Water 101: Understanding our Water Issues

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On a spring day in 1869, ten men and four dories slipped into the current of the Green River just below the railroad bridge at Green River Station, Wyoming. Just days before, as the party camped below waiting to leave, the first transcontinental train had crossed the bridge above them. The East had joined the West.

The expedition was led by Major John Wesley Powell, a one-armed Civil War veteran. Over the next three and a half months Powell would lead the men over 1000 miles through the unexplored canyons of the Green and Colorado rivers.

When the journey ended it would be declared a success. Major Powell would become a hero. And the cover would be pulled off of the last major watershed in the west.

What Powell discovered was a mysterious land, desperately arid, hauntingly beautiful, and destined to be misunderstood.

He would make a second trip down the river in 1871 and follow it up with a survey of the canyon country in addition to a notable study of the indigenous Native American tribes. His observations of these lands would produce one of the most revolutionary documents to ever roll off of a government printing press.

In 1878, John Wesley Powell published his treatise on the West as he saw it. Entitled "Report on the Lands of the Arid Region of the United States," it would become the first attempt to understand the nature of the Great American Desert.

As Powell saw it, there was too much land and too little water. To address that reality, he offered a radical approach to land use. Powell saw the village pattern of the Spanish Southwest and Mormon Utah as a more workable solution to land use than the pattern of large ranches that dominated the Midwest. He also saw that organizing states by counties would be cumbersome and illogical. Instead he opted for political divisions organized by river valleys and watersheds.

His vision of dams, reservoirs, and communal irrigation companies would become a reality, but his warnings about land use would be ignored.

The consequences of that ignorance have led us to move mountains and relocate rivers in an effort to support a lifestyle that is alien to the land, and as a result of our aspirations, we now find ourselves grappling with the difficulties of how to make infinite a finite supply of water.

In Yavapai County we also find his ideas of political division would have proved themselves to be quite beneficial, and as you will see, logical.

In many ways, Yavapai County is a microcosm of the west. It has gold, it has cowboys, it has Indians—it also has a history of economic booms and busts, and a spirit of independence that has been both a benefactor and a bane. Oh yea, and it has a limited supply of water.

The reality of that limited water supply hit home in 1998, when legislation was introduced at the state capitol to allow pumping of the aquifer at the headwaters of the Verde River. In the grand tradition of the west, a water fight broke out between the community leaders on the Prescott side of the county and the leadership on the Verde side.

The underlying causes of the dispute are far from being resolved, but the emotions have cooled considerably.

The long-term supply of water is an issue of primary importance to all who live in Yavapai County. However, our problems as well as our solutions are inseparably connected with those of the rest of the state.

The state's water history is a story of towns, miners, farmers, land speculators, Native Americans, civic aspirations, neighboring states and the federal government—each with their own vision and their own special interest. Sometimes they were in collusion with one another, but most of the time they were in conflict

Arizona's water feuds have primarily been fought between four factions: the farmers, the miners, the towns and the tribes.

When not fighting amongst themselves they have stood together in Arizona's fights with adjoining states or the federal government. This has especially been true when fighting for Arizona's share of Colorado River water.

It took almost 75 years to build the Central Arizona Project (CAP) and utilize the state's appropriation of Colorado River water.

The CAP, however, did not come into being until the state was forced to resolve a number of issues pertaining to its own groundwater. Those issues eventually came to a head when some pecan farmers and some copper miners locked horns over a well and led to one of the nations most stringent and comprehensive groundwater acts.

The Groundwater Management Act of 1980, as it was called, was certainly not the last fight between the farmers, the miners, the towns and the tribes. It did, however, force the parties to face the reality of our limited water resources.

The very same problems the state experienced 25 years ago, involving groundwater, surface water and the legal overlapping of the two, rose to the surface again and initiated the water war within Yavapai County. It would seem that the groundwater in Prescott is connected to the surface water in the Verde Valley.

One of the most interesting aspects of our states water history is that the vast majority of resolutions have come as a result of compromise. Resolutions have occurred when both parties realized the inevitable benefit of discontinuing the fight. All indications are that the solution to the county's problems will be no different.

To resolve the county's water dispute, the Yavapai County Board of Supervisors initiated the idea of creating a committee comprised of all parties and stakeholders in the water issues on both sides of the mountain.

Today the Yavapai County Water Advisory Committee (WAC), is comprised of one representatives from each of the three county supervisors' districts, one each from the communities of Prescott, Prescott Valley, Chino Valley, Jerome, Cottonwood, Clarkdale, Camp Verde, and Sedona, along with a representative from the Arizona Department of Water Resources, and one each from the Yavapai Apache Nation and the Yavapai Prescott Tribe.

Over the next few months, the members of the committee will be attending meetings in which experts in the field of water policy, science, and history will school them on the issues they will need to understand in order to make informed decisions.

Realizing that it is not convenient for the average citizen to attend such meetings, though open to the public, the Board of Supervisors has decided to produce a series of articles that will help all of us have a better understanding of our water issues.

Over the next few weeks the board will present a series of 7 more articles explaining the background behind our current water situation. The articles will not make someone an expert, but they will provide a basic understanding and are designed to provide assistance as the problems are dealt with in the future.

The articles will cover the legal, scientific and historical aspects of the subject and will be present as follows:

102. What Lies Beneath: Some scientific assumptions of the county's water
103. Policy and Proceedings: The laws and court cases that have had an effect on Yavapai County's current water problems
104. The Gila River Adjudication: The granddaddy of all court cases
105. The 1980 Groundwater Management Act: Arizona's radical groundwater legislation
106. Problems in Prescott: Prescott dig itself a dry hole
107. The Water War of 1998: Whiskey's for drinkin' and water's for fightin'
108. All the King's Horses and All the King's Men: How do we fix the problem

Water 102: What Lies Beneath

By STEVE AYERS
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In order to understand the fundamental water issues that confront Yavapai County, it is necessary to understand some basic assumptions made by those who study hydrology, the science of water.

One of the core assumptions of modern hydrology is that groundwater is contained in basins. Surface water can flow over basin borders but groundwater flow from basin to basin is contained or at least very restricted. Each of these basins is considered to be a separate geologic enclosure, lined by bedrock at the bottom and mountains or other impermeable layers on the sides.

There are 53 such basins in Arizona.

Contained within each of these groundwater basins are sub-basins — individual parts of the larger basin. The assumption is that sub-basins interconnect with other sub-basins within the larger basin, while the larger basins are distinct hydrologic bodies. Seven different basins lie, either all, or in part within the borders of Yavapai County.

Arizona's radical 1980 Groundwater Management Act designated the basin that underlies Prescott, Prescott Valley, Humbolt, Dewey, and Chino Valley as an Active Management Area (AMA). They are called Active Management Areas because the state concentrates its most aggressive programs and policies with regards to groundwater management in those basins most impacted by municipal growth or large agricultural withdrawals.

For the purposes of this series of articles, we will deal with only two: the basin that underlies the Prescott AMA and the Verde River Basin.

The Verde River Basin is divided into the Big Chino Sub-basin, the Verde Valley Sub-basin and the Verde Canyon Sub-basin.

The Prescott AMA Basin is divided into the Upper Agua Fria Sub-basin and the Little Chino Sub-basin.

Identifying the groundwater connection between the basin beneath the Prescott AMA and the adjoining Verde River Basin lies at the crux of Yavapai County's water dispute.

Hydrologists also hold a core assumption that if the depth of the water in a well is continually dropping over an extended period of time, then the aquifer it is drawing from is draining. It also holds true that if the majority of wells within a basin are dropping, then that groundwater basin is being overdrafted or "mined."

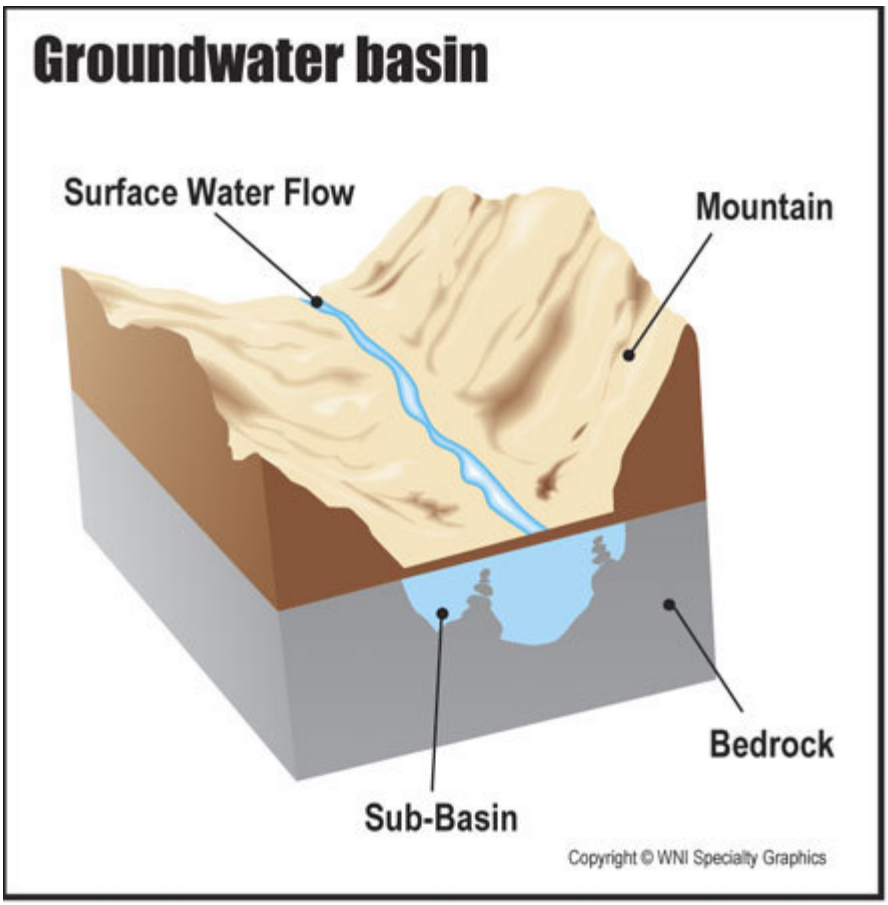
This assumption is critical in understanding the problems in the Prescott AMA.

Hydrologists, however, disagree on the subject of recharge of aquifers.

Underground aquifers recharge by one of two methods — natural and artificial. Natural recharge occurs from rain water or snow melt that works its way to the aquifer by naturally occurring fissures in the ground or by creating a saturated connection to the aquifer usually beneath a flowing river or stream.

Artificial recharge is any water added by man-made devise. It is either accomplished by treating effluent, or wastewater, and injecting it into the aquifer by means of infiltration basins or it is accomplished by taking water from another source outside of an aquifer and adding it to the groundwater.

Another assumption is that in most instances water that perks into a leach field from a septic system does not reach the aquifer below. This is because the water is not significant enough in volume to saturate the ground all the way to the upper levels of the aquifer.



When calculating how much water can safely be taken from an aquifer, it is important to understand how much water is recharged to the aquifer annually. Hydrologists often disagree on the amount of natural recharge within a specific area. They agree on the formula. They just don't agree on the information that goes into the formula.

It was estimated in 1995 that the United States was pumping 77 billion gallons a day of fresh groundwater, which is about 8 percent of the estimated 1 trillion gallons per day of nature recharge.

The problem is that certain areas are not as fortunate as others to have an excess of recharge —t he Prescott AMA being of those areas.

The amount of usable groundwater must also be taken into consideration when determining the availability of water within an aquifer. Only part of the water within an aquifer can be recovered in an economical manner and without adverse consequences to water quality or damage to the land above.

It is for these reasons that groundwater sustainability, or safe yield, within an aquifer has proven to be an elusive concept to define in a precise manner. Essentially, safe yield is when no more water is leaving an aquifer than is being recharged.

The problem lies in how you determine the amount of water going in and coming out. More than one opinion and more than one study has stood in conflict with an official study conducted in Yavapai County.

Hydrologists also study the connection that exists between surface water and groundwater. Groundwater is commonly an important

source of surface water. According to the U.S. Geological Survey, groundwater may account for as much as 40 percent of all streamflow in the country.

Hydrologists agree that water within a river or stream channel not only flows on the surface, but it also flows, though considerably slower, beneath the surface. What portion of that subflow is part of the surface water of the river and what portion is groundwater is an issue currently being decided by both hydrologists and argued over in the courts.

Groundwater is not a nonrenewable resource in the sense of minerals or oil, nor is it totally renewable like solar energy. This is because groundwater is contained in two different kinds of aquifers. Upper level aquifers are called unconfined aquifers because water freely seeps in from the surface.

Below the unconfined aquifer and separated by a layer of material that does not allow water to permeate it easily, or at all, sits what is called the confined aquifer, also called an artesian aquifer. Water within the confined aquifer is much slower to recharge and can take hundreds of years to do so.

In this sense, confined aquifers do renew themselves, but in a practical sense they drain faster and take too long to replenish to be of much use after they have been depleted.

Arizona is not lacking in the availability of large artesian aquifers. The basin and range province, which Arizona is located in, is blessed with many deep aquifers — a characteristic of that geology. Unfortunately, those aquifers are not always strategically placed under population centers — Prescott being a prime example.

Yavapai County does not have the benefit of access to water from an outside source like the CAP to help fuel its growth.

Faced with what nature has dealt us and learning as much as we can about what really lies beneath is of the utmost importance if we are to manage our water resources into the future.

It will not be an easy job.

Attempts to address our limited water supply and manage it have manifested themselves in a number of laws and court decisions.

Water 103: Policy and Proceedings

By STEVE AYERS
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Throughout Arizona's history, four major interest groups have been at the forefront of water issues. Sometimes they have fought amongst themselves and sometimes they have fought together.

Without a doubt the largest users of water in the state are the farmers. At last count they were estimated to use about 68 percent of the water in the state.

The second largest user is the cities and towns. They currently use about 25 percent of the water.

The third major party is the mines, which combined with other industries, use about 7 percent of the water. The copper mine's economic engines have propelled many water rights issues to the forefront.

Last in use but not in importance are the native Indian tribes who posses 25 percent of the land in the state, but use less than 1 percent of the water.

The conflicting interest and changing agendas of these key players have been the moving force behind most of the key legal proceedings and legislative policies that affect water in the state.

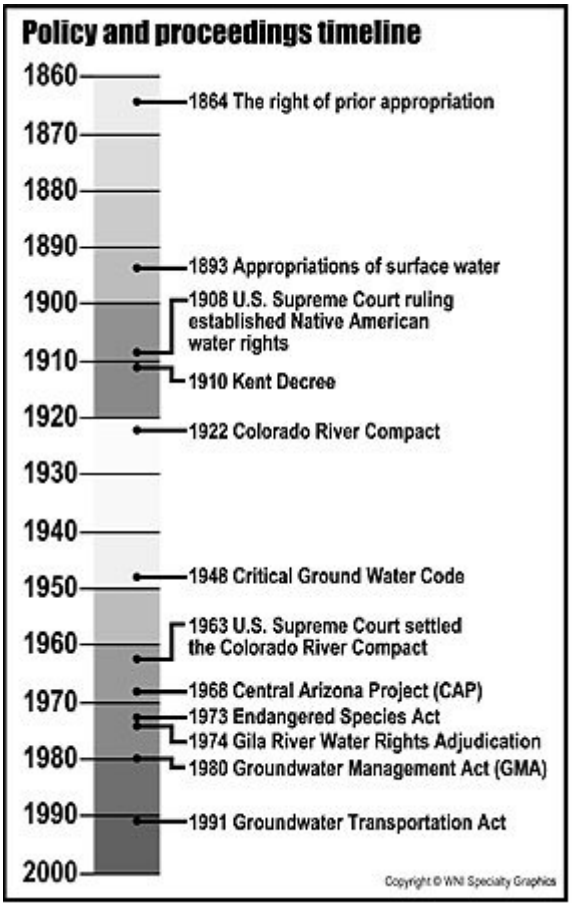
To understand water issues in the state and in Yavapai County, one needs to be aware of the key pieces of the legislative and legal

puzzle that make up our water laws.

All laws and legal proceedings address one of four categories of water. They are surface water law, groundwater law, effluent water law, and the "Law of the River" that governs water in the Colorado River.

In 1864, Arizona's first territorial legislature adopted the rule known as the right of prior appropriation. This doctrine simply states "first in time, first in right." It means that the holder of the oldest claim is entitled to the full amount of water legally allocated to them before any subsequent claim holder receives any of their allotment.

This doctrine is still the primary rule governing surface water rights in the state.



Appropriations of surface water were not recorded until an act in 1893 that required the posting and recording of surface water withdrawals.

In 1912 Arizona became a state and seven years later enacted the Public Water Code, which except for some small changes is essentially the same today. It set forth the procedures for establishing a water right and required, among other things, that appropriations be registered with the water authority in place at the time. The state's water authority has changed several times over the years. The current presiding authority is the Arizona Department of Water Resources.

The 1919 Public Water Code also stated "the waters of all sources, flowing in streams, canyons, ravines, or other natural channels, or in definite underground channels … belongs to the public and are subject to appropriation and beneficial use." The statement about underground channels is what brings issues of subflow and groundwater into play when discussing surface water rights.

What is deemed to be surface water and what is deemed to be groundwater is important because the law treats the two categories differently. The right of prior appropriation controls surface water, while groundwater is generally for the taking. There are, however, exceptions and limits for the taking of groundwater

The first major piece of state-enacted legislation to deal with the state's groundwater was the Critical Ground Water Code of 1948. It gave the State Land Commissioner the power to designate Critical Groundwater Areas where new irrigation wells would be prohibited. The code did not, however, restrict the amount of groundwater that could be pumped by existing wells. This feeble legislation was the result of federal pressure to address the state's groundwater prior to the approval of the Central Arizona Project.

Of all the water legislation that has affected Yavapai County, and the all other large municipal areas of the state for that matter, it is Arizona's 1980 Groundwater Management Act. It has so great an impact that the subject will be dealt with separately in a later segment of this series.

A close second in its impact to the county's water problems is the 1973 Endangered Species Act. One of the most far-reaching and controversial pieces of federal legislation ever enacted, its restrictions will have to be addressed in any regional solution to our water problems.

The latest legislative act to have an impact, and the one that eventually precipitated the conflict between the Verde Valley and Prescott, is the 1991 Groundwater Transportation Act. This act forbade the transportation of groundwater from one basin to another with three exceptions. In one of these exceptions, Prescott was given legislative approval to pump groundwater from the Big Chino aquifer.

As the state legislature and the Congress have impacted our water, so have the courts.

The 1908 U.S. Supreme Court ruling in Winters vs. United States established Native American water rights. It stated that in creating

tribal reservations the congress also set aside enough water to meet the needs of those reservations.

This ruling established that any adjudication of water rights in a state would include the Indian tribes. If any state was ever affected by this ruling, it has been Arizona where 25 percent of the land is Indian reservation.

In 1910, a Federal District Court Judge in Arizona, Edward Kent, handed down what is known as the Kent Decree. It established, among other things, the right of the Salt River Valley Water Users Association, an entity of the Salt River Project (SRP), to the surface water in the Salt River watershed. The decree set up a hierarchy of rights based on the oldest claims getting the priority allotment.

The Colorado River Compact of 1922, eventually settled by the U.S. Supreme Court in 1963, established Arizona's entitlement of 2.8 million acre feet (maf) of water from the lower basin of the Colorado River and established the need for a system to deliver that allocation.

The settlement of the Colorado River Compact in 1963 would lead to the final congressional approval of the Central Arizona Project (CAP). Funded in 1968, the $4.3 billion project has enabled the state to take advantage of its full allotment of Colorado River water by delivering 1.5 maf of water to the Phoenix and Tucson metropolitan areas.

The two cities have fueled their growth on the basis of this allotment. Ironically, this water in which the state has invested so much is, in fact, a junior claim on the Colorado River's water, to be received during times of drought, only after California and Nevada have received their allotments.

The CAP allotments would also play a role in the eventual water fight within the county.

For anyone keeping score, an acre foot of water is the amount of water it takes to cover one acre of land, one foot deep — about 325,851 gallons.

Another critical case was Bristol v. Cheatham (II) that reversed an earlier ruling and established that the right to use ground water was a property right subject to the doctrine of reasonable use. This doctrine allowed a land-owner to pump as much water as could be put to reasonable and beneficial use on the "land from which it was taken."

Water 104: Gila River Adjudication

By Steve Ayers
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So you ask, why does the Salt River Project (SRP) feel they have the right to the water in my well? Perhaps you might ask, as a resident of the Prescott area, why SRP feels you have no right to the water in the Big Chino.

The answer to both of those questions lies in what is known as the general stream adjudication, a legal proceeding of enormous impact.

The general stream adjudication, whose full title is "The General Adjudication of All Rights to Use Water in the Gila River System and Source," is the most comprehensive judicial proceeding involving water ever initiated in Arizona.

It is a legal action designed to determine, once and for all, who has the right to what and how much water in the Gila River system. Keep in mind that the Verde River flows into the Salt River and the Salt River flows into the Gila River. Therefore, our watershed is a tributary of the Gila River.

The Gila adjudication has about 84,000 claims filed by about 24,000 parties and will affect every entity within the Gila River watershed that uses water, whether it be a lone residential well or the larger water systems owned by the cities, mines and farmers.

Unlike a class action lawsuit with one defendant and numerous claimants, this case places all parties in the role of being both claimant and defendant.

A similar adjudication is taking place within the Little Colorado River watershed. Between the two proceedings, virtually the entire

watershed of the state is being adjudicated.

When completed they will quantify (say how much) and prioritize (decide the order of claims) of virtually all the water rights in the state. That is what adjudication does.

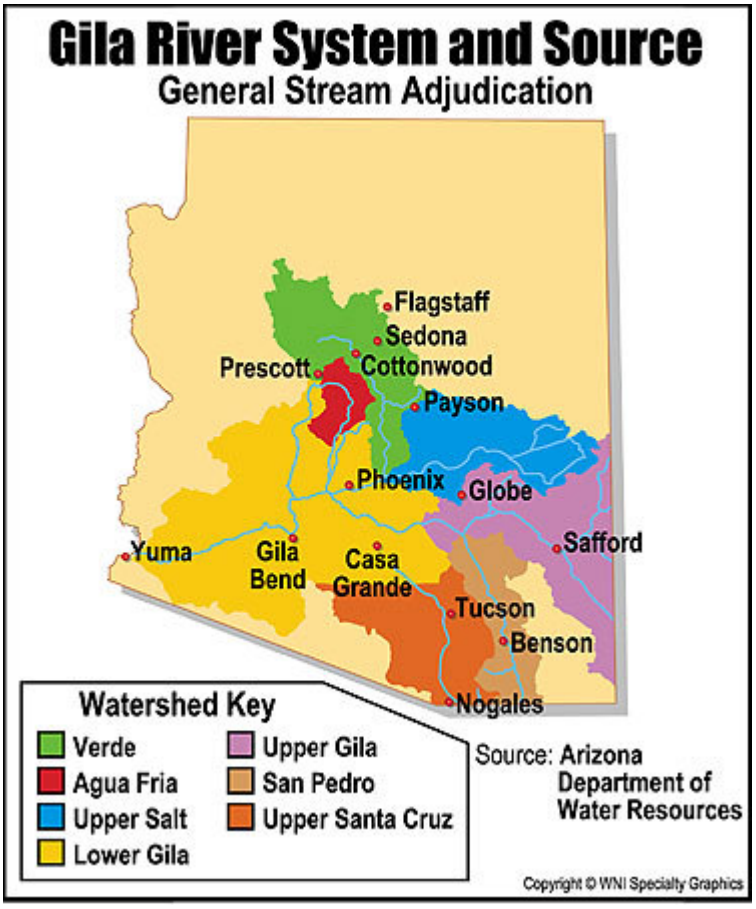
The proceedings began in 1974 when the Salt River Water Valley Users Association, better known as its parent company, SRP, filed a petition to determine the water rights in the Salt River above the Granite Reef diversion dam, excluding the Verde River. Two years later, SRP would file for adjudication on their Verde River claims.

State statutes allow for any party to seek adjudication of their water rights.

This move by SRP prompted several copper mines and other agricultural water users to also file petitions. Eventually, the scope of the claims, petitions and intervening motions took in most of the state's watersheds.

In 1981, the Arizona Supreme Court consolidated the separate cases involving the Gila River into a single proceeding and moved the case to Maricopa County Superior Court.

During this time, two similar lawsuits were brought by Arizona Indian tribes in federal court. Their claim was that the state of Arizona had no right to adjudicate Indian water claims.



The first court to hear the Indian claims disagreed with the tribes and said the states did have the right to adjudicate their rights. A second court found in favor of the tribes. Eventually, the U.S. Supreme Court determined that Arizona had the right to determine the Indian's water rights, but only if the adjudication was entirely comprehensive.

This made the Gila River case issue extremely more complex.

The court has been slowed by changes in the adjudication statutes in 1979 and again in 1995. Each time the law changed, the parties involved have challenged one portion or another, causing delays.

The Indian water rights issues have also been a cause for delay. To move the proceedings along many parties have been trying to resolve the Indian issues outside of court.

To date, several tribes including the Ak-Chin, Salt River Pima-Maricopa, Fort McDowell, the Salt River portion of the San Carlos Apache and the Yavapai-Prescott, have implemented congressionally enacted settlements.

The largest settlement still pending involves the Gila River Indian Community. Senators John McCain and John Kyl have submitted a bill in Congress to settle the tribe's claims. It is reported to be the largest single water rights settlement in U.S. history. The settlement would allocate 653,500 acre-feet to the tribe. That is enough water to supply a city of 3 million people.

Despite the slow pace of the adjudication, many complex and tough issues have been decided. Various appellate courts and a "Special Water Master," appointed by the court, have gone a long way toward sorting out claims and thorny legal issues.

The court is also deciding on a number of other smaller issues at the same time. It is one of these other issues the court is dealing with, which affects the wells in the Verde Valley.

During the proceedings, the Arizona Supreme Court accepted six interlocutory appeals. An interlocutory appeal is when a higher court

asks a lower court to decide an issue which cannot be decided on the facts involved in a case, but whose resolution is needed to arrive at a final decision in the larger case.

In this case, the appeal regarding the Verde involved what test would be used to determine whether water in a particular well was coming from the subflow of the river. If a well is tapping into the subflow of the river or stream then the water being taken from that well is considered to be surface water and therefore appropriable by whomever has the right to that surface water.

In other words, that water would no longer be groundwater, and no longer free for the taking by the owner of the land that overlies it.

The test case for this appeal is based on issues in the San Pedro watershed in southern Arizona.

The court has determined that any well that taps into, or is determined to be drawing from the "saturated floodplain Holocene alluvium," is appropriating surface water. It will be up to the Arizona Department of Water Resources (ADWR) to determine where the saturated floodplain is located and how deep it goes.

When the court refers to the Holocene alluvium, they are referring to the geologic formation formed by loose sand and rock that has been deposited beneath the river's floodplain in the last approximate 10,000 years. In geologic terms that recent period of time is known as the Holocene period.

The court also said that although a well is tapping into the Holocene alluvium, if the well has a "de minimis" effect, meaning little or no effect on the flow of the river, it could be exempted from case.

The final decision concerning residential wells in the Verde Valley that tap into the subflow of the Verde River has yet to be issued.

As for the issues in the case that involve the Prescott area, one must remember that SRP, and its division the Salt River Valley Water Users' Association claims to have the rights to the majority of, if not all of, the surface flow of the Verde River.

Consequently, SRP would claim that any pumping of the Big Chino that has a detrimental effect on the flow of water in the Verde River also has a detrimental effect on their water customers in the Phoenix area.

One thing is for sure — whatever the eventual outcome of the adjudication — it is not likely to be resolved anytime in the near future. All the decisions of the court, and the hydrologic findings of the ADWR, are all subject to the appeal process.

It is anybody's guess how long it will take, but be sure that when it is completed most of the questions about water rights in Arizona will at last be answered.

The case has proved to be beneficial in one major aspect. The adjudication process has brought many warring parties to the negotiation table in an attempt to resolve their own differences rather than waiting to see how the court resolves the issues for them.

As we see how the Gila River adjudication is attempting to answer the surface water rights issues, we need to look at how the 1980 Groundwater Management Act attempted to answer the groundwater problems in the state.

Get ready for some mud slinging.

Water 105: The 1980 Ground Water Management Act

By Steve Ayers
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In 1980, Gov. Bruce Babbitt signed into law the Arizona Groundwater Management Act (GMA). It is perhaps the most comprehensive and aggressive piece of groundwater legislation in the nation.

Like the 1948 Critical Groundwater Act, the GMA was pushed along by pressure brought to bear on the state by the federal government. The Secretary of the Interior refused to allocate any water to the CAP unless a comprehensive groundwater policy was established.

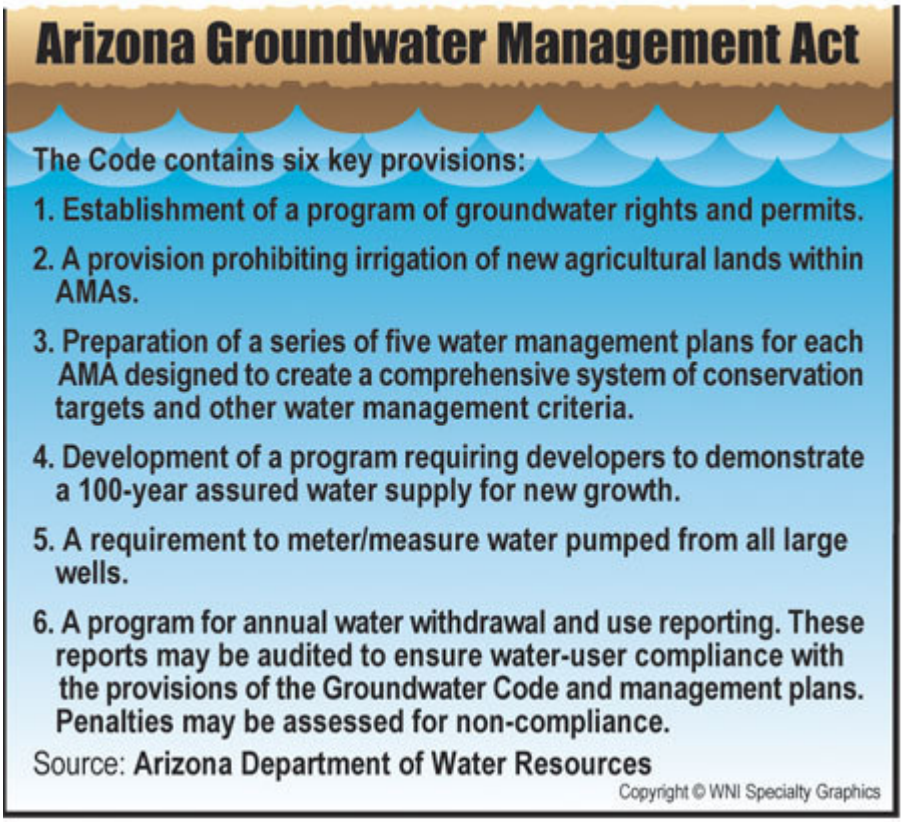
The incentive for the legislation, however, had already been set in motion by a legal challenge between some pecan farmers and a

copper mine.

In 1976, the Arizona Supreme Court ruled in the Farmers Investment Co. (FICO) v. Bettwy case. FICO, the plaintiff, owned two large pecan groves totaling about 7,000 acres in a Critical Groundwater Area south of Tucson. The primary defendant in the case was Anamax, a mining company that was developing a well in the same Critical Groundwater Area.

The well, the mine and the pecan groves were all within the same groundwater basin, but the mine was outside of the Critical Groundwater Area. Previous court rulings had held that water could not be transported away from "the land from which it was taken" if it caused harm to those whose lands overlie the common supply. The disagreement was over the definition of "the land from which it was taken."

It should also be noted that the City of Tucson was also pumping from the same basin and became involved in the lawsuit.



On Aug. 26, 1976, the court ruled in favor of FICO, much to the outrage and astonishment of the mines and the cities. The decision, however, failed to define "the land from which the water is taken," and thereby establish some guidelines. The decision had a potentially devastating effect on the cities and the mines, in that any movement of water from a wellhead could be stopped.

Soon after the case was decided, it was realized that any implementation of the decision was politically impractical. It became apparent that due to the mines being a major employer and their significant power at the legislature, any injunction by the farmers would likely result in legislation contrary to agriculture's best interest.

The ensuing legislative maneuvering pitted the interests of the mines, the cities and the farmers in opposition to one another.

The mines' primary goal was to change the transportation rules.

The cities, experiencing significant growth, sought more comprehensive groundwater management that would include conservation measures on agriculture, which was using 89 percent of the ground water at the time.

Agriculture, meanwhile, was promoting the status quo.

The Indian tribes were sitting this one out.

In 1977, amendments were made to the Critical Groundwater Act that attempted to deal with the issues of groundwater transportation brought about by the FICO decision. The legislature also established, that year, a commission of lawmakers and representatives of the mines, cities and agriculture, called the Groundwater Study Commission to try and sort out the mess.

The commission decided that groundwater management legislation needed to address eight issues: 1) resolution of groundwater rights and uses, 2) manage groundwater overdraft, 3) groundwater transportation, 4) accommodating growth, 5) environmental protection, 6) conveyance of groundwater rights, 7) management efficiency, 8) recognition of federal and Indian water rights.

It was during these contentious negotiations that the Carter Administration announced that it would not allocate any water to the CAP until a groundwater code was passed. It was the incentive needed to get the bill finished in 1980 and keep the CAP on schedule.

A series of private meetings and negotiations among a group of attorneys representing the particular interest groups, along with Gov. Babbitt and other legislative leaders, eventually led to a compromise.

It had been previously agreed to among the legislative leaders that any compromise agreed to by the commission would be enacted as law by the legislature. Groundwater legislation was too controversial to be handled by the usual legislative process. It was not a model of the democratic process, but it did address the reality of the situation.

The resulting compromise resolved some of the issues, but passed the buck on some other. The warring parties inevitably gave the power to administrate the Act to a new Arizona Department of Water Resources (ADWR), headed by a director who would be labeled as the "water czar." The director's decisions on water matters would be final.

The Department of Water Resources and its director were given the power to establish a program of water management, due to the parties' inability to come to any agreement. The success or failure of the compromise was placed squarely on the director of the department.

The Act had many features.

It put voluntary conservation goals on all of the parties that if not attained, can eventually be forced upon them. It also permits the director, if necessary, to purchase and retire grandfathered irrigation rights in order to achieve management goals.

There are also complex sections of the code that deal with protection of existing water users and the transfer of water rights, which were inserted to protect the farmers. It also spelled out a permit system to acquire and transport water, which was put in for the mines.

However, the most far ranging portion of the Act, and the one most affecting Yavapai County, was the establishment of the Active Management Areas (AMA). The bill established that those groundwater basins most impacted by agriculture and the growth of residential communities, would be designated as special groundwater basins, subject to a specific set of rules designed to intensely manage water groundwater use within their boundaries.

These basins were the ones containing the Phoenix, Tucson and Prescott metropolitan areas as well as the agriculturally dominated Pinal County.

The law required that new developments within an AMA have a 100-year Assured Water Supply (AWS), although it took a number of years to establish the rules used to attain that goal.

It also establishes that the goal of the AMA's in Phoenix, Tucson and Prescott be to create a balance between groundwater withdrawals and the ability of the aquifer to recharge from both natural and artificial sources. This equilibrium is known as "safe yield" and is the primary goal of the legislation.

The legislation sets the year 2025 as the date for the AMA's to reach a state of safe yield.

It is this key segment of the legislation that set the stage for the disagreements in Yavapai County between the interest of the residents of the Verde Valley and the interest of the residents of the Prescott AMA.

Quite simply, the law requires the two areas to develop under a different set of rules.

Development within the Prescott AMA now requires adherence to the Assured Water Supply rules established by the ADWR, rules that limit its access to groundwater.

In order to for the cities and towns of the Prescott AMA to continue to grow, alternative water supplies, other than groundwater within the AMA must be found and developed.

It is this hunt that sparked the controversy.

Water 106: Problems in Prescott
By Steve Ayers
Administrative Aide
Yavapai County

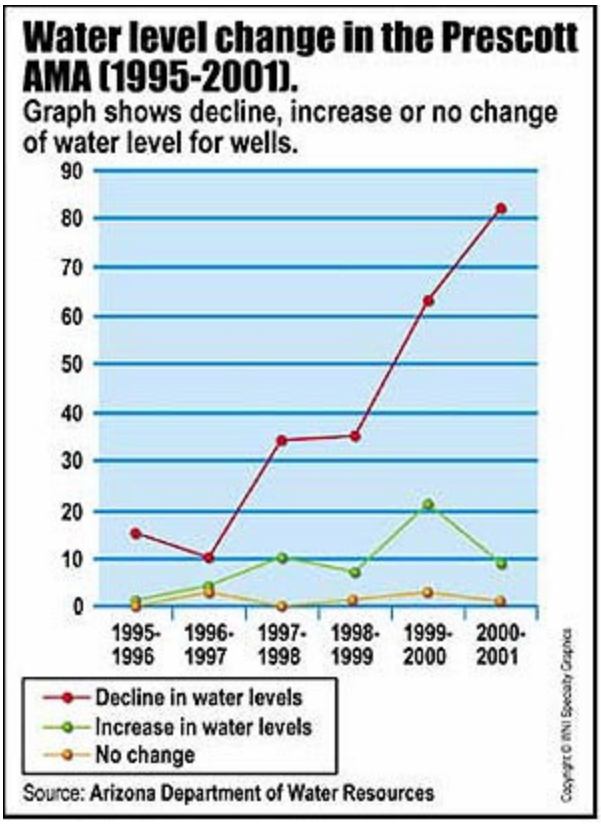
One of the last issues tackled by the Groundwater Study Committee when putting together the 1980 Groundwater Management Act was to establish the rules for Assured Water Supply.

This portion of the bill was designed so that any development within an Active Management Area would have a 100-year supply of water that would not adversely impact the aquifer.

Negotiations at the capitol in 1980 had failed to establish those rules before the GMA became law, so the burden was passed to the director of the Arizona Department of Water Resources The Adequate and Assured Water Supply Rules were not finalized until 1995.

At the same time that ADWR was holding talks to finalize Assured Water Supply rules, there was a considerable amount of discussion concerning the water supply in the Prescott AMA. It was commonly believed that water was being "mined" in the AMA.

Mining water is the term used to describe a situation where more water is being pumped from a water basin than is being recharged by natural and artificial means. If mining is occurring within an AMA, the basin is declared to be "out of safe yield," and puts into effect severe restrictions on the use of groundwater.



In some areas of the Prescott AMA, well levels were increasing in the 1990s along with increased discharge from springs. It was believed this occurred as a result of diminished agricultural pumping. The phenomenon caused some uncertainty as to whether groundwater mining was in fact occurring.

The ADWR formalized the for Assured Water Supply rules in 1995 with a provision that these rules apply to all AMAs except the Prescott AMA, where groundwater withdrawals could continue until evidence of groundwater mining was proven.

During this time, a subdivision could get a certificate of for Assured Water Supply based on withdrawals of groundwater. The assumption being was that if there was no mining occurring, the area should have access to groundwater for residential development.

The ADWR established a test to determine if mining was occurring. It said that if groundwater levels fell off in the AMA for three consecutive years and there was increased demand for more groundwater, the area would be declared out of safe yield. The result would be that no further development could occur that would use groundwater for the development's for Assured Water Supply certificate.

The next two years, 1996 and 1997, saw declining levels in wells and increased demand for groundwater.

The ADWR director at the time, Rita Pearson, met with leaders of the Prescott AMA communities to explain her agency's findings. The assumption of the director was that this warning would motivate the communities to slow down the rate of growth.

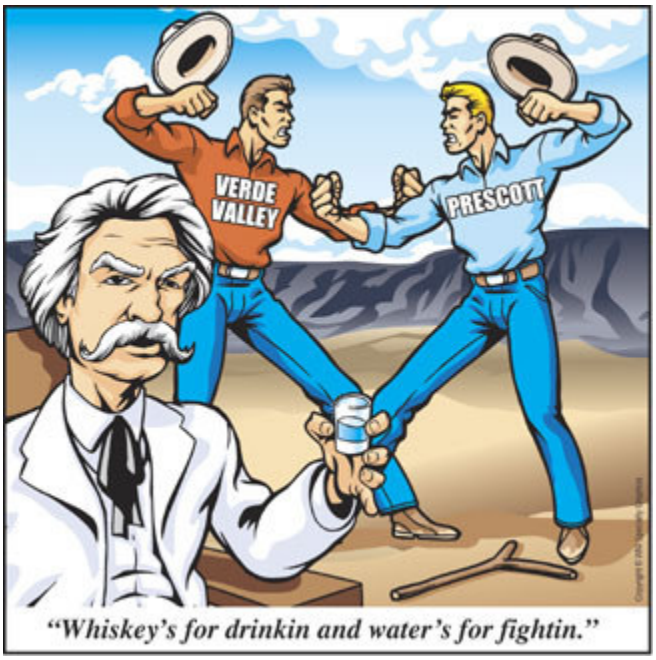
In fact, just the opposite happened.

With the knowledge that ADWR was going to pull the plug on the use of groundwater, the platting authorities within the AMA issued preliminary plat approval to over 32,000 new residences, thereby establishing those developments right to groundwater for their assured water supply.

As long as a developer had a subdivision plat plan on file with the proper platting authority, before the AMA was declared to be out of safe yield, they would have access to groundwater for their 100 year water supply, regardless of when they planned to build the development.

Legislation passed in 1998 had set the date for implementation of restrictions to groundwater use for Aug. 21, 1998. Twice as many homes were platted in the two months prior to that date than had been platted in the entire 17 years prior. Half of those approvals were given in the last week before the deadline.

Water 107: The Water War of 1998
By STEVE AYERS
Administrative Aide
Yavapai County



"Whiskey's for drinkin and water's for fightin."

Mark Twain once said "Whiskey's for drinkin' and water's for fightin'."

Although he was not in Yavapai County in the late 1990s when he made that statement, his observations would have held true.

Before the Prescott AMA was declared out of safe yield and before the platting rush, community leaders in the Verde Valley area were becoming concerned about affairs in the Prescott area.

The Arizona Department of Water Resources had already announced its discovery that well levels had been dropping in the Prescott AMA for the last two years and demand for water was going up. It was also common knowledge that communities in the AMA were hunting for new sources of water.

The one source the Prescott AMA had a right in statute to transfer water from was the Big Chino aquifer. To set up a taxing authority to build the infrastructure needed to move the water, State Senator Carol Springer and Representative Sue Lynch, both of Prescott, introduced legislation.

The bills, Senate Bill 1270 and the concurrent House Bill 2649, would allow for the formation of a water district, with the authority to pump the water allotted to Prescott by the 1991 Groundwater Transportation Act (GTA).

Among other things, the bill would have delayed any declaration of the AMA being out of safe yield to the year 2000, and it also removed the Verde's allotment claimed in the 1991 GTA and gave that allotment to the towns of Prescott Valley and Chino Valley.

The bills were drafted and introduced without input from anyone in the Verde Valley. They were almost through the committee approval process when Yavapai County District 3 Supervisor Chip Davis inadvertently became aware of their existence at a meeting of the Verde Watershed Association.

Angered by the fact that the legislation was drafted without notification of the Verde communities and alarmed by the speed with which it had moved through the committee process, Davis and other leaders on the Verde side went on the offensive.

An eclectic collection of ranchers, politicians, college students and environmentalist descended on the capitol in Phoenix to protest the bill. Their opposition was based on the assumption that pumping the Big Chino would have an adverse effect on the flow of the Verde River.

What ensued over the next year was a great western tradition—a water war. Letter writing, personal attacks and media campaigns, waged on both sides of the county, eventually brought the legislation to a halt. In the wake was left a lot of bad feelings.

Before the legislature adjourned that year, both sides agreed to a compromise bill. The new bill, Senate Bill 1124, removed any authorization to pump the Big Chino and set a specific deadline for when water restrictions would begin — those based on the assured water supply rules — in the Prescott AMA.

The problems that came about in 1998 were a direct result of the 1991 GTA, which proved itself to be a bad piece of legislation as far as the exceptions concerning water transportation issues in Yavapai County. The bill failed to take into consideration both the Endangered Species Act and the potential harm to the flow of the Verde River that might result from additional pumping in the Big Chino.

The bad feelings and the war of words continued between the Verde and the Prescott AMA throughout 1998.

Developers in the Prescott Valley area, and the Shamrock Water Company that serves the area, produced a study of their own that stated there were more than adequate water supplies to continue building. That study was subsequently reviewed by a third party and dismissed in favor of the original ADWR study.

Communities in the Prescott AMA continued to plat new developments, in spite of the facts presented by ADWR, while the arguments continued. ADWR was finally able to stop further pressure on the water supply in August when restrictions written into the compromise legislation where put in place.

On Nov. 5, 1998, the two sides finally met together at the Jerome Grand Hotel to discuss each other's opinions on the issues in the Prescott AMA.

One of the primary differences of opinion existed between County Supervisors Chip Davis of the Verde and Bill Feldmeier of Prescott. Feldmeier, supporting the Town of Prescott Valley's point of view, wanted an extension on the AMA declaration on safe yield, while Davis wanted the ADWR to make a final declaration that the AMA was out of safe yield.

Both sides realized that once the declaration was made it would be permanent.

In spite of the various opinions aired at the meeting, it was agreed that further study was needed to determine if there existed, and if so to what extent, a connection between the Big Chino and the Verde River.

The meeting concluded with the county Board of Supervisors assuming a leadership role. It was determined that the county should act as the facilitator in further discussions and organize the various studies needed to make informed decisions.

By no means were the hard feelings behind everybody, but some sort of east-west cooperation was now being established.

By the end of November, the City of Prescott had decided to drop any efforts to delay the safe yield declaration. The Prescott City Council also decided to join a regional committee effort and to assist in its funding.

Prescott took the issue a step further in December by resolving to establish a water management plan that would try to limit the city's use of groundwater to 8,000 acre-feet per year. They also revised their effluent management policy and established an ordinance requiring that any new hookups to the city water system had to also hookup to the sewer system.

At last, solutions were being sought and the stage was set to end the fighting.

On Jan. 14, 1999 the Prescott AMA was officially declared to be out of safe yield.

On Jan. 26, the Yavapai County Board of Supervisors announced the establishment of the Water Advisory Committee (WAC). It would be charged with reviewing information on water and reporting any recommendations or findings to the Board of Supervisors.

The WAC is made up of representatives from Sedona, Cottonwood, Clarkdale, Jerome, Camp Verde, Prescott, Prescott Valley, Chino Valley, the Yavapai Prescott Tribe, the Yavapai Apache Nation, one representative from each of the county supervisor's districts and one from the ADWR.

The committee acts as an information conduit between the board and the various water user groups and arrives at decisions by consensus rather than majority vote. They are assisted in their search for answers by a technical advisory committee composed of experts in the fields of hydrology, geology, engineering and water policy.

In essence, it is the WAC that will work toward recommending water policy for the future.

Water 108: All the Kings Horses and All the Kings Men

By Steve Ayers
Administrative Aide
Yavapai County
"If I were king for the day, and I were able to immediately wave a wand and say that I would have implemented and enacted all the maximum conservation I could achieve, and I am securing all the alternative and renewable supplies of water from within the AMA, whether they are surface water, or (effluent) … and I am recharging and reusing all that water, I still can't make up the hole we've already dug ourselves into."

Prescott AMA Director Jim Holt

The answers to the difficulties that exist in the Prescott AMA will not come easy.

The mining of groundwater continues at an average rate of 10,900 acre-feet per year. An acre-foot of water per year will serve the demands of three to four households. Add the 30,000 homes not yet built, but with access to groundwater, and that figure will easily double.

After every home that has been given approval to use groundwater is built, about 7 billion gallons of water will be leaving the Prescott AMA every year that is not being replaced.

Combine those figures with the fact that for the foreseeable future there is no alternate source of water to import into the AMA. Current Arizona Department of Water Resources estimates put the water storage capacity of the Prescott AMA ground water basin at 3 million acre-feet. If you were to divide that figure by the estimated 21,800 acre-feet of overdraft each year, that will result from the additional homes being built, you would arrive at an estimate of 137 years of water left in the basin.

Now add the one factor that is not figured in the equation. Each year for the last five years, approximately 700 new homes were built in the AMA on lots that are exempt from the Assured Water Supply rules, due to fact they are lot splits and not subdivisions as defined by the law.

It might also be a good idea to factor in new data from wells drilled by ADWR in the basin. Data from those wells indicate the basin is not as deep as originally thought— therefore, the 3 million acre feet estimate may be high.

Does anyone hear a giant sucking sound?

The question that should be asked is not how long the aquifer will last, but how do we create a long-term balance between the amount of water taken from the aquifer and the water recharged to the aquifer.

The answer, quite simply, is it cannot be accomplished without the AMA importing water from somewhere else. That is a mathematical certainty.

For the last 20 years, there have been extensive hydrologic studies performed in the Prescott AMA. The ADWR has a pretty good handle on what is going on in that basin.

The same, however, cannot be said for the Verde Valley.

The truth is there is little data available to make any assumptions about the long-term supply of water in the Verde River Basin.

No one can deny that the Verde Valley is not already being impacted by growth. The Verde Valley side of the county has grown by 52 percent since 1990 and projections predict an additional 30-percent growth in the next 10 years.

There is no data to determine the rate of recharge within the Verde River Basin. Nor has a conclusive study been done that has determined the extent of the aquifer and the impact of growth on it.

There are wells in the Verde Valley, however, experiencing significant drops in water level.

The connection between the water in the Big Chino and the Verde River has not been firmly established and will probably not be known with any certainty until the U.S. Geological Survey and ADWR studies are completed.

The USGS is currently developing a conceptual model — a blueprint of the subsurface geology that will help to give better definition to the basin boundaries along with locating the subsurface flow paths of the groundwater and the natural recharge areas.

They are also creating a regional numerical groundwater model, a useful tool designed to look at the groundwater and predict future scenarios.

Because the Verde River's primary flow comes from the Coconino Plateau and the Mogollon Highlands, the regional groundwater model will also be studying those two areas. Oak Creek, Sycamore Creek, Beaver Creek, Clear Creek and Fossil Creek are the result of the dewatering of the Coconino Plateau and play a major role in understanding the Verde River Basin and watershed.

Both the conceptual model and the numerical model are expected to be completed in 2007.

The question is not if water can be pumped from the Big Chino, the question is how much can be safely pumped. What is certain is that the population of the Verde Valley will work to oppose any proposal that could jeopardize the flow of the Verde River. In fact the communities of the Prescott have publicly stated their support toward maintaining flows in the Verde River

Since the water war of 1998, a lot of discussion and several proposals have been made to find a solution to the Prescott AMA's situation.

There has been a proposal put forth to pipe water into the AMA from the Colorado River. The Northern Arizona Municipal Water Users Association promotes this concept.

The idea sounds far fetched, but then again so did the idea of digging a canal from the Colorado River, through Phoenix, and ultimately to Tucson, when it was proposed 80 years ago.

Perhaps an unused adjacent aquifer can be tapped into that does not have a detrimental effect on the neighbors.

As things stand today, there is not enough data to make any long-term decisions. We will have to wait until those studies are completed.

There are also legal proceedings that will not be resolved for some time to come and their effects will have to be known in order to make future plans.

In the mean time:

‰ There will be no further additional pumping of the Big Chino.
‰ SRP will not come and seize our wells.
‰ Prescott will continue to pursue pumping of the Big Chino, but not without addressing the concerns of the Verde Valley.
‰ These efforts will lead to better hydrologic understanding.
‰ County leaders will seek more local control of their water destiny.

One thing is for sure — whatever decisions result from the efforts of the Yavapai County Water Advisory Committee, they will be by consensus.

It is a time-honored tradition in Arizona that we shoot first and then get together and work things out later. What is important is that we get together.

No major water issue in the state's history has been resolved without the participation of all of the stakeholders involved.

In the end, balance and compromise have always won the day.

Our problems will be no exception.