ARIZONA
WATER RESOURCE

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Farmers to Use More CAP Water

The Central Arizona Water Conservation District's plans to promote indirect recharge (March *AWR*, p.1) have induced Central Arizona Project farmers to contract for the use of up to 237,500 acre-feet (af) of Colorado River water this year in addition to their normal orders. This boosts the total amount of CAP water that may be used this year by farmers in Arizona to 412,500 af. Actual usage will depend on other economic factors of putting land into production.

Under the CAWCD's in-lieu recharge program, the farmers will irrigate their fields with additional CAP water in place of groundwater. Leaving this water in the ground is legally equivalent to storing CAP water underground for later use. State law allows CAWCD to recover 95 percent of the water "recharged" in this way (see March *AWR*, p. 4).

The farmers, represented by five irrigation districts in Maricopa, three in Pinal, and one in both counties, have contracts to receive 185,000 af of

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National Drinking Water Week begins May 3. Arizona is reviewing its drinking water rules this year, with one of the major issues being maximum contaminant levels for lead and copper. The rules were last revised in August 1991.

Yuma Desalting Plant May Create New Environmental Woes

The fate of one of the largest remaining wetland wildlife habitats in the Southwest is stirring controversy within the western water establishment and between the U.S. and Mexico. Scientists at the University of Arizona's Environmental Research Laboratory (ERL) and Mexico's Centro de Ecologia (UNAM) have warned Bureau of Reclamation officials that proposed operation of the new Yuma Desalting Plant could have a devastating effect on the lower Colorado River's largest remaining wetland. The International Boundary and Water Commission (IBWC) met with U.S. and Mexican officials in April to discuss a number of border water issues including the potential environmental effects of the desalting plant's operations on Cienega de Santa Clara, located about thirty miles south of the international border in the Colorado River delta.

Under a U.S.-Mexico agreement the IBWC, an agency of the U.S. State Department, has jurisdictional authority for resolving border pollution problems in a 100 km corridor along each side of the international border. The IBWC is also mandated to collect field data and observations to detect and identify sources of pollution in the waters of the boundary rivers. However, the scope of the

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/ore CAP usage, cont. from page 1

CAP water, for which they will pay $52 per af. The nine districts have contracted for the use of interim excess water for in-lieu recharge projects. These contracts require the CAWCD to buy Colorado River water from the Bureau of Reclamation at $38 per af. In turn, the districts will pay a share of that cost to CAWCD. Some districts are paying through power exchange agreements, which benefit the CAWCD because the hydropower the farmers will be exchanging is cheaper than steam-generated power which the CAP normally uses. Other districts are paying $13 per af to the CAWCD. This price, plus irrigation district conveyance charges and groundwater pump taxes (ADWR considers water used under this arrangement groundwater) makes the cost to the farmer about equal to the cost of pumped groundwater.

In exchange for CAWCD's $25 per af subsidy, the farmers will refrain from pumping an amount of groundwater equivalent to the amount of CAP water they receive. Through permits issued by ADWR, the CAWCD will receive the right to pump groundwater when a shortage of water exists on the Colorado River or when the CAP is closed for repairs. Thus, these in-lieu recharge projects both increase Arizona's use of its yearly entitlement of 2.8 million af of Colorado River water and enhance the CAWCD's ability to provide water when it is needed.

The CAWCD is taking a one-year-at-a-time approach to this program. The indirect recharge statute will expire in January 1995 unless the legislature extends it. Through June of this year, the CAWCD has allocated $3 million for this program. Next year it plans to spend $6-7 million. These costs are included in the blended water rates set annually for CAP contractors.

The benefits of this program to the CAWCD are: 1) insurance. In times of major Colorado River water shortage or system outages, recharge and recovery permits will keep the CAP viable; 2) flexibility. For example, permits in Pinal can be used to keep water in the canal for Tucson; and 3) security of Arizona's Colorado River allocation through fuller use. The CAWCD considers the program not a subsidy to farmers but rather an opportunity to exchange cash for assets — water in the ground. The CAWCD plans to continue to build its groundwater credit account until it determines that there is enough water banked to assure these benefits.

Desalting plant woes, cont from page 1

bi-lateral Agreement does not include other types of issues, such as natural resource management, which could become important. In January 1992, SEDUE, the Mexican counterpart of the EPA, made a request of the Mexican Section of the IBWC for a study of the effects of operating the Yuma desalting plant on Cienega de Santa Clara, which is the largest of the remaining vestiges of wildlife habitat in the Colorado River delta, where the Colorado River empties into the Sea of Cortez.

Prior to completion of Hoover Dam in 1935, most of the delta area was inundated by the river and richly vegetated except in drought years. Following the construction of upriver dams in the U.S. which trap silt as well as water, most of the delta is no longer replenished by floods; now, in most years scarcely any river water reaches the sea. Today, most of the great wetland habitat, an important part of the Pacific flyway for migratory birds, has turned into barren, saline mudflats. Satellite photos revealed that by the late 1960s Cienega de Santa Clara was suffering the same fate as the rest of the delta. The area had been significantly diminished from what early travelers described. The great gallery forests of willow and cottonwood disappeared from the delta and hundreds of species of plants and animals were lost. The Cucapá Indians, who have lived in the delta for centuries, could barely survive on the diminished resources.

The once rich estuary was described in a June 1991 *National Geographic* article as "filled with weeds, trash and occasional swamps of unhealthy water." One of the Cucapá Indians, who are the last in line for the waters of the Colorado River system, observed in the article, "We are the river people. We're still here. But what river? I haven't seen it. It doesn't get this far."

In 1960, Mexico filed an official complaint with the IBWC that waters in the Colorado were so salty from irrigation return flows in the U.S. that crops and farmland in Northern Mexico were being devastated. A decade of arguments produced no changes in the situation. The political winds suddenly shifted in the early 1970s when the oil crisis loomed and the U.S. was courting the support of oil-producing nations. President Nixon met with incoming Mexican President Echeverria and promised to find a "permanent, definitive and just" solution to the salinity problem on the Colorado River. The permanent solution found was a huge desalting plant, built at U.S. expense. Scheduled for completion in 1978, it was just completed, at a cost several times the original estimate.

A temporary solution was devised for the interim. Beginning in 1977, 118,000 acre-feet of brackish drainage water from the Wellton-Mohawk Irrigation District was diverted into a canal and discharged at the Santa Clara Slough. Over the intervening years, while the desalting plant was being constructed, this "temporary solution" resulted in a dramatic increase in the size of the wetland, located entirely in Mexico but supported by water originating in the U.S.

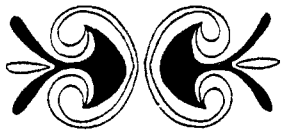
Concerns raised by bi-national scientists include reduction in the volume of flow from Wellton-Mohawk drainage diversions, which now provides the largest water source supporting the wetland; increasing levels of salinity as concentrated brine discharges

rom the desalting plant replace the brackish drainage waters; and potential long-term adverse effects on plant and animal life in the 50,000-acre ecosystem. Conservationists hope that a binational study team can suggest mitigation measures that will preserve the habitat for remaining species even when the desalting plant is fully operational. Bureau of Reclamation officials expect to bring the plant up to one-third (24 mgd) of operational capacity this year, and gradually increase to full capacity of about 80,000 acre feet per year during the 1990s.

According to Ed Glenn, a senior research scientist at ERL, who has been researching in the area for more than a decade, preserving the vegetation is critical to maintaining the waterfowl habitat in the wetland. In the 15 years since bypass drainage flows from the Wellton-Mohawk Irrigation District have been diverted into the wetland, extremely diverse bird populations and at least two endangered species (Yuma clapper rail and Desert pup-fish) have found sanctuary in the cienega. The biological diversity of the wetland is directly related to the emergent vegetation, dominated by cattails.

Glenn notes that if the brackish diversions are replaced with brine discharges from the desalting plant to any significant degree, the cattails eventually would die out or be succeeded by a more salt-tolerant emergent. Unfortunately, there is no obvious candidate to replace the existing cattails, and a die-out would lead to a major loss of vegetative cover and wildlife habitat. Increased salinity also could disrupt the reproduction of crayfish, a plentiful food source in the marsh. There have been no recorded studies of this wetland by either Mexican or U.S. government officials or by private organizations involved in wetland protection.

The UA's ERL and Mexico's UNAM are seeking cosponsors and support for a baseline study of the Colorado River's delta resources. In the watershed as a whole, it may be time to reexamine management choices and our decision-making models for water allocation and salinity control in the Southwest.



Communications

In April we printed two unsolicited letters to the editor and asked for feedback on issues discussed in AWR. *We braced ourselves for a flood of response to our riparian pieces. What we got instead was the following. Go figure.*

Love Your Newsletter!

I would like to congratulate you and your staff on the first edition of *AWR*. I believe you will find, as we have here in Colorado, that there is definitely a need for this type of publication. I am sure that your newsletter will, as you hope, "become a valuable resource within the Arizona water community."
Robert Ward, Director
Colo. Water Resources Research Inst.

I enjoy reading your publication very much and I've just called to be put on your mailing list . . .
Don L. Weesner
Gila Water Commissioner

We're not adverse to kudos, but we're not aspiring to be another Arizona Highways, *either. If something in this newsletter provokes a response, we want you to share it with us, and our readers. Write or fax us today!*

Arizona Water Resource Stories "Я" Us

Arizona Water Resource is now four months old. *AWR*'s purpose is to serve the Arizona water community by providing its members — from government agencies, universities, interest groups, other water organizations and private sector associations — a means to communicate and share news and information. In a sense, *AWR* is a water bulletin board for Arizona.

Response to *AWR* has been very favorable, with many individuals providing material for the newsletter and others expressing an interest in doing so in the future. Circulation has grown to over 2,500. Some organizations are supporting *AWR* through sponsorships (see p. 11). This response demonstrates that the newsletter does indeed provide a valued service and that it represents a cooperative effort within the water community.

In an attempt to provide more varied information, we have expanded our format to 12 pages. We again invite you to contribute material and information of interest to the Arizona water community. FAX ensures timeliness and accuracy (major considerations for a monthly publication) but phone messages and mail also are welcome. Black and white photos for the front cover or news stories are especially appreciated. FAX 602-792-8518; Phone 602-792-9591.

Arizona Water Resource is published monthly, except for January and August, by the University of Arizona's Water Resources Research Center. *AWR* accepts news, announcements and other information from all organizations concerned with water. All material must be received by the 14th of the month to be published in the following month's issue. Subscriptions are free upon request.

Arizona Water Resource Staff		***Arizona Water Resource***
Editor:	Joe Gelt	Water Resources Research Center
Reporter:	Todd Sargent	College of Agriculture
Calendar:	Jim Suriano	The University of Arizona
Publisher:	Gary Woodard	350 North Campbell Avenue
		Tucson, Arizona 85719
WRRC Director:	Hanna J. Cortner	602-792-9591; FAX 602-792-8518

News Briefs

Pilot Management Plans for Glen Canyon Dam

Until recently the Grand Canyon experienced daily floods greater than many basins experience once a year or even once a century. Fluctuations in dam releases resulting from daily and seasonal hydropower demands damaged beaches, archaeological sites, vegetation and recreational areas in the canyon, and affected the types of fish able to survive or breed in the river.

The Bureau of Reclamation has initiated a pilot program to moderate daily fluctuations. Studies by Duncan Patten of ASU and others suggest that some fluctuation is normal and beneficial. The new release regime, incorporating water level ranges indicated by these studies, will be evaluated on such effects as growth of native and exotic fish, sediment loading, rafting uses, and vegetation. Ultimately, the Bureau of Reclamation will modify its long-term release schedules.

Verde River Watershed Conference Convenes

The Cocopai Resource Conservation and Development Area, Inc., sponsored a conference on April 20-22 in Prescott, Arizona, bringing people in the basin together to discuss water use in the Verde River. Important local issues include the impact of the Gila River adjudication and Indian water rights claims on the basin, CAP allocations, and the protection of riparian habitat.

The first day of the conference featured panel discussions of federal, state and local speakers. On the second day, participants broke into eleven work groups to develop recommendations for water management in the Verde River basin. These groups reconvened on the third day to formulate consensus recommendations and assess unresolved differences. The groups agreed to recommend development of a permanent, locally organized and maintained water management entity, where the views of various interested parties can be heard and considered. Consensus was not reached on the appropriate geographic scope of the new group, or on issues of representation, such as whether members should be appointed or elected.

A "bridging committee" was appointed to implement the recommendations from the conference and to carry forward discussions. This committee will propose a structure and organization for the permanent water management entity, identify all affected parties, and establish a time frame for work. The first meeting of the group will be held this summer. For more information, contact Smith Covey, Cocopai Resource Conservation and Development Area Inc., 602-556-7504.

UA to Conserve Water, Utilize Effluent

The University of Arizona has converted to a computerized sprinkler system for turf irrigation on its main campus. The new system is expected to reduce water usage by some 65 percent over historical flood irrigation, and was designed to use reclaimed water when it becomes available from Tucson Water next year. Reclaimed water also will be used in the University's cooling towers.

Riparian Systems and the Challenges of Urban Needs

This topic was the focus of the Arizona Riparian Council's Annual Meeting in Cottonwood. Communities throughout Arizona face hard decisions about the value of their riparian areas as well as methods for protecting them.

Discussions ranged from Sierra Vista to Glen Canyon; from preserving urban greenways to pressures on the Grand Canyon from electricity use hundreds of miles distant. Communities must face issues such as these:

- Will continued population growth and its associated water demand threaten riparian areas that make some communities unique and appealing?
- Is adequate scientific information available to determine at what point additional groundwater pumping will deplete surface flows? If not, how should a community plan?
- Is community decision-making, as in the Verde River Corridor study, an effective way to protect rivers which include towns as well as rural areas?

In addition to policy discussions, technical papers were presented on riparian topics. For information on the Arizona Riparian Council, contact ASU, Center for Environmental Studies.

Legislation

Of the many water-related bills introduced this session, ADWR's omnibus bill is only one to date signed into law. The bill contained 19 technical items, including clarification of the accounting of co-mingled surface and groundwaters and an emergency clause allowing ADWR to continue spending funds on conservation assistance projects.

HB2452, which provides alternatives to municipal gpcd-based conservation targets and agricultural water duties, has been radically changed as the result of an agreement between ADWR and municipal and agricultural interests. Prospects for passage appear good.

No major water bill has died as of yet. The closest to being dead was HB2531, drafted by the Water Utilities Association of Arizona to change the way the Arizona Corporation Commission performs its private utility rate-setting functions (see March *AWR*, p. 4). After passing out of the Government Operations Committee, the bill was sent to the Rules Committee, where constitutional concerns led to it being sent back to Government Operations Committee, but too late to be heard.

Portions of HB2531 re-emerged as a strike-all amendment to SB1324 that would allow rate-making under bond and pass-through to utility customers of certain expenses. It also strengthens the ACC's rule on ex parte communications.

Special Projects

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

Black Mesa Coal Slurry Alternatives Studied

For years, Navajos and Hopis have expressed concern about possible long-term impacts of groundwater pumping from the Navajo aquifer underlying Black Mesa on spring flow and groundwater levels. Some 4,000 acre-feet of groundwater is pumped annually to transport 5 million tons of coal via a 275-mile long slurry pipeline that extends from Black Mesa to the Mohave Generating Station at Laughlin, Nevada.

The Secretary of the Interior, in response to the expressed concerns, has contracted for a study to evaluate alternatives for transporting the coal. These alternatives include other water supplies available in the region to replace all or part of the groundwater pumped from the Navajo aquifer. Montgomery & Associates of Tucson are the consultants for the hydrogeologic aspects of the study; economic and environmental constraints are being studied by Spectrum Economics of San Diego; and legal issues related to water availability are being investigated by Ryley, Carlock & Applewhite of Phoenix.

The three-phase study is scheduled for completion by June 1994. Phase I involves compiling available data to define the geologic and hydrologic environment and conducting a comprehensive literature review; Phase II will include data analysis and development of a short list of alternatives; and Phase III will entail evaluating and comparing several alternatives selected by the Secretary of Interior as most feasible.

The area being considered in the study includes all of northern Arizona as well as small parts of northwestern New Mexico, southwestern Colorado, and southeastern Utah. Among the alternative water supplies being researched are surface water sources throughout the region and groundwater sources from regional and local aquifer systems. Regional aquifers are extensive and include the Redwall-Muav, Coconino-DeChelly, Navajo-Kayenta-Wingate, and Dakota-Cow Springs aquifers; local aquifers are of limited areal extent and include the Bidahochi and Toreva-Wepo. Hydrogeologic information vital to the study includes data on the extent of the aquifers, site-specific hydraulic properties of the geologic units that make up the aquifers, potential well production rates, pumping lifts, and water quality characteristics. A final report for Phase I of the study will be completed by July 1992. For more information, or to discuss availability of hydrogeologic data for the study area, contact Tom Anderson, Project Coordinator for Montgomery & Associates, 602-881-4912.

Oak Creek NPS Pollution to be Studied

The EPA has funded a Best Management Practices implementation project to protect Oak Creek watershed's unique waters and designated uses by reducing impacts of nonpoint source pollution. BMPs will be implemented for several activities, including urban runoff, on-site wastewater management, silviculture, grazing and recreation.

Agencies involved in the project are also developing a proposal for long-term funding under the EPA's National Monitoring Program. The proposed program would evaluate impacts of BMPs on the watershed and on the quality of the perennial waters of Oak Creek Canyon, as well as provide information to land managers. Because water quality in Oak Creek is generally good, efforts will focus more on pollution prevention than remediation. Oak Creek is one of Arizona's prime perennial streams, but most of its tributaries are ephemeral or flow intermittently during spring runoff or storm events. The proposed monitoring program includes watershed conditions as well as quality of perennial waters.

All agencies, groups and private property owners in the watershed are invited to participate in a steering committee. For more information, contact Christine Nelson, Environmental Planner, Northern Arizona Council of Governments, 119 E. Aspen Ave., Flagstaff, AZ 86001; 602-774-1895.

Project WET Promotes Water Education

Project Water Education for Teachers-Arizona offers expertise and resources to people teaching youth, including public and private school teachers, 4-H leaders, Boy and Girl Scout leaders, and other group leaders. WET resources are for learners of all ages, although primary emphasis is given to providing teaching aids for K-12 teachers.

Project WET's goal is to encourage students' awareness and appreciation of Arizona's valuable water resources. Knowledge of these resources will be gained through the use of classroom-ready teaching aids. Students will also be encouraged to understand the needs of all state water users, (e.g., farmers and ranchers, recreationists, towns, fish and wildlife, and power industry). Students will be introduced to the concepts of wise water management to promote an appreciation of their necessity to ensure Arizona's future prosperity.

Project WET Arizona teaching aids are designed specifically for Arizona educators and address a wide variety of water-related concepts. Students will learn about Arizona's surface water and groundwater and become aware of contemporary water issues involving such matters as water conservation, water pollution, and water rights. The hands-on, self-contained, and user friendly WET teaching aids and activities are varied to accommodate the educational needs of many different learning styles.

Project staff will provide technical assistance and guidance to groups interested in planning and developing locally sponsored water education programs and projects. Interested people should contact: Larry Sullivan, Project WET Arizona, Water Resources Research Center, UA, 350 N. Campbell Ave., Tucson, AZ 85721; 602-792-9591.

Guest Views

Three views on CAP underutilization are presented. First, Dave Iwanski of the Agri-Business Council of Arizona gives a historical perspective:

Rejecting the view that the frontier was pushed back, historian Patricia Limerick suggests that the history of the west has been a series of rendezvous. Here people of different cultures and values blended the synergism of their cultures to form common benefits.

To understand the future of the Central Arizona Project, the rendezvous analogy is helpful. In the 1880s, Gila River Indian Community farms fed both the U.S. Cavalry and California-bound pioneers. In the late 1800s and early 1900s, the U.S. Government required homesteaders to develop groundwater as a condition of receiving patented land, which was to provide sustenance for families and growing communities. In the middle of this century, farmers championed the arduous Supreme Court and Congressional battles enabling Arizona to fully develop its Colorado River entitlement. In 1968, the Central Arizona Project finally was authorized. Only near the end of these battles did municipal and industrial interests rendezvous with agricultural entities to secure enabling legislation and subsequent appropriations for construction.

Agriculture was to be the biggest end-user of Colorado River water allocation during the early water delivery years. Over time, as Municipal and Industrial and Indian water demands increased, agriculture would use less. Decreased levels of Colorado River water availability due to upper basin development also were forecast. But today, the CAP is nearly 50 percent under-utilized. Allow me to examine the reasons why.

Increased M&I and Indian demand for CAP water has not materialized as expected. Some M&I subcontractors have not completed requisite treatment plants and distribution systems. Full usage of tribal allocations awaits final settlement of Indian Water Rights claims.

Let us focus more on agriculture, however, because of the presumption that now is the time when the largest use would be for irrigation. Agricultural sub-contractors, especially those in Pinal County, simply cannot afford CAP at the present time. What has made this water unaffordable?

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Another view is offered by Mike Brophy, a native Arizonan and water attorney with Ryley, Carlock & Applewhite:

Most Arizonans think the Central Arizona Project is a "done deal." They take it for granted. They look at the completed canal, see water in it, and assume that all is well.

All is not well. Events are unfolding which may — in the near future — result in the State transferring a portion of its CAP water to other states, risking the possibility we may never get it back.

The problem starts with agricultural economics. In order to take CAP water, central Arizona farmers contracted approximately $320 million in debt. This debt, coupled with high water prices from the CAP, likely will drive most CAP agricultural subcontractors into bankruptcy. The result would be the non-use of as much as 900,000 acre-feet of Arizona's annual entitlement over perhaps the next two decades.

If agriculture goes broke, municipal users will be impacted. Fixed operating costs that agriculture would have paid will have to be picked up by municipalities. Fixed costs will reach about $24 million per year by 1993, and will escalate. If municipal subcontractors must shoulder these operating costs, they are likely to curtail their use of CAP, at least in the early years of the Project. Thus, the U.S. will have constructed a huge project for Arizona, which will experience very little initial use.

The Central Arizona Water Conservation District (CAWCD), which is in charge of repaying the costs of the CAP, can meet its financial obligation to the U.S. under two scenarios. First, it can meet its obligations by selling significant amounts of water. Second, if it doesn't sell water, it can sell on a long-term basis the power needed to pump project water. But selling power deprives the CAWCD of the means to pump water for CAP. The result: significant amounts of Arizona's entitlement left in the Colorado River, and the CAWCD still burdened with repaying the costs of CAP.

Keeping CAP for Arizona will take money, and lots of it.

On the Colorado River itself, California is looking for additional supplies through the year 2010. Nevada is looking for 200,000 acre-feet in additional permanent supplies. Under current circumstances, these amounts of water can come only from Arizona.

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A proposal by Mark Myers, a small businessman and third generation Arizonan active in water and environmental issues:

Panic inevitably leads to poor public policy, and the present frenzied state of affairs surrounding the declining use of Arizona's CAP water carries with it the unmistakable scent of panic. We are told we must travel through the looking-glass into fiscal Wonderland to save ourselves. Three unpalatable alternatives are offered — directly pay some farmers and irrigation districts, indirectly pay those same farmers (through arcane mechanisms involving indirect recharge credits or purchase/leaseback arrangements), or risk losing a large share of Arizona's Colorado River water to California and Nevada.

With the loss of Mo Udall as head of the House Interior Committee and the impending bankruptcy of several large irrigation districts, the CAP situation clearly is far from ideal. We will have to commit more scarce public resources to solve the problem; however, I part company with the patrons of panic in the analysis of what can and should be done to solve the problem.

Several subjects essentially have been banished from public discourse regarding utilization of Colorado River water in Arizona. In this current CAP "crisis", the quality of the debate has suffered because of the unwillingness to broach these politically taboo subjects. Let's drag the skeletons out of the closet and encourage policy makers to give them the serious consideration they deserve.

First, agriculture — which already receives subsidies through price supports, cheap power, very limited CAP capital repayment obligations, favorable payback terms on CAP distribution systems, and property taxes that ignore the market value of agricultural land — should receive no further subsidy from Arizona taxpayers. Second, the settlement of Indian water rights claims should be at the top of everyone's agenda, both for reasons of simple justice and, for those to whom fairness has insufficient appeal, eminently practical considerations relating to the economic future of our state. Third (and listen to the howls that arise at this suggestion), we should seriously consider transferring some portion of Arizona's Colorado River allocation to California and/or Nevada, via sale or long-term lease.

Let's begin contemplating these heresies by examining some fundamental water resource facts in Arizona. Between the Salt River Project, natural recharge and the Central Arizona Project, approximately 2.5

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Dave Iwanski, cont. from page 6

Back in the late 1970s and early 1980s, when the Bureau of Reclamation was conducting its economic feasibility studies for CAP Irrigation Districts, commodity prices were much higher than today. The Bureau used a modest inflation rate for the commodity price estimates and assumed that over the early repayment period, revenues would keep pace with costs. The Bureau also assumed more acres would be planted in higher-valued citrus and vegetables than has been the case.

The reality today is that commodity prices have fallen drastically, and revenue projections upon which debt service was incurred are out of balance. This is largely due to flawed foreign policy. During the 1960s and 1970s, the U.S. helped developing countries acquire the ability to "feed and cloth themselves". These nations, particularly in the third world, now are our most worthy competitors. Mainland China, Egypt and the Sudan export cotton to Europe and the Pacific Rim, markets historically dominated by the U.S. Russia is "dumping" some of its cotton for less than the cost of production to earn badly needed hard currency. Fruits and vegetables from Mexico and Central and South America are exported throughout the world in direct competition to our own growers.

The solution rests with generating debt relief and lowering water costs.

A number of other key factors besides falling commodities prices impact CAP affordability. In 1986, changes to the tax code eliminated accelerated depreciation rates for land, equipment and other tangibles. Economic indicators took a downturn beginning in 1987, which gravely impacted the real estate markets. Agricultural land which rapidly appreciated in years prior, appreciation which would be borrowed against as "equity", began depreciating in value. Savings and Loan and related banking industry corruption resulted in more stringent lending requirements. This reduced financing available to agriculture. During the last two years, lousy weather and insect infestation, mainly the pink boll worm and the white fly, have led to below-average crop yields in some areas. All these factors have an incredible cumulative effect on CAP irrigation districts and their farmers to stay financially viable.

These same farmers who championed the creation of the CAP now are burdened with paying for a system they can ill afford, through no fault of their own. The pain already is being felt with personal bankruptcies destroying families financially and emotionally. If irrigation districts begin to default on debt service obligations, adverse impacts on county budgets and school and fire districts will result.

We need to thoroughly examine the kinds of partnerships that can benefit a wide range of water users. The solution rests with generating debt relief and lowering water costs so that agriculture can afford to maximize its CAP usage. In exchange for financial relief in the interim years, CAP irrigation districts are willing to make portions of their agricultural supplies available for future M&I use. In addition, agriculture can make land and infrastructure available for direct and in-lieu recharge activities. Agriculture can be a large-scale end-user of effluent that M&I providers may not be able to use or store in a cost-effective manner.

There are those who will claim that this type of relief is another in a series of "bail-outs" for agriculture. Nothing could be further from the truth. This is an attempt to get our CAP water out of the river, bring it into Central Arizona, stay off groundwater, and make a significant amount of water available to the cities in the future. Added benefits could be realized by setting aside water earmarked for settlement of Indian water rights claims.

Why should CAP agriculture be helped? The question only needs to be looked at through the historical window of Pima and Maricopa Counties, who themselves evolved from irrigation beginnings. Pinal County is the transportation link between the two metropolitan areas. With I-10 and the proposed regional jet port, the cities of Eloy, Casa Grande, Coolidge and Florence could become the future core of Central Arizona. Projections of future CAP water supply and distribution systems will be critical.

If we allow CAP water to remain in the Colorado River, external pressure from California and Nevada will mount to redirect our allocation to those two states. The growing political clout of California should cause concern about momentum being generated in congress to reexamine the apportionment of water. Ad valorem taxes already are being paid by citizens of the tri-county CAP Service Area for water that is being used by southern California households and businesses. It just may be worthwhile for Arizonans to participate in finding ways to keep our water closer to home.

Mark Myers, cont. from page 6

million acre-feet of renewable water per year will be available to central and southern Arizona. If used exclusively for municipal and industrial purposes, this water will support roughly five million households or twelve million people, and will generate an effluent flow of about 1.5 million acre-feet per year that can irrigate hundreds of thousands of acres of farmland, turf, and/or riparian habitat areas.

Other businesses must stand or fall on their ability to compete. . .

In western Arizona, where the vast majority of the balance of the Colorado allocation is used for agriculture, the existing population could be quadrupled through the transfer of only two to three hundred thousand acre-feet of water from agricultural to M & I uses. If you start adding all the numbers together, then factor in the compounding effect of effluent generation, it becomes clear that Arizona can support a population of more than 15 million and retain a substantial agricultural sector without having to make full use of the Colorado River allocation. A population that size scares the hell out of me but ought to warm the heart of even the most ardent growth champion.

The economic future of central and western Arizona clearly does not depend on retaining the entire 2.8 million acre-foot Colorado River allocation. Conversely, the potential benefits of selling perhaps 400,000 acre-feet of Colorado River allocations to California and Nevada are impressive:

- By transferring only its lowest priority allocation, Arizona (which otherwise is last in priority in the lower basin) can ensure that California and Nevada will bring their political clout to bear to protect their new junior position and, by extension, Arizona.
- By helping California and Nevada with their water problems, Arizona can both defuse some of the volatility of the allocation issue and set a precedent that might later be followed by some upper basin states. Further, the water will be moved from low value-added, subsidized agricultural uses to much higher value-added economic activities that improve the economies of our neighbors. In the long run, Arizona benefits from a strong regional economy.

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Transitions

Thomas Whitmer was hired as Assistant Director, Tucson Active Management Area Water Augmentation Authority, effective May 4. Mr. Whitmer has been employed as a market analyst for American Electric Power in Ohio; previously, he was a water resources planning analyst with SRP. 326-8999.

Donald Weesner was appointed Gila Water Commissioner in March, replacing George Grinner, who retired in January at age 83 after serving as Commissioner for 35 years. Mr. Weesner had retired from a 25-year career with SRP in 1986, where he was Assistant General Manager of Water. The Commissioner is appointed by the U.S. Federal District Court to oversee the Globe equity decree of 1935. 602-867-1074 (Phoenix) or 602-428-3220 (Safford)

Publications

National Water Summary 1988-89: Hydrological Events and Droughts

Published as USGS Water Supply paper #2375, this study includes summaries of major U.S. floods and droughts up to 1989. Also included are articles on scientific and societal aspects of floods and droughts. A chronological listing of 175 U.S. water-related events that occurred during 1988 and 1989 also is included. Available for $39 through USGS, Books and Open-File Reports, Federal Center, P.O. Box 25425, Denver, CO 80225.

Flood Hazards of Distributary-Flow Areas in Southwestern Arizona

H.W. Hjalmarson and S.P. Kemna. Published as USGS Water-Resources Investigations Report 91-4171, this study, done in cooperation with the Arizona Department of Water Resources, defines flood hazards for five types of distributary-flow areas using hydraulic and physiographic characteristics. Microfiche, $4, paper, $10.25. Available through USGS, Books and Open-File Reports, Federal Center, P.O. Box 25425, Denver, CO 80225.

Arizona's Other Lakes

Maps of 75 lesser known lakes and descriptions of recreation facilities, depths, surface areas, seasons, etc., $9.10 from Arizona State Parks Publications, 800 W. Washington, Suite 415, Phoenix, AZ 85007; 602-542-4174.

Arizona Rivers and Stream Guide

Maps and narratives of 74 river and stream segments and describes canoe, rafting and fishing opportunities, recreation facilities, access, seasons, etc., $6.90 from Arizona State Parks Publications, 800 W. Washington, Suite 415, Phoenix, AZ 85007; 602-542-4174.

A Preliminary Assessment of Corps of Engineers' Reservoirs, Their Purposes and Susceptibility to Drought and *National Study of Water Management: A Research Assessment*

The above are the second and third of a continuing series of reports from the National Study of Water Management During Drought. The primary goal of the study, which will continue through 1993, is to improve the way water is managed during drought in this country. The study is funded through the U.S. Army Corps of Engineers.

Information about the study can be obtained from Bill Werick, the Study Manager, at (703) 355-3055; copies of the reports are available from Arlene Nurthen at (703) 355-3042.

1991 State Governmental Affairs Summary

This publication is available for $10 (12.50 for non-members), plus $3 for handling and shipping from the National Groundwater Association Bookstore, P.O. Box 182039, Dept. 017, Columbus, Ohio 443218-2039; 614-761-1711.

This is a review of 1991 state laws enacted and state regulations adopted that impact the groundwater industry.

Mike Brophy, cont. from page 6

Should the State sell its water to California and Nevada? If it does so, is it likely to get the water back? Will Nevada and California simply take Arizona's water without paying for it? If Arizona does not sell its water to California and Nevada, how will it raise the money to fully use CAP? Who will pay for it? Who will benefit?

These are questions of great importance to the State. How they are answered will profoundly affect the future of Arizona. The answers involve not just agricultural interests and municipal interests, where the debate currently is confined, but all of Arizona's citizens. However, most citizens are unaware there is even a debate about CAP, much less that the State could lose a portion of its entitlement. They deserve to know that the State is facing two fundamental questions about CAP — shall we keep the water and pay what it takes to do so? Or shall we attempt to sell it, and risk never getting it back?

Keeping CAP for Arizona will take money, and lots of it. It may entail increasing the ad valorem taxing authority of the CAWCD. It may require other financial measures as well. It will involve a genuine debate about who should share the burden to keep from losing the water, who should get the water, how the benefits and burdens of CAP should be distributed, and over what period of time. This author thinks Arizona should have the debate and pay whatever is necessary to keep the water. The State should not give it up.

May 1992 Water-Related Events in Arizona

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Open House, Tucson AMA new offices	2
3 National Drinking Water Week Casa del Agua	4 Yav. Flood Control Seminar, UA Dept. of Hydrology	5 Tucson CWAC AZ Hydrological Society	6 Phoenix GUAC US - Mexico Relationship AZ Water & Pollu-	7 CAWCD AZ Rainforest tion Control Assoc.	8 Tucson Water Augmentation Authority Operators' Forum	9 6th Nat'l Outdoor
10 Casa del Agua Action Confer. on	11 Unsteady Flow Modeling Un- Aquifer Restoration,	12 steady Flow Model- GW Monitoring, &	13 ing Using DAM- Geophysical Methods	14 BRK and DOW- Commission on the	15 Tucson GUAC PER AZ Environment	16
17 Casa del Agua	18	19 AZ Outdoor Rec.	20 San Pedro Riparian Coordinating Com-	21 AZ Rainforest PAG Water Quality mission Workshop	22	23
24 Casa del Agua	25 Yav. Flood Control	26	27 Pinal GUAC	28	29	30
Society of 31 Wetlands Casa del Agua						

Calendar of Events

RECURRING

Arizona Hydrological Society. 2nd Tuesday of the month. Times vary. Water Resources Research Center, 350 N. Campbell, Tucson. Contact: Mike Block. 602-792-1093.

Arizona Rainforest Alliance. 1st & 3rd Thursdays of the month. UA Student Union Rm. 280, Tucson. Contact: Jeff/Julia 602-621-6401; 738 N. 5th Ave., Tucson 85705.

Arizona Water Commission. No meeting scheduled for May. Meetings held at ADWR, 15 South 15th Ave, Phoenix. Contact: MaryGrace Hoard, 602-542-1540.

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

Central Arizona Water Conservation District. First Thursday of the month, 12:30 p.m.. Central Arizona Project board room, 23636 N. 7th Street. 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.

EPA, Successful Tools in Environmental Negotiations. Various times & locations. Contact: The nearest EPA office.

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

Phoenix AMA, GUAC. May 6, 9:30 a.m., Phoenix AMA Offices, 15 South 15th Ave. Phoenix. Contact: Mark Frank 602-542-1512.

Pinal AMA, GUAC. May 27, 7:00 p.m., Pinal AMA Office, 901 E. Cottonwood Lane, Suite B, Casa Grande. Contact Tom Carr 602-836-4857.

Prescott AMA, GUAC. May meeting not scheduled. Prescott AMA offices, 1316 Iron Springs Road, Prescott.

Tucson AMA, GUAC. May 15, 9:00 a.m.. Tucson AMA offices, 400 West Congress, Suite 518, Tucson.

Tucson Augmentation Authority. 2nd Friday of the month, 7:30 a.m. Water Resources Research Center, 350 N. Campbell, Tucson. Contact: Shelley Stefanski 602-326-8999.

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

MAY

1 (Fri) **Tucson AMA Office Open House.** 2:00 - 4:00 p.m., 400 W. Congress, Suite 518, Tucson. Refreshments. Contact: TAMA, 628-6758.

4 (Mon) **Seminar by Shimin Li, topic TBA.** 4:00 p.m. UA Geology Building, Room 206, Tucson. Contact: Department of Hydrology and Water Resources, 602-621-5082.

6 (Wed) **Politics, Trade, and Water Policy: The U.S. - Mexico Relationship.** 7:30 - 9:00 p.m., UA Education Building, Kiva Auditorium, Tucson. Contact: The Udall Center, 602-621-7198.

6-8 (Wed-Fri) **Arizona Water & Pollution Control Association Operators' Forum.** Mesa Community & Conference Center. Contact: AWPCA, Brian Peck, 602-263-9500.

9-13 (Sat-Wed) **6th Nat'l Outdoor Action Conf. on Aquifer Restoration.** Las Vegas, NV. Fee. Contact: National Groundwater Association, 6375 Riverside Drive, Dublin, OH 43107.

11-15 (Mon-Fri) **Unsteady Flow Modeling Using DAMBRK and DWOPER.** ASU Engineering Center, Tempe. Fee. Contact: Center For Professional Development, College of Engineering and Applied Sciences, ASU, Tempe 857287-7506; 602-965-1740.

14-15 (Thu-Fri) **Commission on the Arizona Environment Conference / Workshop.** Discussion of 1993 environmental legislation, including property rights and water. Ramada Hotel, Phoenix. Contact: Commission on the Arizona Environment, 602-542-2102.

19-21 (Tue-Thu) **Arizona Outdoor Recreation Coordinating Commission Workshop.** Contact: Peggy Tabor, Arizona State Parks, 880 W. Washington, Suite 415, Phoenix 85007; 602-542-1996.

May 31-June 6 (Sun-Sat) **Annual Meeting of the Society of Wetlands Scientists.**, New Orleans,LA. Contact: Dr. Mary Landin, 1-800-LAB-6WES ext. 2942 for information.

UPCOMING

15-17 June (Mon-Wed) **Uncovering the Hidden Resource: Groundwater Law, Hydrology and Policy for the 1990s.** Boulder, CO. FEE. Contact: Natural Resources Law Center, University of Colorado School of Law, Campus Box 401, Boulder, CO 80309-0401.

1-3 September (Tue-Thu) **2nd Symposium on the Settlement of Indian Reserved Water Rights Claims.** Albuquerque, NM. Contact: Western States Water Council or Native American Rights Fund.

10-11 September (Thu-Fri) **Arizona Water 2000.** Conference / Workshop sponsored by The Commission on the Arizona Environment. Phoenix. Contact: The Commission on the Arizona Environment. 602-542-2102.

10-11 September (Thu-Fri) **1992 Arizona Hydrological Society Symposium.** Current Water Quality and Quantity Issues and Players. Sedona, AZ. Contact: Bruce Mack. 602-236-2579.

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

30 September - 2 October (Wed- Fri) **Aquifer Restoration: Pump-and-Treat and the Alternatives.** Las Vegas, NV.

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

The *Arizona Water Resource* is financed in part by sponsoring agencies, including:

Arizona Department of Water Resources

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Their contributions help make continued publication of this newsletter possible.

Mark Myers, cont. from page 7

• Perhaps most importantly, the economic benefits from a sale could be enormous. 400,000 acre-feet at $2,500 per acre-foot would generate $1 billion. If invested in a "water resources endowment" yielding 8 percent per annum, $80 million per year would be available with no draw-down of principal. We could spend $25 million per year paying off CAP distribution systems in return for farmers yielding their CAP allocations to Indian settlements, $25 million per year retiring 10,000 or so acres of Wellton/-Mohawk each year for 10 years to reduce Colorado River demand by 400,000 acre-feet (and, incidentally, turning a lot of farmers into millionaires), $10 million per year to provide effluent distribution lines to Indian land as part of an agreement to lease CAP water to municipalities, $10 million per year on major recharge projects throughout central Arizona, and $10 million per year for payments in lieu of taxes and economic development efforts for western Arizona to offset the reduction in the farm economy. After the CAP distribution systems are paid off and the farm retirement completed, the funds available for other water projects would increase by $50 million per year.

Is $2,500 per acre-foot for Colorado River allocations too high a price? Hard to say, but we sure won't know what is achievable unless negotiations begin. The cost (capital plus present value of excess O & M) per acre-foot of desalination capacity would be an interesting beginning point for negotiating price.

While such negotiations were ongoing, the Colorado River allocation should be protected by a large-scale transfer of CAP allocations from agriculture to Indian settlements, especially for the Gila River Indian Community. Our present "crisis" is in fact an amazing opportunity to solve a problem that, for both moral and legal reasons, must be addressed. And, in this case, doing the right thing has some immediate ancillary benefits. The Federal government will then have the obligation to pay a proportionate share of CAP capital and O & M costs, as well as to protect the Indian water from outside "raids" until it can be put to beneficial use. Underutilization of Colorado River water magically disappears, and the direct cost of CAP to Arizonans drops dramatically.

The only additional benefit that should be offered to irrigation districts, and that only in return for permanently relinquishing their CAP rights, is to assume the burden of paying off the CAP distribution system costs. The useless canals will serve as a monument to the folly of multiply subsidizing an uneconomic industry.

The future of much of the agricultural sector actually may be pretty bright under this scenario. SRP farmers likely will continue becoming enormously wealthy selling their land for urban development. Farms within reasonable distances of sewage treatment facilities will be able to substitute reclaimed effluent for much of their surface water and groundwater use. Other farmers will become wealthy selling their land in programs designed to retire groundwater pumping in order to reach safe yield, particularly in the Tucson and Phoenix Active Management Areas.

Another group of farms currently exists, however, only because their owners hope to receive some additional public subsidy on top of existing layers of subsidy. Absent such compounding subsidies, they will go out of business. To these people, I say, not another penny! Other businesses must stand or fall on their ability to compete effectively, and many fall each year. If existing subsidies cannot keep some farms viable, they must also be allowed to fall. As a state, we must use our scarce public resources more wisely, avoiding Mad Hatter "solutions" to the CAP utilization problem.

Announcements

Calls for Papers

An announcement and call for papers has been issued by the American Water Resources Association (AWRA) for a conference and symposium to be held in Tucson, Arizona, August 29 to September 2, 1993. The conference, "Innovations in Ground Water Management," and symposium, "Effluent Use Management," will highlight innovative approaches, new technologies, and improved strategies for ground water and effluent management. Papers are invited on a wide range of topics. Abstract must be submitted no later than October 23, 1992. For more information contact: Water Resources Research Center, 350 N. Campbell Ave., Tucson, AZ; 602-792-9591.

Papers are requested for the September 20-24, 1993 International Association for Water Pollution Research and Control Conference, "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact and Abatement," in Chicago. 500-word abstracts must be submitted by June 15, 1992 with authors specifying whether the abstract describes a platform or poster presentation. For information contact: IAWPRC Conference, Dr. Vladimir Novotny, Dept. of Civil and Environmental Engineering, Marquette University, 1515 W. Wisconsin Ave., Milwaukee, WI 53233.

Position Available, UC-Davis

Assistant/Associate Cooperative Extension Specialist in Hydrology/Hydrogeology at the Kearney Agricultural Center of the University of California in Parlier (near Fresno), CA. This is a 12-month, academic career-track position in the Department of Land, Air, and Water Resources - Hydrologic Sciences Section, at UC - Davis. Responsibilities include development and implementation of an applied multidisciplinary research program emphasizing mitigation and prevention of groundwater contamination, as well as educational and technical support to regulatory agencies and others. Good oral and written communication skills are necessary. Applicant should have a Ph.D. in geology, engineering, hydrology, hydrogeology, or a closely related field. Salary commensurate with experience. Application deadline is May 31, 1992. Direct applications and inquiries to Larry Schwankl, Search Committee Chair 916-752-1130.

Scholarships Offered for Water Studies

The Arizona Hydrological Society will award three $500 scholarships in 1992 to full-time junior, senior or graduate students studying hydrology, hydrogeology, or any water resource-related field at an Arizona university. Interested students must submit an application letter describing interests and career goals, official transcripts, and at least one letter of recommendation by June 30, 1992 to Aregai Trecle, Northern Arizona University, School of Forestry, P.O. Box 4098, Flagstaff, AZ 86001.

ARIZONA WATER RESOURCE

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