DRAFT

SONORAN DESERT CONSERVATION PLAN
STEERING COMMITTEE

EDUCATION SESSION #3

July 24, 1999 (9:00 - 11:30 a.m.)
Arizona-Sonora Desert Museum (Gallery)
2021 N. Kinney Road /
Tucson, Arizona, 85743

PIMA COUNTY'S PEOPLE, ECONOMY, WATER AND LAND

Pima County's Water
Michael McNulty

INTRODUCTION: SHARON BRONSON

Let me introduce to you now, Mr. Michael McNulty. He is going to talk to you about water. Water as we talk in terms of growth, habitat protection and it is probably the limiting natural resource in this valley and region. Michael is a partner in the law firm of Brown & Bain, he concentrates in the field of water law, natural resources, land use regulation and high technology. He graduated from Yale University and the University of Arizona College of Law. He is on the board of directors at Greenfield Country Day School, he is on the board of directors at Sam Hughes Neighborhood Association, is the general counsel to Native Seeds Search and he is on the board of directors of the Planetary Coral Reef Foundation. Please welcome Michael McNulty.

PIMA COUNTY'S WATER: MICHAEL MCNULTY

There are soldiers who are going through Pristina looking for land mines and I kind of have the feeling I am going to go through that a little bit this morning. Water can be contentious. I will do my best to stick to the facts and nothing but the facts. About one month ago, President Likens at the University of Arizona presented a three steps back analysis picture involving water in Southern Arizona. What I did was to go to the University of Arizona's website and download those charts and copied them to overheads.

We will start out with my most difficult to read slide. The earlier statistics had to start with a description of what the geographical area was for which statitistics were collected. Most of you know what a watershed is, there is both surface watersheds and groundwater sheds. When the State of Arizona decided to manage the groundwater supply they began by defining groundwater sheds.

This is the Tucson Active Management Area (TAMA) which is a groundwater shed and as you can see Interstate 10 running through the middle of it. It goes down to the Mexican border through Avra Valley and this also happens to include the land that is irrigated in this watershed being FICO down by Green Valley in the Cortaro/Marana Irrigation District and the Avra Valley Irrigation District.

This is a long term chart for the amount of groundwater that has been pumped in this area. The unit of measurement when discussing water is acre feet. An acre foot, if you can picture it, is an acre covered by 12 inches of water, it is 325,000 gallons.

Here you see hundreds of thousands of acre feet that can be pumped for a year or so. The peak around 1975 was when the high point of agriculture was present and it was about that time that the City of Tucson headed by Mr. Brooks, began an intensive program to purchase the entire water system. The current company is about 300,000 acre feet and most of these numbers incidentally are published by the University of Arizona and came from the State Department of Water Resources. Kathy Jacobs from the Tucson AMA is here to step on my toes if I say anything wrong.

The division of total water use among the interests, municipal is the most agricultural, copper mining and down here is golf courses and other uses. Most people have a vision of farming using the most water in Arizona. It is true on a state made basis, it has been ten years since that has been true here.

On the left you see the water demand, the water used, you see agriculture up around 130,000 acre feet. Municipal uses are almost 170,000 acre feet, golf and copper mining pushing it almost all the way up to 350,000 acre feet and not all of that comes from groundwater. The way these are stacked it starts with the water that comes from the Central Arizona Project (CAP). The amount of water available from the CAP is much larger than groundwater. The treatment plant and so forth, we have not yet been able to put that water to use.

The CAP Water that is counted, part of that is recharged and part of it is indirect recharge from CAP that is given to the farmers for credits. The next part is affluent and incidental recharge and of course, it comes out of the Roger Road and Ina Road

Treatment Plants. Much of that recharge is natural, in fact, about one-half of the water that comes through the various municipal water systems returns as effluent. Between 75-90% of that returns and then there is about 60,000 acre feet of water that naturally percolates into the ground via the rains. The remainder is a deficit. It is how much more water you have taken out of the aquifer that the aquifer can naturally support.

This brings us to what I think Chuck wants me to talk about which is how you reach sustainability. Sustainability was drafted into the groundwater proposal in 1980 and it required all of the Active Management Areas of Arizona to achieve a safe deal within 45 years after balance of plan. That is what Tucson is focused on trying to achieve.

This is a little tough to read, the coloration does not really mean anything. It is simply the gradations of groundwater table in feet above sea level. You are more familiar with water experts when you are talking about the elevation of the groundwater table above sea level. The flow as you see goes towards the north, there is saturated aquifers in Avra Valley in the central basin here, the Catalina's and the Rincon. As you see out here, there is almost no groundwater and there is the community of Santa Rita, I believe it is called, it is part of the County programs as you head south.

This shows the total number of irrigated acres. And you see in the mid-1970's where it started to drop off as the City of Tucson is beginning to purchase the groundwater. Quickly, this is the three areas in which there is a lot of farming, a number of acres and how much water they use. An acre foot of water can support about five or six people with various uses so as you see, the irrigation district uses 33,000 acre feet of water.

These are the major water utilities and obviously, Tucson Water is the largest. Metro Water District is second, Oro Valley purchased groundwater from within their city limits quite well. Flowing Wells and Oro Valley Irrigation Districts does not have any irrigation use coming from their wells.

Q:Is Marana a water district:

A:They are but I do not think they are big enough to be on this chart. These are the top eight or so and they are growing quickly, it is still pretty small.

These dots are over the wells and the encircled area is where the City of Tucson's principal well fields are, the Central Wellfield. The proportion of water used by homes is 62% from the Central Wellfield, 18% from Avra Valley, 9% from Santa Cruz near Green Valley, 2% from the southside. Seven and a half percent from the Tucson Airport Remediation Program which formerly polluted waters from this strip of land and then once it is clean, put it through the City's stormwater.

This shows the differences in a home with conservation and I have put it up here particularly so that you can learn how many gallons per capita, per day for shower water uses with conservation versus without conservation, but rather to give you some insight as to the detail, to try to help you understand and try to figure out some way to bring it down and add a little balance.

Conservation is a very big component of groundwater uses. As far as the industrial water uses, mining is about 70% and of course, that has to go higher. Sand and Gravel uses between 10-12%, golf courses 13%".

This shows how much of the watersheds water use is used by industry which is about 20%.

What is shows is for the smaller water users, the cost of the average monthly bill is less today than it was 35 years ago. For slightly larger water users, it is less today than it was 20 years ago. Economists who make argument that you have to adjust your behavior is premature.

You can see how much of the water is supplied by groundwater versus how much is supplied by effluent. Most of the golf courses that were existing when the groundwater law was passed were allowed to keep pumping groundwater. It is difficult to get them off of groundwater and onto effluent because of the cost of effluent and the City of Tucson tends to be quite a bit higher. The effluent use is growing, the City of Tucson is prohibiting any new golf courses using groundwater in their jurisdiction. Pima County has made aggressive moves in the same direction.

We saw earlier that the average population growth in Pima County is about 23,000 people and what you find when you divide the total number of people by the total number of golf courses, this gives the kind of golf course you will have in 24 years. So what you can perceive is that there is going to be one new golf course about every year. There will be 36 golf courses locally.

The concern about continued groundwater pumping is concern for subsidence because you can pull water from underneath in the aquifer and as the aquifer settle, what the USGS has predicted is that you can see subsidence of up to 10 feet. That is relatively modest compared to the situation in Casa Grande. Let's look at aerial photo's from satellites and around this entire perimeter of the valley, you can see cracks where the valley has separated from the bedrock that surrounds it. It is closer to sea level today than it was 30 years ago but it has settled relatively uniform, there is no differential in some areas, in some places the valley curves and all of a sudden the sewer lines are trying to flow uphill. You can see diverse subsidence predicted for the surrounding area.

The effort to balance supply and demand has put (?) upon the potential for recharging the aquifer. There is a (?) at Avra Valley, it was the first one that was permitted, the city built this Avra Valley storage project. It is hoped to recharge somewhere between sixty and ninety thousand feet per year which would be a huge addition. This one in the middle is the Sweetwater Basin where the City of Tucson takes it out and runs it through a filter and puts it into the reclaimed system in order to irrigate golf course.

The groundwater code had a very unique way to meet the assured water supply requirements. Before you can subdivide property you have to show that there is adequate water supply for 100 years. It is a struggle to know what is going to happen over a century. The Department of Water Resources has been trying to do is push people onto lower resources and this may accomplish with CAP.

When you see the difference between how much water we need and how much we have to have. Tucson Water has taken the position that they will do whatever it takes to provide for growth. They are trying to acquire sufficient water resources in order to meet growth demands, still the amount of CAP Water available to them is about 136,000 feet.

Thank you very much.