ARIZONA
WATER RESOURCE

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No CAP AG Bailout in Task Force Report

The Governor's CAP Task Force has released a report that is as noteworthy for what it fails to recommend as for what it does (see accompanying article). The task force declined to call for any major new taxes to bail out irrigation districts so they could continue to use large portions of the state's Colorado River allocation.

The task force also declined to endorse short-term interstate leasing of unused Colorado River water. In addition to concerns over the legalities of such a move and the risk that temporary reallocations might become permanent, there was recognition that such leases would make it easier for the holders of other, more senior Colorado River rights to enter into interstate transfers.

The task force also gave a low priority to sales of surplus power from the Navajo Generating plant, which provides electricity to CAP pumping stations. There currently is a surplus of low-cost electric power in the West.

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The CAP aqueduct zigzags across the desert bearing Colorado River water. Underutilization of the system remains an unresolved issue. Meanwhile, Tucson prepares to receive CAP water amid controversy over treatment of the city's CAP allocation. (Photo: J. Madrigal, Jr., U.S. Dept. of Interior)

Report Addresses CAP Water Underutilization

In January of this year Governor Fife Symington appointed a 16-member task force to address problems associated with the Central Arizona Project (CAP), particularly the underutilization of available Colorado River water. The Task Force membership provided broad representation from affected regions of the state, government agencies and water-using sectors. The report from the Task Force has been presented to the Governor.

Arizona's underutilization of its Colorado River supplies is due principally to the fact that the CAP is operating at much less than full capacity. From 1985, the first year of deliveries, until 1991, CAP water deliveries increased each year. However, in 1991 there was a sharp decline in requests for CAP water. Deliveries dropped from 745,000 acre-feet in 1990 to 420,000 acre-feet in 1991. Both agricultural and municipal and industrial (M&I) uses declined, but the greatest reduction based on volume of water was in agricultural water deliveries. Reductions in agricultural use are caused in part by the unhealthy financial condition of many agricultural users and may be compounded in the future by a worsening of that situation.

This problem comes at a time when both California and Nevada are searching for additional Colorado River water. Maximum utilization of the State's

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Colorado River entitlement is widely viewed as the best protection against possible attempts by neighboring states to permanently capture a portion of that supply.

The objective of the Task Force was to review the issues affecting the use of CAP water and to develop recommendations which could increase use of that supply. This would benefit water management programs in the State and in turn provide further assurance that the long-term security of Arizona's Colorado River entitlement is not jeopardized.

It became apparent early in the discussions that the most significant impediment to greater use by the agricultural sector was the high cost of CAP water. The bulk of these costs are the debt burden of irrigation districts from loans and bonds necessary to pay for construction of CAP distribution systems, and the fixed and variable operation, maintenance and repair (OM&R) costs, which must be recaptured by the Central Arizona Water Conservation District (CAWCD).

Irrigation districts which are subcontractors for CAP water have borrowed a total of over $228 million dollars from the Federal Government to construct distribution systems. Additional private financing was necessary to pay at least 20 percent of distribution system cost.

The rate to pay fixed OM&R costs has serious implications because the non-Indian agricultural subcontracts provide that such costs are take-or-pay. Because each subcontractor receives a percentage of available supplies, until Indian and M&I users take their full allocations, a large supply of water will be available for non-Indian agricultural users. Thus, the take-or-pay provision requires a large payment by agricultural users if they take the water or not.

While agricultural use of CAP water has fallen far short of expectations, uses by non-agricultural sectors also has failed to use anticipated amounts of water. Therefore, the Task Force evaluated CAP use by all sectors.

For discussion purposes, the issues addressed were categorized by water use sector: non-Indian agriculture, M&I and Indian. For each sector, historic and projected CAP use was evaluated and impediments to increased CAP use were determined.

Potential opportunities to increase water use in all sectors were addressed. Intrastate marketing of CAP M&I and agricultural priority water were considered as possible mechanisms to promote increased use of projected M&I water. Interstate leasing of unused CAP water and increased marketing of electric power available to CAWCD were evaluated as mechanisms to generate revenues to offset the high cost of water.

The entitlement is permanent and not subject to the "use-it-or-lose-it" doctrine.

An issue of general concern was the impact of the Bureau of Reclamation's proposal to have the Secretary of the Interior declare the CAP substantially complete on December 15, 1992. The Task Force also assessed the risk of Arizona losing a portion of its Colorado River entitlement due to non-use.

No single recommendation or set of recommendations were developed which would resolve the situation of underutilization of Colorado River water. However, a number of conclusions and recommendations were agreed upon and reported to Governor Symington. If implemented, these recommendations each could incrementally increase use of CAP water.

The Task Force concluded that Arizona's Colorado River entitlement was secure, even though the State is not utilizing its full apportionment. The entitlement is permanent and not subject to the "use-it-or-lose-it" doctrine. Arizona's entitlement of 2.8 million acre-feet has been acknowledged by the Secretary of the Interior, confirmed by the United States Supreme Court and ratified by Congress. Arizona has both a legal and an equitable right to enforce its Colorado River entitlement against all others and to be secure that its entitlement may not be diminished.

Recommendations of the Task Force, by category of discussions, are briefly summarized below:

Non-Indian Agricultural Use

- The Bureau of Reclamation should accelerate the reevaluation of irrigation districts' ability to pay CAP-related costs.
- Agricultural and M&I users should explore with the investment banking industry opportunities to restructure irrigation district debts.
- The Governor and Legislature should support a line item appropriation to pay delinquent state guaranteed taxes or assessments on State-leased lands in irrigation districts receiving CAP water.
- The CAP should be exempt from certain provisions of the Reclamation Reform Act.

Municipal and Industrial Use

- The Phoenix Active Management Area groundwater replenishment district should be formed as a mechanism to ensure the long-term use of CAP water by the M&I sector in that area.
- The regional authority or district in the Tucson Active Management Area should be permanently established and pursue policies that facilitate increased use of CAP water.
- CAWCD should address the issue of finding funding for fixed OM&R costs that will not result in increased charges to CAP M&I users.
- CAP agricultural subcontracts should be amended so water could be assigned or leased for more than one year provided such assignments satisfied conditions and specific purposes.
- Marketing of CAP M&I water should be deferred until after the initial subcontracting process is complete.
- The DWR should adopt a policy regarding how agricultural priority water counts towards an Assured Water Supply.
- The Federal Government should pay the fixed OM&R costs associated with CAP allocations for Federal (Indian) purposes.
- The DWR should form a group of interested parties to evaluate opportunities for providing incentives for early use of CAP water.

Indian Communities' Use of CAP Water

- Indian water rights settlements should be diligently pursued through negotiations.

Opportunities for Additional Revenue

- Additional marketing by CAWCD of surplus Navajo Generating Station power, which may be made available through exchanges for hydro power allocated to agricultural CAP users, should not be a high priority proposal.
- Arizona should reaffirm its position that any interstate lease or sale of Colorado River water is contrary to the "Law of the River" and is not currently in the interest of the State.

Declaration of Substantial Completion

- The Secretary of the Interior should not declare the CAP substantially complete this year. CAWCD and the Bureau of Reclamation should resolve outstanding issues related to project completion and repayment, and mutually agree on a date of completion.

While the Task Force did not develop recommendations to resolve all CAP underutilization issues it did lay an excellent foundation for further discussions. Responsible government agencies and affected water users are expected to consider the recommendation as well as further explore avenues for resolution of the issues.

Written by Larry Linser, Deputy Director, Arizona Dept. of Water Resources

Communications

With the end of summer at hand, *AWR* returns to its monthly schedule. Unfortunately, we are unable to return to our 12-page format. The September issue remains at 16 pages, due in large part to the number of announcements we received. Meeting dates, calls for papers, other announcements and our calendar now account for four-and-a-half pages of material.

Nobody responded to the last issue's "Who said that?" trivia question, so the prize, a seven-nozzle backyard misting system, goes unclaimed. (Actually, we're not certain whose quote it was, although we believe it was Groucho Marx.)

Summer may be all but gone, but the state's numerous pressing water resource issues remain. No solutions, real or partial, have been found to the CAP underutilization problem; the SAWRSA amendments continue to languish in congress, 10 years after the original settlement was reached, with no water delivered; and a compromise agreement on riparian protection remains elusive.

Some water issues even grew and festered in the monsoon heat. In the Tucson area, concerns over fluoridation of CAP water, health risks associated with various CAP treatment options, start-up glitches and delays at the water treatment plant and purported delays in dealing with leaky underground fuel storage tanks all have combined to create considerable doubt and fear in the minds of residents over the safety of their drinking water supply. Technical water quality issues have become the subject of political campaigns, and a confused public, most of whom cannot distinguish fluoride from chloramine from benzene, is left floundering about, not knowing whom to trust.

This month's Guest Views section (following pages) clearly illustrates what can happen when technical water quality issues become the subject of political debate. Questions like, "If it will kill my fish, how can it be safe for my children?" receive glib responses such as, "Orange juice and soda pop will kill your fish too," because the real answer is too long for a sound bite and in any event, too hard to understand.

What to do when a water provider, for reasons real or imagined, no longer has the trust and confidence of a substantial number of its customers? A public initiative on technical water treatment options is a terrible idea. Public servants and elected officials are supposed to make informed decisions in our best interest on these kinds of issues. But once officials begin disagreeing strongly and publicly over interpretation of the underlying technical facts, the debate quickly spirals downward into charges, counter-charges and denials.

The Tucson metropolitan area does not need a prolonged, emotional, uninformed debate over the safety of its drinking water. Instead, the issue must be moved into a forum where, as one of the current protagonists entreat, we can "Let facts, not political agendas, dictate decisions on public health issues." The initiative process and other political activity relating to the issue must be suspended before it begins, while a panel of acknowledged experts in the fields of water treatment and public health examines the situation and reports back to the relevant public officials. Any other approach will leave a legacy of public confusion and distrust.

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Guest Views

The safety of Tucson's drinking water supply has become an issue (see Communications). Offering his views on the subject is Ed Moore, Supervisor, District 3, Pima County Board of Supervisors:

"...Tucson's groundwater is exceptionally free of bacteria and is of such high quality that, without treatment, it meets all state and federal requirements..." Tucson Water made this statement in the Final Environmental Assessment on the CAP Treatment Plant filed October 1987.

It is not in the public interest to introduce a new water source that requires chemical treatment and forces the public to drink, bathe and swim in water that can best be described as a chemical soup. It will kill fish. It will harm people.

I had a review paper prepared by experts in the field to address the issues that Tucson Water's staff doesn't want to talk about. It contains the following recommendations which could be acceptable considerations to any honest government:

- A competent and objective out-of-town expert in drinking water treatment and toxicology should be selected by a committee made up of representatives from the various groups concerned about the safety of treated CAP water. The duties of this expert consultant would be to evaluate the health risks associated with the treatment process and report his findings to the City of Tucson and Pima County.

- The analyses of water from the City of Tucson treatment plant should be reviewed by an independent consultant or firm for their completeness regarding the constituents likely to impact long-term health. At the minimum, these analyses should include trihalomethanes, halogenated acids, aldehydes, and bromate. Standards should be set for the maximum levels allowed. These standards, and the reasons behind their selection, should be disseminated to the community as part of the health education process.

- Independent expert(s) should be selected, with community participation in the selection process, to examine methods to reduce health risks. These methods could include:

(a) Re-examination of recharge vs. chemical treatment. The proposed Metropolitan Domestic Water Improvement District could be used as a pilot project to demonstrate recharge versus chemical treatment. The success or failure of the district can show alternatives and allow evaluation of methods to reduce the concentrations of carcinogenic byproducts in CAP water disinfected by ozone and chloramine.

(b) Study should be made of the various disinfection methods to determine if ozone/chloramine treatment is safer than other potential procedures, if chemical treatment is indicated for all or part of the community.

In short, why decide on an option that many scientists will agree is a fourth-rate choice when a nationally recognized first-class product is available?

Our citizens have become too wary to trust Tucson Water any longer.

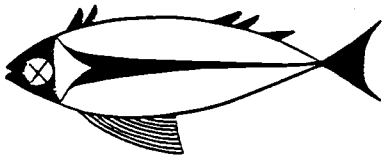
Tucson Water staff doesn't want to admit that recharge is still a viable alternative. Public health requirements mandate that this issue once again be reviewed objectively, with no interference from Tucson Water. Should our community drink high quality groundwater ... or the City's chemical soup? (Will people be harmed by chemicals who would not be harmed by pure water?)

Tucson Water already has damaged many people with their callous, knowing use of TCE-laden water. As a result, our citizens have become too wary to trust them any longer. In the past few weeks, the disclosure of leaks at the Thomas Price Service Center has added to the public's legitimate distrust of Tucson Water. The revelations about faulty planning and mishandling of liquid chlorine at the treatment plant can only add to the distrust.

In my opinion, the above-described recommendations should be evaluated objectively, publicly discussed and implemented. I expect the usual attempt at whitewash and denial from Tucson Water. If they cannot predetermine the results of a study, they will oppose letting the study take place. When the recharge versus chemical treatment vote was taken several years ago, the public was not told the truth, nor did they know how corrupt and deceptive top-level Tucson Water staff were. Honest recharge alternatives were not put before the public. Worst of all, the 42 percent of Tucson Water customers who live in the County never had a vote on the issue. Now, the public is better informed about the dishonest activities of the bumbling bureaucrats at Tucson Water.

This issue must have free and open public discussion. Let facts, not political agendas, dictate decisions on public health issues. Let facts highlight what may well be a huge wasted investment in an unnecessary water treatment plant. Inform the public that our use of pure groundwater can continue as an alternative to chemically treated CAP water if Tucson Water is removed from the decision making process.

If the City will not support this approach then I commit to place an initiative on the City ballot demanding pure water, not chemical soup, plus removal of the top 20 highest-paid employees of the bloated bureaucracy of Tucson Water.



Offering a contrasting view is Joe Scott, Chairman of Tucson Water's Citizens Water Advisory Committee:

As an informed member of the Citizen's Water Advisory Committee and an enthusiastic consumer of Tucson's water I was amused to read of a political candidate's recent theatrical and hysterical criticism of the use of ozone and chloramine to disinfect Tucson's CAP water. This is but a smoke-screen and the latest in a series of politically motivated grudge assaults on the Tucson City Council and Tucson Water. The candidate seeks to exploit this non-issue for its free press coverage through demagoguery. His ultimate aim may be to break the intergovernmental agreement with the City of Tucson and get Pima County back into the water business.

Some of his supporters seek the resurrection of the CAP streambed recharge initiative which voters wisely rejected by a wide margin in 1987 because of the danger of groundwater contamination from numerous dumps in or near those streambeds. Other supporters seek alternatives to proven methods of disinfection, for their own reasons. Taking a page from an opponent's "government by plebiscite" manual, this candidate threatens to unleash the fury of the masses through an initiative that not only would seek to prevent Tucson Water from using its $80 million, state-of-the-art treatment plant, but that also threatens the jobs of its top staff.

The candidate's repulsive tactics are comparable to yelling "Fire!" in a crowded theater.

All this makes for good reading in the papers and entertaining TV news. But from the point-of-view of third-generation science illiterates among an under-informed public, the candidate's repulsive tactics are comparable to yelling "Fire!" in a crowded theater, and that is not funny at all!

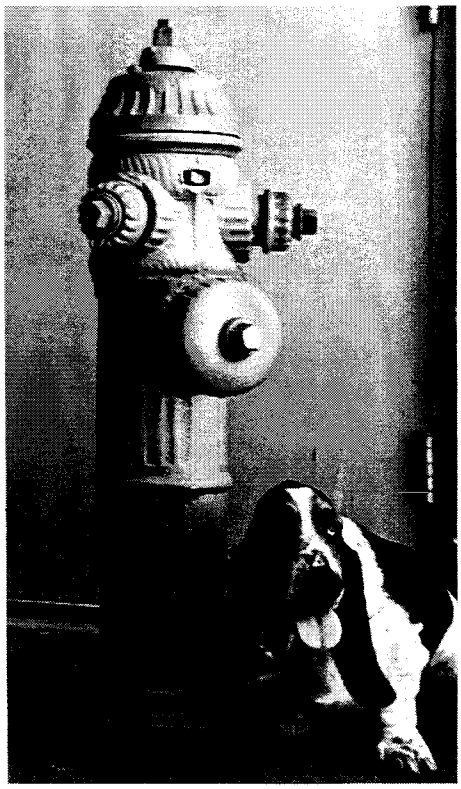
So the candidate argues for streambed recharge in lieu of chemical disinfection and off-stream, well-field recharge. I, too, would enjoy white-water rafting down Rillito Creek, but the disadvantages of stream-bed recharge are well documented: First, the cost of untreated, stream-bed recharge of expensive CAP water is estimated to be in the hundreds of millions, requiring pumps, pipes, dams, canals, channels, gates, and sundry other improvements. In essence, we would be re-inventing the proverbial water-wheel regarding our distribution system.

Secondly, even after this outrageous cost, there would be the added (yes, added) risk of pollution to our water supply from hundreds of known and unknown dumps and landfills all along the streams in the city and county. Persistent saturation of the dump-sites would assure that pollutants planted years ago would now be reliably harvested and carried downward into the water table. This does not occur with intermittent wetting associated with periodic natural flow events.

We would be leaching all of that chemical garbage and rotting matter directly into our underground water supply. It would be a cruel irony to cause Mother Nature to be the agent of this kind of groundwater contamination, when she is otherwise renowned for her ability to remove certain kinds of pollutants from water. In fact, Tucson Water plans to recharge and bank excess CAP water—but at safe, off-stream sites. Scratch one fatuous argument.

Still, the candidate's stream-bed recharge proposal offers some unintended air-quality benefits. Saturated streambeds might cause significant flood events after major rain-fall events. Long-distance commuters finally will be able to leave their cars at home and sail from the far eastside to Marana. Marana might even become a marina! However, the Town of Marana may not take kindly to this modification of the County's long-range transportation plan. Instead, the Town may be inclined to sue the City of Tucson for major flood damage caused by the water in our saturated washes that did not sink into the ground, but instead careened into town carrying the Rillito white-water rafting club on the crest of the flood wave.

This affair is but the most egregious example of a growing willingness on the part of certain local, elected officials to exploit public hysteria surrounding water issues, i.e. fluoridation, chloramination, groundwater contamination cleanup, etc. Tucson Water's plan to disinfect CAP water with ozone and chloramine uses the demonstrably safest available disinfection technology. Tucson Water's only political agenda is to deliver safe, high-quality water at reasonable cost to the Tucson public. And the Citizen's Water Advisory Committee will be there, as ever, to ensure that the public interest is served.



Tucson Water replaces about 200 of the 13,000 hydrants in its system each year. People buy the retired hydrants for yard ornaments, planters, table legs, even as a multi-spout beer spigot at a fireman's union. Basset hound Prunella Le Paux contemplates another tried-and-true use. Tucson Water donated the 19th-century vintage hydrant to the Water Resources Research Center's educational program. (Photo: B. Tellman)

News Briefs

Regional Riparian Conference Planned

Plans are underway for a western regional conference to discuss managing riparian areas under multiple ownership. The conference, scheduled February 4-6, 1993 in Albuquerque, New Mexico, will offer riparian land owners and riparian users practical information on coordinated management of riparian areas flowing through several jurisdictions—federal, Indian, state, local, and private. Examples of successful techniques used to achieve cooperative management are to be featured.

The conference poster session will include two types of posters: technically focused posters dealing with such topics as riparian restoration techniques and posters describing successful projects in specific western riparian areas.

Poster papers will be published in the conference proceedings. Abstracts must be submitted to Mary G. Wallace by October 31, 1992 at the Water Resources Research Center, University of Arizona, 350 N. Campbell Avenue, Tucson, AZ 85721; 602-792-9591.

Further information about the conference can be obtained by contacting the Water Resources Research Center at the above address.

Major cosponsors include the U.S. Forest Service, U.S. Soil Conservation Service, Bureau of Reclamation, Council of Energy Resource Tribes, Bureau of Land Management, U.S. Fish and Wildlife Service and the University of Arizona.

Western, Urban Water Interests Form Coalition

Public and investor owned water suppliers from six western states have banded together to form the Western Urban Water Coalition. The coalition, which was announced in July, is to represent urban water interest in a region that traditionally favored agricultural water uses.

Its goals include advocating water conservation and the cooperative sharing and transfer of water resources. Also sought are congressional changes in western water allocation from agricultural to urban uses.

Founders of the coalition state the organization is in response to the new realities of the West. The region is said to be the most urbanized area of the country, with about 86 percent of its population located in urban centers. The coalition is to represent a "third voice" among agricultural and environmental interests.

Charter members of the coalition include 21 major water utilities in six western states: California, Nevada, Utah, Colorado, Oregon, and Washington. Together they serve more than 35 million urban dwellers. No Arizona utilities have joined the fledgling organization.

Coolidge Dam to be Improved, Modified

The Bureau of Reclamation has awarded an $11,554,727 contract for safety modifications to Coolidge Dam, located 80 miles southeast of Phoenix.

Safety modifications to be made include placement of concrete on the canyon walls flanking the dam to protect them against erosion, construction of a mass concrete section to support the left canyon wall adjacent to the dam, and rehabilitation of the two spillway chutes to allow for greater release of water from the dam's reservoir. In addition, large rocks (riprap) will be placed in the basin and along the river bank immediately downstream of the dam to prevent erosion of the earthen materials if the dam is overtopped by a flood.

All of the concrete work, which will increase the stability of the dam in the event of an earthquake, will be completed by mid-1993, with the rest of the work scheduled for completion by February 1995.

Coolidge Dam was designed and constructed and is operated by the Bureau of Indian Affairs. Safety evaluations of the dam performed by Reclamation in the late 1980s indicated it failed to meet safety requirements for normal operating conditions, and was subject to failure if struck by a maximum credible earthquake or probable maximum flood.

Reclamation was directed to proceed with safety modifications to Coolidge Dam. While safety repairs were being designed, the dam's reservoir was restricted to a safe operating level, and early warning monitoring devices were installed at various locations within the dam for the protection of downstream communities.

Border Land Uses are Forum Topic

Adding to the complexity of managing natural resources along the U.S.- Mexico border are various factors affecting land use. These include changes in patterns of economic development, land tenure, and population growth.

The Lincoln Institute of Land Policy, in association with the Sonoran Institute, is offering a forum to address concerns relating to the above situation. The forum begins with the premise that natural resources problems in the area are best addressed regionally to encourage better understanding among the many and diverse neighbors sharing this fragile arid environment.

The area of concern includes parts of the Gulf of California, the Goldwater Aerial Bombing Range, the Pinacate, Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge, the Tohono O'odham Nation, as well as the communities of Ajo, Lukeville, and Why in Arizona and Puerto Peñasco and Sonoyta in Sonora.

The forum is scheduled October 22-25 in Ajo, Arizona and costs $25. For additional information contact Wendy Laird, Director, U.S.-Mexico Borderlands Program, or Paul Williams, Sonoran Institute, 6842 E. Tanque Road, Suite D, Tucson, AZ 85715, 602-290-0828.

U.S., Russia Share Hydrologic Expertise

A hydrogeologist from Montgomery & Associates of Tucson is travelling to Russia as part of an exchange program between the consulting firm and the Hydrology Division of the Scientific Center of Engineering Geology and Environment, Russian Academy of Science.

Hydrogeologist Deborah J. Tosline specializes in conduct and oversight of field operations, analysis of hydrogeologic data to evaluate groundwater conditions and contamination, and review of water policy issues. Her initial assignment will be with the St. Petersburg Mining Institute, with work scheduled later in Moscow at the Russian Academy of Science.

The initial work-visit exchange occurred in 1991 when Russian hydrogeologist Margarita Kochneva worked with Montgomery & Associates in Tucson. The principal goal of the work-visit exchange is to provide an environment for the two-way, Russian-U.S. transfer of scientific hydrogeologic experiences as well as encouraging an exchange of information on investigative hydrogeologic procedures.

Mines Proposed for Pinto Creek Area

Pinto Creek in the Miami-Superior area of Arizona is the site of two proposed mining operations. Cambior Inc., a Montreal gold mining company, has plans to develop the Carlota Mine near the creek. Expectations are the mine will yield 25,000 tons of copper annually, but at the expense of pumping 12,000 acre feet of water. Also, water from mining operations would be discharged into the creek.

Area residents are concerned that mining activities will affect drinking water supplies, as well as threaten the water quality of Pinto Creek.

Raising further concern is a submitted plan of operation for gold mining at a site 15 miles further downstream. The plan calls for excavating a mile of Pinto Creek down to bedrock and removing trees and shrubs from a cottonwood-willow riparian area. Critics of the project also are concerned that the water quality of Roosevelt Lake, located downstream, will be affected.

Both of the proposed projects are located on U.S. Forest Service land.

Survey Measures Arizona Environmental Views

A survey of Arizonans' environmental interests shows they are very concerned about the degradation of the environment and are willing to support programs to preserve and protect the state's air, water, and natural habitats, even if it means paying higher taxes. The survey further indicates that Arizonans are willing to sacrifice growth for the sake of the environment and are one step ahead of their leaders on this important issue.

The survey also reports that a large majority of Arizona citizens believe there is insufficient government regulation of the environment. A narrower majority support a "command-and-control" regulatory approach for environmental improvement, in preference to a free-market approach. The latter is characterized by businesses responding to consumers' desires, as expressed in the market place, for environmentally friendly products.

The survey also found that 56 percent of the state's population strongly favor a mandated use of water conservation devices in all new construction and reconstruction, despite possible higher real estate costs. Another 25 percent somewhat favor this proposal.

The survey shows that about 70 percent of Arizona citizens favor stricter water treatment regulations that would require 98 percent of contaminants to be removed rather than the current 95 percent, even if this results in significantly higher sewer rates. Another 70 percent somewhat favor stricter groundwater-use regulations that might discourage growth and development. Pima County residents are noticeably more likely to strongly favor stricter groundwater-use regulations and the use of water conservation devices.

According to 60 percent of those surveyed tighter pesticides controls are in order, even if some farmers go out of business and food costs increase. A majority of 59 percent of Arizona residents would keep California and Nevada from receiving Arizona's unused CAP Colorado River allotment, even if increased property taxes result.

The survey is discussed in the report, *Arizonans and the Environment* and is available to the public. (See "Publications", p. 9.) The report was coordinated by the Morrison Institute for Public Policy at Arizona State University.

AZ Groundwater Programs to be EPA Model

Arizona has been selected by the U.S. Environmental Protection Agency as a model state for the Comprehensive State Groundwater Protection Program, designed to foster more effective groundwater protection through interagency cooperation.

The Arizona Department of Environmental Quality will work with EPA to profile the state's groundwater protection programs. Information will be collected about Arizona's efforts in six categories: groundwater protection goals; prioritization of resources for groundwater-related programs; delineation of roles, responsibility and interagency coordination; program implementation; data collection and management; and public participation.

EPA Region 9 will profile and assess its own programs, particularly as they relate to Arizona. A joint review of both Arizona and EPA programs will serve as a guide to both the state and EPA in future efforts to protect groundwater.

Special Projects

Current water-related studies, pilot projects and applied research are summarized below.

ADEQ Program to Protect Wellheads

Communities, the Arizona Department of Environmental Quality, and the U.S. Environmental Protection Agency will work together to protect and manage groundwater supplies under Arizona's new Wellhead Protection Program (WHP).

Under the Safe Drinking Water Amendments of 1986, states are required to develop and submit wellhead protection programs to EPA. Arizona's program, the first in EPA's Region IX to win approval, is designed to help protect groundwater, especially from improper disposal or accidental spills of contaminants. The Wellhead Protection Program will provide extra protection in areas that may significantly impact drinking water supply wells. These areas are "wellhead protection areas."

Methods of defining wellhead protection areas vary, in costs incurred and in the degree of protection afforded. All of these methods, when used as a factor in land use and other resource planning and management, should add some degree of additional groundwater quality protection.

Arizona's WHP encourages and guides voluntary local delineation of wellhead protection areas, the implementation of local land use and other management activities, and local involvement in related state programs. Because of local agencies' closeness to community needs and water issues, their involvement is necessary. Local economic and social issues, as well as variable hydrological conditions, are important factors in resource decisions.

ADEQ currently is finalizing the state's WHP program document, and is initiating public outreach and education activities. For more information contact Lisa Hastings at the ADEQ, 3033 N. Central Ave., #426, Phoenix, AZ 85012; 602-207-4425.

Artificial Wetlands Focus of Research

The Pima County Wastewater Management Department is evaluating the concept of artificial wetlands. Artificial wetlands are being used as an ecological and economic alternative to traditional treatment methods.

At its research site a raceway lined with 30 mil hyperlon (heavy plastic sheeting) serves as the artificial wetlands setting. The wetlands system is 200 feet long, 25 feet wide, and 5 feet deep.

The wetlands will be continually supplied with unchlorinated, secondary effluent from the Roger Road Wastewater Treatment Facility. The average flow rate into the wetlands will initially be 20-25 gal/min. Estimated detention time will be about three days.

As the secondary effluent enters the wetlands, it will be retained in an area planted with duckweed for 24 to 36 hours. It will then flow through gravel beds where it will contact cattail, reed and bulrush. In addition to these species, willow, cottonwood, and mesquite will also be used to increase the species diversity, provide opportunities to observe effluent impact on plants, and to increase habitat diversity. The treated wastewater then will return to the headworks at the Roger Road Wastewater Treatment Facility.

Areas adjacent to the wetlands will be planted in FY93 with more xeric species such as creosote bush, fairy duster, and jojoba. These plantings will provide additional species and habitat diversity as well as research opportunities to study the impact of effluent irrigation on landscape species. Constructed wetlands wastewater treatment facilities using multiple species are capable of polishing secondary influent to attain the tertiary standard for BOD and TSS of 10 m/1.

This artificial wetlands project is designed for evaluation and demonstration under the guidance and leadership of PCWWMD and operated by the University of Arizona's Office of Arid Lands Studies. It is to be a model for future scale-up. For additional information contact Kathy Chavez, Pima County Wastewater Management Department, 201 N. Stone Ave., Tucson, AZ 85601, 602-740-6500; or Dr. Martin Karpiscak, Office of Arid Lands Studies, University of Arizona, Tucson, AZ 85719, 602-621-1955.

Report Urges TAMA Artificial Wetland Use

A Southern Arizona Water Resources Association Wetlands Subcommittee was established to evaluate the potential for use of constructed wetlands as a conjunctive or alternative water treatment method in the Tucson Active Management Area (TAMA). To complete its task the subcommittee involved various experts including Arizona Department of Environmental Quality officials and consultants from ongoing wetland projects, for example in Show Low and Kingman.

The committee issued a report providing a review of current literature and regulations related to the use of constructed wetlands locally. Along with background on the constructed wetlands issue, the report discusses benefits, regulatory issues, technical issues, and funding opportunities.

The report's purpose is to acquaint people with the wetlands concept and its potential, especially elected officials and planners. Although specifically focusing on situations in the Tucson area, the report is of relevance to other semiarid regions of the state.

The report concludes: "Since constructed wetlands are emerging as viable, potentially cost-effective water treatment systems that benefit the community through enhancement of natural habitat, they are appropriate for integration into this region's water planning and management schemes." The complete report will be printed in *Water Words* available from SAWARA, 48 N. Tucson Blvd., Suite 106, Tucson AZ 85716; 602-881-3939.

Publications

Land Subsidence, Earth Fissures Change Arizona's Landscape

Joe Gelt. The above is Vol. 6 No. 2 of *Arroyo*, a quarterly publication of the Water Resources Research Center. Subsidence and earth fissures are geological events accelerated by man through a long-term extraction of groundwater. Their occurrence in Arizona and the effects are discussed.

Individual copies—also subscriptions—of *Arroyo* are available without charge from the Water Resouces Research Center, University of Arizona, 350 N. Campbell Avenue, Tucson, AZ 85721; 602-792-9591.

Maps Showing Groundwater Conditions in the Eloy and Maricopa-Stanfield Sub-basins of the Pinal Active Management Area

Bruce Hammett. Issued by the Arizona Department of Water Resources, the above is Hydrologic Map Series Report 23. The report provides information on groundwater levels, water-level changes, and quality of water.

Hydrologic Map Series Reports have been prepared for many groundwater areas in the state. Each report costs $1.50 and is available from ADWR, Basic Data Section, 2810 S. 24th Street, Suite 122, Phoenix, AZ 85034; 602-255-1543.

Water Publications Digest

This new eleven-issue-a-year review abstracts and summarizes information appearing in about 12 leading water periodicals. It is available for $59 per year from Water Publications Digest, Lakeview Publications, P.O. Box 6866, Charlottesville, VA 22906-6866; 804-973-5111. A sample issue is available for $2 from the same address.

Statewide Water Planning: Agenda for Implementation

Arizona Section, American Water Resources Association. This publication consists of proceedings of the AWRA symposium conducted October 25, 1991 in Tucson, Arizona. Copies are available for $14 from Dale Wright, University of Arizona, Office of Arid Lands Studies, 845 North Park Avenue, Tucson, AZ 85719; 602-621-1955.

1992 Arizona Environmental and Resources Conservation Directory

This updated directory includes listings of businesses, educational institutions, federal, state, and municipal government agencies, citizen and nonprofit organizations, and professional associations. The directory can be ordered from the Commission on the Arizona Environment, 1645 W. Jefferson, Suite 416, Phoenix, AZ 85007; 602-542-2102. The cost is $12.50 if ordered by mail and $10 if picked up at the Commission's office.

Arizona Water: Information and Issues

Susanna Eden and Mary Wallace. Directed at a general audience, this issue paper discusses important elements of water resource management in Arizona. Described within are the sources of the state's water supplies, their uses, and management. In addition, the publication discusses the major water policy issues challenging Arizona's water managers, planners, and policy makers in the final decade of the twentieth century.

Water Resources Research Center, University of Arizona, 350 N. Campbell Ave., Tucson, Arizona 85721; 602-792-9591. Up to two copies free. Call for pricing on larger orders.

Arizonans and the Environment: Attitudes Toward the Key Environmental Issues Facing the State

This survey demonstrates that Arizonans are very concerned about the degradation of the environment and are willing to support programs to preserve and protect the state's air, water, and natural habitats, even if it means paying higher taxes or limiting growth (see story, p. 7). Copies of the report are available free by calling the Morrison Institute for Public Policy, Arizona State University, 602-965-4525.

The following two publications are available from the US Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, CO 80225. (Report 92-54, $1.50 microfiche, $6.50 paper copy) (Report 92-4045, $4 microfiche, $6.50 paper copy)

Annual Summary of Ground-Water Conditions in Arizona, Spring 1986 to Spring 1987 (USGS Open-File Report 92-54)
A.D. Konieczki and R.P. Wilson.

Results of Ground-Water, Surface-Water and Water-Quality Monitoring, Black Mesa Area, Northeastern Arizona, 1990-91 (USGS Water Resources Investigations Report 92-4045)
J.P. Sottilare.

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Tucson AMA Water Augmentation Authority

Tucson Water

USGS Water Resources Division

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Their contributions help make continued publication of this newsletter possible.

Legislation & Law

Need for National Water Policy Debated

To adopt a national water policy or not, that is the question, particularly in the West. Central to the question and the ensuing debate is whether natural resource management, and specifically water management, will be improved by better coordinating federal water management activities, a strategy that also would include adopting a national comprehensive water management policy.

Currently, a plethora of federal players participate in water resource management. Involved in the action are at least 13 separate congressional committees, eight cabinet-level departments, six independent agencies, and two White House offices. The perception is one of disjointed, fragmented, and uncoordinated federal water policy. This state of affairs is especially bothersome to the West where the federal government controls much of the water, with the Bureau of Reclamation and the Army Corps of Engineers in charge of major regional water projects.

Whatever might have previously justified these circumstances is likely to be challenged by new water management situations. For example, drought, population growth, water pollution, and new demands for water for instream uses are stressing the water supplies of many communities across the nation. For the first time, particularly in the West, water users are facing trade-offs between, for example, groundwater pumping to support economic development in an area and the maintenance of a free-flowing stream. Such developments further the call for a review of federal water management activities, with the intent of effectively coordinating among agencies and devising relevant and appropriate policy statements.

The American Water Resources Association conference in Washington, D.C. in June addressed this pressing issue. Consensus prevailed among participants and presenters that a change in water policy is indeed needed. The times are ripe for such a change. The era of dam-building and large-scale water development projects is over. The previous lock that "iron-triangles" had on policy formation is gone. New interests, from Indian tribes to environmentalists to recreationalists, are participating in the formation of policy. New values of water also are being proposed, with water being viewed less simply as a commodity and more broadly valued as component within an ecosystem.

Conference debate centered on a key question: What is the appropriate federal role in this emerging water policy environment and what type of changes must be made to improve water management? A theme recurring in the debate was that water management needed to be improved on a regional and watershed basis. At the same time, however, the difficulty of this strategy was acknowledged because of the many jurisdictions and agencies involved.

Many participants agreed that despite the multiplicity of jurisdictions and agencies efforts must continue to more effectively use existing resources through coordination. Strategies to accomplish this goal were suggested. One method proposed was to form partnerships to develop, manage, and protect water resources among all relevant players—federal, state, local, and Indian governments. Further, working relationships among water users need to be established to foster more flexibility in water law, a condition notably lacking with current practices.

Despite the general consensus for better coordination of federal water management programs, there was little agreement on how best to achieve this result. Some people believed the River Basin Commissions established in the 1970s and disbanded during the Reagan administration should be revived. Others called for an update to the National Water Commission Study of the early 1970s. And still others looked to the emergence and involvement of regionally-based groups.

Most agreed, however, that a key role of the federal government's national water policy is to provide a forum where issues and problems can be discussed and solved. Other roles discussed included providing technical and financial assistance to local communities and direction for research.

SAWRSA Amendments Discussed

Proposed amendments to the Southern Arizona Water Rights Settlement Act were the subject of a joint congressional hearing on August 6 before the Senate Select Committee on Indian Affairs and the House Committee of Interior and Insular Affairs. Presided over by Senator John McCain, the hearing featured presentations by representatives of several southern Arizona groups, including two panels representing the Tohono O'odham Nation and allottees from the San Xavier District.

Proposed amendments include clarification of the right to lease water off-reservation; an option for Tucson Water to lease CAP water; and also an allowance of more time to plan water use. In addition, the amendments seek to extinguish the water right claims of the allottees of the San Xavier Reservation (see June *AWR*, p.1 for background).

Representatives of all but two of the parties present testified in favor of the amendments. The amendments are opposed by the allottees, who claim $94 million in economic damages. They believe they have private property rights to the water separate from the Tohono O'odham Nation and should receive the bulk of the water rights and other settlement benefits directly. The Department of Interior opposes the amendments because they slightly increase the federal commitment and do not postpone the October 12 1992 date which triggers penalties for non-delivery of water.

The consensus of Arizona's congressional delegation is that the bill will not pass without resolution of the allottees' concerns. Further negotiations are planned in Albuquerque on September 1 and 2 concurrent with a symposium on Indian water rights.

Proposition 102 to Allow State Land Trades

Proposition 102 on the November ballot would amend the Arizona Constitution to allow the State Land Department to trade lands for various purposes. Currently, if the State wants to sell land, the Constitution requires sale to the highest bidder for maximum profit. No leeway exists for trades that might protect sensitive lands.

Land trading was attempted to protect Catalina State Park near Tucson. The park was leased from the State Land Department for a minimal fee. Over time, nearby development increased land values, thereby boosting leasing fees to an unaffordable level for State Parks. A complicated trade was contemplated, with the U.S. Forest Service taking possession of the land and State Parks administering it. This plan was challenged in court and declared unconstitutional.

Proposition 102's passage would permit such trades and increase flexibility for State Land Department decision-making, including decisions impacting water supplies. No organized opposition to Proposition 102 exists, but the same measure lost two years ago, primarily through lack of voter information in a year in which more than 15 propositions were on the ballot.

Referendum in Progress to Challenge Taking Law

The 1992 Legislature passed a bill described by some as the "private property protection act" and others as the "polluter protection act" (see July/August *AWR*, pp. 1,8). The bill directs the attorney general to set up guidelines for state agencies to use in determining whether proposed regulations or permit or license conditions will impact negatively on private property rights. A full or partial impact would require compensation. The law applies to all areas of state regulation.

Supporters of the bill believe added protection is needed because they consider private property rights insufficiently protected by the Constitution and Supreme Court. Further, they believe government regulation has gone too far and that further regulation may jeopardize the economy. They do not believe the new law will be costly or onerous to implement. Supporters include the grazing industry, agribusiness, power companies, and other business interests.

Opponents argue the law was unnecessary, pointing out that no supporter was able to give an example of property rights being violated in Arizona without compensation. Also, opponents believe the law is so vaguely worded that a great deal of money will be spent on lawsuits to determine its true meaning. They depict the required studies as a waste of money at a time when the state has severe budgetary problems. No additional agency positions were funded to implement the law, leading to fears that government protection measures will be stifled by hesitancy of agencies to regulate under threat of lawsuits.

Opponents, including environmental, social service, and neighborhood interests, as well as public interest organizations, claim that the bill will lead to paying polluters not to pollute. They have organized an effort, "Take Back Your Rights," to repeal the law through referendum. Some 52,000 valid signatures must be gathered by the end of September to place the issue on the ballot. If the effort is successful, the item likely would be on the 1994 general election ballot, since the deadline for the 1992 election has passed.

Siphon Bill Passes House

Legislation in Congress to have the cost of repairing siphons in the Central Arizona Project's aqueduct system be nonreimbursable has passed the House and now is in the Senate (see June *AWR*, p. 7). The bill also states that repair costs will not count against the Project's expenditure cap.

Yesterday's Water Hogs, Today's Riparian Gems

"Phraetophytes are worthless plants, mainly trees such as salt cedars and cottonwoods and willows" that "produce nothing but trouble." So begins an article in the December 1954 issue of *Land Improvement*. It goes on to claim that "twice the annual flow of the Colorado is being wasted on these plant-life drunkards." (And you thought the wind made them sway!) Variously described as "greedy water hogs", "wastrels of the West", and "a group of destructive enemies formerly regarded merely as nuisances," the author declares their defeat to be "the greatest challenge before the land improvement industry today."

Wasted water wasn't the only harm done by the riparian vegetation. "Something positively must be done to ameliorate flood dangers wholly or partially caused by phraetophytes. They are the sole cause of uneasiness felt in the fertile Salt River and Buckeye Valleys of Arizona, embracing the state's capital city, Phoenix... When the torrent batters against those jungles, it will be whipped from side to side; it will wash banks away, perhaps cut completely new channels through cities and towns and some of the richest farmland that lies out of doors."

Technology was up to the battle. "In this age of giant bulldozers, and of chemical herbicides that can be quickly distributed from airplanes, phraetophytes can be checked if not entirely controlled." But if the 2,4-D and 2,4,5-T doesn't work, "the only sure way to kill off phraetophytes is to pull their water out from under them... the drop must be rapid, otherwise the roots will keep pace with the declining water table and keep the plant alive until conditions are again stable."

One's initial reaction to these 1950s views might be, how could they have been so near-sighted? A more interesting question is, what water management policies of today may be viewed with equal amazement and dismay 40 years hence?

Announcements

Tucson Water Augmentation Authority Wants You

The Tucson Active Management Area Water Augmentation Authority (soon to be the Santa Cruz Valley Water District) Public Participation Program is underway. Governance, Operations, and Public Affairs working groups will be meeting over the next several months to assist the authority in formulating its plan of permanent operation.

For information on the program and how to become a participant, call Tom Whitmer or Sharon Megdal at 602-326-8999.

Call for Papers for AWRA Conference and Symposium

AWRA's 29th annual conference and symposium is to be held in Tucson August 29-September 2, 1993. October 23, 1992 is the deadline for submitting abstracts for both the conference, Innovations in Ground Water Management, and the symposium, Effluent Use Management.

For more information on submitting papers, as well as about the conference and symposium, contact the appropriate person: Conference Technical Co-Chairperson, Hanna J. Cortner, Water Resources Research Center, 350 N. Campbell, University of Arizona, Tucson, AZ 85721, 602-621-7607; or Symposium Technical Chairperson, Ken Schmidt, 1540 E. Maryland, Suite 100, Phoenix, AZ 85014, 602-224-4412.

Ag Research Funding Available

The Department of Agriculture requests proposals for international collaborative research on topics of benefit to agriculture in the United States and the proposed cooperating country. Funding is up to $20,000 per year for one to three years. There is no set deadline for applications. For additional information contact Calvina Dupre, USDA/OICD/RSED, Collaborative Research Program, Rm. 3222, South Bldg., 14th & Independence Ave. SW, Washington, DC, 20250-4300; Phone 202-720-5762, FAX 202-690-0892.

Notable Water Quote

"The wonder would be if the water did not fall."

Oscar Wilde on observing Niagara Falls

Environmental Service for Small Communities

The National Association of Towns and Townships is offering a new service to officials in small communities. It will be providing them information about cost-effective strategies for meeting state and federal environmental mandates.

NATaT's Environmental Resource Center catalogs resources in six areas: wastewater, groundwater, solid waste, drinking water, hazardous materials, and underground storage tanks. Resources include publications and videos available from the USEPA industry associations and nonprofit organizations. In addition, the center provides the addresses and telephone numbers of state and federal agencies with jurisdiction in each issue area. The service is free.

For additional information, contact: NATaT, Environmental Resource Center, 1522 K Street, NW, Washington, DC 20005; 202-737-5200.

Pima County Flood Control District Issues RFP

The Pima County Flood Control District requests proposals for resource inventory and management planning for its Cienega Creek natural Preserve and Empirita Ranch acquisitions. The selected consultant team is to identify plant communities, sensitive wildlife species, and existing public uses, and recommend recreational use levels, access locations, and management actions for a 5000-acre riparian habitat preserve. A detailed scope of work is available from Mr. Mike Studer, Pima County Department of Transportation and Flood Control District, 201 N. Stone Ave., Tucson AZ 85701-1207; 602-740-6409. Five copies of the proposal are to be submitted to Mr. Studer by Sept. 24, 1992.

Subsurface Science Funds Available

The Office of Health and Environmental Research of the Office of Energy is requesting applications to support research on the origins of microorganisms in the deep subsurface. This is a coordinated, multidisciplinary program directed toward determination of the origins of microorganisms that occur in deep sediments and geological formations with emphasis on field investigations. Emphasis is on collaborative interdisciplinary research that draws on the fields of microbiology, geology, geochemistry, hydrology, microbial ecology, and molecular biology.

Deadline for applications is Nov. 16, 1992. For additional information contact Dr. Frank J. Wobber, Office of Health and Environmental Research, ER-74 (GTN), Office of Energy Research, U.S. Department of Energy, Washington, DC 20585; 301-903-5324.

continued on page 16

September 1992 Arizona Water-Related Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Tucson CWAC Gila Box, Safford <-- Settlement of In-	2 dian Reserved Water	3 CAWCD Rights Claims ---->	4	5
6 Casa del Agua	7 Yav. Flood Control	8 AZ Hydrological Primary Elections, Don't forget to vote!	9	10 Hazardous Waste Minimization <--- Arizona	11 Water 2000 --->	12 A Taste of CAP
13 Casa del Agua <--- New Mexico <-- INTECOL <- National Rural	14 Conference on the International Wetlands Clean Water Program	15 <--- Environ- Environment -----> Conference (runs Symposium (runs	16 mental Assessment through the 17th) ---- through the 17th) ----	17 PAG Water Quality of Mountain --->> --->	18 Streams --->	19 A Taste of CAP
20 Casa del Agua	21 <------	22 <-- Introduction to -- Flood Plain	23 Prescott AMA, GUAC Ground Water Hydrology	24 Tucson AMA Water Authority <-- Public Land Law Geochemistry -----> Using HEC-1 --	25 Tucson AMA, GUAC Program (p. 16) -->> ------>	26
27 Casa del Agua <-----	28 Yav. Flood Control NACOG, Springerville Protecting Our	29 NACOG, Holbrook Nation's Waters	30 NACOG, Flagstaff<br-----> <--- National Water	October 1 NACOG, Prescott Works Association	October 2 Annual Meeting --->	October 3

Calendar of Events

RECURRING

Arizona Hydrological Society. No September meeting due to Arizona Water 2000 on 10-11 September. Water Resources Research Center, 350 N. Campbell Ave., Tucson. Contact: Mike Block 602-792-1093.

Arizona Water Commission. September meeting not yet scheduled. Meetings held at ADWR, 15 South 15th Ave., Phoenix.

Casa Del Agua. Water conservation tours hourly, Sundays noon to 4:00 p.m., 4366 North Stanley, Tucson. Contact: 602-881-3939.

Central Arizona Water Conservation District. 1st Thursday of the month, 12:30 p.m. Central Arizona Project board room, 23636 North 7th Street, Phoenix. Contact: 602-870-2333.

City of Tucson Citizens Water Advisory Committee. 1st Tuesday of the month, 7:00 a.m. 310 W. Alameda, Tucson. Contact: Trish Williamson 602-791-4331.

Northern Arizona Council of Governments Areawide (208) Water Quality Management Plans. 28, 29 & 30 September in Springerville, Holbrook, and Flagstaff, respectively. 4:00 p.m. and 7:00 p.m. Contact: Christine Nelson, NACOG, 119 East Aspen Avenue, Flagstaff, AZ 86001; 602-774-1895.

Phoenix AMA, GUAC. 8 September, 9:30 a.m. ADWR, Phoenix AMA Conference Room, 15 South 15th Avenue, Phoenix. Contact: Mark Frank 602-542-1512.

Pima Association of Governments / Water Quality Subcommittee. 3rd Thursday of the month, 9:30 a.m. 177 N. Church Ave., Tucson. Contact: Gail Kushner 602-792-1093.

Pinal AMA, GUAC. Meeting not yet scheduled for September. Pinal AMA Office, 901 E. Cottonwood Lane, Suite B, Casa Grande. Contact: Tom Carr 602-836-4857.

Prescott AMA, GUAC. 23 September, 10:00 a.m. Prescott City Council Chambers, 201 South Cortez, Prescott. Contact: Phil Foster 602-778-7202.

Tucson AMA, GUAC. 25 September, 9:00 a.m. Tucson AMA offices, 400 West Congress, Suite 518, Tucson. Contact: Linda Stitzer 602-628-6758.

Tucson AMA Water Authority. 24 September, 7:30 a.m. Water Resources Research Center, 350 North Campbell Avenue, Tucson. Contact: Warren Tenney 602-326-8999.

Yavapai County Flood Control District. 1st Monday of the month in Prescott; 4th Monday of the month in Camp Verde. Contact: YCFCD, 255 E. Gurley, Prescott, AZ 86301.

SEPTEMBER

1 (Tue) **Gila Box Planning Committee.** 10:00 a.m. - 4:00 p.m. BLM Safford District Office. Contact: Diane Drobka 602-428-4040.

1-3 (Tue-Thu) **Second Symposium on the Settlement of Indian Reserved Water Rights Claims.** Albuquerque, NM. Sponsored by the Western States Water Council and the Native American Rights Fund. Contact: Norm Johnson, Western States Water Council, Creekview Plaza Suite A-201, 942 E. 7145 South, Midvale, UT 84047; 801-561-5300.

10 (Thu) **Hazardous Waste Minimization: Regulation, Applications and Policy.** Arizona DEQ and the Office of Hazard Studies (ASU). ASU Downtown campus, Room 350, 502 E. Monroe St., Phoenix. Contact: 602-965-4518.

10-11 (Thu-Fri) **Arizona Water 2000.** Arizona Hydrological Society and the Commission on the Arizona Environment. Sedona, AZ. Contact: Bruce Mack 602-236-2579 or Commission on the AZ Environment 602-542-2101.

12 (Sat) **A Taste of CAP.** 9:30 a.m. - 11:00 a.m. Samples, displays and a question-and-answer session. Tucson Community Center, Turquoise Ballroom. Contact: SAWARA 602-881-1165.

13-15 (Sun-Tue) **New Mexico Conference on the Environment.** Sponsored by New Mexico Env. Dept. Albuquerque, NM. Contact: Conference Coordinator, UNM Institute of Public Law, 1117 Stanford NE, Albuquerque, NM 87131.

13-17 (Sun-Thu) **INTECOL International Wetlands Conference.** Columbus, OH. Contact: William Mitsch, School of Natural Resources, 2021 Coffey Road, Ohio State University, Columbus, OH 43210.

13-17 (Sun-Thu) **The National RCWP Symposium.** Rural Clean Water Program. Orlando, FL. Contact: National RCWP Symposium, c/o The Terrene Institute, 1000 Connecticut Ave., NW, Suite 802, Washington, DC 20036.

15-18 (Tue-Fri) **Environmental Assessment of Mountain Streams.** Allenspark, CO. Sponsored by Rocky Mountain Hydrologic Research Center. Contact: Janet Lee Montera, Civil Engineering Dept., Colorado State University, Fort Collins, CO 80523; 303-491-7425.

19 (Sat) **A Taste of CAP.** 9:30 a.m. - 11:00 a.m. Samples, displays and a question-and-answer session. Udall Center Meeting Rooms, 7200 E. Tanque Verde Rd. Contact: SAWARA 602-881-1165.

21-25 (Mon-Fri) **Flood Plain Hydrology Using HEC-1.** Tempe, AZ. ASU Center for Professional Development. Contact: Center for Professional Development, Arizona State University, Tempe, AZ 85287-7506; 602-965-1740.

22-24 (Tue-Thu) **Introduction to Ground Water Geochemistry.** San Antonio, TX. Contact: National Ground Water Association 614-761-1711.

27-30 (Sun-Wed) **Protecting Our Nation's Waters.** Norfolk, VA. National Environmental Health Association. Contact: National Environmental Health Association, 720 S. Colorado Blvd., Suite 970, Denver, CO 80222-1925; 303-756-9090.

30 September - 2 October (Wed-Fri) **National Ground Water Association Annual Meeting/Exposition.** Las Vegas, NV. Contact: National Ground Water Association, 6375 Riverside Dr., Dublin, OH 43017; 614-761-1711.

30 September - 2 October (Wed-Fri) **Environmental Drilling, Ground Water Monitoring and Sampling.** Short course. Houston, TX. Environmental Education Enterprises Institute. Contact: Association of Engineering Geologists 508-443-4639.

UPCOMING

1 October (Thu) **Northern Arizona Council of Governments Areawide (208) Water Quality Management Plan.** 4:00 & 7:00 p.m. 201 S. Cortez, Prescott, AZ. Contact: Christine Nelson, NACOG, 119 E. Aspen Ave., Flagstaff, AZ 86001; 602-774-1895.

1-2 October (Thu-Fri) **Arizona Environmental Law.** Federal Publication Inc. Scottsdale, AZ. Contact: 202-337-7000 or Miss J.K. Van Wycks, Federal Publications Inc, 1120 20th Street NW, Washington, DC 20036.

2-3 October (Fri-Sat) **Western Regional Instream Flow Conference II.** Jackson Hole, WY. Contact: Suzanne Van Gytenbeek, Trout Unlimited 307-733-0484.

5-7 October (Mon-Wed) **Irrigation and Water Resources in the 1990's.** U.S. Committee on Irrigation and Drainage. Scottsdale, AZ. Contact: USCID, 1616 Seventeenth Street, Suite 483, Denver, CO 80202; 303-628-5430.

6-9 October (Tue-Fri) **Jurisdictional Delineation of Wetlands in the American West.** Seattle, WA. American Fisheries Society. Contact: Mr. Leidy 415-744-1970.

9 October (Fri) **Arizona Water Resources Committee Annual Meeting—Maintaining Forest Boidiversity.** Sunburst Resort, Phoenix. Contact: AWRC 602-250-2879.

9-11 October (Fri-Sun) **National Conference on Environmental Entrepreneuring.** The Common Ground Project of Prescott College. Prescott, AZ. Contact: Prescott College, 220 Grove Ave., Prescott, AZ 86301; 602-778-2090.

12-16 October (Mon-Fri) **Flood Plain Hydrology Using HEC-2.** Tempe, AZ. ASU Center for Professional Development. Contact: Center for Professional Development, Arizona State University, Tempe, AZ 85287-7506; 602-965-1740.

15-17 October (Thu-Sat) **Eighth Annual Tri-State Seminar On-The-River: Walking the Environmental Tightrope.** Laughlin, NV. Contact: Tri-State Seminar Registration, c/o Pat Nelson, P.O. Box 48468, Phoenix, AZ 85075-8468.

16-22 October (Fri-Thu) **Interdisciplinary Approaches in Hydrology and Hydrogeology.** 1992 Annual Meeting of the American Institute of Hydrology. Portland, OR. Contact: AIH, 1992 Fall Meeting, 3416 University Ave. SE, Minneapolis, MN 55414-3328; 612-379-1030.

17 October (Sat) **AZ Water Well Assoc.** 8:00 a.m. Francisco Grande, Casa Grande. Contact: Dorothy 602-952-8116.

20-23 October (Tue-Fri) **Management of Hazardous Substances.** Rocky Mtn. Mineral Law Foundation. Breckenridge, CO. Contact: RMMLF, Porter Administration Bldg., 7039 East 18th Ave., Denver, CO 80220; 303-321-8100.

22-24 October (Thu-Sat) **Rangeland Watershed Management.** Society for Range Management. Safford, AZ. Contact: Bill Brandau or Clay Templin at 602-428-4040.

22-25 October (Thu-Sun) **Land Use Changes in the Western Sonoran Desert Border Area: A Regional Forum.** Lincoln Inst. of Land Policy, Ajo, AZ. Contact: Sonoran Inst., 6842 E. Tanque Verde, Suite D, Tucson, AZ 85715; 602-290-0828.

23-25 October (Fri-Sun) **Keep on Keeping On.** Arizona Association for Learning in and about the Environment Annual Conference. Prescott, AZ. Contact: Debra Howell, Grand Canyon University, College of Education, 3300 W. Camelback Rd., Phoenix, AZ 85017.

27-29 October (Tue-Thu) **Changing Climate and Water Resources.** 1992 Southeast Regional Climate Center Symposium. Charleston, SC. Contact: Mr. D.J. Smith, Southeast Regional Climate Center, 1201 Main Street, Suite 1100, Columbia, SC 29201; 803-737-0849.

27-29 October (Tue-Thu) **Collection, Treatment and Disposal of Liquid Wastes.** Austin, TX. Contact: University of Texas at Austin, College of Engineering, ECJ 10.324, Austin, TX 78712; 512-471-3506.

27-30 October (Tue-Fri) **Groundwater Contamination from Petroleum Hydrocarbons.** Austin, TX. Contact: University of Texas at Austin, College of Engineering, ECJ 10.324, Austin, TX 78712; 512-471-3506.

1-5 November (Sun-Thu) **Managing Water Resources During Global Change.** Conference & Symposium sponsored by the American Water Resources Association. Reno, NV. Contact: Michael C. Fink, Director of Meetings, AWRA, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192; 301-493-8600.

4-6 November (Wed-Fri) **Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Restoration.** Houston, TX. Contact: National Ground Water Association 614-761-1711.

Announcements cont. from page 12

Drinking Water Information for Small Communities

The National Drinking Water Clearing House (NDWC) provides various services to small comunities including a quarterly newsletter, technical assistance, and a computer bulletin board to disseminate drinking water information.

The newsletter, *On Tap*, covers drinking water assistance programs, regulations, technologies, as well as health, finance and management issues. The newsletter is free.

NDWC Technical Service staff will respond to questions regarding drinking water regulations, financial resources, and technical issues. Referrals to other organizations might be made when appropriate. Call 1-800-624-8301 for technical assistance services, as well as information about the newsletter.

The bulletin board service is called the Drinking Water Information Exchange (DWIE) and has two access lines available 24 hours a day from anywhere in the United States. A computer with a modem and communications software is necessary to access the system. The DWIE phone number is 1-800-932-7459.

Located at West Virginia University, NDWC was established last year by the Farmers Home Administration to disseminate drinking water information to small communities. Its central phone number is 1-800-624-8301.

Public Land Law Program Scheduled

The Special Institute on Public Land Law is to provide a comprehensive overview of the statutory and regulatory framework governing the management and use of our public lands. This framework includes not only organic acts for the governing agencies, but also constitutional considerations and the plethora of often conflicting statutes governing use of the public lands and protection of public land resources.

The Institute will address the role of the National Environmental Policy Act, which is implicated in virtually every decision affecting the public lands. The appeal process of the Bureau of Land Management and the Forest Service, as well as the role of other oversight and dispute resolution processes in the management of the public lands will be discussed. Also included will be a panel discussion of the state of public land management more than 20 years after the release of the Public Land Law Review Commission's report and a forecast of the future of public lands. The program's targeted audience includes timber and real estate interests, recreational users, conservation and preservation organizations, federal and state agencies, and other groups interested in management of the public lands.

For additional information contact the Rocky Mountain Mineral Law Foundation, 7039 East 18th Ave., Denver, CO 80220; 303-321-8100.

ARIZONA WATER RESOURCE

The University of Arizona
Water Resources Research Center
Tucson, Arizona 85721

Address Correction Requested

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