produce Class A+ reclaimed water – the highest quality: fully denitrified, filtered and disinfected. In fact, this water is required to meet the Aquifer Water Quality Standards (AWQS) as defined by ADEQ. This high quality allows for a multitude of uses. For example, a key use is for irrigation of common areas, medians, parks, golf courses and school fields. In addition, reclaimed water can be used for recreational impoundments such as lakes and fountains. Class A+ reclaimed water is suitable for toilet flushing. It is suitable for irrigation of food crops and for spray irrigation in areas of probable human contact. As such reclaimed water can and must take the place of potable water for as many non-potable uses as possible. It is simply imprudent to use scarce groundwater for such purposes when reclaimed water is available. Furthermore, employing recharge as a mechanism for storing excess reclaimed water and counteract the seasonality of the water demand, has a dramatic impact on the use of groundwater in the area. The use of reclaimed water for uses where traditionally potable water or ground water were employed can save as much as 0.16 to 0.20 acre-feet of water per dwelling unit per year. These numbers are staggering considering new developments are seeing residential demands in the order of 0.35 acre-feet per dwelling unit per year.

Water reclamation facilities are the wastewater treatment plants that produce this reclaimed water. That nomenclature, however, belies the true purpose of the facilities: they are water factories, taking raw wastewater and producing reclaimed water. Homeowners associations and other customers will use reclaimed water to irrigate common areas for parks, schools and golf courses. A separate network of pipes, independent of the water and wastewater pipes, and distinguished by their purple color, will deliver this reclaimed water to integrated irrigation impoundments at developments and golf courses, to commercial

and industrial facilities, to residential lots for outside irrigation and ultimately for residential direct re-use.

The reclaimed water is metered and customers are billed for the reclaimed water they use. Finally, any excess reclaimed water not used can be recharged and stored underground for future use.

At some point in the future, you will see reclaimed water being fed directly back to the water treatment facilities. While not an aspect of this application, it is only a matter of time before the strain placed on water resources – particularly in arid areas – will require innovative and novel solutions such as direct-to-potable-re-use.

As a means of encouraging reclaimed water acceptance, Global has partnered with the United States Department of Agriculture ("USDA") to assess the microbial action of soil bacteria under reclaimed water, and to assess impact of salt etc on plants. In addition, USDA has an entire cell dedicated to the development of salt tolerant plants that can find their way to the lawns and gardens of consumers. With our cooperation, the USDA is installing an experimental site at our Campus 1 water reclamation facility to conduct research along these lines. USDA is even evaluating the potential microbes in soil moistened with reclaimed water to ensure greenhouse gases to reduce global warning.

THE IMPACT OF RESIDENTIAL USES OF RECLAIMED WATER

Class A+ Reclaimed Water can be considered as a direct replacement for potable water, employed in conditions where highly treated potable water is not required – for instance in the transport of waste material from toilets.

From a regulatory standpoint, the use of reclaimed water is well established. Indeed many states encourage reclaimed water use as a means of reducing potable water requirements. California, Florida, North Carolina, Washington, Texas and Arizona all encourage highest and best uses for reclaimed water that meets stringent quality standards. Most of these jurisdictions allow for commercial and residential irrigation, and for commercial/industrial toilet water flushing. The introduction of reclaimed water into homes for use as flush water requires a higher degree of scrutiny associated with the potential risk of accidental cross-connection. However, there are several methodologies that can be employed to alleviate this concern, including public awareness and education, coloration of reclaimed water, routine cross connection inspections etc. A review of jurisdictional reclaimed water regulations is provided at Appendix 2.

Review of Reclaimed Water Potential

Residential water use distribution can be broken down by category as follows (source EPA):

WATER USE DISTRIBUTION	
Indoor Use – 56%	
Kitchen	2.8%
Shower/Bath	17.4%
Toilet	24.6%
Cleaning	1.0%
Laundry	10.2%
Outdoor Use – 44%	
Swimming Pools etc	5.0%
Garden/lawns/washing cars/Construction etc	39.0%

From the above table, there are two categories that may be directly replaced by Class A+ Reclaimed Water: Toilet Flush Water; and Residential Irrigation. The impact of employing reclaimed water on the potable water consumption is dramatic.

The attached Appendix 3 demonstrates the impact of residential reclaimed water use on potable water demand under five scenarios:

State		Description	Potable Water Demand		Overall Demand
Scenario 1	Non-Integrated Utility	All water supplied via potable water system. No reclamation activities.	9323 Gallons per DU per month	0.3433 AF/yr	0.3433 AF/yr
Scenario 2	Integrated Utility	Reclaimed water supplied for common area irrigation	6249 Gallons per DU per month	0.2301 AF/yr	0.3433 AF/yr
Scenario 3	Integrated Utility	Reclaimed water supplied for common area irrigation and for Residential Irrigation	3834 Gallons per DU per month	0.1412 AF/yr	0.3433 AF/yr
Scenario 4	Integrated Utility	Reclaimed water supplied for common area irrigation and for Residential Irrigation and for Toilet Flushing. Theoretical maximum re-use opportunity.	2326 Gallons per DU per month	0.0857 AF/yr	0.3433 AF/yr
Scenario 5	Integrated Utility	Reclaimed water supplied for common area irrigation and for Residential Irrigation and for Toilet Flushing. **Most probable reduction goal**.	4288 Gallons per DU per month	0.1579 AF/yr	0.3433 AF/yr

Scenario 2 represents Santa Cruz's current reclamation status. Scenario 4 represents a theoretical maximum deployment of reclaimed water. In large-scale, municipal

deployment of reclaimed water, a more likely water reduction will be in the 40 to 70% range, as depicted in Scenario 5 where the reduction is 55%.

Graphs showing these scenarios are included as Appendix 4.

Impact of Commercial Uses of Reclaimed Water

Commercial recycling initiatives can yield much greater reductions in potable water consumption than residential applications. The reason for this is that commercial activities are primarily focused on waste transport – there are usually not significant potable water consumption activities occurring in commercial (schools, office buildings etc) facilities.

Typically a commercial facility can see a reduction in the order of 80 to 90% of the potable water consumption when toilets and urinals are supplied with reclaimed water.

Reclaimed Water as a Perpetual Right

Employing reclaimed water as flush water and for other "internal" uses, allows for the permanent offset of potable demand. As such, it represents a perpetual right of the utility – once charged, an internal-use reclaimed water system is self sustaining as the production capacity of reclaimed water exceeds the potential demand (only non-potable demands may be replaced).

In the case of residential/commercial uses, wastewater sources include:

- Toilets/Urinals
- Handbasins
- Drinking fountains

- Kitchen facilities
- Showers
- Floor drains
- Etc

As only (a) may be realistically serviced by reclaimed water, there is always an overage of wastewater from which to make reclaimed water for redeployment to the facility. In a residential application, this represents 44% of the water used. Assuming a demand of 210 GPD/DU, 117.6 of which is consumed inside the home, toilet flushing represents 51.7 GPD/DU. If this 51.7 GPD/DU is supplied by reclaimed water, 65.9 GPD/DU of potable water is required. Notionally then, there is always 14.2 GPD/DU "excess" water to be used for make-up purposes.

As a result, the reclaimed water system is naturally "topped up" and all reclaimed water consumed is returned for re-use in the system once again after having been treated, filtered and disinfected.

Reclaimed water employed as irrigation supply represents a reduction in overall potable demand, but is a single use activity. Despite some incidental recharge, most of this water will be lost to evapotranspiration (plant uptake and evaporation). However, the savings represent in the order of 81.9 GPD/DU – or 39% of the water demand. This translates to a reduction in the amount of water treated, a reduction in the amount of water required to be physically proven.

Surface Water

Surface water is a renewable resource. The Commission should therefore encourage its use. While not an infinite source, as a leg in the triad stool and complementary to the

deployment of reclaimed water, its value cannot be overestimated. By employing a renewable resource, the overall impact of development on the disappearing groundwater is diminished.

We are building surface water treatment facilities which will treat water from the Central Arizona Project ("CAP") and other surface water sources. We can also blend surface water with groundwater to reduce arsenic treatment costs and complexity and thereby increase the use of poor quality water sources by way of blending and consolidated treatment. So surface water becomes a terrific additional source from which to produce potable water and thereby reducing groundwater pumping. In addition, excess surface water can be recharged and recovered later.

Recharge

Recharge involves adding – or in many cases, returning – water into the aquifer. Recharged water has several uses. It can be stored for later use through recovery wells. It can be used to offset groundwater pumping from other wells. A recharge facility essentially uses the aquifer as a giant storage tank. While technically challenging, the use of underground storage and recovery is an efficient method of combating the perennial problem of seasonality: that is, demand for reclaimed water exceeds supply in the summer months; conversely, in winter months, supply exceeds demand.

Q. Has Global implemented its triad of conservation in Santa Cruz's and Palo Verde's existing service territories?

A. Yes. We have taken a number of steps for each component of the triad. Regarding reclaimed water, we produce Class A+ reclaimed water and deliver it to integrated irrigation impoundments for use in irrigation of common areas, parks, medians, golf courses, school fields and similar uses as described above. These measures have already

achieved substantial results. Santa Cruz has one of the lowest water usages per customer of any private water utility in the state. And we are only getting started, as we plan to roll out further uses for reclaimed water as described above.

Regarding surface water, we are presently converting the 387 Wastewater Improvement District Water Reclamation Facility[2] to a surface water treatment facility. Design documentation has been completed and construction is scheduled to begin in the second quarter 2007. This facility should be completed by the first quarter of 2008

In addition to that facility, Santa Cruz is presently constructing a second surface water treatment facility in our south west service area. In the area under consideration today, we will also bring surface water to the region – a requirement not only of water conservation, but the generally poorer groundwater qualities encountered in the area.

Regarding recharge, we are planning a series of distributed recharge facilities throughout our service areas. Our south west service area treatment facility is permitted by ADEQ for recharge and we have recently applied for an area-wide recharge permit for the northern service area. This same plan will be followed in the extension area. In addition, an affiliated company (West Maricopa Combine) recently completed construction of a major recharge facility in western Maricopa County. This facility is adjacent to the CAP canal and the Hassayampa River. West Maricopa Combine has already entered into agreements with the Arizona Water Banking Authority to recharge water on their behalf, and is actively seeking other customers for its services.

Global is at the forefront of self-sustainability – recharging CAP water in the west valley, reclaimed water in the Maricopa/Casa Grande area, replacing groundwater with surface

[2] This facility never became operational, which contributed to the serious problems facing the 387 districts before Global took over.

water and reclaimed water, and deploying reclaimed water to the widest extent possible. It is these aspects of true water resource management which will maintain Arizona at the fore of the development cycle and sustainability – two goals so often at odds.

Q. How does Global, Santa Cruz and/or Palo Verde encourage customers to use reclaimed water?

A. Our plan has two stages. The first stage involves relatively easy measures. We have already implemented the first stage. For example, as part of the main extension process, Palo Verde requires developers to make provisions with storage impoundments to accept reclaimed water for reuse in their common areas. Palo Verde also imposes restrictions on the turf or type of vegetation planned in common areas so that less water in general is needed to irrigate these common areas. Analytically, Global determined that a turf area of 22% of the open space requirement will yield a nearly zero-sum water impact – provided that the elements of the triad are employed – reclaimed water, recharge activities and deployment of surface water.

Infrastructure the developers build is used to deliver reclaimed water from storage impoundments for those irrigation uses. The developments and/or HOAs will own this infrastructure. Palo Verde provides this service and bills customers based on the amount of reclaimed water used.

Stage two involves more difficult and advanced measures which we are actively exploring. One aspect of stage two is delivering reclaimed water to individual residential customers. Residential customers can use this water to irrigate their yards and for other uses. Global intends to actively plan and pursue Palo Verde providing pressurized reclaimed water service to residential customers in new developments starting in 2008. Global is working

towards developers building the infrastructure so that reclaimed water can be delivered directly to residential customers.

In addition, reclaimed water can be used as a source of water for cooling and process water for certain industrial purposes, and may also be used to flush toilets and urinals inside public, commercial and industrial buildings. Our new Global Water administrative building in Maricopa located at our Campus 1 WRF will employ this methodology of water conservation.

Q. Do you have any final comments about Global's plan to implement its triad of conservation for Santa Cruz and Palo Verde?

A. Global, Santa Cruz and Palo Verde are at the forefront of water conservation activities in Arizona. We are actively encouraging the highest and best use for all water sources and demonstrating a commitment to reducing the use of scarce groundwater. Reclaimed water is at the fulcrum of Global's plan for water conservation. Santa Cruz and Palo Verde will continue to develop and enhance a network of facilities to maximally employ reclaimed water for irrigation and explore additional uses. Santa Cruz will also treat and use surface water to supplement groundwater for potable sources to ensure reliability of the water supply and preserving groundwater and the aquifer for future generations. Surface water treatment facilities are planned for the South East Service Area. Finally, recharging reclaimed water is a key component of the triad and we will develop recharge facilities for this area. Global, Santa Cruz and Palo Verde believe their record in promoting water conservation is unmatched and is a big reason why Santa Cruz and Palo Verde should be awarded their respective CC&N extensions requested in their Joint Application.

IV. REGIONAL PLANNING

Q. Why does regional planning make sense when implementing water conservation measures?

A. To implement conservation measures efficiently and effectively, regional planning is essential. Building the water reclamation facilities and surface water treatment facilities requires a lot of up-front capital costs. It is not cost-effective to build these facilities on a development-by-development basis or to attempt to enforce water reclamation policy through an *ad hoc* deployment of facilities. The deployment of reclaimed water systems requires that a business application be forwarded to ensure maximum use. Small scale systems are simply undercapitalized to achieve the necessary distribution network. Regional planning allows Global, Santa Cruz and Palo Verde to plan for conservation while accommodating future growth.

Q. Will regional planning for facilities also provide additional benefits like economies of scale?

A. Yes. Planning for facilities on a region-wide basis, versus a development-to-development basis will allow Santa Cruz and Palo Verde to coordinate the timing of constructing these facilities, as development fills in throughout a certain area. Therefore, the costs are shared by multiple developments for these regional facilities. Since the costs are spread across multiple developments and because the facilities themselves are more efficient when designed as part of a regional plan, economies of scale can be achieved. Regional planning also provides the following additional benefits to water treatment and production, distribution and collection, and wastewater treatment:

- Santa Cruz can take advantage of centralized treatment and distribution facilities, while minimizing the need for raw water piping. This includes clustering wells around treatment facilities. Regional planning allows Santa Cruz to identify

locations where centralized treatment can provide the most advantage to customers within its service territory.

- Santa Cruz can deploy water treatment infrastructure in a phased approach to meet demand. Surface water treatment facilities can also be deployed in a similar manner.
- The cost difference between large-scale infrastructure and small-scale is really is insignificant when considering materiel alone. By enforcing a regional plan where all development is considered, substantial savings are made in the requirement for retrofitting or duplicating existing pipeline infrastructure. For instance, Palo Verde installs sewer mains in the order of 48" in diameter – clearly larger than required for any single development. But by doing so, Palo Verde can ensure that wastewater flows by gravity to Regional Water Reclamation Facilities reducing deployment and operating costs.
- Palo Verde can install reclaimed water lines and sewer lines along the same alignments to save construction costs.
- Regional planning maximizes the gravity potential for wastewater collections systems – larger pipes at deeper depth will eliminate or at least substantially reduce the number of lift stations scattered throughout the service area. This saves on power costs, equipment costs, odor control costs and labor.
- Regional planning also eliminates the NIMBY (not in my backyard) problem associated with the siting of water reclamation facilities. By defining where and when treatment facilities are located, setbacks can be assured, and appropriate development plans made to reduce direct abutment of treatment facilities to residential areas.
- Palo Verde can design and construct water reclamation facilities to produce Class A+ reclaimed water that can then be reused for several purposes. Inefficient package plants cannot treat wastewater to produce this quality of reclaimed water

as cost-effectively, let alone producing this quality of reclaimed water. Like with water treatment facilities, these water reclamation facilities can be located to provide the maximum benefit to the entire area as growth continues to occur.

- Regional planning also naturally leads to standardization – of treatment systems, of equipment, of training, of expertise. All of these have a direct impact on the efficient operations of the utility.

Q. How do Francisco Grande and CP fit into Global's regional plan?

A. They show the benefits of regional planning. The large "Legends" development by D.R. Horton is partially located in the Francisco Grande and CP certificate areas. D.R. Horton is proceeding rapidly with Phase I of Legends. Phase I is within the Francisco Grande certificate area. Francisco Grande essentially had no infrastructure of its own when we acquired it, yet Legends urgently needs service. We are able to meet these demands by utilizing existing capacity of Palo Verde and Santa Cruz – the benefit of deploying infrastructure at a regional scale is clearly evident when large developments can effectively be "snapped-on" with little or no retrofit work.

AWC seems to argue that its requested extension area is a natural extension area for them. Yet their extension area does not lie in-between their existing certificate areas. In contrast, our requested extension area lies largely between our existing Santa Cruz and Palo Verde certificate areas, and our existing Francisco Grande and CP service areas.

Much of our requested extension area falls between Francisco Grande and the existing certificate areas of Palo Verde and Santa Cruz. It would make little sense to interconnect Francisco Grande and existing Santa Cruz and Palo Verde systems without also tying in our extension areas in this case. Service is needed in our extension area, as shown by the requests for service we received for 100% of the extension areas.

Our requested extension area will allow us to integrate Santa Cruz, Palo Verde, Francisco Grande and CP into a seamless regional system. Our customers will benefit from the economies of scale that can be achieved, as well as the robustness that such a large, interconnected system will create.

V. ENGINEERING PLANS

Q. Please give use an overview of the engineering plans for the Santa Cruz and Palo Verde extension areas.

A. Details of our engineering plans are shown on Exhibit 6 to our application filed on December 28, 2005, which I incorporate by reference.

Q. How will Palo Verde serve this area?

A. Initially, we will provide service through our existing "Campus 1" water reclamation facility, which is located in Palo Verde's existing certificate area. The Campus 1 facility has a current constructed capacity of 3.0 million gallons per day ("MGD") and a permitted capacity of 9.0 MGD

Once there is sufficient demand, we will introduce additional water reclamation facilities directly into what we call the South East Service Area. These facilities will be phased in as growth occurs within the South East Service Area. For instance, we already plan on building a new water reclamation facility within the South East Service Area to meet expected growth. We expect to complete this facility in 2009 – depending on the absorption rates. Again the beauty of regional planning is that the maximum use of available infrastructure is driven by design into the plan. This eliminates the "lost leader" potential or the over extension of utility systems in areas where development decelerates.

These facilities also will be very similar to facilities already in existence or being constructed by Global. By having standardized facilities, operators who are trained to use one water reclamation facility will be essentially trained for all of Palo Verde's water reclamation facilities. In addition, most parts will be interchangeable, so that a part for one reclamation facility can be used with all of Palo Verde's other reclamation facilities. Moreover, having a standardized design saves on design saves on engineering, design, permitting and construction costs.

Q. Will Global also construct standardized surface water treatment facilities throughout Santa Cruz's service area?

A. Yes. The same concept will also apply to surface water treatment facilities that Global is planning to construct in Santa Cruz's service area. Santa Cruz has already developed a standardized water treatment facility. This standardized design is already in the final approval stages for the existing North Service Area, and will be used in the recently approved Southwest Service Area. So the treatment processes and equipment will be the same for all three service areas. These surface water facilities will take advantage of the availability of Central Arizona Project or CAP water.

Q. Will Santa Cruz initially provide service to the extension area using existing facilities to the north?

A. Yes, the concept is the same. Santa Cruz will use excess capacity in its existing treatment and production facilities to provide service until sufficient demand exists to justify building additional capacity in the South East Service Area.

Q. Can you describe in further detail how Santa Cruz and Palo Verde will implement the triad of conservation over the near- to intermediate-term in the South East Service Area?

A. We intend to have Santa Cruz and Palo Verde take advantage of whatever existing facilities are present in the early phases, so that this existing infrastructure is maximally used while also maintaining flexibility for addressing growth as it occurs into Santa Cruz's and Palo Verde's service territories. The deployment of surface water as both a source of potable water production and make-up water for reclaimed systems will dramatically reduce the amount of groundwater required for the extension area.

As I mentioned above, we are also planning to interconnect the South East Service Area with the Campus #1 water reclamation facility so that wastewater can be immediately treated to produce Class A+ reclaimed water. The Palo Verde North Campus 1 water reclamation facility will be expanded to a capacity of MGD to meet the additional flows coming from the South East Service Area. Also, new surface water treatment facilities located in other parts of Santa Cruz's service territory will be interconnected with the South East Service Area so that this area can take advantage of CAP water availability and other surface water sources. Eventually, as growth occurs in the South East Service Area, we will construct new facilities for both reclaimed water and surface water.

Q. You used the term "campus." Please explain.

A. Santa Cruz and Palo Verde refer to their different treatment and reclamation locations as "Campus 1", "Campus 2" and so on.

Q. Where will the CAP water come from?

A. This CAP water will be provided, in part, through the Maricopa-Stanfield Irrigation and Drainage District ("MSIDD") canal system. This CAP water can prove especially useful

to blend with groundwater high in arsenic. This has the potential of dramatically reducing the amount of water required to be withdrawn for potable purposes. The reason for this is simple: direct groundwater treatment systems typically require the supply of more water than is produced for consumption. For example – a reverse osmosis treatment system requires a minimum of 25% additional water – that is 1.25 gallons of water are required to produce 1 gallon of potable water. By blending with surface water – all water supplied makes its way to potable production. The EPA's Filter Backwash Rule allows that surface water treatment facilities may recycle filter backwash to the inlet side of the treatment facility thereby increasing the water efficiency of the system.

Q. What percentage of water provided to customers will ultimately come from surface water sources?

A. Global expects, and is planning for, the provision of up to 50 percent of water supplied by Santa Cruz to customers will be treated surface water.

Q. What are the plans to develop and construct recharge facilities in the proposed extension area?

A. Global is presently evaluating the South East Service Area for recharge wells. These will be a combination of vadose zone wells and deep injection wells. We anticipate following the same methodology as established in our other service areas – recharge systems will be deployed at the water reclamation sites, at eh water distribution sites and at other utility owned properties. We expect that ADEQ will permit the system in an Area-Wide recharge permit, allowing maximum flexibility.

Q. Does Global, Santa Cruz and Palo Verde expect there to be reclaimed water available for recharge?

A. Yes. At build-out we expect that there will be excess reclaimed water available for recharge during the winter months. Demand for reclaimed water is highly seasonal. This is because less water is used for irrigation in the winter. Thus, in the winter there is likely to be excess reclaimed water available for recharge.

Q. What about the new water reclamation facility planned for the South East Service Area?

A. The planned water reclamation facility within the South East Service Area will be constructed at the Campus #3 location at the Northwest corner of Section 27, Township 5 South and Range 4 East. This water reclamation facility at Campus #3 will ultimately treat wastewater from the South East Service Area. By the time wastewater flows reach 1.0 MGD, the first phase of the Campus #3 water reclamation facility will be available for service. This phase has the capacity for up to 3.0 million gallons per day. Subsequent phases will then be constructed based on the needs in the area.

Q. What facilities are planned to treat and distribute water in the South East Service Area?

A. We plan to construct the Southeast Water Distribution Center soon after Certificates of Convenience and Necessity ("CC&Ns") are granted to Santa Cruz and Palo Verde. Further details are included in our response we filed on April 6, 2006 to Staff's request for further information on February 8, 2006. I incorporate this response by reference into this testimony.

The Water Distribution Facility will treat groundwater and will include the storage and booster tanks needed to distribute potable water to Santa Cruz's customers in the South

East Service Area. Santa Cruz expects to replicate the existing Campus 1 Water Distribution Facility at Rancho El Dorado, which includes two 1,500,000-gallon storage tanks, two 5,000-gallon hydro-pneumatic tanks and six booster pumps. Santa Cruz will use liquid sodium hypochlorite to disinfect water.

Q. Will additional wastewater facilities be built so that Palo Verde can transport wastewater to existing water reclamation facilities for treatment?

A. Yes. Naturally, some new facilities will be built to transport the wastewater from the South East Service Area to existing Palo Verde facilities as the initial wastewater solution. We will build an influent lift station and a 3.5-mile force main to transport wastewater from the South East Service Area to Palo Verde's Campus 1 water reclamation facility.

Q. Can you please provide some additional specifics about Palo Verde's current and planned water reclamation facilities?

A. These water reclamation facilities produce Class A+ reclaimed water for use as irrigation in common areas. These are facilities designed on a regional basis and are a key component to implementing water conservation and supporting the use of reclaimed water. Other features of these water reclamation facilities include having totally enclosed process tanks, odor control facilities and aesthetic controls consistent with surrounding architecture. We also use noise abatement systems in our design and construction of these water reclamation facilities. For the proposed water reclamation facility at the Campus #3, the site is suitable to accommodate a 350-foot setback around the entire facility at its ultimate build out capacity of 13 MGD.

Q. Please provide further information about how facilities will be phased in.

A. Attached as Appendix 5 is a graph showing how wastewater capacity will be added to correspond to growth in the extension area. Attached as Appendix 6 is a similar graph for water capacity.

VI. WATER SUPPLY AND QUALITY

Q. How will Santa Cruz go about securing water supplies for the South East Service Area?

A. Santa Cruz requires that property owners surrender their irrigation grandfathered rights when they contract with Santa Cruz for service. Furthermore, we did an extensive review of available wells in the South East Service Area and found that several high production wells are available that would be eligible for rehabilitation. Rehabilitating and converting these wells into potable water supply wells will minimize initial capital costs.

Q. Please explain further.

A. Out of the total amount of currently-existing wells in the South East Service Area, there are 29 wells that have potential for rehabilitation and conversion into production wells for Santa Cruz. 23 of these wells were irrigation wells and 6 of the wells were domestic wells. In particular, 13 of the irrigation wells look the most promising as high producers. Santa Cruz plans to convert into wells that Santa Cruz could use to provide potable water to customers. These 13 wells produce 17,250 gallons per minute ("GPM"). At build out, only 11,800 GPM will be needed. So, Santa Cruz believes these wells will more than adequately provide the water supply needed to serve this area. Initially, Santa Cruz will put into place a minimum of two sources of water generating at least 3,000 GPM before commencing service.

In response to further information Staff requested on April 28, 2006, we provided the specific locations of the 13 most promising wells currently undergoing a more detailed appraisal to convert to potable water wells. That information was provided May 8, 2006, and I incorporate it by reference in this testimony.

Q. Please describe how these wells would be rehabilitated and converted into production wells for potable wells.

A. Santa Cruz employs a three-phased approach to evaluating the existing wells in the South East Service Area:

1. Review of available ADWR and ADEQ data and a physical assessment of wells;
2. Analytical sampling of flow rates and quality, using depth-specific sampling and spinner logs; and
3. Installing sanitary seal, re-screening, renewal of electrical control system, installation of SCADA control system and new source approval.

Global contracted Clear Creek & Associates to execute Santa Cruz's three-phase evaluation of all the wells in the area to determine suitability for conversion to potable water wells. Using this approach, Santa Cruz identified the wells that would be suitable for conversion. Assuming Santa Cruz's and Palo Verde's Joint Application is approved, Santa Cruz will commence converting some of the wells it has identified to use as potable water wells. A copy of Clear Creek's preliminary report was included our Joint Application.

With regards to water quality, the four areas of concern are with arsenic, fluoride, nitrates and total dissolved solids ("TDS"). Each of these elements can be treated with well rehabilitation, well head treatment, centralized treatment, slipstream treatment, blending with other groundwater supplies or blending with surface water supplies. The specific type of treatment is totally dependent on the source water quality and the particular chemistry of the water.

Q. Are there other methods Santa Cruz will explore to address water quality issues?

A. Yes. In addition to rehabilitating and sealing high quality wells in the service area to reduce the likelihood of contaminants, Santa Cruz will also employ the following strategies:

- Blending higher quality water to ensure compliance with the Safe Drinking Water Act and Arizona Administrative Code. Current review of available data shows sufficient water of good quality to execute a blending plan operation, if needed.
- Further modifying existing wells to isolate areas of high contaminant concentration and to access higher quality water.
- Explore surface water treatment options, like treating CAP water obtained through the MSIDD canal system I mentioned earlier in my testimony.
- Provide slipstream treatment processes in conjunction with an effective blending plan.
- Provide full scale treatment of groundwater.

All of these methods can be used to ensure excellent water quality for Santa Cruz customers, but water quality appears to improve moving eastward in the aquifer. Therefore, extensive water treatment may not be needed – particularly with the introduction of surface water. Santa Cruz may initially perform some blending to reduce levels of some contaminants. And Santa Cruz is prepared to install, operate and maintain any additional treatment processes required to ensure water quality.

Q. How will Santa Cruz deal with treating water so that it meets the new arsenic standard put forth by the Environmental Protection Agency?

A. Santa Cruz will meet the current arsenic standard through judicious application of surface water, well rehabilitation, blending, and treatment.

Q. With these wells, will Santa Cruz have any issues meeting flow requirements, including fireflow?

A. No. Santa Cruz's well-selection process includes rehabilitating wells that will allow it to provide a maximum day flow of 495 gallons per unit per day, a peak-hour flow of 0.58 GPM/DU and a fireflow meeting the requirements of local authorities having jurisdiction (1,000 GPM at 20 pounds per square inch ("psi") for one- and two-family residences and 1,500 GPM at 20 psi for other dwellings). Firm capacity will be sufficient to meet the maximum daily demand of 11,800 GPM at build out, even with the largest well out of production.

Q. How does the triad of conservation fit into production and flow requirements?

A. The triad strategy dramatically reduces our need for groundwater. The above discussion demonstrates that we could meet all production and flow requirements with groundwater alone. However, in actuality, the need for groundwater will be much less. As I have explained, we will be deploying surface water to the extension area, which will directly reduce the need for groundwater. In addition, the use of reclaimed water sharply reduces the demand for potable water. A surprising amount of potable water is used for irrigation purposes. So promoting the use of reclaimed water cuts the amount of groundwater we need to pump. Moreover, using reclaimed water for non-potable purposes, such as irrigation, means that we don't have to treat that water to a potable standard. It makes little sense to spend millions to cut arsenic levels by a few parts per billion, only to dump the expensive treated water on landscaping.

VII. TECHNICAL CAPABILITY OF SANTA CRUZ AND PALO VERDE.

Q. Please describe the engineering staff that will be in charge of ensuring that customers in this area receive safe and reliable service?

A. GWM has a number of highly qualified and experienced engineers on staff who will be involved in providing service. Attached as Appendix 7 are brief professional biographies of each of our senor engineers.

Q. Please describe the operational staff that will be in charge of ensuring that customers in this area receive safe and reliable service?

A. GWM has more than 100 capable employees, including many qualified operators. A list of our certified operators is attached as Appendix 8.

Q. How will Santa Cruz and Palo Verde ensure that they comply with any conditions the Commission orders in its decisions?

A. Global has established its own compliance section for its regulated utilities. This section exists outside the line organization and reports directly to me. The purpose is to allow the compliance department the freedom of impartiality and objectivity required to ensure Global systems are operated in accordance with their respective permits. This Compliance organization also assists our system in returning to compliance after any process upsets occur. This system works very well – this section was recently commended by ADEQ for timely, accurate and objective reporting.

This section focuses on ensuring that our regulated utilities comply with Commission rules and orders, as well as requirements of the U.S. Environmental Protection Agency, Arizona Department of Environmental Quality ("ADEQ"), Maricopa County Environmental

Services Department, Arizona Department of Water Resources ("ADWR") and other agencies.

Q. Do you know of any outstanding compliance issues with either Santa Cruz or Palo Verde?

A. No. I believe that Santa Cruz and Palo Verde are in full compliance with all Commission decisions. Further, I believe neither Santa Cruz nor Palo Verde has any outstanding compliance issues with ADEQ, ADWR or any other regulatory body.

VIII. REGULATORY APPROVALS.

Q. Will Santa Cruz apply to extend its current Designation of Assured Water Supply ("DAWS") to include the South East Service Area?

A. Yes. We have full confidence that we will receive a DAWS extension for the South East Service Area. As we all know, the availability of groundwater in the Pinal AMA is limited. In order to ensure water availability, the tenets of the Triad are very important – reduction in demand through reclaimed water and surface water deployment are mandatory aspects of the water supply equation.

Q. Will Santa Cruz also seek Approvals to Construct ("ATCs") from ADEQ?

A. Yes. Once the design work for the facilities is completed, Santa Cruz will apply for ATCs for the storage tanks and booster stations for the Water Distribution Center planned for the South East Service Area, and for the South East Service Area Surface Water Treatment Facility. Santa Cruz will also seek New Source Approval for any new wells brought into its potable water well inventory. Palo Verde already has an approved APP to 9.0 MGD in the North, and as such does not require further regulatory approval to expand. An APP will be required on start-up of the Campus 3 WRF.

Q. Please describe the efforts Palo Verde has made to seek an amendment to its Section 208 Water Quality Management Plan with the Central Arizona Association of Governments ("CAAG").

A. Palo Verde filed its proposed amendment to its CAAG 208 Plan in December 2005. This amendment encompasses approximately 288 sections, including the existing Palo Verde and Francisco Grande certificate areas as well as the South East Service Area which we are requesting in this case. The 208 amendment went through an extensive public process, which included involvement by Pinal County, Casa Grande, Maricopa, and the Ak-Chin Indian Community. This application was certified by ADEQ in January 2007.

Q. Will Palo Verde also have to apply to ADEQ for an Aquifer Protection Permit ("APP")?

A. Yes. Palo Verde will likely not complete the new Campus #3 water reclamation facility for until the fall of 2009. So, Palo Verde will likely file for an APP for this new water reclamation facility soon. Also, ADEQ requires consistency with the Section 208 plan and it would not have been prudent to have filed for an APP until after receiving approval for the Section 208 Plan amendment from CAAG.

Q. What other regulatory approvals may Palo Verde seek?

A. Because of Global's plan for reuse and recharge, Palo Verde will likely also apply for the following permits from ADEQ or ADWR:

- For recharge, Palo Verde is required to obtain an Underground Storage Facility permit. ADWR issues these permits that allows Palo Verde to collect recharge credits that may be applied against the water balance in the area. Palo Verde envisions having recharge facilities where water reclamation facilities are located.

- Palo Verde will facilitate end-users receiving Type 2 Reclaimed Water General Permits for A+ reclaimed water from ADEQ. That process includes public notification and signage requirements for areas employing reclaimed water.
- For its water reclamation facilities, Palo Verde will need to obtain air quality permits from Pinal County. As I described above, Palo Verde's water reclamation facilities include fully integrated odor control technologies.
- Palo Verde will also be required to obtain a Special Use Permit from Pinal County for the zoning of any water reclamation facility.

IX. ANALYSIS OF AWC'S WATER USAGE AND ENGINEERING PLANS.

Q. Have you looked at any information regarding how much groundwater AWC pumps?

A. We have reviewed AWC's ACC Annual Reports to establish trends in water usage across the region, and on a utility by utility basis.

Q. What comments do you have about AWC's groundwater pumping?

A. Based on our analysis, it appears that the average water use per customer in AWC's Pinal County operations ranges from 9000 GPD/DU to 17,500 GPD/DU (data derived from ACC Annual Reports).

Q. What about AWC's projected groundwater usage in its proposed extension area?

A. AWC's development plans are unknown at this stage.

Q. Has AWC put forth any plans to reuse reclaimed water or make arrangements with other entities to do so?

A. No. AWC has provided no plans to implement the reuse of reclaimed water for its proposed extension area. Indeed AWC's "master plan" includes potable water mains but does not show reclaimed water mains.

Q. What about surface water usage?

A. I am only aware that AWC discussed a CAP water treatment plant with an initial capacity of 10 MGD that will treat its Casa Grande and Coolidge CAP allocations. AWC discussed this plant in its last rate case for its Casa Grande and Coolidge divisions in Decision No. 68302. I do not know of any other surface water treatment facility AWC is planning that would provide a benefit to AWC's proposed extension area. By contrast, Santa Cruz is currently building surface water treatment facilities and will actively deploy surface water in the area.

Q. Does AWC have any plans to deploy recharge facilities in its proposed extension area?

A. Not that I am aware of. We issued data requests to AWC about this and other issues. AWC did not provide any specifics about deploying recharge facilities in its proposed extension area.

Q. AWC wants to provide stand-alone water rather than the integrated water, wastewater, and reclaimed water service provided by Santa Cruz and Palo Verde. Please comment on this from an engineering perspective.

A. From an engineering perspective, the decision to provide a water-only service is certainly cheaper in the short term. The problem of this short-sighted vision will not be immediately apparent, but will compound itself over time and result in an elimination of groundwater as

a supply for potable water. Moreover, the decision to eliminate the potential of reclaimed water is foolhardy at best and reckless at worst. Whilst the regulatory environment continues to seek a 100 year assured water supply – the question remains: what happens after 100 years? In order to address these issues in a true sustainable way, all sources of water need to be managed; and the appropriate quality of water used for the desired need.

By ignoring the potential of reclaimed water as a resource, AWC is sentencing its potential customers to treating substantially more water for the purposes of conveying waste. Without dual water systems, all water must meet potable standards. As the regulatory environment becomes more strict, and the levels of detection are pushed to nano-scopic levels, the costs of treatment to meet new and emerging contaminants of concerns will skyrocket. The reduction in the arsenic MCL is but the thin edge of the wedge in this regard – treating 100% of the water for endocrine disrupters, or personal care products, or perchlorate, or sulfate – is folly. We already know the water industry has been devoid of investment in infrastructure, and has been slow to accept that most of the infrastructure installed only 50 years ago is aging to the point of disrepair. Ignoring reclaimed water will simply exacerbate that issue – money spent treating new constituents cannot be spent on upgrading aging infrastructure. Reducing the volume of treatment required has a direct, real and immediately quantifiable impact on the cost of treatment.

Without integration, there is no benefit for a water company to participate in water conservation programs. Not only does it immediately reduce revenue, it reduces plant, rate base, and operating expenses. The very viability of a water-only utility is threatened by integration. An integrated utility receives benefit of water conservation by a realization of reduced wastewater treatment capacity and reduced potable treatment costs.

While many of those are intangibles, let's consider what the impact of a water only utility means in terms of infrastructure:

1. Greater demand for groundwater will require deep wells – and a higher power cost to bring it to the surface;
2. Higher volume of potable water delivered to customers means a higher overall treatment cost to meet the demand;
3. Greater demand from the aquifer to allow for water losses during treatment;
4. Treatment of all water to a potable standard – that means the water you flush down the toilet has just been treated to remove arsenic – or the next constituent on the horizon;
5. Higher costs in ensuring "firm" capacity – more wells are required to meet the demand;

X. CONCLUSION.

Q. Are there additional items attached to your testimony?

A. Yes. I have also attached the final legal descriptions for our requested extension areas. The Palo Verde extension area is shown on Appendix 10.

Q. Does that conclude your direct testimony?

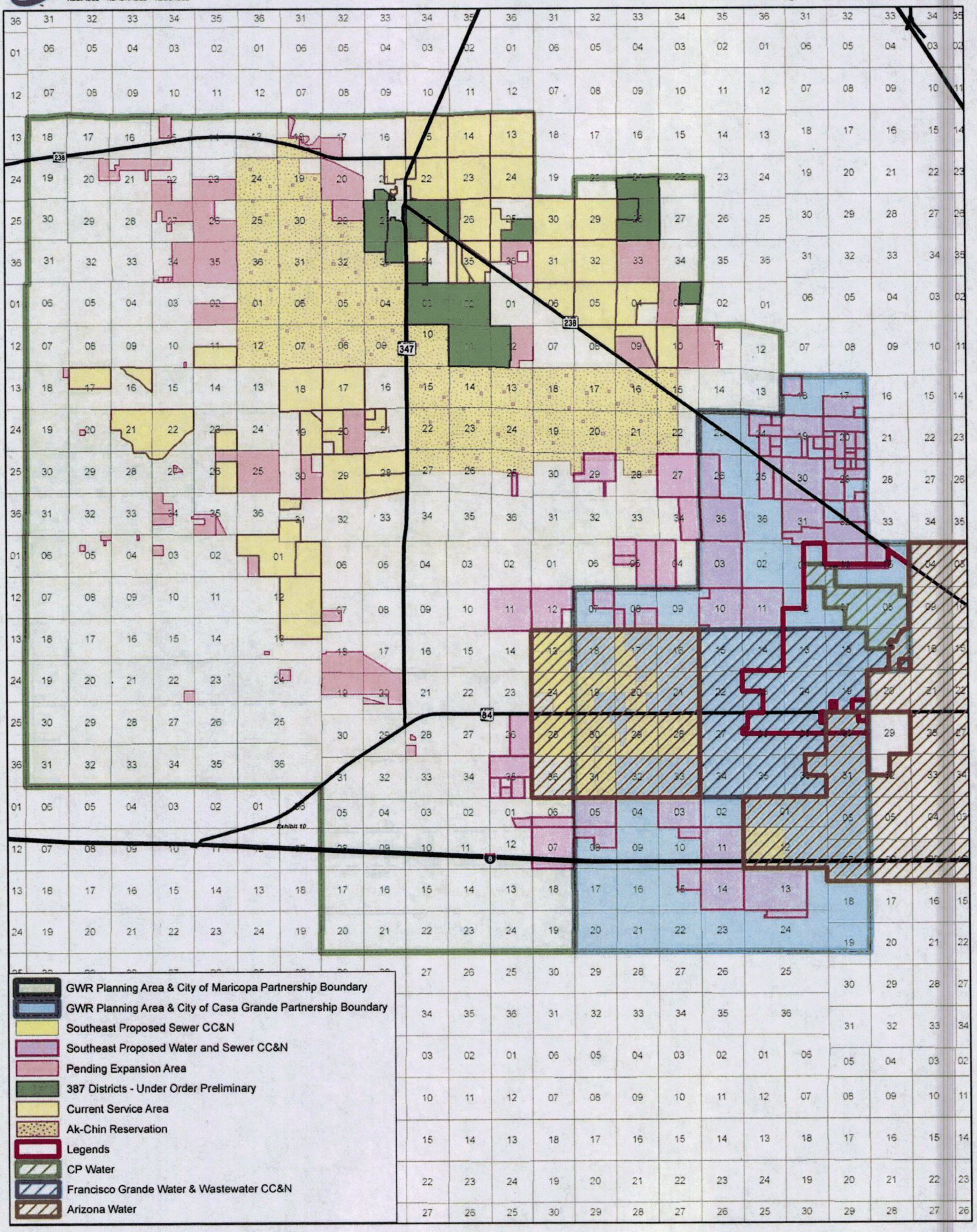
A. Yes it does.

EXHIBIT

"1"

GLOBAL WATER
RELIABLE · RENEWABLE · REUSABLE

Santa Cruz Water Company & Palo Verde Utilities Company
Current & Pending Services & Planning Areas



EXHIBIT

“2”

State	Reclaimed Water	Toilet Flushing - Commercial	Toilet Flushing – Residential	Residential Irrigation	Reference
California	Disinfected Tertiary Reclaimed Water	Yes	Yes	Yes	Title 22
Florida	"Reclaimed water", except as specifically provided in Chapter 62-610, F.A.C., means water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility.	Yes - Reclaimed water may be used for toilet flushing in motels, hotels, apartment buildings, and condominiums where the individual guests or residents do not have access to the plumbing system for repairs or modifications. Reclaimed water pipes shall be color coded.	No - Reclaimed water shall not be used for toilet flushing in any residential property or dwelling unit where the residents have access to the plumbing system for repairs or modifications.	Yes	62-610.476 Toilet Flushing and Fire Protection.
North Carolina	Reclaimed water is wastewater that has been tertiary treated and meets the States requirements found in the .0219(k) rules. Specifically, this water must meet strict effluent requirements for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), Ammonia (NH3), turbidity, and fecal coliforms. The intent of using reclaimed water is to reduce the use of potable water from public water supplies for processes such as irrigation.	Yes - Reclaimed water is has many uses, which include golf course and lawn irrigation, industrial cooling water, street cleaning, dust control, and decorate ponds or fountains. In addition, reclaimed water may be used for toilet and fire protection systems in buildings that have separate plumbing from potable (i.e., drinkable) water. Reclaimed water may not, however, be used to irrigate food crops, fill swimming pools, or be used as drinking water. Reclaimed water is a viable alternative to potable water for State approved uses, especially during drought periods.	Yes	Yes	
Washington	"Class A Reclaimed Water" means reclaimed water that, at a minimum, is at all times an oxidized, coagulated, filtered, disinfected wastewater. The wastewater shall be considered adequately disinfected if the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.	Yes - Section 11. Toilet and Urinal Flushing (a) Reclaimed water used to flush toilets and urinals in commercial or industrial facilities or buildings, hotels, and motels shall be at all times Class A reclaimed water or better. (b) Reclaimed water used to flush toilets in apartment buildings and condominiums where the residents do not have access to the plumbing system for repairs or modifications shall be at all times Class A reclaimed water or better.	No - Reclaimed water shall not be used to flush toilets in any residential property or dwelling unit where the residents have access to the plumbing system for repairs or modifications.	Yes	Water Reclamation and Reuse Standards September 1997
Texas	Type I reclaimed water uses, reclaimed water on a 30-day average shall have a quality of: BOD5 or CBOD5 5 mg/l Turbidity 3 NTU Fecal Coliform 20 CFU/100 ml Fecal Coliform (not to exceed) 75	Yes - (G) Toilet or urinal flush water.	Yes - (G) Toilet or urinal flush water.	Yes - (A) Residential irrigation, including landscape irrigation at individual homes. (B) Urban uses, including irrigation of	Texas Natural Resource Conservation Commission Page 1 Chapter 210 - Use of Reclaimed Water SUBCHAPTER C : QUALITY CRITERIA AND

State	Reclaimed Water	Toilet Flushing - Commercial	Toilet Flushing – Residential	Residential Irrigation	Reference
	CFU/100 ml			public parks, golf courses with unrestricted public access, school yards, or athletic fields.	SPECIFIC USES FOR RECLAIMED WATER §§210.31 - 210.36
Colorado	Category 3 Standards: Reclaimed water for uses where Category 3 water is required shall, at a minimum, receive secondary treatment with filtration and disinfection. The following reclaimed water standards shall apply at the point of compliance: Parameter Limit E. coli/100 ml None detected in at least 75% of samples in a calendar month and 126/100 ml single sample maximum. Turbidity, NTU Not to exceed 3 NTU as a monthly average and not to exceed 5 NTU in more than 5 percent of the individual analytical results during any calendar month.	No	No	Resident-Controlled Landscape Irrigation means irrigation of areas of grass, trees and other vegetation located on the property of a single family or other residential occupancy where the occupant is the User and is responsible for the maintenance and/or operation of the irrigation system.	COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT WATER QUALITY CONTROL COMMISSION REGULATION NO. 84 RECLAIMED WATER CONTROL REGULATION
Arizona	The turbidity of Class A reclaimed water at a point in the wastewater treatment process after filtration and immediately before disinfection complies with the following: a. The 24-hour average turbidity of filtered effluent is two NTUs or less, and b. The turbidity of filtered effluent does not exceed five NTUs at any time. 2. Class A reclaimed water meets the following criteria after disinfection treatment and before discharge to a reclaimed water distribution system: a. There are no detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken, and b. The single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23 / 100 ml.	Yes	Yes	Yes	ARTICLE 3. RECLAIMED WATER QUALITY STANDARDS R18-11-301. Definitions

EXHIBIT

"3"

THE IMPACT OF RESIDENTIAL USES OF RECLAIMED WATER

Class A+ Reclaimed Water can be considered as a direct replacement for potable water, employed in conditions where highly treated potable water is not required – for instance in the transport of waste material from toilets.

Residential water use distribution can be broken down by category as follows (source EPA):

WATER USE DISTRIBUTION	
Indoor Use – 56%	
Kitchen	2.8%
Shower/Bath	17.4%
Toilet	24.6%
Cleaning	1.0%
Laundry	10.2%
Outdoor Use – 44%	
Swimming Pools etc	5.0%
Garden/lawns/washing cars/Construction etc	39.0%

From the above table, there are two categories that may be directly replaced by Class A+ Reclaimed Water: Toilet Flush Water; and Residential Irrigation. The impact of employing reclaimed water on the potable water consumption is dramatic.

The attached annex demonstrates the impact of residential reclaimed water use on potable water demand under four scenarios:

State		Description	Potable Water Demand		Overall Demand
Scenario 1	Non-Integrated Utility	All water supplied via potable water system. No reclamation activities.	9323 Gallons per DU per month	0.3433 AF/yr	0.3433 AF/yr
Scenario 2	Integrated Utility	Reclaimed water supplied for common area irrigation	6249 Gallons per DU per month	0.2301 AF/yr	0.3433 AF/yr
Scenario 3	Integrated Utility	Reclaimed water supplied for common area irrigation and for Residential Irrigation	3834 Gallons per DU per month	0.1412 AF/yr	0.3433 AF/yr
Scenario 4	Integrated Utility	Reclaimed water supplied for common area	2326 Gallons per DU per month	0.0857 AF/yr	0.3433 AF/yr

		irrigation and for Residential Irrigation and for Toilet Flushing			

Scenario 2 represents Santa Cruz's current reclamation status.

IMPACT OF COMMERCIAL USES OF RECLAIMED WATER

Commercial recycling initiatives can yield much greater reductions in potable water consumption than residential applications. The reason for this is that commercial activities are primarily focused on waste transport – there are usually not significant potable water consumption activities occurring in commercial (schools, office buildings etc) facilities.

Typically a commercial facility can see a reduction in the order of 80 to 90% of the potable water consumption when toilets and urinals are supplied with reclaimed water.

RECLAIMED WATER AS A PERPETUAL RIGHT

Employing reclaimed water as flush water and for other "internal" uses, allows for the permanent offset of potable demand. As such, it represents a perpetual right of the utility – once charged, an internal-use reclaimed water system is self sustaining as the production capacity of reclaimed water exceeds the potential demand (only non-potable demands may be replaced).

In the case of residential/commercial uses, wastewater sources include:

a. Toilets/Urinals
b. Handbasins
c. Drinking fountains
d. Kitchen facilities
e. Showers
f. Floor drains
g. Etc

As only (a) may be realistically serviced by reclaimed water, there is always an overage of wastewater from which to make reclaimed water for redeployment to the facility. In a residential application, this represents 44% of the water used. Assuming a demand of 210 GPD/DU, 117.6 of which is consumed inside the home, toilet flushing represents 51.7 GPD/DU. If this 51.7 GPD/DU is supplied by reclaimed water, 65.9 GPD/DU of potable water is required. Notionally then, there is always 14.2 GPD/DU "excess" water to be used for make-up purposes.

As a result, the reclaimed water system is naturally "topped up" and all reclaimed water consumed is returned for re-use in the system once again after having been treated, filtered and disinfected.

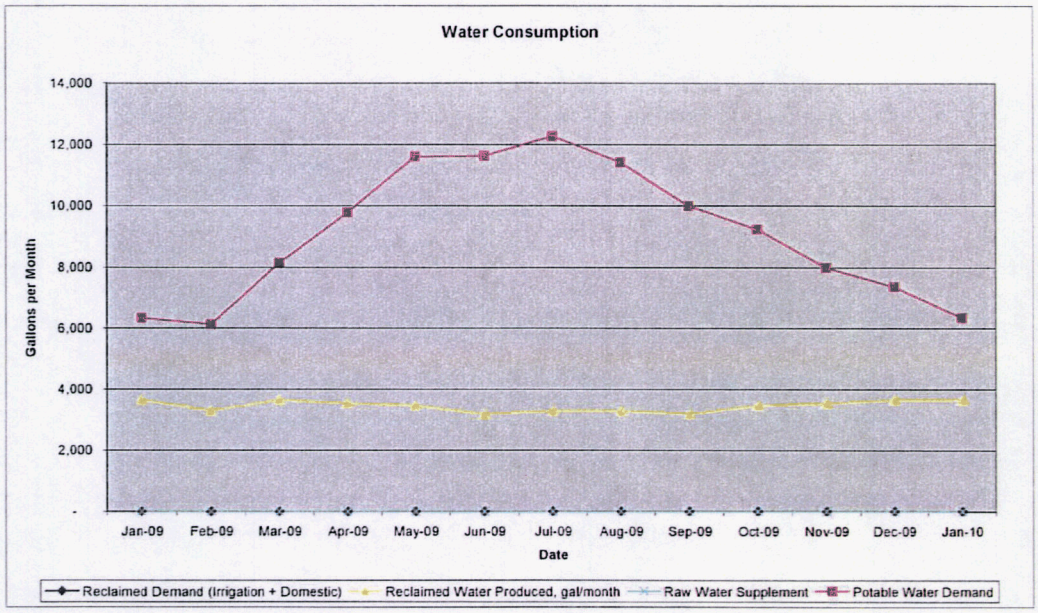
Reclaimed water employed as irrigation supply represents a reduction in overall potable demand, but is a single use activity. Despite some incidental recharge, most of this water will be lost to evapotranspiration (plant uptake and evaporation). However, the savings represent in the order of 81.9 GPD/DU – or 39% of the water demand. This translates to a reduction in the amount of water treated, a reduction in the amount of water required to be physically proven.

EXHIBIT

"4"

RESIDENTIAL RECLAIMED WATER IMPACT ON POTABLE WATER DEMAND

WATER CONSUMPTION REVIEW



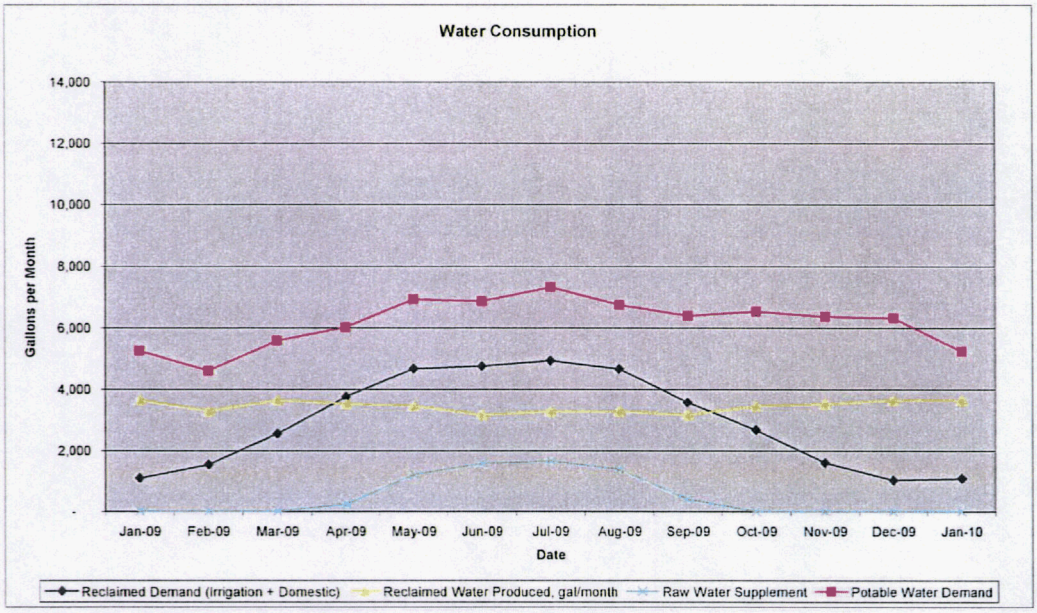
Common Area Irrigated by	Potable		
	15%	open space	
Persons per House	2.5		
Flow per Unit per Day	210	GPD/DU	84 GPD/person
Avg Potable Consumption	9,323	Gallons/Month/DU	

Uses				
Indoor Use		**Using Reclaimed?**	**GPD**	
Kitchen	2.8%	No	5.9	
Shower/Bath	17.4%	No	36.5	
Toilet	24.6%	No	51.7	
Cleaning	1.0%	No	2.1	
Laundry	10.2%	No	21.4	
			Sub-Total	117.6
Outdor Use				
Swimming Pools etc	5.0%	No	10.5	
Garden/lawns/washing cars/Construction etc	39.0%	No	81.9	
			Sub-Total	92.4
			TOTAL	210.0

Annual Potable Consumption per DU	0.3433	ac-ft/yr
Annual Consumption per DU (Common Area Irrigation)	Included Above	ac-ft/yr
Residential Reclaimed Water Demand	-	
Total Demand	0.3433	ac-ft/yr

Scenario 1 – NON-INTEGRATED WATER ONLY UTILITY

WATER CONSUMPTION REVIEW



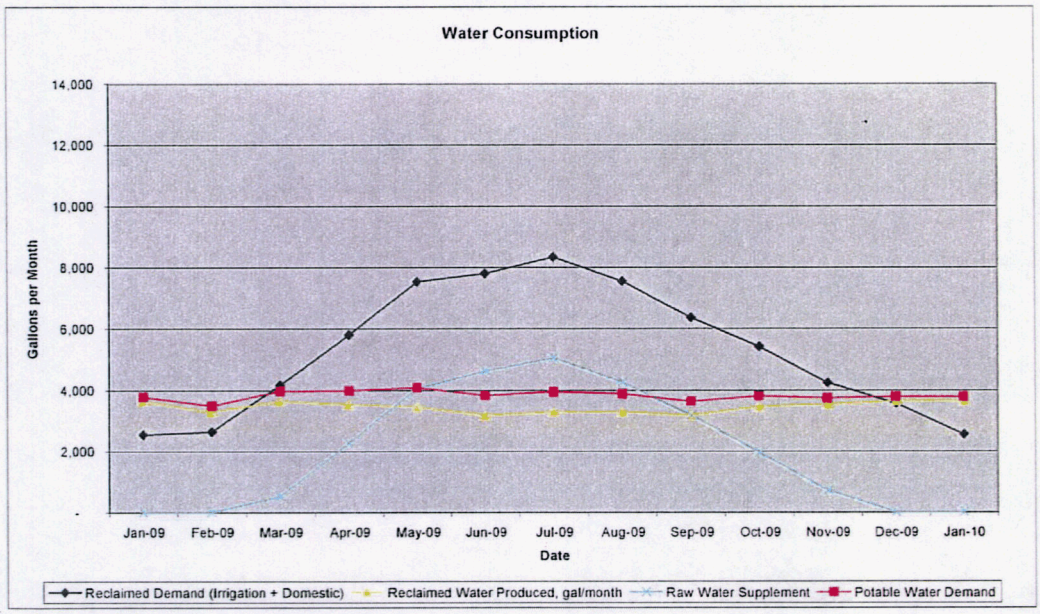
Common Area Irrigated by	Reclaimed		
	15%	open space	
Persons per House	2.5		
Flow per Unit per Day	210	GPD/DU	84 GPD/person
Avg Potable Consumption	6,249	Gallons/Month/DU	

Uses				
Indoor Use		Using Reclaimed?	GPD	
Kitchen	2.8%	No	5.9	
Shower/Bath	17.4%	No	36.5	
Toilet	24.6%	No	51.7	
Cleaning	1.0%	No	2.1	
Laundry	10.2%	No	21.4	
			Sub-Total	117.6
Outdor Use				
Swimming Pools etc	5.0%	No	10.5	
Garden/lawns/washing cars/Construction etc	39.0%	No	81.9	
			Sub-Total	92.4
			TOTAL	210.0

Annual Potable Consumption per DU	0.2301	ac-ft/yr
Annual Consumption per DU (Common Area Irrigation)	0.1132	ac-ft/yr
Residential Reclaimed Water Demand	-	
Total Demand	0.3433	ac-ft/yr

Scenario 2 – INTEGRATED UTILITY – 30% Reduction in Potable Demand

WATER CONSUMPTION REVIEW



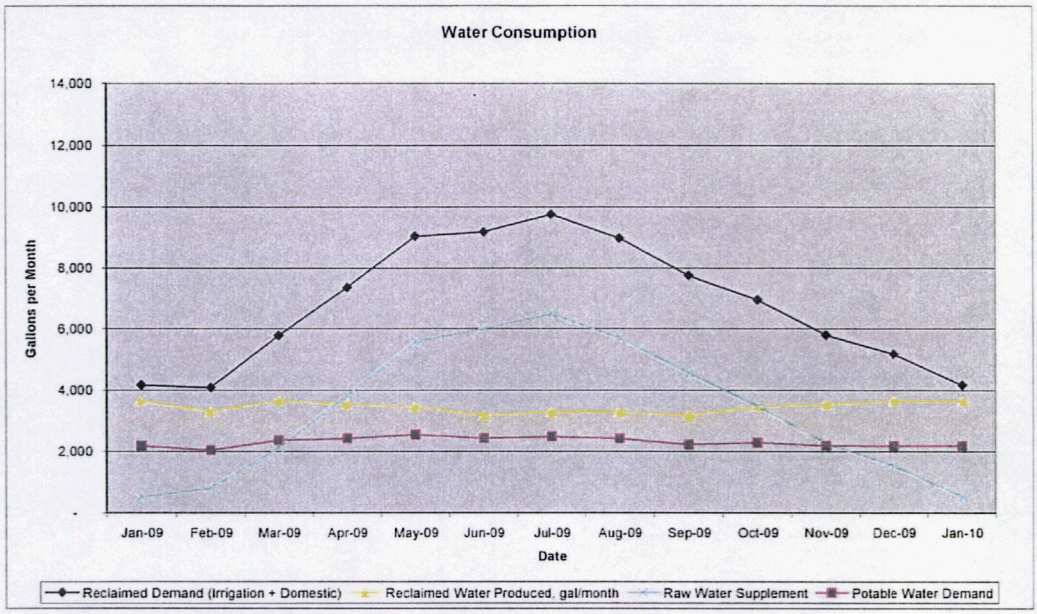
Common Area Irrigated by	Reclaimed		
	15%	open space	
Persons per House	2.5		
Flow per Unit per Day	210	GPD/DU	84 GPD/person
Avg Potable Consumption	3,834	Gallons/Month/DU	

Uses				
	Indoor Use		**Using Reclaimed?**	**GPD**
	Kitchen	2.8%	No	5.9
	Shower/Bath	17.4%	No	36.5
	Toilet	24.6%	No	51.7
	Cleaning	1.0%	No	2.1
	Laundry	10.2%	No	21.4
				Sub-Total 117.6
	Outdor Use			
	Swimming Pools etc	5.0%	No	10.5
Garden/lawns/washing cars/Construction etc		39.0%	Yes	0.0
				Sub-Total 10.5
				TOTAL 128.1

Annual Potable Consumption per DU	0.1412	ac-ft/yr
Annual Consumption per DU (Common Area Irrigation)	0.1132	ac-ft/yr
Residential Reclaimed Water Demand	0.0889	
Total Demand	0.3433	ac-ft/yr

Scenario 3 – INTEGRATED UTILITY – Residential Irrigation via Reclaimed Water - 60% Reduction in Potable Demand

WATER CONSUMPTION REVIEW



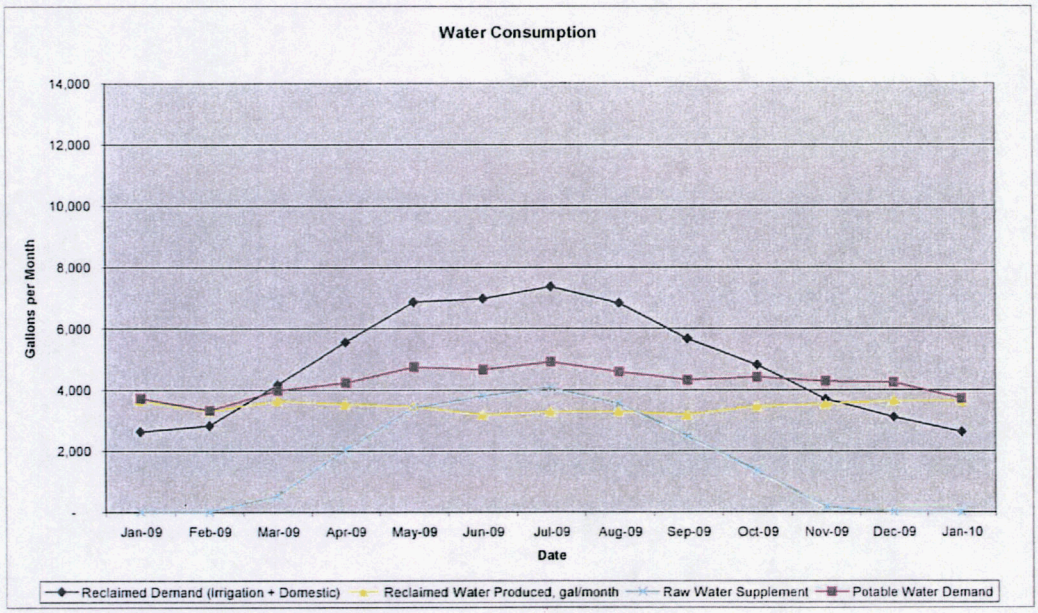
Common Area Irrigated by	Reclaimed		
	15%	open space	
Persons per House	2.5		
Flow per Unit per Day	210	GPD/DU	84 GPD/person
Avg Potable Consumption	2,326	Gallons/Month/DU	

Uses				
Indoor Use		Using Reclaimed?	GPD	
Kitchen	2.8%	No	5.9	
Shower/Bath	17.4%	No	36.5	
Toilet	24.6%	Yes	0.0	
Cleaning	1.0%	No	2.1	
Laundry	10.2%	No	21.4	
			Sub-Total	65.9
Outdor Use				
Swimming Pools etc	5.0%	No	10.5	
Garden/lawns/washing cars/Construction etc	39.0%	Yes	0.0	
			Sub-Total	10.5
			TOTAL	76.4

Annual Potable Consumption per DU	0.0857	ac-ft/yr
Annual Consumption per DU (Common Area Irrigation)	0.1132	ac-ft/yr
Residential Reclaimed Water Demand	0.1445	
Total Demand	0.3433	ac-ft/yr

Scenario 4 – INTEGRATED UTILITY – Residential Irrigation and Toilet Flushing via Reclaimed Water - 75% Reduction in Potable Demand. Theoretical Maximum

WATER CONSUMPTION REVIEW



Common Area Irrigated by	Reclaimed		
	15%	open space	
Persons per House	2.5		
Flow per Unit per Day	210	GPD/DU	84 GPD/person
Avg Potable Consumption	4,288	Gallons/Month/DU	

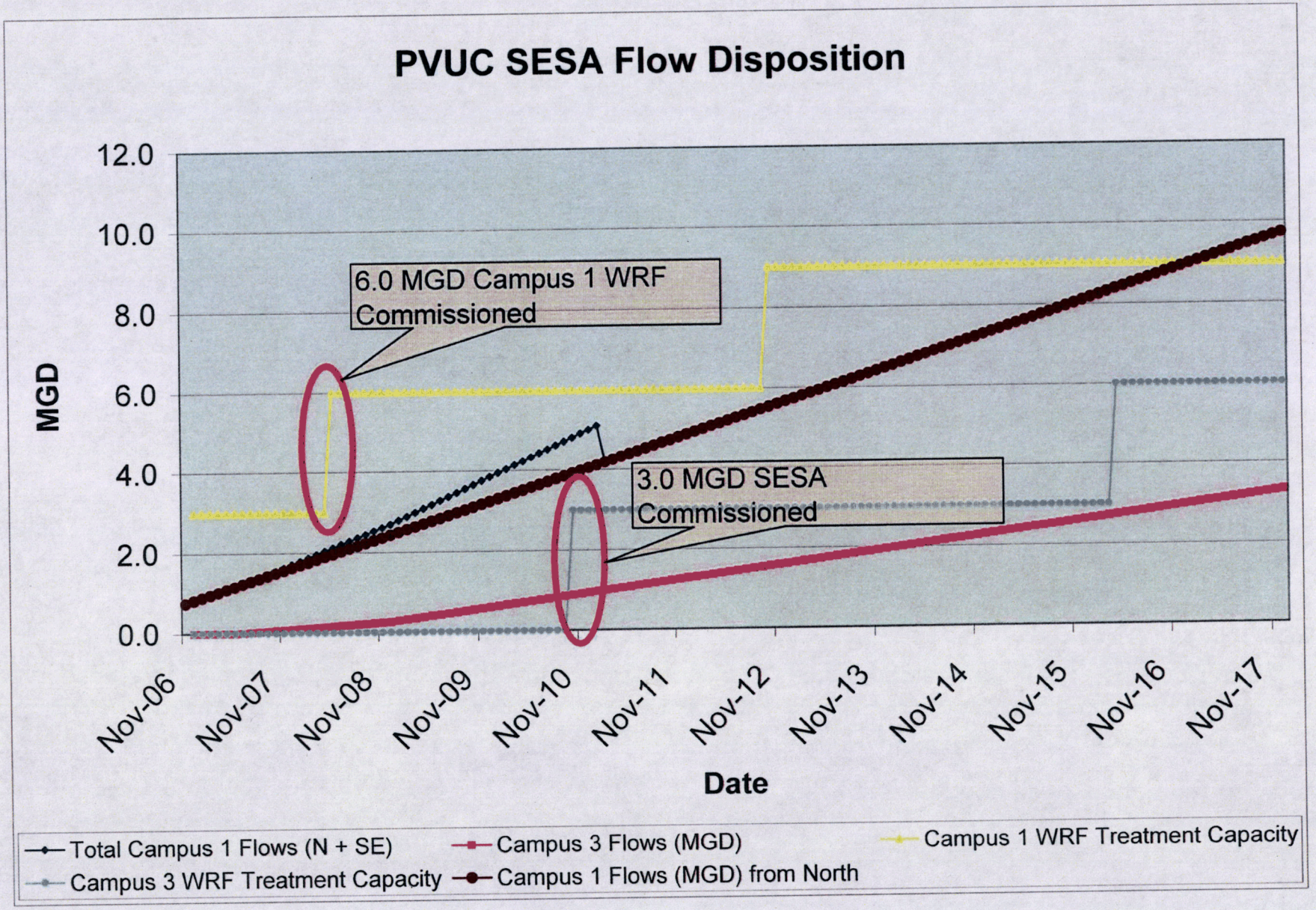
Uses				
Indoor Use		Using Reclaimed?	GPD	
Kitchen	2.8%	No	5.9	
Shower/Bath	17.4%	No	36.5	
Toilet	24.6%	50%	25.9	
Cleaning	1.0%	No	2.1	
Laundry	10.2%	No	21.4	
			Sub-Total	91.7
Outdor Use				
Swimming Pools etc	5.0%	No	10.5	
Garden/lawns/washing cars/Construction etc	39.0%	50%	41.0	
			Sub-Total	51.5
			TOTAL	143.2

Annual Potable Consumption per DU	0.1579	ac-ft/yr
Annual Consumption per DU (Common Area Irrigation)	0.1132	ac-ft/yr
Residential Reclaimed Water Demand	0.0722	
Total Demand	0.3433	ac-ft/yr

Scenario 5 – INTEGRATED UTILITY – Most Likely Residential Irrigation and Toilet Flushing - 55% Reduction in Potable Demand

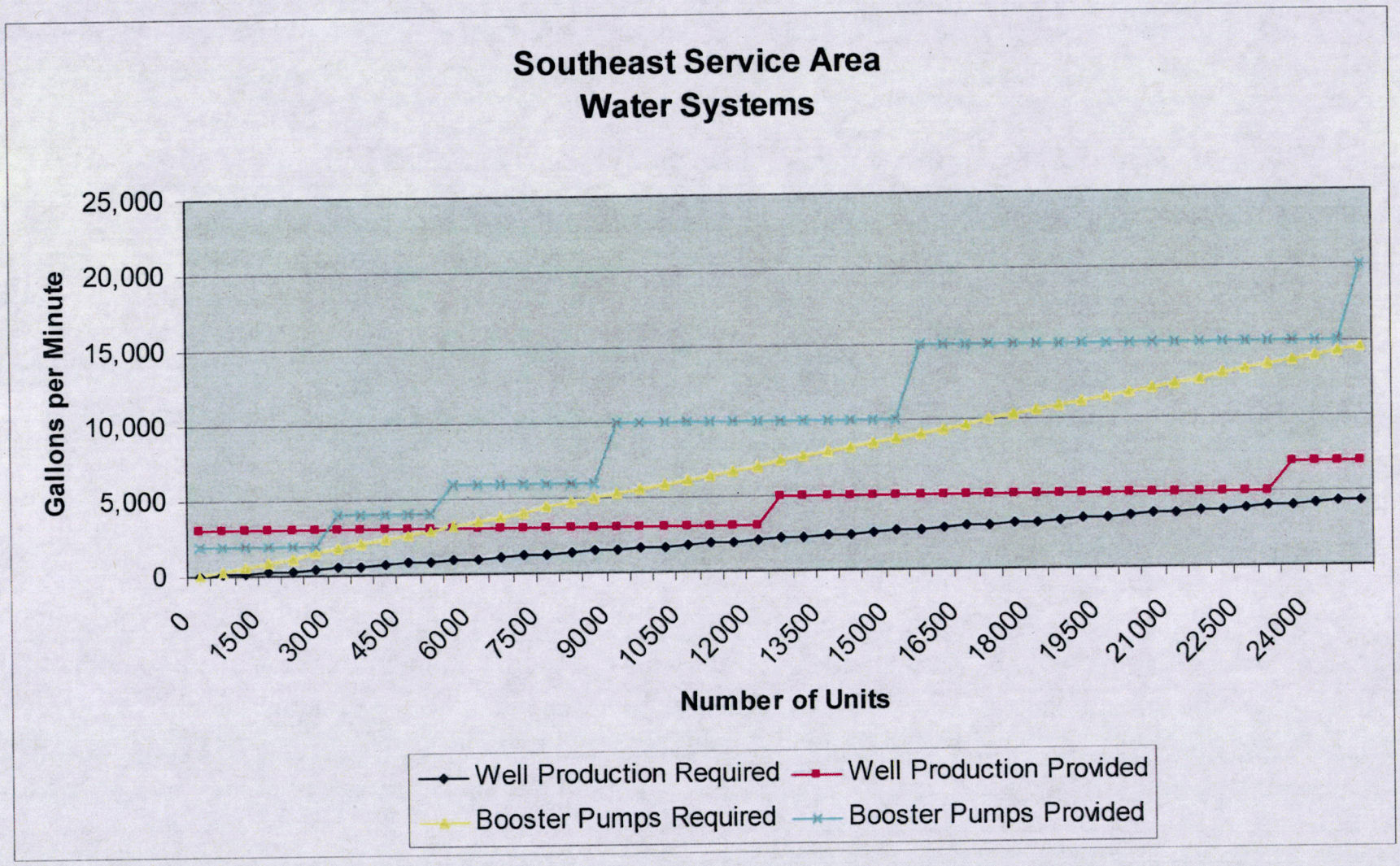
EXHIBIT

"5"


PVUC SESA Flow Disposition
MGD
12.0
10.0
8.0
6.0
4.0
2.0
0.0
6.0 MGD Campus 1 WRF Commissioned
3.0 MGD SESA Commissioned
Nov-06
Nov-07
Nov-08
Nov-09
Nov-10
Nov-11
Nov-12
Nov-13
Nov-14
Nov-15
Nov-16
Nov-17
Date
Total Campus 1 Flows (N + SE)
Campus 3 Flows (MGD)
Campus 1 WRF Treatment Capacity
Campus 3 WRF Treatment Capacity
Campus 1 Flows (MGD) from North

EXHIBIT

"6"


Southeast Service Area
Water Systems
Gallons per Minute
25,000
20,000
15,000
10,000
5,000
0
0
1500
3000
4500
6000
7500
9000
10500
12000
13500
15000
16500
18000
19500
21000
22500
24000
Number of Units
Well Production Required
Well Production Provided
Booster Pumps Required
Booster Pumps Provided

EXHIBIT

"7"

developed the integrated control suite known as enviroSMART (Systems Monitoring and Remote Telemetry) which allowed for unmanned operations of water reclamation facilities, and second and third order condition assessments.

In 2001, Mr. Symmonds joined Algonquin Water Resources of America as Director of Operations, responsible for the day-to-day operation of AWRA's utilities, including regulatory filings, growth management, plant operations and capital project planning and execution.

In 2003, Mr. Symmonds joined Global Water Resources as the Senior Vice President of Operations & Compliance.

PROFESSIONAL AFFILIATIONS

Association of Professional Engineers and Geoscientists of British Columbia (Lic # 20642)

Wesley Smith, Vice President Engineering & Construction

Mr. Smith graduated in 1989 with a Bachelor of Science in Engineering from the Colorado School of Mines. He began his engineering career with Perini Corporation, constructing the Central Artery (The Big Dig) and Deer Island projects in Boston. In addition, he acted as senior tunnel engineer for the Tunnel and Reservoir Program (TARP) in Chicago. In 1994, he joined Western Summit Constructors in 1994, and commenced work on the Southern Nevada Water Authority's (SNWA) facilities improvement project – a series of infrastructure projects associated with the expansion of the SNWA water treatment and distribution system in Las Vegas. In 1997 he accepted a project management position with MMC, Inc., a Nevada general construction firm specializing in water/wastewater construction. He was promoted to Operations Manager in 2001, and in 2003 assumed the role of General Manager, overseeing $100 million dollars per year in public works projects in both Nevada and Arizona.

Mr. Smith joined Global Water in 2004 and was promoted to VP Engineering and Construction in 2005, where he now oversees Global's CAPEX program – including project definition, budgeting, approvals, construction and commissioning.

Scott Lee, PE - Engineering Manager

Mr. Lee is the Engineering Manager for Global Water responsible for master planning activities, development and deployment of engineering and construction standards and for plan reviews. Mr. Lee is responsible to ensuring adequate capacity is available at each phase of development and works closely with developers to ensure construction of facilities meets the development timeline.

Mr. Lee is leading the development of standards to expand the deployment of reclaimed water within the Global service areas.

Mr. Lee graduated from Arizona State University and previously has worked in the consulting field in Arizona, Iowa and Minnesota.

PROFESSIONAL AFFILIATIONS

Arizona Board of Technical Registration (Lic # 41202)

Robin Bain, PE - Permitting Manager

Ms. Bain has over 26 years of experience in engineering project and program management, most of which has been in municipal public works and utilities. She currently serves as the Global Water Permitting Manager, responsible for the acquisition of all permits required to develop and enable service areas. Ms. Bain was formerly employed as the Baker Phoenix Office/Operations Manager, and as such she was responsible for a 70+ person multi-discipline engineering and architecture office, serving local, State, Federal, utility and private clients. Ms. Bain is a former Plant Operations and Maintenance Manager at Clark County Water Reclamation District, Las Vegas, NV; Deputy Public Works Director in Springfield, MA; and Deputy Director, Line Maintenance Division, Fairfax County, VA.

Ms. Bain is a certified Wastewater Operator and registered Professional Engineer in numerous states. She is currently on the Board of Arizona Water Pollution Control Association, formerly served on the Board of the Arizona Floodplain Managers Association, and is a past president of the Nevada Water Environment Association. She has also previously served as the Publications Committee Chair for the Water Environment Federation, on the Engineering Advisory Council for the University of Nevada at Las Vegas, the Las Vegas Wash Coordination Committee, and the Nevada Board of Technical Registration for Engineers and Land Surveyors. Ms. Bain also serves on the Arizona Public Works Association annual conference committee, now in her sixth year.

Ms. Bain holds an M.S., Environmental Engineering from Virginia Tech (1987) and a B.S., Civil Engineering from Virginia Tech (1980). She is a registered Professional Engineer in Arizona, Nevada, Massachusetts, and Virginia. She also holds a Diplomate of Environmental Engineering designation.

PROFESSIONAL AFFILIATIONS

Arizona Board of Technical Registration, Civil Engineer, (Lic # 36797)
Registered Professional Engineer, Civil, Virginia
Registered Professional Engineer, Civil, Nevada
Registered Professional Engineer, Civil, Massachusetts
Class 4 Wastewater Treatment (AZ)
Class 5 Wastewater Treatment (NV)
Class 1 (highest level) Wastewater Treatment (VA)

Joel Wade, Process Engineering Manager

Mr. Wade has a Masters of Business Administration (1999), and a Bachelor of Science, Civil Engineering, from Southern Illinois University (1991). He also holds the following certifications:

- Class 1, 2, 3, 4 Wastewater operator (IL)
- Class A, B, C, D Water operator (IL)
- Class 4 Wastewater Collection (AZ)

- Class 4 Water Distribution (AZ)
- Class 4 Wastewater Treatment (AZ)
- Class 4 Water Treatment (AZ)

Mr. Wade is currently the Process Engineering Manager for Global Water. He is responsible for executing process designs for water and wastewater systems to meet the needs of Global utilities. Formerly, Mr. Wade was employed as the Manager of Engineering and Construction for Algonquin Water Services. His experience in the design, development, operation and management of water and wastewater utilities spans over 24-years, including 13-years in the privatization, contract operations area. His diverse background as facility manager, designer and technical consultant has led to the successful start-up and procurement of nine (9) treatment facilities, ranging from 0.250 to 180 MGD, as well as consulting service to twenty-five individual facilities including project engineering, planning and investigation, civil design, technical research, development, and efficiency evaluation. Mr. Wade was instrumental in the design, construction and start-up of the first wastewater membrane treatment facility in the state of Arizona. Recent projects include; simultaneous start-up of two 0.500 mgd reverse osmosis wellhead treatment units and one 0.650 mgd ion exchange resin wellhead treatment units (City of Goodyear AZ, 6/03), start-up of a 1.9 MGD Water Reclamation Facility in Gold Canyon Arizona (10/05) as well as current construction of the largest arsenic treatment facility (5.0 MGD) in the state of Arizona.

EXHIBIT

"8"

GWM EMPLOYEE OPERATION CERTIFICATIONS

	Operator Name	Certification Number	Expires	WT	WWT	Dist	Coll
Southern Division							
1	Ismael Barba	12156	31-Mar-07		3		
2	Jeff Lemley	20649	31-May-08	1	3	2	1
3	Eloy Garcia						
4	Don Wachter	22757	30-Jun-06	2			
5	Dean Ureneck						
6	Dewarn Allen						
7	Manuel Molina	23232	31-Mar-09		4		
8	Filimone Macedo						
Northern Division							
9	Dave McLeod	05669	30-Jun-08	3	2	3	2
10	Jay George	03530	30-Nov-08	3		3	
11	Rick Davis						
12	Fernando Espinoza						
13	Dave Adams						
14	George J. Lennon	20650	31-May-09	3			
15	Gustavo Picano						
Western Division							
17	Jamaine Berry	21621	31-Jul-09			2	
18	Blain Harold	09133	28-Feb-09	2		4	
19	Gregory Guy	23129	28-Feb-09	1	2	1	2
20	Jarvis Gale	23128	28-Feb-09	1		1	
21	Jubal Whitlock	25128	31-Jul-09	1		1	
22	Roger Ward	23348	31-May-09	1		1	
24	Chad McKeon						
25	Clyde Vaugh						
26	Russell Basham						
27	Oliver Caldwell						
Bullhead City							
28	Curtis Pine						
29	Allen Edgeman						
30	Ronald Terafaj						
31	Joseph Samante						
32	Buddy Anderson						
Maintenance							
33	James Creaghe	21852	31-Mar-08	1	4	2	
34	Jesse Ochoa						
CSR/Inspector							
35	Paul Hagert	22647	30-Apr-08				1
36	Dann Posastiuc	22655	30-Apr-08			1	
Compliance							
37	Susan Armijo	20448	31-Oct-07	1	1		
38	Tammy Maher	23282	30-Apr-09	1	3	2	1
39	Shawneen Michaud	22374	30-Sep-08	4		2	
40	Robyn Wymer	23139	28-Feb-09	1		1	
Engineering & Permitting							
41	Robin Bain	20397	30-Sep-07		4		
42	Joel Wade	06327	31-Aug-08	4	4	4	4
Education							
43	Greg Frech	6981	30-May-07	4	4	4	4

EXHIBIT

"9"

CENTRAL
ARIZONA
ASSOCIATION OF
GOVERNMENTS

Serving Gila & Pinal Counties since 1970!

HISTORIC BELMONT BUILDING
271 MAIN STREET
SUPERIOR, AZ 85273

December 13, 2005

Edwina Vogan
Arizona Department of Environmental Quality
1110 W. Washington Street – 5th Floor
Phoenix, AZ 85007

Dear Ms. Vogan:

RE: CAAG 208 Areawide Water Quality Management Plan Amendment for Palo Verde Utilities Company Southwest Water Reclamation Facility (WRF)

The Central Arizona Association of Governments has reviewed the proposed CAAG 208 Areawide Water Quality Management Plan Update Amendment for the Palo Verde Utilities Company (PVUC) Southwest Water Reclamation Facility, submitted by PVUC, and their engineer, Kennedy/Jenks Consultants. The plan received an initial and final review in concert with the Arizona Department of Environmental Quality.

The amendment was advertised locally and made available to the public. On November 1, 2005, a Public Hearing was held, and no negative comments were received. The amendment was reviewed by the CAAG Environmental Planning and Management Committees. Both groups recommended approval to the Regional Council. On November 16, 2005, the CAAG – Region V Council approved the amendment to the CAAG AWWQMP Update (1994). The State Water Quality Working Group reviewed the plan on December 13, 2005, and approved it for consideration by ADEQ and the Governor of the State of Arizona.

Enclosed are five copies of the CAAG 208 AWWQMP Amendment for the PVUC Southwest WRF. CAAG respectfully submits this plan for consideration by the Arizona Department of Environmental Quality and the Environmental Protection Agency.

Sincerely,

J. Peter Armenta
Environmental Planner

GILA COUNTY: GLOBE, HAYDEN, MIAMI, PAYSON, WINKELMAN
PINAL COUNTY: APACHE JUNCTION, CASA GRANDE, COOLIDGE, ELOY, FLORENCE, KEARNY, MAMMOTH, MARICOPA, QUEEN CREEK, SUPERIOR

LOCAL: (520) 689-5004 • TOLL-FREE & V/TTY: 1-800-782-1445 • TDD: (520) 689-5009 • FAX (520) 689-5020

EXHIBIT

"10"

MEMORANDUM

TO: Linda Jaress
Executive Consultant III
Utilities Division

FROM: Barb Wells
Information Technology Specialist
Utilities Division

THRU: Del Smith
Engineering Supervisor
Utilities Division

DATE: June 15, 2006

RE: **ARIZONA WATER COMPANY (DOCKET NO. W-01445A-06-0199)**
PALO VERDE UTILITIES COMPANY (DOCKET NO. SW-03575A-05-0926)
SANTA CRUZ WATER COMPANY (DOCKET NO. W-03576A-05-0926)
REVISED LEGAL DESCRIPTION

The area requested by Palo Verde and Santa Cruz for an extension has been plotted with no complications using a revised legal description, which was docketed on May 31, 2006. This legal description is attached and should be used in place of all previous revisions as well as the original description submitted with the application.

Also attached are copies of the maps for your files.

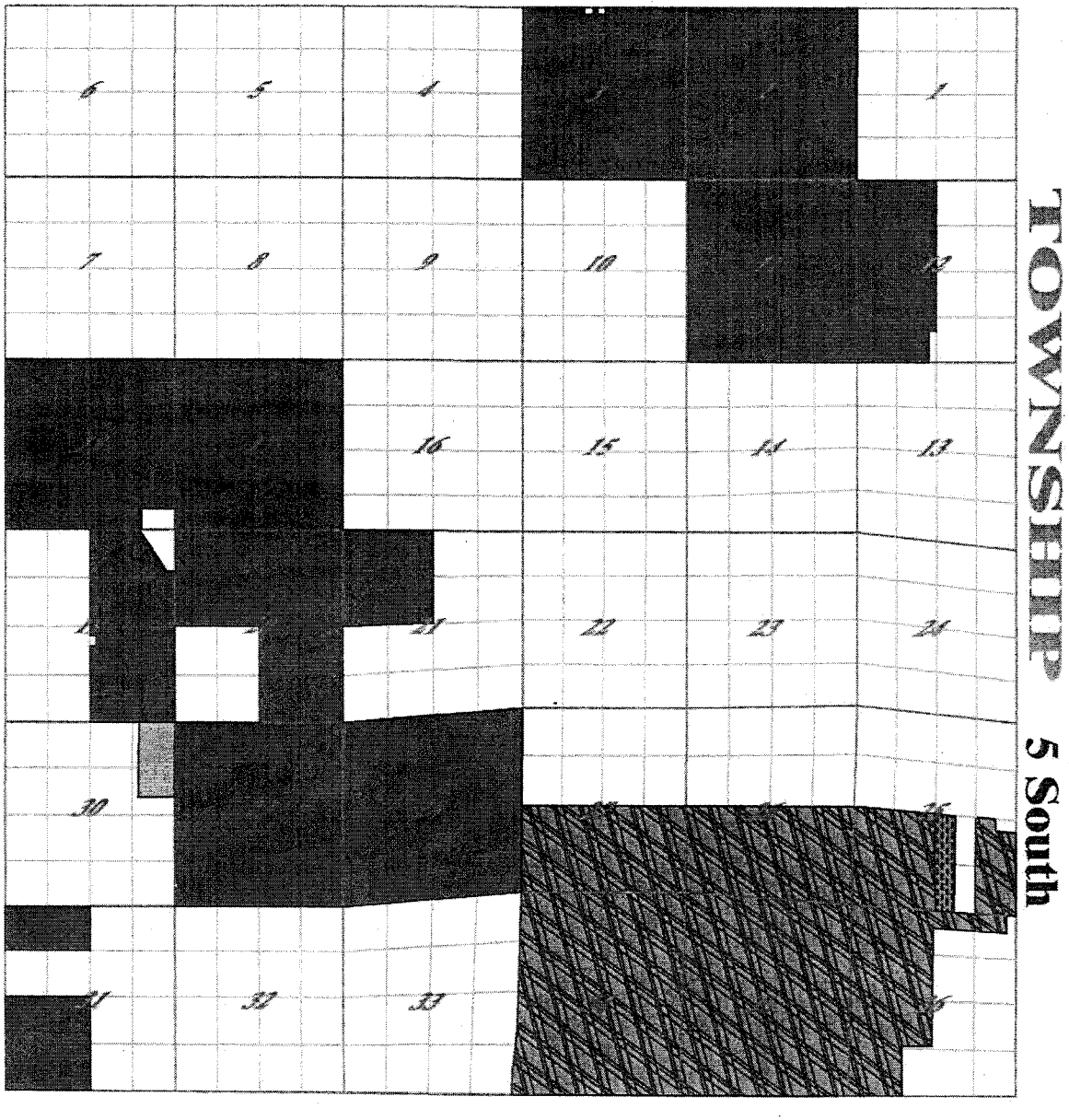
:bsw

Attachments

cc: Ms. Cindy Liles
Mr. Robert Geake
Ms. Deb Person (Hand Carried)
File

COUNTY: *Pinal*

RANGE 3 East



W-4137 (2)
Santa Rosa Water Company

Sewer SW-4136 (2)
Santa Rosa Utility Company

W-4195 (1)
The Ranches at Maricopa Homeowners Association
Adjudicated 'Not a Public Service Corporation'

(3)
Santa Cruz Water Company
Docket No. W-3576-05-307
Palo Verde Utilities Company
Docket No. SW-3575-05-307
Application for Extension

(4)
Santa Cruz Water Company
Docket No. W-03576A-05-0470
Palo Verde Utilities Company
Docket No. SW-03575A-05-0470
Application for Extension

(6)
Santa Cruz Water Company
Docket No. W-03576A-06-0155
Palo Verde Utilities Company
Docket No. SW-03575A-06-0155
Application to Transfer to Global Water
Docket Nos. W-20446 and SW-20445

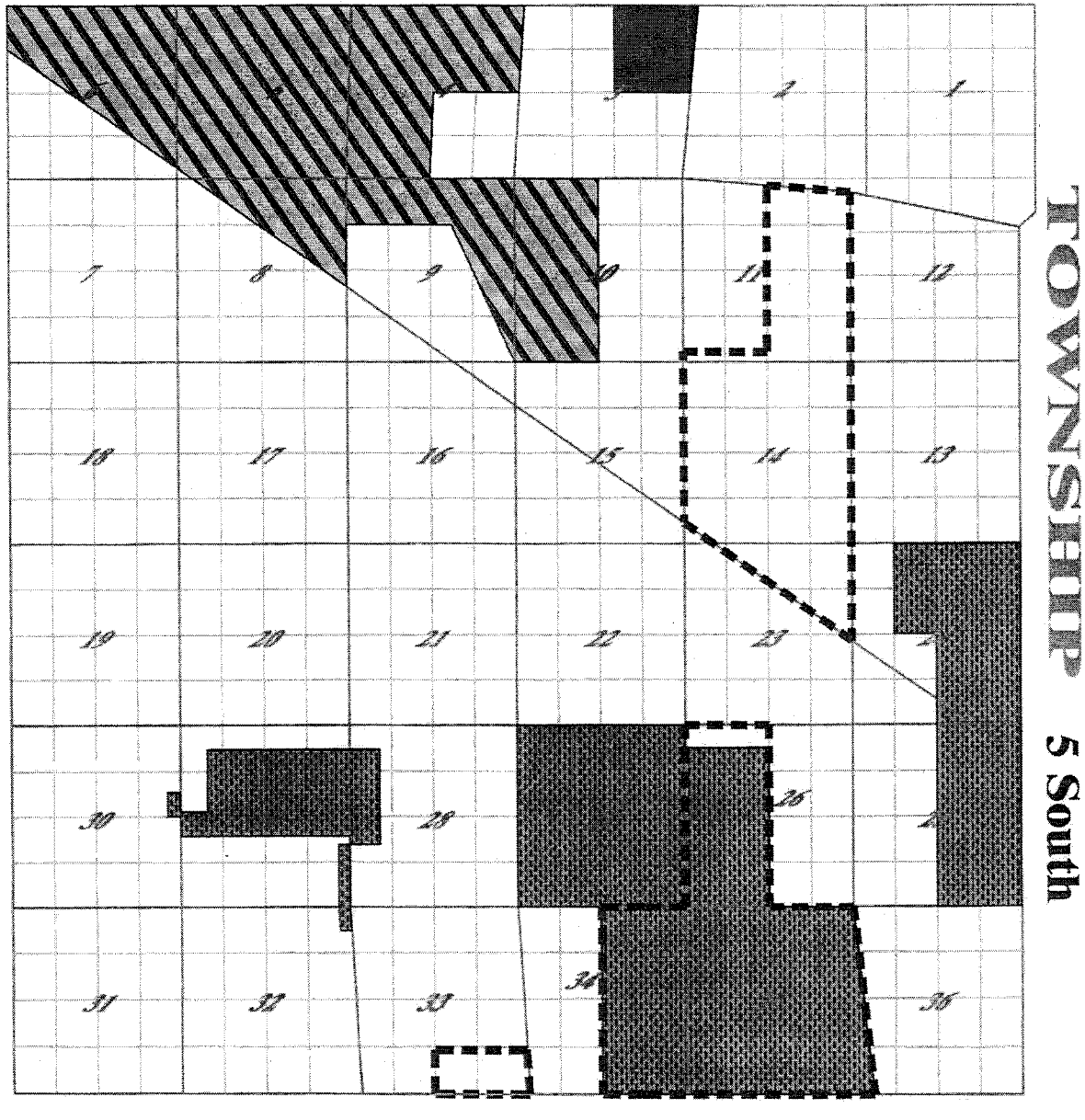
(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR5S3E 25 OCT 2005

COUNTY: *Pinal*

RANGE 4 East



W-3576 (3)
Santa Cruz Water Company

Sewer SW-3575 (3)
Palo Verde Utilities Company

Nonjurisdictional (2)
Copper Mountain Ranch Community Facilities District

(4)
Santa Cruz Water Company
Docket No. W-03576A-05-0470
Palo Verde Utilities Company
Docket No. SW-03575A-05-0470
Application for Extension

(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

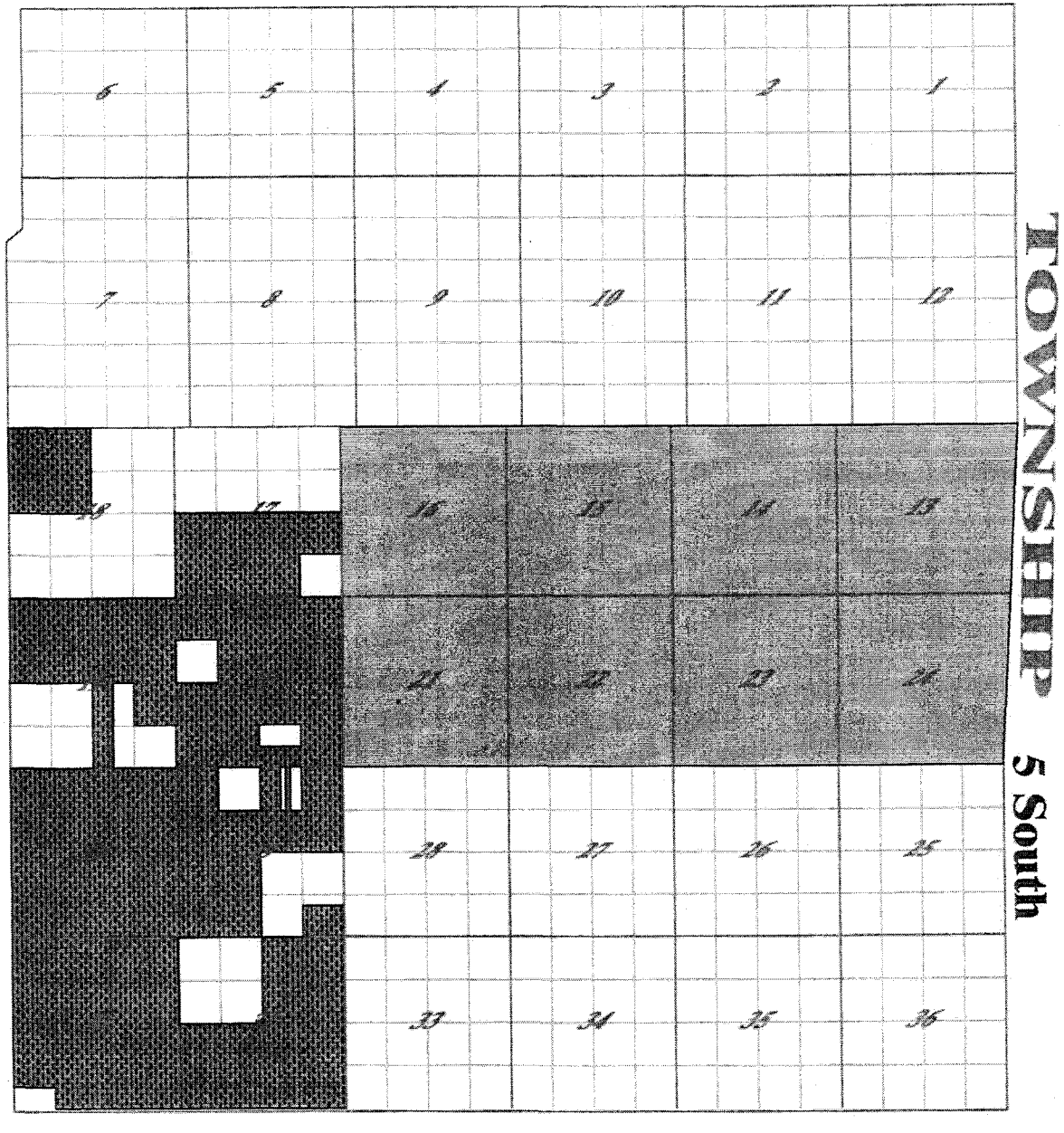
(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

(6)
Santa Cruz Water Company
Docket No. W-03576A-06-0155
Palo Verde Utilities Company
Docket No. SW-03575A-06-0155
Application to Transfer to Global Water
Docket Nos. W-20446 and SW-20445

TR5S4E 05 MAY 2005

COUNTY: *Pinal*

RANGE 5 East



(2)
Arizona Water Company
Docket No. W-1445-04-743
Application for Extension

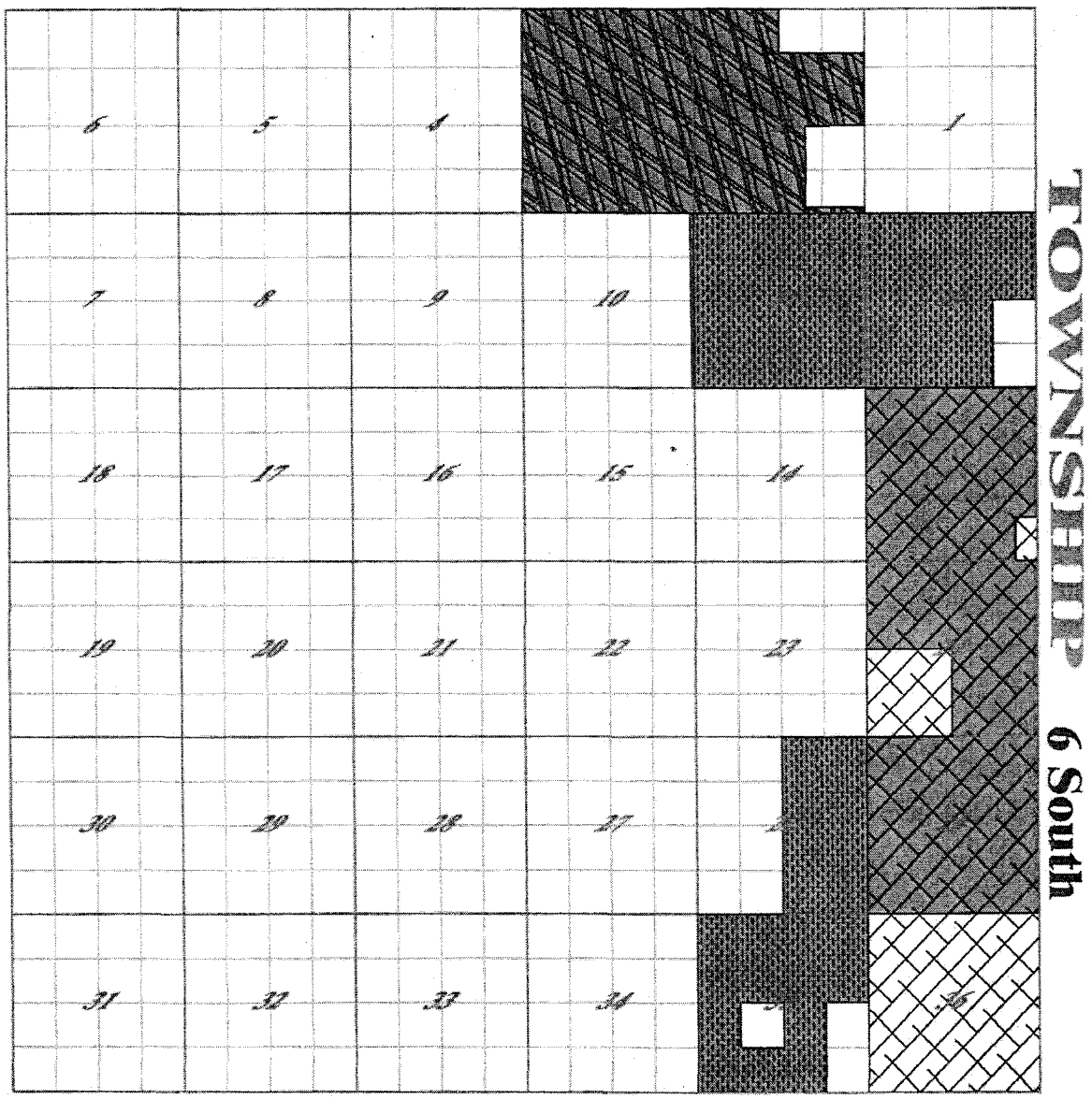
(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR5S5E 20 OCT 2004

COUNTY: *Pinal*

RANGE 3 East



W-1445 (39)(5)
Arizona Water Company (Stanfield)

W-4137 (2)
Santa Rosa Water Company

Sewer SW-4136 (2)
Santa Rosa Utility Company

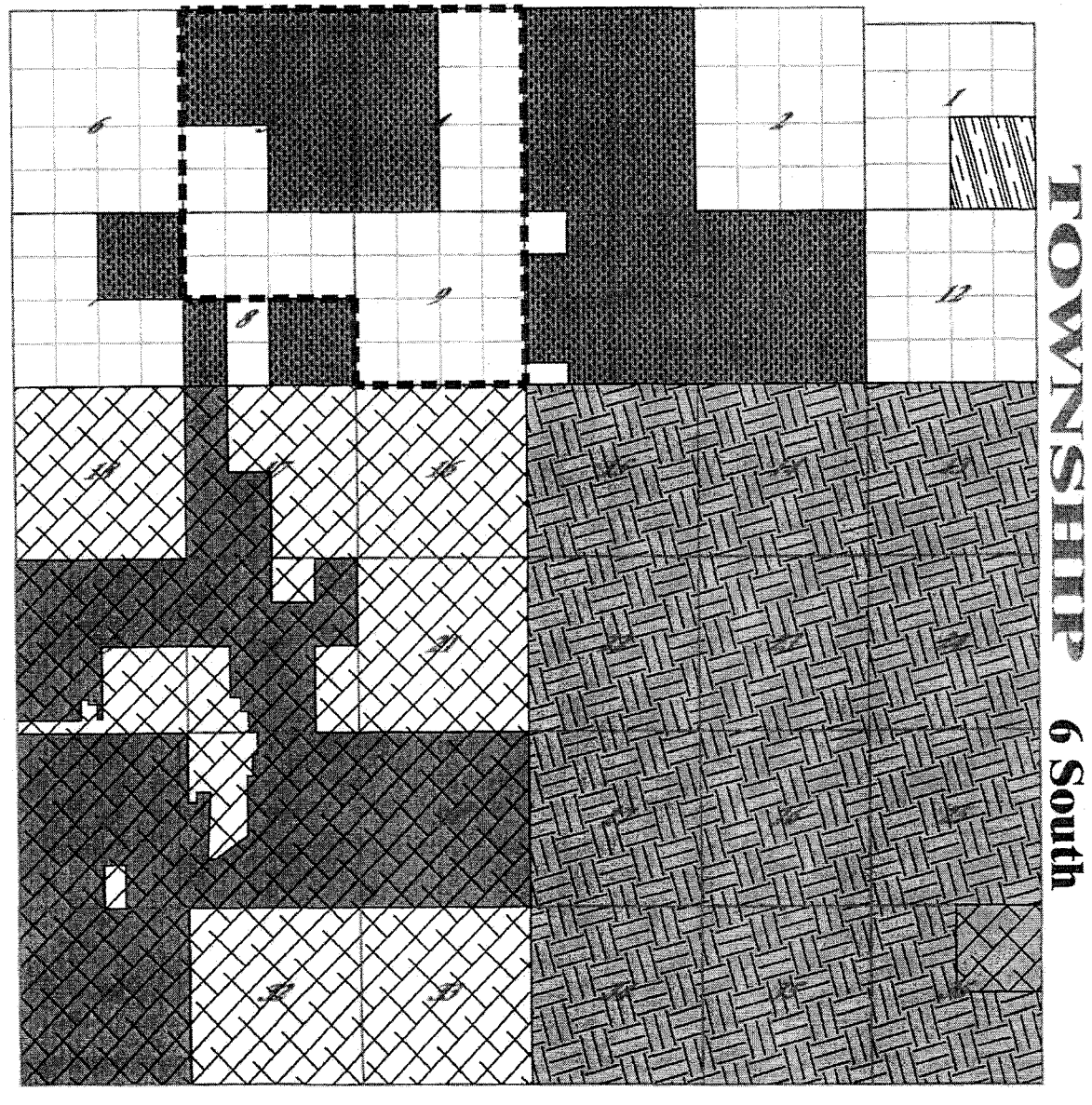
(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR6S3E 25 OCT 2005

COUNTY: *Pinal*

RANGE 4 East



W-1445 (39)(5)
Arizona Water Company (Stanfield)

W-2442 (2)
CP Water Company

WS-1775 (2)
Francisco Grande Utility Company

Sewer

Nonjurisdictional (2)
Copper Mountain Ranch Community Facilities District

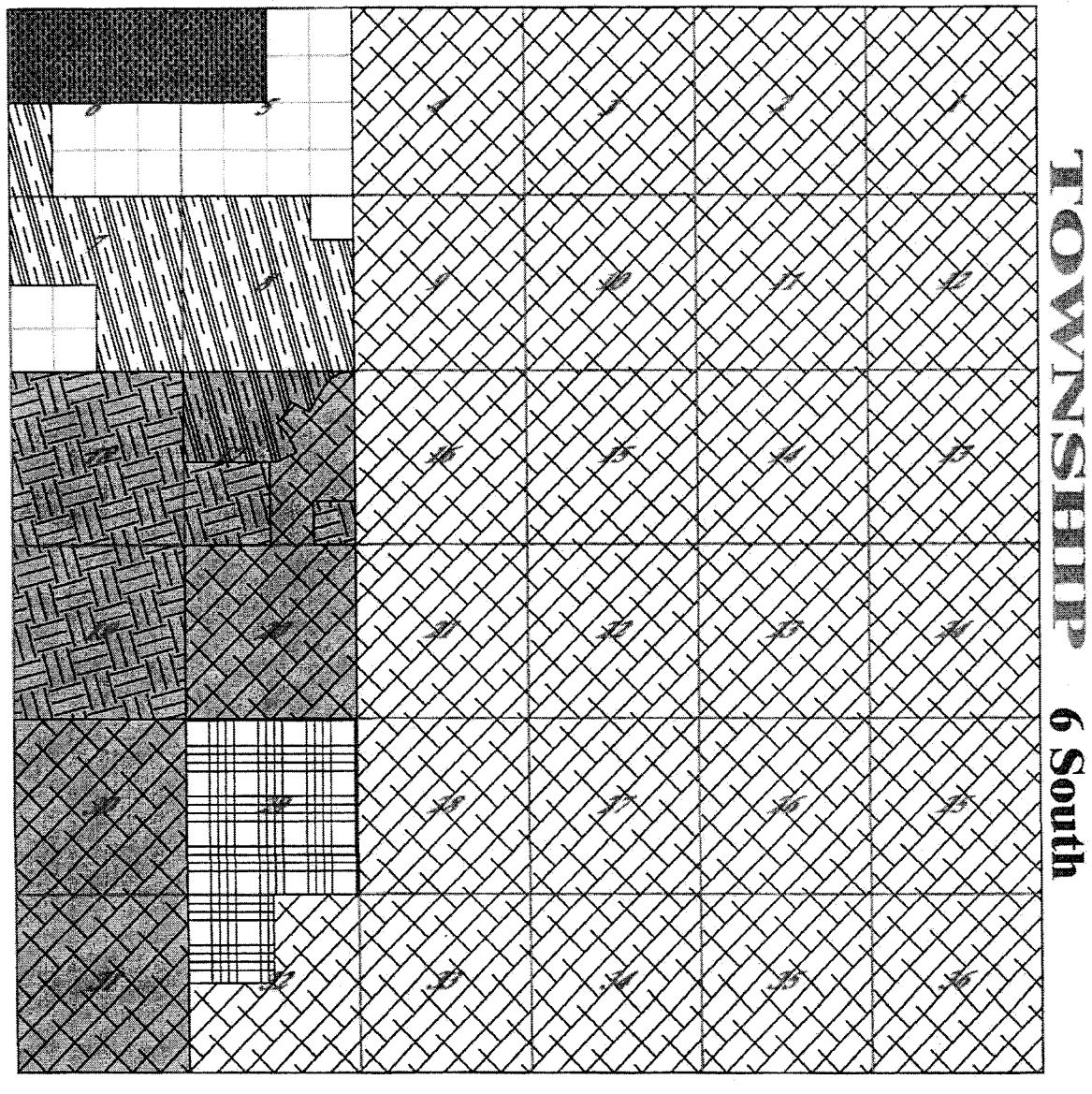
(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR6S4E 12 APR 2006

COUNTY: *Pinal*

RANGE 5 East



W-1445 (39)(11)
Arizona Water Company (Casa Grande)

W-1990 (1)
Casa Grande West Water Company, Inc.

W-2442 (2)
CP Water Company

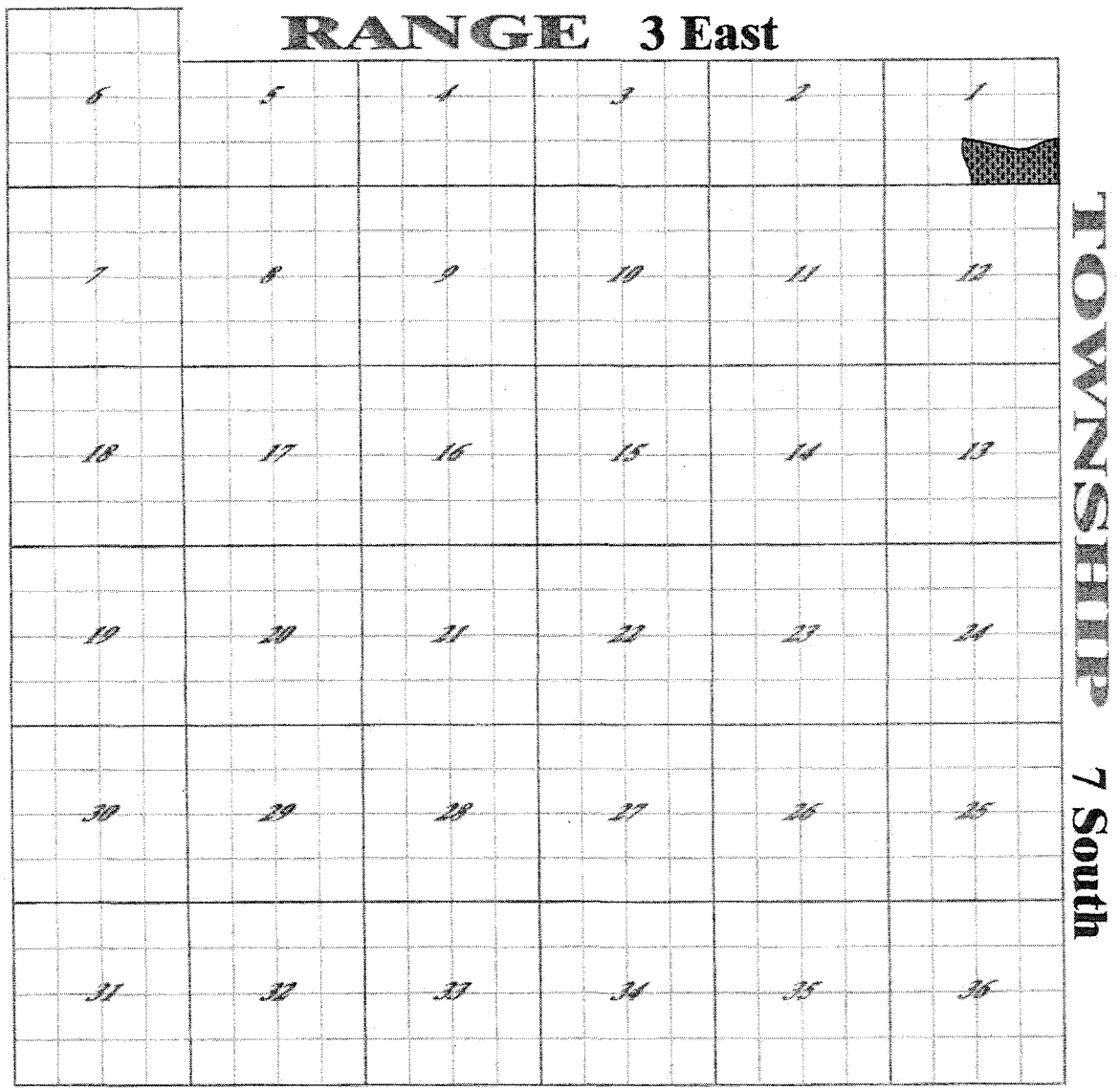
WS-1775 (2) Sewer
Francisco Grande Utility Company

(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR6S5E 12 APR 2006

COUNTY: *Pinal*



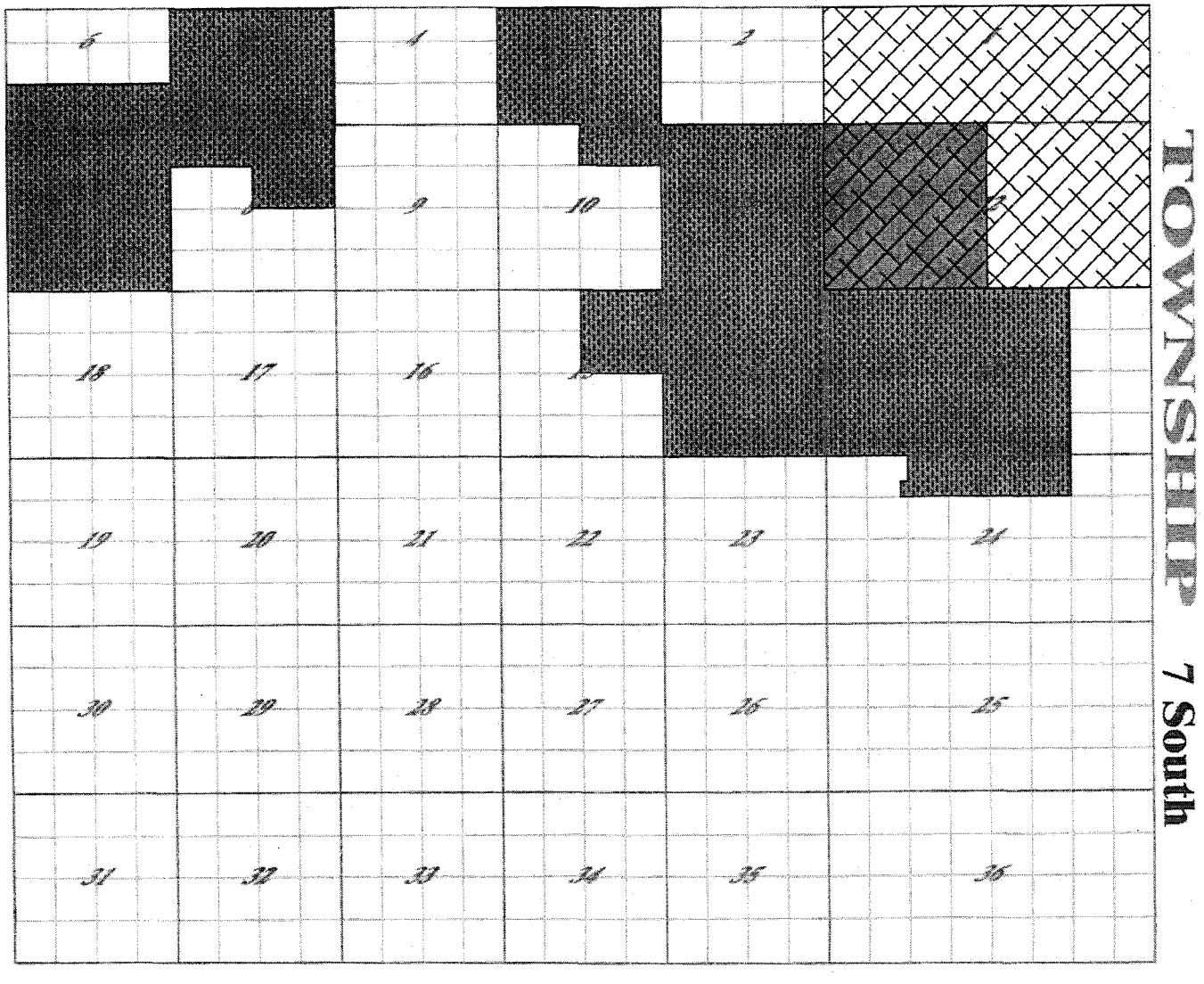
(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR7S3E 09 JAN 2006

COUNTY: *Pinal*

RANGE 4 East



W-1445 (39)(5)
Arizona Water Company (Stanfield)

(8)
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

(8)
Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

TR7S4E 23 MAR 2006

PINAL COUNTY

W-1445
Arizona Water Company

W-1990
Casa Grande West Water Company, Inc.

Nonjurisdictional
Copper Mountain Ranch Community Facilities District

W-2442
CP Water Company

WS-1775
Francisco Grande Utility Company

Sewer SW-3575 (3)
Palo Verde Utilities Company

W-3576 (3)
Santa Cruz Water Company

Sewer SW-4136 (2)
Santa Rosa Utility Company

W-4137 (2)
Santa Rosa Water Company

W-4195 (1)
The Ranches at Maricopa Homeowners Association
Adjudicated 'Not a Public Service Corporation'

Pending Applications

Arizona Water Company
Docket No. W-01445A-04-0743

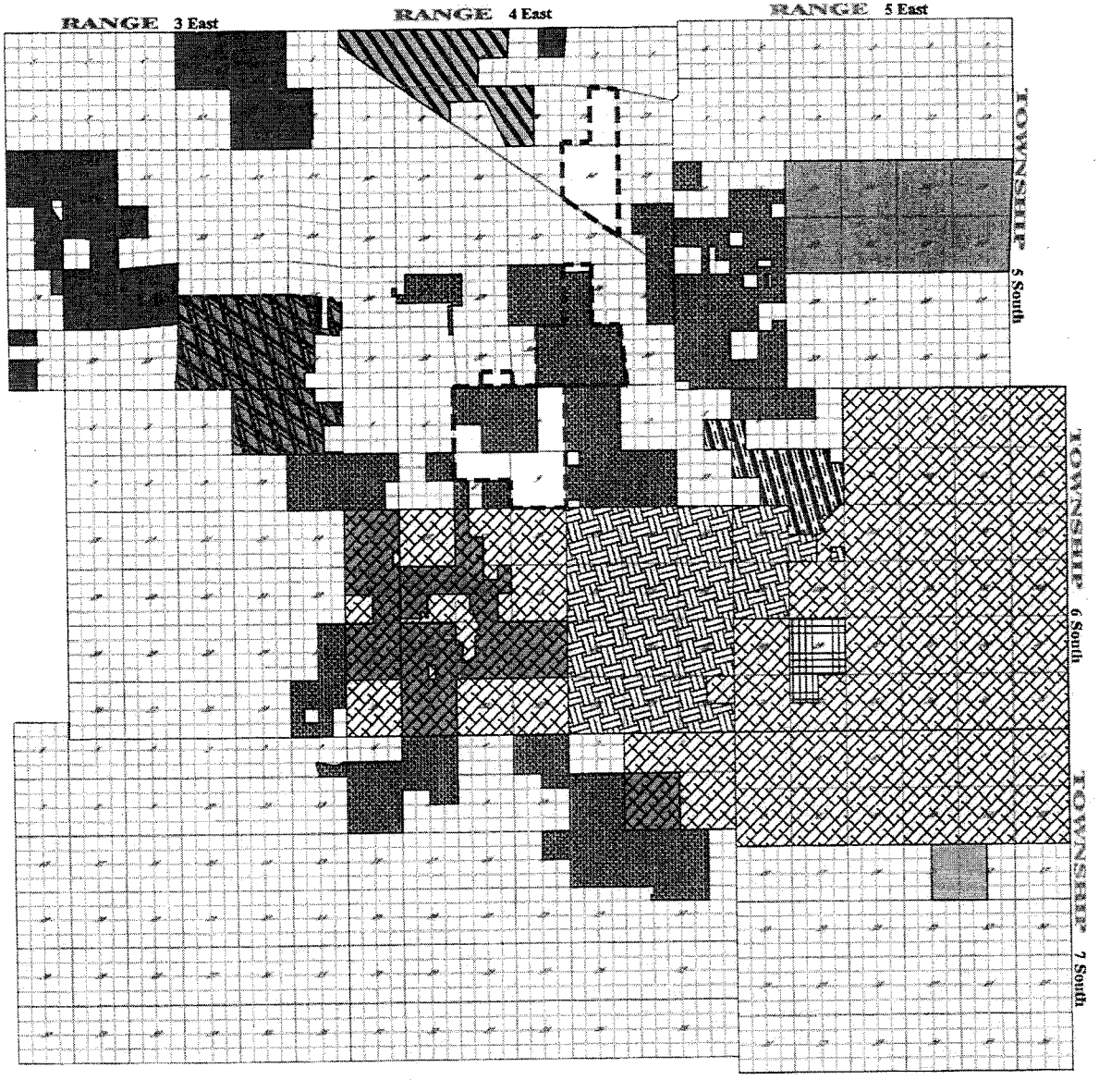
Santa Cruz Water Company
Docket No. W-03576A-05-0926
Application for Extension

Palo Verde Utilities Company
Docket No. SW-03575A-05-0926
Application for Extension

Arizona Water Company
Docket No. W-01445A-06-0059

Santa Cruz Water Company
Docket No. W-3576-05-307
Palo Verde Utilities Company
Docket No. SW-3575-05-307
Application for Extension

Santa Cruz Water Company
Docket No. W-03576A-05-0470
Palo Verde Utilities Company
Docket No. SW-03575A-05-0470
Application for Extension



EXHIBIT

"A"

AMENDED SOUTHEAST WATER EXPANSION LEGAL DESCRIPTION

TOWNSHIP 5 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

COMMENCING at the South quarter corner of Section 25;
THENCE North 00 degrees 36 minutes 49 seconds East along the West line of, said Southeast quarter, a distance of 1,580.97 feet to the TRUE POINT OF BEGINNING;
THENCE continuing North 00 degrees 36 minutes 49 seconds East, a distance of 1,267.58 feet to the center of Section 25 marked by a 1/2 inch iron pin;
THENCE South 82 degrees 44 minutes 30 seconds East along the North line of said Southeast quarter, a distance of 650.75 feet to a point;
THENCE South 00 degrees 32 minutes 20 seconds West, o distance of 1,405.95 feet;
THENCE North 84 degrees 21 minutes 45 seconds West, a distance of 645.68 feet to a point;
THENCE North 01 degrees 12 minutes 58 seconds West, a distance of 157.21 feet to the TRUE POINT OF BEGINNING;

COMMENCING at the South quarter corner of Section 25;
THENCE South 85 degrees 59 minutes 00 seconds East along the South line of Section 25, a distance of 50.69 feet to the TRUE POINT OF BEGINNING;
THENCE North 01 degrees 12 minutes 58 seconds West, a distance of 1,427.58 feet to a point;
THENCE South 84 degrees 21 minutes 45 seconds East, a distance of 645.68 feet;
THENCE South 00 degrees 32 minutes 20 seconds West, a distance of 1,405.95 feet to a point on the south line of said Section 25;
THENCE North 85 degrees 59 minutes 00 seconds West along said south line, a distance of 600.51 feet to the TRUE POINT OF BEGINNING;

TOWNSHIP 5 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE EAST HALF OF SECTION 24, TOGETHER WITH THE EAST HALF OF THE NORTHWEST QUARTER THEREOF.

THE EAST HALF OF SECTION 25.

THE WEST HALF OF SECTION 26, EXCEPT THE NORTHERLY 700 FEET THEREOF.

SECTION 27.

THE WEST 950 FEET OF SECTION 28, EXCEPT THE NORTH 750 FEET THEREOF, AND EXCEPT THE SOUTH 1930 FEET THEREOF.

THE NORTH 3400 FEET OF SECTION 29, EXCEPT THE NORTH 750 FEET THEREOF, AND EXCEPT THE WEST 850 FEET OF THE NORTH 2640 FEET THEREOF; TOGETHER WITH THE EAST 350 FEET OF THE SOUTH 1930 FEET OF SAID SECTION 29.

THE SOUTH 750 FEET OF THE EAST 400 FEET OF THE NORTHEAST QUARTER OF SECTION 30.

THE EAST 350 FEET OF THE NORTH 750 FEET OF THE NORTHEAST QUARTER OF SECTION 32.

THE EAST HALF OF SECTION 34.

SECTION 35.

TOWNSHIP 5 SOUTH, RANGE 5 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE SOUTH HALF OF SECTION 17, EXCEPT THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER THEREOF.

THE NORTHWEST QUARTER OF SECTION 18.

THE NORTH HALF OF SECTION 19, TOGETHER WITH THE WEST HALF OF THE WEST HALF OF THE SOUTHEAST QUARTER, AND TOGETHER WITH THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 19.

SECTION 20, EXCEPT THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT THE NORTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER.

SECTION 29, EXCEPT THE NORTH HALF OF THE SOUTHEAST QUARTER THEREOF, AND EXCEPT THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE NORTH HALF OF THE NORTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT THE EAST HALF OF THE EAST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER, AND EXCEPT THE WEST HALF OF THE WEST HALF OF THE EAST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER.

SECTION 30.

SECTION 31, EXCEPT THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER.

SECTION 32, EXCEPT THE NORTHWEST QUARTER.

TOWNSHIP 6 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 11.

SECTION 12, EXCEPT THE EAST HALF OF THE SOUTHEAST QUARTER.

THE EAST HALF OF SECTION 26.

SECTION 35, EXCEPT THE SOUTHEAST QUARTER, AND EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER THEREOF.

TOWNSHIP 6 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 3.

THE WEST HALF OF SECTION 4.

THE EAST HALF OF SECTION 5, TOGETHER WITH THE NORTHWEST QUARTER OF SAID SECTION 5.

THE NORTHEAST QUARTER OF SECTION 7.

THE SOUTH HALF OF SECTION 8, EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER THEREOF.

SECTION 10, EXCEPT THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER THEREOF.

SECTION 11.

TOWNSHIP 6 SOUTH, RANGE 5 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE NORTHWEST QUARTER OF SECTION 5.

THE NORTH HALF OF SECTION 6.

TOWNSHIP 7 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

TOWNSHIP 7 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THAT PORTION OF ANZONE ACRES NO.2 RECORDED IN BOOK 11, MAPS AND PLATS, PAGE 48, WITHIN SECTION 1, TOWNSHIP 7 SOUTH, RANGE 3 EAST, GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA, DESCRIBED AS FOLLOWS:
BEGINNING AT THE SOUTHEAST CORNER SAID SECTION 1;
THENCE N 00°04'50" W, ALONG THE EAST LINE OF SAID SECTION A DISTANCE OF 1320.14 FEET;
THENCE S 89°55'10" W, 52.00 FEET TO A POINT OF CURVATURE OF A TANGENT CURVE CONCAVE TO THE SOUTH;
THENCE SOUTHWESTERLY ALONG THE ARC OF SAID TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1051.00 FEET, A CENTRAL ANGLE OF 31°03'30", FOR AN ARC DISTANCE OF 569.72 FEET TO A POINT OF A REVERSE CURVE;

THENCE SOUTHWESTERLY ALONG THE ARC OF SAID REVERSE CURVE TO THE RIGHT, HAVING A RADIUS OF 1051.00 FEET, A CENTRAL ANGLE OF 42°56'20", FOR AN ARC DISTANCE OF 787.65 FEET TO A POINT OF TANGENCY;
THENCE N 78°12'00" W, 1557.00 FEET;
THENCE S 11°48'00" W, 37.00 FEET TO A POINT OF CURVATURE OF A TANGENT CURVE CONCAVE TO THE EAST;
THENCE SOUTHERLY ALONG THE ARC OF SAID TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1088.48 FEET, A CENTRAL ANGLE OF 40°25'20", FOR AN ARC DISTANCE OF 767.92 FEET TO A POINT OF A REVERSE CURVE;
THENCE SOUTHERLY ALONG THE ARC OF SAID REVERSE CURVE TO THE RIGHT, HAVING A RADIUS OF 1088.48 FEET, A CENTRAL ANGLE OF 28°40'00", FOR AN ARC DISTANCE OF 544.60 FEET TO A POINT OF TANGENCY;
THENCE S 00°02'40" W, 52.00 FEET TO THE SOUTH QUARTER CORNER OF SAID SECTION;
THENCE S 89°55'40" E, ALONG THE SOUTH LINE OF SAID SECTION A DISTANCE OF 2642.96 FEET TO THE POINT OF BEGINNING.

TOWNSHIP 7 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 3.

SECTION 5.

THE SOUTH HALF OF THE SOUTH HALF OF SECTION 6.

SECTION 7.

THE NORTH HALF OF THE NORTH HALF OF SECTION 8, TOGETHER WITH THE SOUTH HALF OF THE NORTHEAST QUARTER OF SAID SECTION 8.

THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 10.

SECTION 11.

THE WEST HALF OF THE EAST HALF OF SECTION 13, TOGETHER WITH THE WEST HALF OF SECTION 13. (NOTE: SECTION 13 IS TWO (2) MILES WIDE, THEREFORE THIS PARCEL IS 1.50 MILES WIDE (EAST-WEST).)

SECTION 14.

THE NORTHEAST QUARTER OF SECTION 15.

THE NORTH HALF OF THE NORTH HALF OF THE WEST HALF OF THE EAST HALF OF SECTION 24. (NOTE: SECTION 24 IS TWO (2) MILES WIDE.)

THE NORTH HALF OF THE NORTH HALF OF THE EAST HALF OF THE WEST HALF OF SECTION 24. (NOTE: SECTION 24 IS TWO (2) MILES WIDE.)

COMMENCING AT THE WEST QUARTER CORNER OF SECTION 24; THENCE EASTERLY ALONG THE EAST-WEST MIDSECTION LINE A DISTANCE OF 2640 FEET; THENCE NORTH 1320 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 500 FEET; THENCE WEST 232 FEET; THENCE SOUTH 500 FEET; THENCE EAST 232 FEET TO THE TRUE POINT OF BEGINNING.

The West half of the Southeast quarter AND the Southeast quarter of the Southwest quarter of Section 35, Township 6 South, Range 3 East

The East half of the Southwest quarter of Section 20, Township 5 South, Range 5 East

END

EXHIBIT

"B"

AMENDED SOUTHEAST SANITARY SEWER EXPANSION LEGAL DESCRIPTION

TOWNSHIP 5 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

COMMENCING at the South quarter corner of Section 25;
THENCE North 00 degrees 36 minutes 49 seconds East along the West line of, said Southeast quarter, a distance of 1,580.97 feet to the TRUE POINT OF BEGINNING;
THENCE continuing North 00 degrees 36 minutes 49 seconds East, a distance of 1,267.58 feet to the center of Section 25 marked by a 1/2 inch iron pin;
THENCE South 82 degrees 44 minutes 30 seconds East along the North line of said Southeast quarter, a distance of 650.75 feet to a point;
THENCE South 00 degrees 32 minutes 20 seconds West, o distance of 1,405.95 feet;
THENCE North 84 degrees 21 minutes 45 seconds West, a distance of 645.68 feet to a point;
THENCE North 01 degrees 12 minutes 58 seconds West, a distance of 157.21 feet to the TRUE POINT OF BEGINNING;

COMMENCING at the South quarter corner of Section 25;
THENCE South 85 degrees 59 minutes 00 seconds East along the South line of Section 25, a distance of 50.69 feet to the TRUE POINT OF BEGINNING;
THENCE North 01 degrees 12 minutes 58 seconds West, a distance of 1,427.58 feet to a point;
THENCE South 84 degrees 21 minutes 45 seconds East, a distance of 645.68 feet;
THENCE South 00 degrees 32 minutes 20 seconds West, a distance of 1,405.95 feet to a point on the south line of said Section 25;
THENCE North 85 degrees 59 minutes 00 seconds West along said south line, a distance of 600.51 feet to the TRUE POINT OF BEGINNING;

TOWNSHIP 5 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE EAST HALF OF SECTION 24, TOGETHER WITH THE EAST HALF OF THE NORTHWEST QUARTER THEREOF.

THE EAST HALF OF SECTION 25.

THE WEST HALF OF SECTION 26, EXCEPT THE NORTHERLY 700 FEET THEREOF.

SECTION 27.

THE WEST 950 FEET OF SECTION 28, EXCEPT THE NORTH 750 FEET THEREOF, AND EXCEPT THE SOUTH 1930 FEET THEREOF.

THE NORTH 3400 FEET OF SECTION 29, EXCEPT THE NORTH 750 FEET THEREOF, AND EXCEPT THE WEST 850 FEET OF THE NORTH 2640 FEET THEREOF; TOGETHER WITH THE EAST 350 FEET OF THE SOUTH 1930 FEET OF SAID SECTION 29.

THE SOUTH 750 FEET OF THE EAST 400 FEET OF THE NORTHEAST QUARTER OF SECTION 30.

THE EAST 350 FEET OF THE NORTH 750 FEET OF THE NORTHEAST QUARTER OF SECTION 32.

THE EAST HALF OF SECTION 34.

SECTION 35.

TOWNSHIP 5 SOUTH, RANGE 5 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE SOUTH HALF OF SECTION 17, EXCEPT THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER THEREOF.

THE NORTHWEST QUARTER OF SECTION 18.

THE NORTH HALF OF SECTION 19, TOGETHER WITH THE WEST HALF OF THE WEST HALF OF THE SOUTHEAST QUARTER, AND TOGETHER WITH THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 19.

SECTION 20, EXCEPT THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT THE NORTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER.

SECTION 29, EXCEPT THE NORTH HALF OF THE SOUTHEAST QUARTER, AND EXCEPT THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE NORTH HALF OF THE NORTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER, AND EXCEPT THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT EAST HALF OF THE EAST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER, AND EXCEPT THE WEST HALF OF THE WEST HALF OF THE EAST HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER.

SECTION 30.

SECTION 31, EXCEPT THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER.

SECTION 32, EXCEPT THE NORTHWEST QUARTER.

TOWNSHIP 6 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 11.

SECTION 12, EXCEPT THE EAST HALF OF THE SOUTHEAST QUARTER.

SECTION 13, EXCEPT THE EAST HALF OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER THEREOF.

SECTION 24, EXCEPT THE SOUTHWEST QUARTER THEREOF.

SECTION 25.

THE EAST HALF OF SECTION 26.

SECTION 35, EXCEPT THE SOUTHEAST QUARTER, AND EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER THEREOF.

TOWNSHIP 6 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 3.

THE WEST HALF OF SECTION 4.

THE EAST HALF OF SECTION 5, TOGETHER WITH THE NORTHWEST QUARTER OF SAID SECTION 5.

THE NORTHEAST QUARTER OF SECTION 7.

THE SOUTH HALF OF SECTION 8, EXCEPT THE EAST HALF OF THE SOUTHWEST QUARTER THEREOF.

SECTION 10, EXCEPT THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER, AND EXCEPT THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER THEREOF.

SECTION 11.

THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 17, TOGETHER WITH THE SOUTHWEST QUARTER OF SAID SECTION 17.

SECTION 19, EXCEPT THE SOUTHEAST QUARTER, AND EXCEPT THE SOUTH 410.3 FEET OF THE WEST HALF, AND EXCEPT THE FOLLOWING: COMMENCING AT THE SOUTH QUARTER CORNER OF SAID SECTION 19; THENCE NORTH ALONG THE NORTH-SOUTH MID-SECTION LINE A DISTANCE OF 410.3 FEET TO THE TRUE POINT OF BEGINNING; THENCE WESTERLY 659.8 FEET; THENCE NORTHERLY 620 FEET; THENCE EASTERLY 230 FEET; THENCE SOUTHERLY 130 FEET; THENCE EASTERLY 260 FEET; THENCE SOUTHERLY 460 FEET; THENCE EASTERLY 169.8 FEET; THENCE SOUTHERLY 29.7 FEET TO THE TRUE POINT OF BEGINNING.

THE NORTH HALF OF SECTION 20, EXCEPT THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER; TOGETHER WITH THE WEST HALF OF THE SOUTHEAST QUARTER; TOGETHER WITH THE EAST HALF OF THE SOUTHWEST QUARTER EXCEPT THE FOLLOWING: BEGINNING AT THE SOUTHWEST CORNER OF THE

SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 20; THENCE NORTH 00°35'48" EAST TO A POINT WHICH LIES 225.20 FEET SOUTH OF THE CENTER OF THE AFORESAID SOUTHWEST QUARTER OF SECTION 20; THENCE NORTH 89°58'58" EAST A DISTANCE OF 322.18 FEET; THENCE SOUTH 00°05'48" WEST A DISTANCE OF 435.31 FEET; THENCE NORTH 89°58'40" EAST A DISTANCE OF 238.00 FEET; THENCE SOUTH 00°05'48" WEST A DISTANCE OF 660.57 FEET, MORE OR LESS, TO THE SOUTH LINE OF SAID SECTION 20; THENCE NORTH 89°57'17" WEST ALONG THE SOUTH LINE OF SAID SECTION 20 A DISTANCE OF 560 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING.

SECTION 28.

SECTION 29, EXCEPT THE FOLLOWING DESCRIBED PARCEL; COMMENCING AT THE WEST QUARTER CORNER OF SAID SECTION 29; THENCE NORTH ALONG THE

WEST LINE OF SAID SECTION 29 A DISTANCE OF 535.68 FEET TO THE TRUE POINT OF BEGINNING; THENCE NORTH 89°57'08" EAST A DISTANCE OF 247.86 FEET; THENCE NORTH 00°02'27" WEST A DISTANCE OF 291.15 FEET; THENCE SOUTH 89°48'31" EAST A DISTANCE OF 445.83 FEET; THENCE SOUTH 03°02'38" WEST A DISTANCE OF 1977.58 FEET; THENCE NORTH 89°58'58" EAST A DISTANCE OF 225.00 FEET; THENCE NORTH 54°45'13" EAST A DISTANCE OF 1237.66 FEET; THENCE NORTH 00°12'35" WEST A DISTANCE OF 1758.56 FEET; THENCE NORTH 89°5'01" EAST A DISTANCE OF 161.82 FEET; THENCE NORTH 00°02'39" WEST A DISTANCE OF 660.69 FEET; NORTH 89 °58'30" EAST A DISTANCE OF 165.09 FEET; THENCE NORTH 00°02'40" WEST A DISTANCE OF 660.67 FEET, MORE OR LESS TO THE NORTH LINE OF SAID SECTION 29; THENCE NORTH 89°57'17" WEST ALONG THE NORTH LINE OF SAID SECTION 29 A DISTANCE OF 2145 FEET, MORE OR LESS, TO THE NORTHWEST CORNER OF SAID SECTION 29; THENCE SOUTHERLY ALONG THE WEST LINE OF SAID SECTION 29 A DISTANCE OF 2105 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING.

SECTION 30, EXCEPT THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER.

SECTION 31.

TOWNSHIP 6 SOUTH, RANGE 5 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THE NORTHWEST QUARTER OF SECTION 5.

THE NORTH HALF OF SECTION 6.

TOWNSHIP 7 SOUTH, RANGE 3 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

THAT PORTION OF ANZONE ACRES NO.2 RECORDED IN BOOK 11, MAPS AND PLATS, PAGE 48, WITHIN SECTION 1, TOWNSHIP 7 SOUTH, RANGE 3 EAST, GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER SAID SECTION 1;
THENCE N 00°04'50" W, ALONG THE EAST LINE OF SAID SECTION A DISTANCE OF 1320.14 FEET;
THENCE S 89°55'10" W, 52.00 FEET TO A POINT OF CURVATURE OF A TANGENT CURVE CONCAVE TO THE SOUTH;
THENCE SOUTHWESTERLY ALONG THE ARC OF SAID TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1051.00 FEET, A CENTRAL ANGLE OF 31°03'30", FOR AN ARC DISTANCE OF 569.72 FEET TO A POINT OF A REVERSE CURVE;
THENCE SOUTHWESTERLY ALONG THE ARC OF SAID REVERSE CURVE TO THE RIGHT, HAVING A RADIUS OF 1051.00 FEET, A CENTRAL ANGLE OF 42°56'20", FOR AN ARC DISTANCE OF 787.65 FEET TO A POINT OF TANGENCY;
THENCE N 78°12'00" W, 1557.00 FEET;
THENCE S 11°48'00" W, 37.00 FEET TO A POINT OF CURVATURE OF A TANGENT CURVE CONCAVE TO THE EAST;
THENCE SOUTHERLY ALONG THE ARC OF SAID TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1088.48 FEET, A CENTRAL ANGLE OF 40°25'20", FOR AN ARC DISTANCE OF 767.92 FEET TO A POINT OF A REVERSE CURVE;
THENCE SOUTHERLY ALONG THE ARC OF SAID REVERSE CURVE TO THE RIGHT, HAVING A RADIUS OF 1088.48 FEET, A CENTRAL ANGLE OF 28°40'00", FOR AN ARC DISTANCE OF 544.60 FEET TO A POINT OF TANGENCY;
THENCE S 00°02'40" W, 52.00 FEET TO THE SOUTH QUARTER CORNER OF SAID SECTION;
THENCE S 89°55'40" E, ALONG THE SOUTH LINE OF SAID SECTION A DISTANCE OF 2642.96 FEET TO THE POINT OF BEGINNING.

TOWNSHIP 7 SOUTH, RANGE 4 EAST, G&SRB&M, PINAL COUNTY, ARIZONA

SECTION 3.

SECTION 5.

THE SOUTH HALF OF THE SOUTH HALF OF SECTION 6.

SECTION 7.

THE NORTH HALF OF THE NORTH HALF OF SECTION 8, TOGETHER WITH THE SOUTH HALF OF THE NORTHEAST QUARTER OF SAID SECTION 8.

THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 10.

SECTION 11.

THE WEST HALF OF SECTION 12. (NOTE: SECTION 12 IS TWO (2) MILES WIDE.)

THE WEST HALF OF THE EAST HALF OF SECTION 13, TOGETHER WITH THE WEST HALF OF SECTION 13. (NOTE: SECTION 13 IS TWO (2) MILES WIDE, THEREFORE THIS PARCEL IS 1.50 MILES WIDE (EAST-WEST).)

SECTION 14.

THE NORTHEAST QUARTER OF SECTION 15.

THE NORTH HALF OF THE NORTH HALF OF THE WEST HALF OF THE EAST HALF OF SECTION 24. (NOTE: SECTION 24 IS TWO (2) MILES WIDE.)

THE NORTH HALF OF THE NORTH HALF OF THE EAST HALF OF THE WEST HALF OF SECTION 24. (NOTE: SECTION 24 IS TWO (2) MILES WIDE.)

COMMENCING AT THE WEST QUARTER CORNER OF SECTION 24; THENCE EASTERLY ALONG THE EAST-WEST MIDSECTION LINE A DISTANCE OF 2640 FEET; THENCE NORTH 1320 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 500 FEET; THENCE WEST 232 FEET; THENCE SOUTH 500 FEET; THENCE EAST 232 FEET TO THE TRUE POINT OF BEGINNING.

The West half of the Southeast quarter AND the Southeast quarter of the Southwest quarter of Section 35, Township 6 South, Range 3 East

The East half of the Southwest quarter of Section 20, Township 5 South, Range 5 East

END

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
JEFF HATCH-MILLER- CHAIRMAN
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	)	DOCKET NO. W-01445A-06-0199
IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. SW-03575A-05-0926
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY	)	DOCKET NO. W-03576A-05-0926

Direct Testimony of

Cindy Liles

on Behalf of

Palo Verde Utilities Company and
Santa Cruz Water Company

January 26, 2007

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I. INTRODUCTION.

Q. Please state your name and business address.

A. My name is Cindy Liles. My business address is 21410 North 19th Avenue, Suite 201, Phoenix, Arizona 85027.

Q. By whom are you employed and what is your position?

A. I am Senior Vice President for Growth Management and Chief Financial Officer ("CFO") of Global Water Management, LLC ("GWM"). GWM manages both Palo Verde Utilities Company ("Palo Verde") and Santa Cruz Water Company ("Santa Cruz")[1]. I am also Secretary for both Palo Verde and Santa Cruz.

Q. Please describe your education, background and experience.

A. I graduated from Delta State University in Mississippi with a bachelors degree in accounting in 1984. I am a certified public accountant and was employed by Holiday Inns Worldwide in Memphis, Tennessee in 1987. I was part of the team that structured the sale of Holiday Inns to Bass, PLC in 1990 and spun off Embassy Suites, Homewood Suites, Hampton Inns and Harrah's Casinos to form the Promus Corporation. As the Manager of Accounting, I hired the staff for the Bass, PLC offices in Atlanta, Georgia while also providing consulting to Promus Corporation. I was in that position until 1994.

From 1994 to 2000, I was the Senior Vice President and Chief Accounting Officer for Mid-America Apartment Communities. This was an apartment real estate investment trust

[1] Note that in Global has an application pending to transfer the CC&Ns and assets of Palo Verde Utilities Company, an Arizona limited liability company, and Santa Cruz Water Company, an Arizona limited liability company, to Global Water – Palo Verde Utilities Company, an Arizona corporation, and Global Water – Santa Cruz Water Company, an Arizona corporation. The transfer application is Docket No. SW-03576A-06-0155 et al. The terms "Palo Verde" and "Santa Cruz" as used in this testimony, should be read as applying to the new corporations if and when the transfer is approved by the Commission.

(REIT) headquartered in Memphis that traded on the New York Stock Exchange as MAA. In 2001, I relocated to Phoenix, Arizona, and partnered with the development company that formed Palo Verde and Santa Cruz, to provide wastewater and water services to the fast-growing areas near Maricopa, Arizona. I was the CFO and General Manager of these companies. When Global Water Resources, LLC. ("Global") acquired Palo Verde and Santa Cruz, I joined Global as the CFO and Vice President of Operations.

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

A. I will discuss the following topics in my testimony:

- I explain how Global received requests for service for all of Palo Verde's and Santa Cruz's requested extension areas. Developers approached Global, Palo Verde and Santa Cruz for both water, wastewater and reclaimed water service. Global has received requests for service from developers for the entire extension area Palo Verde and Santa Cruz is applying for. This is in contrast to Arizona Water Company's ("AWC") requested area that is also the subject of this proceeding.
- I describe Global's financial strength and the financial strength of both Palo Verde and Santa Cruz. Global is a financially sound and strong that has ready access to both debt and equity capital. Global's investors are committed to its goals of providing quality service and conserving water. Because Global is financially strong, both Palo Verde and Santa Cruz will be ready able and willing to provide safe and reliable service to its customers.
- I describe the importance of Global's objective of integrated water service and its dedication to conserving water and sustainable consumption of this precious resource. Global, Palo Verde and Santa Cruz work with developers on regional planning and requiring the developers to partner with Global's mission of sustainable water consumption through maximizing use of reclaimed water, using

renewable surface water when available and recharging the aquifer with any available excess water.

- I comment on AWC's application that is also part of this proceeding. I explain how Palo Verde's and Santa Cruz's financial strength, compares favorably with AWC.
- I sponsor the Joint Application from Santa Cruz and Palo Verde and the additional information filed by Global to supplement the Joint Application.
- I respond to both the Staff Report and the Supplemental Staff Report filed in these consolidated dockets. I recommend that the Commission adopt Staff Option 1.

II. REQUESTS FOR SERVICE.

Q. Could you provide a brief description of the extension areas sought by Santa Cruz and Palo Verde in this case?

A. Santa Cruz's requested extension area is about 30 square miles, and Palo Verde's requested extension area is about 40 square miles. While the requested extension areas are large, they are much smaller than AWC's proposed extension area, which exceeds 110 square miles. There is substantial overlap between Palo Verde and Santa Cruz extension areas. Even though the landowners requested water service from Santa Cruz, Santa Cruz did not overlay the extension request over the AWC service area. AWC's area consists of 16 sections of land and approximate 250 customers. The Palo Verde extension area includes all of the Santa Cruz extension area, as well as an additional area that is within AWC's Stanfield water CC&N. Santa Cruz and Palo Verde have current certificate areas in the City of Maricopa and southwest of the City. The extension areas in this case are to the southeast of the City.

Q. Could you describe how Palo Verde and Santa Cruz received requests for service for their respective extension areas.

A. Over 90% of the requests for service are from landowners, developers and homebuilders who have used Global's services in the past and prefer working with Global, an integrated provider. The balance of the requests for service originate from "word of mouth". In either case, the landowners, developers and homebuilders contact Global, and we begin the process to include the areas in an extension request.

Q. Did representatives of Global, GWM, Santa Cruz and/or Palo Verde solicit requests from these developers or landowners?

A. No. We did not "knock on doors" or seek out requests for service from landowners or developers with the requested extension areas for Santa Cruz or Palo Verde. Frankly, it is hard enough keeping up with all the unsolicited requests we get. We simply do not make unsolicited sales pitches. It is true that we have relationships with many of these developers and have a dialogue with them. Most of our requests come from entities whom we have worked with before. Those that are new to us, hear about us from "word of month" from other developers, landowners, or city or county officials. We are proud of Global's excellent reputation in those circles and we are pleased that so many landowners choose to work with us.

Q. Who are the developers and landowners that are requesting service from Santa Cruz and Palo Verde in this case?

A. They are listed on Appendix A to my testimony.

Q. Please describe the type of development anticipated in the Santa Cruz and Palo Verde Extension areas.

A. The requests for service is for land that is being master-planned similar to the land throughout our current service area. The developments will include single family housing, multi-family housing, active adult communities, commercial, retail and possibly some industrial.

Q. When is development anticipated to commence for the Santa Cruz and Palo Verde extension areas?

A. The landowners have requested service as soon as possible and are discouraged over the delay caused by the AWC competing application. Santa Cruz and Palo Verde plan to begin construction as soon as the extension request is approved.

Q. To your knowledge, why are landowners requesting water and wastewater service from Santa Cruz and Palo Verde?

A. I have worked with the landowners in the Maricopa area personally for over five years. I am repeatedly told by landowners that they prefer to offer their homeowners water and wastewater service from the same provider. They frequently mention that they can trust us and know we perform. These developers are also attracted to Santa Cruz and Palo Verde because of the enhanced ability for reclaimed water to be used for these developments, as well as exploring a multitude of methods to conserve scarce groundwater. Because Global owns Santa Cruz and Palo Verde, and has a well-developed plan in place to conserve water, it was logical for developers to seek requests from us.

Q. Do Santa Cruz and Palo Verde have 100% landowner support for their respective extension areas?

A. Yes. Santa Cruz and Palo Verde received requests for service for 100 percent of their respective extension areas in this case.

Q. How does this compare to AWC's proposed extension area and it's requests for service?

A. AWC has requests for service for only a few acres of its extension area. AWC's extension area covers about 110 square miles. Specifically, AWC's extension area is 70,494 acres, but AWC has requests for service from landowners for 197 acres.[2] Thus, AWC has requests for less than 0.3 % of its requested extension area.

Q. What is Global's position regarding requests for service?

A. Global's position is that CC&N extensions should be supported by requests for service to the extending utility for the entire extension area. Global follows this position in its own cases as a matter of policy. Further, this position is based on our understanding of the Commission's traditional approach to these matters. The Commission should continue to follow this tradition. To do otherwise would condone utilities "land-grabbing" to the detriment of landowners and potential customers in those areas.

Service area granted through a CC&N obligates the utilities to serve. Global prefers to take the opportunity to work with each landowner and assist them in their planning process. At a minimum, the planning that a landowner considers include:

- timing of when services can be provided,
- detail of how service will be provided i.e. plant location, plant size, line locations, line sizes,

[2] See Attachment B to AWC's Response to Staff's Insufficiency Letter, filed by AWC on July 7, 2006.

- costs that will be incurred to receive service i.e. what assets are their responsibility to construct,
- assured water supply for 100 years, and
- review of irrigation and landscape plans to maximize the use of reclaimed water for non-potable uses.

Q. Does requiring requests for service honor landowner rights?

A. Yes. Property rights are an important part of the heritage of this country. The Commission should not grant a monopoly over people's property without their consent. Moreover, the request must be directed to the utility seeking the extension. In other words, another utility should not be able to "hijack" requests sent to someone else. Such hijacking thwarts the choices made by the landowner. Unfortunately, that's just what AWC is doing in this case.

Q. Please explain.

A. AWC attached requests directed to Santa Cruz and Palo Verde to its own application. In other words, AWC tried to hijack Global's requests to serve its own purposes. The Commission should reject this ploy and honor the requests by granting CC&Ns to Santa Cruz and Palo Verde, not AWC. Granting these areas to AWC for water service would counter the desires of those landowners, without any real justification to do so.

Q. Do requests for service have other benefits?

A. Yes. Requests for service are typically made as part of the developer's planning process. In the absence of a request, there is no reason to think that a CC&N extension is necessary, or that necessary planning has been done. Efforts to plan for efficient use of resources – especially water – would be hurt if utilities are granted huge expanses of land without any plans in place for development or managing resources. Santa Cruz's and Palo Verde's

requested extension areas are to accommodate master-planned developments, which means they have gone through, or are going through, local zoning processes as well as preparing water budgets and dealing with a myriad of environmental factors. By contrast, the vast majority of land AWC is seeking be included in its CC&N has not been through any planning process. Moreover, without input and cooperation from the developer, the utility will not have basic information needed to plan service for the extension area. Such basic information includes the density of development, the type of landscaping, and the existence of water features. A lot of unanswered questions would remain if AWC's application were approved. This is troubling to us.

Q. Do you have any final comments concerning requests for service?

A. Yes. Santa Cruz, and Palo Verde received requests for service for all of their respective extension areas. These requests were not solicited; developers and landowners initiated these requests. By contrast, AWC has received requests for service for it to provide water service for only 0.3 percent of the vast extension area it requests. Requests for service have and should still continue to be a requirement in CC&N cases. To allow otherwise would invite land-grabs like the one AWC is attempting here. Finally, developers and landowners in Santa Cruz's and Palo Verde's respective proposed extension areas requested service from Santa Cruz and Palo Verde. The Commission should honor the rights of these property owners because Santa Cruz and Palo Verde are fit and proper entities and are ready, willing and able to provide service.

III. FINANCIAL CONDITION OF SANTA CRUZ AND PALO VERDE.

Q. How do Santa Cruz and Palo Verde currently fund capital improvements to their respective systems?

A. Capital improvements for both Santa Cruz and Palo Verde are funded with the retained earnings of Santa Cruz and Palo Verde as well as from the parent, Global. Global's policy is for Santa Cruz and Palo Verde to redeploy all retained earnings into capital improvements in support of growth for the foreseeable future.

Q. Please describe the current financial situation of Santa Cruz and Palo Verde.

Both utilities are financially strong. Neither Santa Cruz nor Palo Verde use debt to finance capital improvements. Both entities have a capital structure of 100 percent equity. Together, they have more than $87 million in equity, and no debt.

Q. Do Global's key officers own equity in Global?

A. Yes. Mr. Hill has a 23.29 percent interest, Mr. Symmonds has a 2.5 percent interest and I have a 1.5 percent interest. All three of us have a vested interest in seeing Global and all of its regulated affiliates remain strong and healthy utilities that fulfill their commitment to safe and reliable service. In contrast, AWC's officers appear to have no financial stake in their company.[3]

Q. How will Santa Cruz and Palo Verde finance new facilities in their respective extension areas?

A. Global will provide equity to fund the construction of regional water treatment plants including surface water treatment, regional water reclamation plants, large mains to the developer's property, and other "off-site" facilities. Facilities within the developer's

[3] See AWC Response to Global 1.4.

property (i.e. "on site" facilities), such as local distribution lines, will be financed with advances in aid of construction ("AIAC") through standard main extension agreements.

Q. Will Global have the financial strength to ensure its regulated affiliates in this case, Santa Cruz and Palo Verde, remain healthy water and wastewater providers.

A. Yes.

Q. Please describe the current financial situation of Santa Cruz and Palo Verde.

A. Neither Santa Cruz nor Palo Verde use debt to finance capital improvements. Both entities have a capital structure of 100 percent equity. Together, they have more than $87 million in equity, and no debt.

Q. How can financial strength be measured?

A. There are many ways to assess financial strength of any company, there are literally dozens of financial ratios available; current ratios, operating leverage ratios, and as the ACC is aware, Funds from Operations to Debt ratios.

Q. What is the best approach to measuring financial strength?

A. I believe that the best approach is to use a variant of the famous "Altman Z-Score". In the 1960's, Edward Altman developed a model for predicting financial distress in a company by combining certain financial ratios and weighting them, the result is the "Z-Score".[4] The Altman Z-Score is taught in business schools across the globe, and has been shown to

[4] See: http://www.nysscpa.org/cpajournal/old/16641866.htm and http://www.investopedia.com/terms/a/altman.asp, and http://financial-dictionary.thefreedictionary.com/Altman+Z-Score (which shows that the model had 72% accuracy in predicting bankruptcies), and http://www.valuebasedmanagement.net/methods_altman_z-score.html

predict financial distress and bankruptcy 72% of the time. Altman found that where $Z < 1.23$ bankruptcy is likely; where $1.23 < Z < 2.9$ a firm is in a 'gray area'; and where $Z > 2.9$ bankruptcy is unlikely.

Q. Has the Altman Z-Score been modified for use in analyzing utilities?

A. Yes. In 1992, the National Regulatory Research Institute ("NRRI"), which conducts research for the National Association of Regulatory Utility Commissioners ("NARUC"), reworked the Altman Model specifically for water utilities.[5] The NRRI found that because the Altman Z-Score model had not "been developed for the specific conditions that apply to water utilities" it did not accurately predict financial distress for them. Thus NRRI modified some of the terms used, and did not weight the ratios.

The resulting model was extensively tested by NRRI and was detailed in the referenced paper. The NRRI found that where $Z < 3$ the utility is distressed; where $3 < Z < 3.9$ a utility is weak to marginal; and where $Z > 4$ the utility has good to excellent financial strength.

Q. Please discuss the results of your study.

A. I used the NRRI version of the Altman Z-Score model, and the results show that Santa Cruz Water Company is in good to excellent financial condition, and Palo Verde Utilities Company is on the borderline of 'distressed' and 'weak to marginal'. These results are not surprising. It is a well established fact that water companies have lower capital

[5] See http://www.nrri.ohio-state.edu/dspace/bitstream/2068/290/1/9718c1.PDF

requirements than wastewater companies. Furthermore, the low rates allowed for sales of reclaimed water have eliminated wastewater companies' ability to earn healthy returns.

Q. Please provide more detail.

A. NRRI uses the following ratios in creating its "Distress Classification Model". Each ratio measures the risk of distress, with lower scores signaling an increased risk of distress. By combining ratios into one model, NRRI (and Altman) have increased the reliability of the predictive nature of the model. This 'sum of the parts' approach to financial analysis provides a more complete picture of the utility's health.

Ratio 1: Profitability.

Net income + Depreciation/ Annual Operating Revenues

Santa Cruz: 0.76

Palo Verde: 0.56

Ratio 2: Liquidity

Current Assets/ Current Liabilities

Santa Cruz: 0.21

Palo Verde: 0.33

Ratio 3: Leverage

Common Stock Equity/ Total Assets

Santa Cruz: 0.82

Palo Verde: 1.02

Ratio 4: Profit Trend

Retained Earnings/ Common Stock Equity

Santa Cruz: 0.43

Palo Verde: 0.018

Ratio 5: Growth & Efficiency

Annual Operating Revenues/ Average Total Assets[6]

Santa Cruz: 0.37

Palo Verde: 0.11

Ratio 6: Efficiency & Profitability

Annual Operating Revenues/ Annual Operating Expenses

Santa Cruz: 2.8

Palo Verde: 1.27

Ratio 7: Profitability

Net Income/ Annual Operating Revenues

Santa Cruz: 0.65

Palo Verde: .021

Adding all the ratios results in the following NRRI Z-Scores:

Santa Cruz: 5.27

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[6] In this ratio, I replaced NRRI's "Total Assets" with "Average Total Assets" which is the sum of 2004's Total Assets and 2005's Total Assets divided by 2. By doing so, the matching principle is improved – the Asset denominator, like the Operating Revenues numerator, reflects 2005 data. If the NRRI model is strictly followed the ratios would be SCWC: 0.XX and PVUC: 0.XX, the Z-Scores would be SCWC: 5.XX and PVUC: 2.XX.

Palo Verde: 2.96

To restate, NRRI found that where $Z < 3$ the utility is distressed; where $3 < Z < 3.9$ a firm is weak to marginal; and where $Z > 4$ the firm has good to excellent financial strength. Applying NRRI, which is more conservative than Altman due to the public health and safety aspect of utility services, we find that Santa Cruz is in excellent financial condition, but Palo Verde is distressed. This is critically important information.

Q. Why is the Z score difference between Santa Cruz and Palo Verde important?

A. The NRRI Z-Score Model demonstrates not only the financial strength of Santa Cruz and Palo Verde, it shows why water and wastewater utilities must be integrated - because wastewater has higher capital requirements and higher O&M costs, and thus, lower profitability. Arizona Water Company, and other water-only companies, know this and have chosen not to own and operate wastewater utilities.

It is worth noting that this doesn't even account for the financial problems resulting when the wastewater utility 'competes' with the water utility by replacing potable water consumption with reclaimed water. Elsewhere, Mr. Hill and Mr. Symmonds address the water conservation, and water resource management benefits of always integrating water and wastewater companies, and the ability to use reclaimed water to offset potable water demand is one of those reasons.

Q. From a financial perspective, why should water and wastewater utilities be integrated?

A. Water and wastewater utilities should always be integrated because a wastewater company, operating independently, will have greater capital requirements than a water company while returning lower profits than a water company; therefore it will have a difficult time competing for capital in the marketplace.

Q. What are the implications for Santa Cruz and Palo Verde?

A. The benefits of the NRRI Z-Score Model are especially shown in the case of these utilities; both are facing extreme growth pressures and are attempting to emplace massive regional infrastructure in advance of that growth. Because of this pressure, investment in infrastructure is made well in advance of growth, and as a result, the liquidity of each company is reduced. Put simply, earnings go back into the ground, not onto the books.

Q. How does AWC compare?

A. I tried to compare them, but their "Ratio 4" was highly abnormal due to their low level of common equity. AWC's NRRI Z-Score was 23.25, but adjusted for this abnormal ration, it would be less than 3.

IV. CHALLENGES OF GROWTH

Q. What are the obvious benefits of regional planning?

A. As discussed within other testimony, Global no longer feels it is prudent for Arizona to build communities in outlying areas without considering regional planning of infrastructure as well as the water resource. Taking a longer view approach versus planning and providing service for one developer at a time promotes economies of scale in

construction costs as well as ongoing operating and maintenance costs. Ignoring regional planning often leads to small, inefficient facilities that cannot take advantages of economies of scale. The numerous small, "package" wastewater plants in Arizona are an example of this phenomenon.

Regional planning is required to support the triad of conservation and align the interests of developers and utilities while allowing both to work with the cities to achieve sustainable and planned growth.

Q. Has Global successfully addressed the significant amount of growth in Maricopa?

A. Yes. Global works closely with each landowner, county and city official to ensure the needs are met of each.

Q. Please elaborate on the challenges posed by the rapid growth in Maricopa.

A. Servicing the fastest growing City in the nation has been extremely challenging. Completing permitting processes, building the water designation and deploying the appropriate levels of infrastructure to achieve our conservation aim has been a daunting task. Not withstanding, I'm proud to report that Global is poised for the next waive of growth and has many thousands of units of constructed capacity presently available.

V. <u>AWC'S FINANCIAL STRENGTH VERSUS GLOBAL</u>.

Q. Have you had the opportunity to review AWC's financial information?

A. Yes. I have reviewed AWC's financial statements for 2003, 2004 and 2005.

Q. How does AWC's financials compare with the financials of Santa Cruz and Palo Verde?

A. AWC is financially weaker. For example, Global has more than $ 87 million in equity, and no debt. In contrast, AWC has only $ 69 million in equity, and more than $ 30 million in debt.[7] AWC also has large amounts of contributions and advances in aid of construction. Thus, of AWC's total assets of more than $ 211 million, only $ 69 million is equity. AWC's low level of equity, as compared to Global, is even more striking when the relative size of the companies is considered. AWC has substantially more customers and revenue than Santa Cruz and Palo Verde, as shown in the chart below. Thus, AWC does much worse on metrics like equity per debt (equity ratio), equity per customer and equity per unit of revenue.

	Palo Verde / Santa Cruz at 12/31/06	AWC
Equity	$ 87 million	$ 69 million
Debt	$ 0	$ 30 million
Customers	12,600	75,000 [8]
Operating Revenue	$12,500,000[9]	$37,545,304
Equity Ratio	100 %	43%
Equity per customer	$6,900	$920
Equity per $ of Revenue	$6.96	$1.84

Q. Are there other signs of financial weakness for AWC?

A. Yes. AWC admits that it is having substantial difficulty selling its bonds.[10]

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[7] AWC 2005 Balance Sheet, provided in response to Global 1.52. (Total of Account 221 – Bonds and Account 231 Notes Payable).

[8] See Decision No. 69163 (December 5, 2006) at 3:16.

[9] Includes revenues from 387 Water and Wastewater Improvement District.

[10] See AWC Response to Global 1.58, 1.59, and 1.60.

Q. Do you have any particular concerns about AWC's financial projections and analysis?

A. A large concern for me is that AWC presented financial projections and analysis without having met with each landowner to discuss their particular plans for development including timing, plant and line location, and irrigation needs. The assumption that all irrigation and non-potable needs can be met and the groundwater impact solved by joining the CAGRD is antiquated thinking and no longer prudent in Arizona.

VI. JOINT APPLICATION OF SANTA CRUZ AND PALO VERDE.

Q. Are you sponsoring the Joint Application of Santa Cruz and Palo Verde that is part of this proceeding?

A. Yes.

Q. Please describe the contents of the application.

A. The application includes nine exhibits:

1. Identification of Master Planned Communities with numbers of acres and number of lots.
2. Requests for service we received to service the proposed extension areas.
3. A legal description for the Santa Cruz Extension Area.
4. A legal description for the Palo Verde Extension Area.
5. Certificates of Good Standing for both Santa Cruz and Palo Verde.
6. Maps and Service Memorandum.
7. Balance Sheets from 2004 for Santa Cruz and Palo Verde.
8. The estimated number of customers in the first five years.
9. The estimated operating revenue and operating income for the first five years.

We filed our Joint Application December 28, 2005. Our application was designed to meet the requirements set forth in the Arizona Administrative Code. We also worked with Staff to provide additional information in response to insufficiency letters. Our Joint Application became sufficient June 23, 2006.

Q. Please describe what additional information Santa Cruz and Palo Verde provided during the sufficiency process.

A. We responded to Staff's request for more information on two occasions. On April 6, 2006, we provided several exhibits and responded to nineteen inquiries from Staff. The exhibits we provided include: (1) a map showing the geophysical boundary of each phase of the proposed water treatment plant planned for the area; (2) the preliminary well assessment; (3) a map showing the geophysical boundary of each phase of the proposed wastewater treatment plant; (4) a legal description for Campus 3 Water Reclamation Facility; and (5) preliminary construction drawings done March 2006. Further, we explained how we intended to use Central Arizona Project ("CAP") water, described our plans to rehabilitate and convert certain wells within the proposed extension area, and how developers are required to make provisions to accept reclaimed water for reuse in common areas, including storage impoundments.

We also provided additional information on May 8, 2006. That information included (1) Santa Cruz's water data from February 2005 through March 2006; (2) a map showing the wells in the South East Service Area ("SESA") proposed for Phase I; (3) Palo Verde's wastewater flow data from February 2005 through March 2006; and (4) revised legal descriptions. I am sponsoring this additional information as well to admit as evidence in this proceeding. Mr. Symmonds, however, is the right person to respond to specific engineering questions regarding these items.

Q. Did Santa Cruz and Palo Verde later provide an updated legal description?

A. Yes, we filed an updated legal description on May 31, 2006, after working with Staff. The legal description is part of Mr. Symmonds' testimony.

Q. Were you in charge of gathering this information together?

A. Yes.

Q. Do you have any changes or additions to make to these documents?

A. No.

VII. RESPONSE TO STAFF REPORTS.

Q. Have you reviewed both Staff's Report dated October 25, 2006 as well as Staff's Supplement Report dated December 26, 2006?

A. I have reviewed both Staff Reports.

Q. What is your understanding of Staff's recommendations regarding both AWC's application and the Joint Application from Santa Cruz and Palo Verde that are the subject of this proceeding?

A. My understanding is that Staff is proposing three options to the Commission with regards to the competing water applications:

1. Grant Santa Cruz those areas where there are requests for service directed to Santa Cruz (i.e. all of its requested extension area) and grant AWC those areas where there are requests for service directed to AWC (i.e. 197[c1] out of 70,494 acres).
2. Grant AWC approval to serve the areas contiguous to AWC's current service territory where there are also requests for service to Santa Cruz or AWC.

3. Grant Santa Cruz approval to serve areas north of Korston Road and grant AWC approval to serve areas south of Korston Road. The areas would be limited to land where either Santa Cruz or AWC received a request for service.

Also, Staff recommends that the Commission should approve Palo Verde's application for its requested extension area.

Q. What are your comments on Staff's options?

A. Staff's first option is clearly superior for several reasons.

First, this is the only option that recognizes that developers and landowners requested service from Global and its regulated utilities. The Commission should take this important factor into consideration, especially since Santa Cruz is a fit and proper entity to provide service.

Second, Staff recognizes that the provision of water and wastewater services from affiliates will likely lead to efficiencies. The potential for centralized customer service and combined bills, as Staff points out, is apparent. Only option one provides more landowners and developers the opportunity to benefit from operational efficiencies. In other words, integrated utilities gain from economies of scale and scope. Further, it is easier for customers to deal with an integrated provider than with separate, unrelated companies. Moreover, developers and landowners will need to only work with one entity for utility infrastructure.

Third, unlike AWC, Global has shown its commitment to finding means to reduce the reliance on groundwater and actively promote conservation. Granting Santa Cruz and Palo

Verde its requested extension areas will best ensure that these important aims are met in those areas.

Fourth, Staff's first option is the only option that promotes groundwater conservation because customers will receive integrated water and wastewater services. Integrated services are the only way to effectively promote real groundwater conservation, as discussed by Mr. Hill and Mr. Symmonds. Under Staff's other options, customers will not receive integrated service.

Fifth, only Staff's first option addresses all the utility needs in the area. Under the first option, customers will receive water, wastewater and reclaimed water service. Under the other options, the customers in AWC areas will receive only water service – i.e. one out of three needed services. Global does not intend to provide stand-alone wastewater service, as explained in Mr. Hill's testimony.

Q. Staff's Report docketed October also discusses the financial health and rates of Santa Cruz and Palo Verde. Do you have any comments to what is stated in Staff's Report on these topics?

A. The necessity for capital expenditure is driven by the conservation model and the requirement to stay ahead of growth. As a result, Santa Cruz and Palo Verde continue to redeploy its earnings in infrastructure.

Q. Do you have any other comments about Staff's Report and Supplemental Report?

A. We are pleased to see that Staff recommended that only those areas where there are requests for service be awarded to any utility. Clearly, AWC has not demonstrated that it should be awarded a vast stretch of territory merely because it believes that it is somehow entitled to this area. This is especially true when AWC can provide no timeframe for when

the vast majority of the territory it seeks may be developed, how it may be developed and has gone through none of the planning processes required to be developed. The Commission simply does not need to approve AWC's application for territory at this time when development prospects are speculative at best.

VIII. CONCLUSION

Q. Do you have any closing comments about how approving Santa Cruz's and Palo Verde's Joint Application is in the public interest?

A. Yes I do. Santa Cruz and Palo Verde are utilities that are run by experienced and capable personnel and management. Santa Cruz's and Palo Verde's ultimate parent, Global, has developed a comprehensive plan to actively implement water conservation in the service territories of its regulated affiliates. Granting Santa Cruz and Palo Verde its Joint Application will allow Global to further that plan for more customers and territory in Arizona. Santa Cruz and Palo Verde are financially-healthy utilities backed by a healthy parent company. Global has actively sought cooperation with developers as well as cities and towns to promote the use of reclaimed water and surface water, and recharging the aquifer when excess reclaimed or surface water is available. We continue to believe that the practice of not granting CC&N extensions absent requests for service is a sound philosophy. AWC's application requests a vast stretch of territory without any requests for service. Santa Cruz and Palo Verde, on the other hand, received unsolicited requests for service from developers and landowners interested in receiving integrated water and wastewater service. Because Santa Cruz and Palo Verde are fit and proper entities, the Commission should strongly consider the rights of these landowners and developers when deciding this case. Staff's first option, granting each utility the service territory it has received requests for service, best balances all of the important considerations I have discussed in my testimony. We would respectfully request that the Commission approve

Santa Cruz's and Palo Verde's Joint Application in its entirety, and award AWC only that territory it had received requests for service from, which amounted to about 175 acres out of the 70,494 acres it requested.

Q. Does that conclude your direct testimony?

A. Yes.

EXHIBIT

"1"

EXHIBIT 1

Developer/Development		Number of Acres		Number of Lots	
		Water CCN Extension		Wastewater CCN Extension	
Legend	Landowner/Developer	Acreage	Number of Lots	Acreage	Number of Lots
1	LLF Stanmar Estates, LLC			431	1,509
2	Langley Farm Investments, LLC			180	630
3	Big Trail, LLC			640	2,240
4	Lonely Trail 780, LLC			780	2,730
5	ROB-LIN Marketing (Vistoso)			1,008	3,528
6	ABCDW, LLC			1,942	6,797
7	TOM-T, LLC / T Farms, LLC / TTTT Farms, LLC			1,200	4,200
8	Langley Stanfield Estates, LLC	441	1,544	441	1,544
9	Langley Farm Investments, LLC	663	2,321	663	2,321
10	Langley Stanmar 160, LLC	160	560	160	560
11	CCB Stanfield Estates, LLC	96	336	96	336
12	Carranza Associates, LLC	80	280	80	280
13	Stanfield Estates	96	334	96	334
14	Dart Properties, LLC	620	2,170	620	2,170
15	Anderson & Val Vista 6, LLC	1,879	6,577	1,879	6,577
16	SCR, LLC	674	2,359	674	2,359
17	Parker Estates, LLC	640	2,240	640	2,240
18	Hondo 640, LLC	640	2,240	640	2,240
19	Rio Lobo, LLC	640	2,240	640	2,240
20	JP Holdings LP	689	2,412	689	2,412
21	Anderson & Barnes 580, LLP	580	2,030	580	2,030
22	120 Townsend, LLC	200	700	200	700
23	NS 120 Limited Partnership, LLLP	120	420	120	420
24	Montgomery 156 Limited Partnership, LLLP	156	546	156	546
25	CG 215 Limited Partnership, LLLP	215	753	215	753
26	Casa Grande Montgomery 240 Limited Partnership, LLLP	240	840	240	840
27	RRY Casa Grande 320 Limited Partnership, LLLP	320	1,120	320	1,120
28	SVVM 80 Limited Partnership, LLLP	80	280	80	280
29	VV Monty, LLC	60	210	60	210
30	RRY Real Estate, LLC	40	140	40	140
31	Robin R Yount, LTD	40	140	40	140
32	Richard and Dana, LLC	40	140	40	140
33	Bruce and Karen, LLC	40	140	40	140
34	Sacaton BL, LLC	280	980	280	980
35	Trading Post Road LLC & DLW Associates, LP	60	210	60	210
36	Chartwell Casa Grande 40, LLC	40	140	40	140
37	Gallup Financial, LLC	1216	4,256	1216	4,256
38	Gallup Financial, LLC	1484	5,194	1484	5,194
39	ROB-LIN Marketing, Inc.	220	770	220	770
40	Jorde Hacienda, Inc.	3,120	10,920	3,120	10,920
41	Vanderbilt Farms, LLC	1,920	6,720	1,920	6,720
42	CRW Holdings I, LLC	30	105	30	105
43	Val Vista & Montgomery, LLC	40	140	40	140
44	Williams Family Revocable Trusts	160	560	160	560
45	Blevins	160	560	160	560
46	Terbus Investments, LLC	40	140	40	140
47	Douglas Payne, individually	80	280	80	280
48	C. Kronwald Children's Trust	80	280	80	280
49	Teel 80, LLC	82	287	82	287
50	KEJE Group, LLC	80	280	80	280
51	Hampden and Chambers, LLC & BevNorm Olive, LLC	807	2,825	807	2,825
52	Henry McMillan and Alexander McMillan, individually	25	88	25	88
		19,373	67,804	25,554	89,437