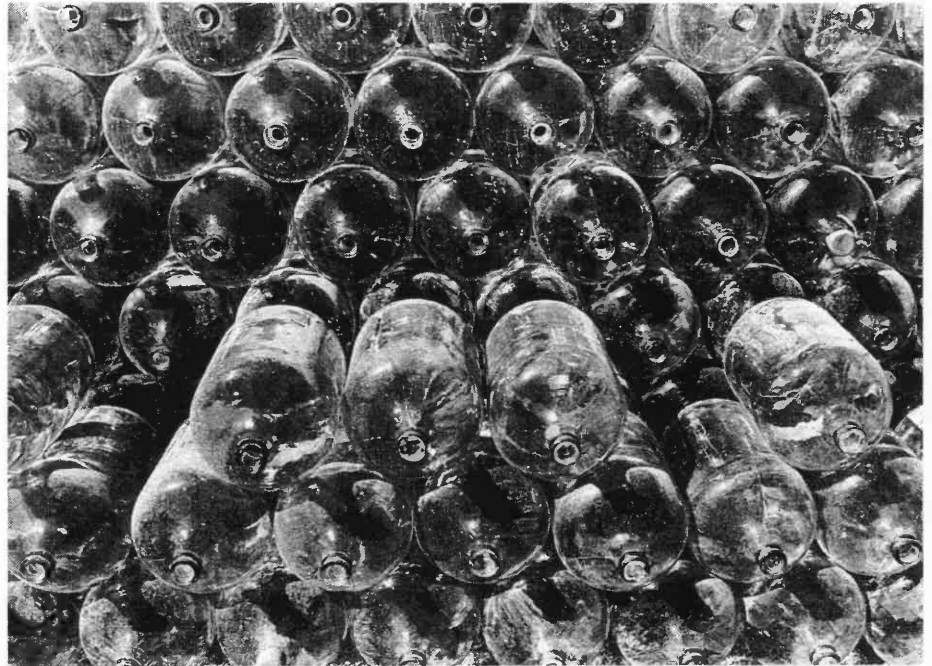


Federal Legislation Addresses Arizona Water Issues

Speculation abounded as to whether President Bush would sign the Omnibus Water Bill. He did so on October 30. Now Arizona and other western states are tallying their gains from this new piece of federal legislation.

One Arizona-specific provision limits Glen Canyon water flows to reduce erosion of Grand Canyon beaches. The law allows interim flows established in November 1991 to remain in place until an environmental impact statement is completed in December 1993. The act strengthens the role that the U.S. Park Service, Fish and Wildlife Service, and Native American groups will have in decision making, along with the Bureau of Reclamation and the Western Area Power Authority.

The new water bill also addresses CAP issues. The law sets the federal government's share of the cost of repairing six defective CAP siphons at 50 percent. This provision is an effort
continued on page 2



(Photo: Arizona Daily Star photo file)

99 Bottles of Water on the Wall Take One Down, Pass it Around...

A century ago, when Arizona had few roads and no cars and statehood was still twenty years away, potable water in the home generally meant bottled water. It often was carried from shallow wells in jars, jugs and canteens. Who would have envisioned that as the twentieth century comes to a close, growing numbers of desert dwellers again would be carrying bottled water to their homes? But as the \$3.6 billion Central Arizona Project (CAP) finally began delivering water to Tucson Water customers last month, sales of bottled water and in-home water treatment systems were booming.

Tucson Water treats CAP water at its new treatment plant with a process using ozone and chloramine, and has begun delivering CAP water to roughly a third of its customers, with all 550,000 scheduled to receive Colorado River water by early 1994. Although the water utility assures the public that the treated water complies with all EPA standards, it is generally acknowledged to have less pleasing taste and odor than the high-quality groundwater it replaces.

Those factors, plus the concerns of some customers about effects of chloramine on health, apparently have created a bonanza for bottled water companies. And purveyors of water filters, softeners and reverse osmosis systems report increased sales, with one home improvement store distributing fliers solely advertising their selection of water treatment devices. Some opportunists have exploited the fears of residents through sales of grossly over-priced water treatment systems or ineffective devices such as magnets wrapped around water pipes.



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to settle a dispute between the federal government and the Central Arizona Water Conservation District (see September *AWR*, p. 11; June *AWR*, p. 7). CAWCD filed suit arguing that the federal government as contractor of CAP is responsible for siphon repair/replacement expenses estimated to be about \$150 million.

As originally written, the legislation established that none of these costs is to be reimbursed by CAWCD and, in return, the district would drop its lawsuit. Congressional negotiations however set the federal government's share at 50 percent. The lawsuit is expected to continue.

A question now being discussed is whether CAWCD is responsible for the full 50 percent of the siphon repair costs that the bill designated as reimbursable. Of total CAP construction costs about 70 percent is interpreted as project costs and reimbursable. The argument is being made that therefore only 70 percent of the 50 percent of the repair costs, or 35 percent, should in fact be repaid.

CAP received further legislative attention when its Salt-Gila Aqueduct was renamed for Paul Fannin and Ernest McFarland. The renaming of CAP aqueducts began when the Granite Reef Aqueduct became the Hayden-Rhodes Aqueduct. The Tucson Aqueduct remains unnamed, not yet a monument to any members of the CAP Hall of Fame.

The bill also includes the San Carlos Apache water rights settlement. The tribe is to receive 152,435 acre-feet of water from various sources including a diversion from the Salt River, reallocated M&I CAP water, excess Ak Chin water, and M&I water reallocated from Phelps Dodge. Along with the water, the bill authorizes the tribe to lease water rights to Scottsdale and possibly other cities in the Phoenix area. Also the tribe is to receive \$36.3 million for water development, mainly from federal sources but with some state contributions as well.

The first Indian Hydrographic Survey Report which was to be done for the San Carlos Reservation is no longer

a priority because of the settlement. This is seen as a hopeful sign that Indian water rights will be able to be settled out of court. The San Carlos settlement is being lauded for continuing a precedent of resolving Indian claims through negotiations rather than litigation. It kindles hopes that the Prescott settlement and aspects of the Gila River settlements may be similarly negotiated and resolved, possibly next year.

The settlement resolves the major portion of the San Carlos water rights claim. Its claim is complicated by the fact that two watersheds are involved — the Salt and the Gila Watersheds. The settlement resolves claims on the Salt River, but aspects of the Gila River watershed claim remain to be settled.

Amendments to the Southern Arizona Water Resources Settlement Act (SWRSA) described as technical in nature also were authorized. More substantive amendments intended to finalize the water rights settlement of the Tohono O'odham Nation were not agreed to, primarily because of a dispute between the San Xavier District and the Nation (see this issue p. 4; September *AWR*, p. 10; June *AWR*, p. 1).

Also authorized was federal acquisition of Scottsdale's Planet Ranch on the Bill Williams River. Scottsdale originally purchased the 8,400-acre Planet Ranch for its 13,500 acre-feet of surface water rights. Meanwhile the city anticipated the possibility of negotiating with the San Carlos Tribe for CAP water. If this arrangement works out — and the San Carlos water claim settlement makes this more likely — Scottsdale would have less need for Planet Ranch water.

The Omnibus Water Bill authorizes the Secretary of the Interior to negotiate a land exchange with the City of Scottsdale for Planet Ranch. If successfully negotiated, the Planet Ranch land then would be managed by either the U.S. Fish and Wildlife Service or the Bureau of Land Management, and the Bill Williams River would be devoted to recreation and wildlife.

The new law also bodes changes for California. A portion of California's Central Valley Project water — 800,000 acre-feet of 12 million acre-feet — is to

be allocated for restoring fish and wildlife habitat. New water contracts will be limited to 25 years, and water users now must meet new requirements, including metering, conservation, and higher prices. Further, the \$25 surcharge resulting from transfers of irrigation uses to municipal use and higher hydropower charges will go into a \$50 million environmental restoration fund.

(U.S. Senator Larry Craig [R-ID], speaking at the University of Arizona on November 17, complained that the CVP reallocation provision was the result of environmental interests going to Congress to override state law. Craig said, "When those kind of things can happen you should be especially concerned," and warned that a dangerous precedent was being set.)

The bill also authorizes the transfer of the Central Utah Project (CUP) from the federal government to the State of Utah (see October *AWR*, p. 5). Some officials view this as a desirable strategy to free a state of federal restraints in managing water projects, allowing more flexible water management goals to meet local conditions and needs.

Some speculate that a similar transfer from federal to state control would be to the advantage of CAP, if local goals are different from new federal reclamation objectives. As it now stands, even when CAP is paid off, it still will be considered a federal project, subject to federal rules and regulations. State control of CAP however is not a likely priority to be pursued amidst the present underutilization crisis.

Quote of the Month

I don't want to spend my time counting buffalo...

Bruce Babbitt, overheard in mid-December, sounding coy about his chances of being appointed Secretary of Interior.



Communications

In October, we mailed out 248 surveys to *AWR* readers to determine how we could better serve Arizona's water community (see November *AWR*, p. 3). Just under half were returned. The survey indicates that each copy of the *AWR* is read by an average of 3.7 persons, or that our current circulation of 2,750 has a readership of just over 10,000. Our readers typically spend about 20 minutes perusing each issue. Over three-quarters of the respondents state that the *AWR* is a major source of their water information; two-thirds also rely on daily papers.

Readers come from diverse backgrounds, with 25 percent of respondents identifying themselves with the fields of education or research, 12 percent with local government, 12 percent with state government, and 11 percent with federal government. Another 10 percent are engineers or hydrologists, 9 percent are with water providers or irrigation districts, and the balance are spread among interested citizenry, libraries, environmental organizations, major water users and law firms.

The most-read section of the newsletter is the cover photo, followed by feature (front-page) stories, news briefs, and the legislation and legal section. Least-read sections are the calendar, communications and letters to the editor (*Hey! Anybody out there?*) and transitions. The calendar section is of little interest to out-of-state readers, which make up 20 percent of our readership; it is not rated as particularly important by most in-state readers either.

Sections rated most useful are legislation and legal stories, feature stories, and news briefs. Least useful sections are transitions and the calendar. The Guest Views and Publications sections are considered both most useful and least useful by about equal numbers of respondents.

Two-thirds of respondents thought

we should try a new column with short notes, items of interest and observations (see page 7 for a preview).

The relative unimportance of the calendar material is also apparent in responses to a question regarding the inevitable tradeoff between timeliness of publication, which maximizes the value of the calendar and announcement sections, and thoroughness of coverage of major water issues. Over half the respondents want us to maintain our current balance between timeliness and depth of coverage, and over a third urged us to take as long as necessary to guarantee thorough coverage. Only one in 12 urged us to publish sooner.

When asked what the optimal length of the *AWR* is, 57 percent said 12 pages, 24 percent said 8 pages, and 14 percent said 16 pages. After discussing the apparent preference for 12 pages and the relative lack of interest in the calendar section with our External Advisory Committee, we have tentatively decided to drop the calendar facsimile (page 13 of this issue) beginning with the next issue. The one page freed up should allow us to hold nearly all subsequent issues to 12 pages. If you find the calendar facsimile to be particularly useful, let us know.

Respondents were invited to suggest topics which they would like to see covered in *AWR*. Environmental issues, water quality and water treatment issues, groundwater hydrology, stories on the CAP, Indian water rights and detailed legislative analysis were mentioned most often.

When asked to state what they liked most about the *AWR*, over one-third said it kept them current or up to date on the entire spectrum of water issues. A large number lauded our willingness to air opposing sides of an issue or unpopular views. A number of respondents complimented *AWR*'s format.

Few respondents took us up on the opportunity to list what they liked least. A handful commented that some of our articles were too long or detailed. One respondent wanted more photos, another fewer. One was concerned that the survey represented a potential attempt to make the *AWR* all things to all people.

In addition to dropping the monthly calendar format for upcoming events and trying to limit future issues to 12 pages, we will be trying out an informal, chatty column of short, "soft" news items. Attempts will be made (again) to encourage letters to the editor; failing that, the Communications section may be scaled back or dropped. More photos, graphs and charts may be used. Overall, the feedback indicates we're on the right track. Future changes will be evolutionary in nature.

As always, your brickbats and kudos are welcome. And your views and opinions on water stories and issues are earnestly sought.

We are pleased to add the Arizona Department of Environmental Quality to our roll of sponsors. These sponsorships are essential to continued publication of the *AWR*. Our sincere thanks.



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.

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News Briefs

Prescott, Chino Valley Settle Dispute

The City of Prescott and the Town of Chino Valley have agreed to end a seven-year court battle over disputes stemming from a sales tax imposed on water transported from Chino Valley and disparities in rate structures between the two neighboring communities.

If the agreement is formally approved by the two councils, Chino Valley will not impose its sales tax on Prescott's transportation of water through the town limits and the current lawsuit will be dismissed. In exchange, Chino Valley will receive title to the land on which the Chino Valley Community Center sits and a reduction in water rates for its residents now served by the City of Prescott water system. (Chino Valley residents currently pay 30 percent more than Prescott residents for their water. The proposed agreement lowers the Chino Valley rate to equal the Prescott resident rate.)

The agreement ends months of negotiations between members of both councils and their staffs. The governmental neighbors together have spent nearly \$600,000 in legal bills alone on the fight. The leaders of both councils, Mayors Guy Parish and Daiton Rutkowski, hailed the proposed agreement as the beginning of a new era of cooperation between the two governments.

CAWCD Election Results Might Shift Board Balance

Maricopa County voters elected five members to the 15-member Board of the Central Arizona Water Conservation District in November (see October *AWR*, p. 5). Two incumbents, both former governors, were reelected to six-year terms; three other board members did not seek reelection. Vote totals for the five elected candidates are:

Virginia Korte	304,254
Sam Goddard	293,816
Jim Weeks	253,711
Grady Gammage, Jr.	240,333
Jack Williams	224,823

Vote totals for the other candidates are:

John Brady	189,415
Bill Wheeler	178,092
Marvin A. Andrews	156,886
Paul T. Gardner	148,153
Dan Sophy	104,375
Michael J. Kielsky	96,224

New board members appear closer to municipal interests, while some outgoing board members were strong supporters of agriculture. The Board has been characterized in the past as having an agricultural bias.

One other board seat is vacant due to a resignation in October. There has been speculation that the Governor might appoint one of the unsuccessful candidates to serve the remaining two years of that term.

A CAWCD nominating committee has come up with a slate of candidates for board officers for next year. Sam Goddard reportedly will be nominated for chairman, Ron Rayner for vice-chair, and Marybeth Carlile for secretary. George Barr, George Renner and Jack Williams also will be nominated to serve on the executive committee.

Phoenix, Scottsdale Bill for Environmental Charges

Phoenix Water customers are seeing a new line item for "environmental mandates" on their water and wastewater bills. The new charges approved by the Phoenix City Council add fees of 4¢ per Ccf of water billed and 16.5¢ per Ccf of wastewater to generate \$6 million of annual revenue for wastewater treatment and \$2 million for water treatment to meet increasingly stringent federal environmental and drinking water quality standards.

The City of Scottsdale also has altered its bills to separate out "environmental" fees from existing water, sewer and sanitation charges. The new bill

represents a clarification of existing charges, not additional fees.

San Xavier District May Secede over Water Dispute

The San Xavier District of the Tohono O'odham Nation may schedule a special election for early 1993 to ask its members whether they want to petition the federal government for recognition as a separate nation. The major impetus for secession is a long-running dispute over distribution of water and other benefits from the SAWRSA settlement of water rights between the District and the balance of the Nation (see June *AWR*, pp. 1 & 5).

Created as a separate reservation in 1874, San Xavier was incorporated into the main Papago (now Tohono) reservation in 1936. The process of petitioning for separate status could take up to a decade with no certainty of ultimate success, particularly if it were opposed by the Nation.

The intra-tribal dispute has frustrated attempts to finally resolve a water rights lawsuit filed in 1975, and has complicated attempts by the City of Tucson to lease CAP water rights from the Nation on an interim basis.

Agreement on Terminal Storage Not so Near

The tentative agreement reached between Tucson Water, the Bureau of Reclamation and the CAWCD has run into opposition on several fronts (see November *AWR*, p. 5). Representatives of the Tohono O'odham Nation, who are to receive 66,000 acre-feet of CAP water under the SAWRSA settlement (see June *AWR*, pp. 1 & 5), are concerned that the reservoir does not include any emergency storage capacity for them.

Mines in the Tucson AMA, which still have not decided on whether or not to sign CAP contracts, also object to the lack of capacity for other than Tucson Water's needs. In addition, the agreement assumes that a recharge facility will be constructed on land owned by ASARCO. The mining company has

been unwilling to sell the land to Tucson in part because of its appurtenant Type 1 groundwater rights.

George Barr, CAWCD board member and long-time critic of Tucson water, also took a swipe at the Agreement in a 14 November memo to Southern Arizona Water Resources Association's (SAWARA) Terminal Storage Committee. "For more than 15 years, Tucson has plotted to get the Federal Government to construct a recreational lake in the Tucson area by attempting to show that such a lake was a necessary reliability feature of the CAP..." The statement appears at odds with Tucson Water's efforts to lower the cost of terminal storage by removing recreational features such as a public beach.

The memo accuses Tucson Water of behaving in an "unprofessional manner" by implying that the proposal had been approved by both the Bureau of Reclamation and the CAWCD and lambastes the city for the decision years ago "to insist on delivery of its CAP water in Avra Valley — on the other side of a 400-foot high mountain barrier," thereby necessitating a \$25 million tunnel through the Tucson Mountains and "creating the largest potential cause of service interruption" to Tucson. At its November meeting, SAWARA's Board called for regional consensus building on the issue of terminal storage.

CAWCD Approves Repayment Delay, HVID Bailout

In an unusual split vote, the CAWCD Board approved on 3 December by a 9 to 5 margin an arrangement with the Bureau of Reclamation whereby the Bureau will postpone for one year the declaration that the CAP is substantially complete. In return for the delay which postpones CAWCD's obligation to pay \$52 million per year in principal, the CAWCD will pay \$20.5 million in 1993 and prepay \$28.8 million in principal to finance federal purchase of Harquahala Valley Irrigation District (HVID) CAP water. The nearly 14,000 acre-feet of water freed up will be used to settle water claims quantified in the Fort McDowell Indian Water Settlement Act

of 1990, which has a December 1993 court-imposed completion deadline.

Opposition to the agreement was based in part on the haste with which it was reached and disagreement over whether the Bureau legally could declare substantial completion until the CAP's siphons are rebuilt. Most of the controversy, however, surrounded terms of the HVID bailout. Described as "improper" by CAWCD Board member Frank Brooks and as a "dangerous precedent" by vice-chairman George Barr, the bailout helped HVID avoid bankruptcy.

Several factors used in valuing HVID's CAP water were questioned, including the figure of \$1,050 per acre-foot for water re-classified from non-Indian ag. water to M&I water. Also questioned was the basic assumption that HVID, given its default position, had water "rights" or anything else to sell. Water attorney Steve Weatherpoon questioned whether the deal was consistent with the Fort McDowell settlement and likened it to someone defaulting on their home mortgage, only to have the banker forgive the mortgage debt and then offer to buy the house.

Roger Manning, director of the Arizona Municipal Water Users Association, observed that the deal "sets Arizona up for a fight" with House Interior Committee Chairman George Miller. Miller already had voiced his displeasure with the proposed agreement in a letter that questioned the Bureau's authority to delay the declaration that CAP is substantially complete and criticized the HVID deal. "The Fort McDowell legislation contemplates that the CAWCD shall receive repayment credit, not that the HVID should receive cash... Reduced to its essence, it seems nothing more than an unauthorized \$29 million gift from the federal taxpayers to the HVID." Acknowledging that restructuring the CAP may be necessary, Miller stated his willingness to "assist in fashioning such a restructuring," while noting a lack of discussion of alternative uses of unused CAP water "for environmental restoration, for settlement of remaining Indian water claims, and for temporary use in Nevada and/or California."

Rebuttals to Miller's letter have come mainly in the form of letters from Senator DeConcini, Secretary of Interior Lujan and others. The issues are expected to be raised again this spring in congressional oversight hearings.

"White Paper" Debated, CAP Price Hikes Predicted

The white paper jointly drafted by CAWCD and the Bureau of Reclamation for dealing with underutilization of CAP water by having non-Indian ag. subcontractors relinquish their rights to CAP water in exchange for debt relief that would allow them to continue irrigating with CAP water purchased on a "spot market" apparently has been rejected by most of the state's water interests. The product of a closed-door process, the basic concept has been criticized by municipalities as an unacceptable ag. bailout, by environmental groups as ignoring other potential uses for the water, by Indians as impeding settlement of their water claims, and even by some irrigation districts who would have less debt forgiven than others (see *Guest Views*, pp. 8 & 9).

First presented on October 9, the white paper concept was discussed at two dozen meetings around the state. A status report was released on December 8, at which time CAWCD director Tom Clark stated, "We know this won't work." The status report noted that "efforts to evaluate the potential of the debt assumption concept have led to a basic finding that there is little acceptance of the concept as the basis of a long-term adjustment in the repayment structure of CAP... Unless major changes evolve in the positions taken by both the agricultural and M&I users, CAWCD and the Bureau of Reclamation will abandon the initial concept and search for an acceptable repayment alternative."

The report concludes that "it is apparent that rate schedules for M&I capital repayment must be significantly increased..." The increase has been estimated from 60 to 300 percent, depending on terms of restructuring and CAWCD's ability to sell surplus power.



Legislation & Law

ADWR Pursues Modest Legislative Agenda

Arizona Department of Water Resources officials do not plan to seek any substantive legislation in the up-coming session, electing instead to put its energies and resources into promoting draft Assured Water Supply rules and participating in the search for solutions to the CAP underutilization conundrum. The sole piece of legislation introduced on its behalf will be an Omnibus Bill containing non-controversial technical changes and corrections to earlier legislation.

ADWR identified 14 amendments to nine statutes which it considers to be non-controversial and technical in nature. In addition, other water interests have proposed three additional amendments. The Santa Cruz Valley Water District wants underground storage and recovery credits to be assignable in the same way that indirect storage and recovery credits are. It also wants its initial board to be able to place a proposed property tax levy on the ballot in which the permanent board first is elected. The City of Chandler proposes extending the deadline by which municipal providers can use stored water credits to offset groundwater withdraw-

als in excess of conservation targets from 1995 to 2000 so as to increase the incentive to beneficially use CAP water. Omnibus ad hoc groups met to discuss each of the 17 proposed amendments.

Symington Names CAP Advisory Committee

Governor Symington appointed on 17 December a 28-member Central Arizona Project Advisory Committee charged with developing recommendations to assure the CAP's long-term viability. The committee, which will first meet in January 1993, will look at options for increasing Arizona's utilization of its Colorado River allotment to fulfill the goals of the Groundwater Management Act and to prevent any of the allotment from being lost to other states. Proposals likely will include reallocation of both water and costs.

Governor Symington will chair the committee, with Mark de Michele of Arizona Public Service serving as co-chair. Staffing will be provided by ADWR and CAWCD. Committee members and affiliations are listed in the box below.

Creation of the committee evokes a sense of déjà vu. Just one year ago, the governor appointed a committee with a similar charge. The first committee, which completed its work in July without making any major recommendations, did not have the benefit of reports by agricultural economist Paul Wilson and CAWCD (the "White Paper").

AZ Reps Get Water-related Appointments

Arizona's three newly-elected Democratic representatives to congress have secured assignments on House committees with authority over federal water policy. Representative Ed Pastor was appointed to the House Appropriations Committee and its energy and water development subcommittee, which oversees spending on federal water projects such as the CAP.

Representative-elect Karan English was appointed to the House Interior Committee, with oversight on water projects and Indian affairs. Representative-elect Sam Coppersmith was named to the Public Works and Transportation Committee, whose agenda includes funding for public works projects along the Mexican border necessitated by the North American Free Trade Act, such as expansion of the international wastewater treatment plant outside Nogales.

Babbitt Appointment Raises AZ Water Hopes

Conventional wisdom has it that Bruce Babbitt's appointment to Secretary of Interior is good news for environmental interests, Indians, utilities and Arizona water interests and a setback for out-of-state water interests and George Miller's agenda for reclamation reform. Miller and Babbitt share many views on the need for reform, however, and both are result-oriented pragmatists.

Governor's CAP Advisory Committee

George Britton, Deputy City Manager, Phoenix
 Frank Brooks, CAWCD Board, Pima County
 Jim Bruener, Supervisor, Maricopa County
 Herb Drinkwater, Mayor, Scottsdale
 Katie Dusenberry, Horizon Moving Systems, Tucson
 Jim Feltham, Rauscher, Pierce, Refsnes
 Don Gaffney, Snell & Willmer
 Paul Gardner, Vice President, Water Utilities Assoc. of Arizona
 John Greene, President, Arizona State Senate
 Art Hamilton, Minority Leader, Arizona House of Representatives
 Jim Henness, President, Agri-Business Council
 Jimmie Kerr, Mayor, Casa Grande and Supervisor-elect, Pinal County
 Mark Killian, Speaker, Arizona House of Representatives
 Francis McAlister, Executive Vice President, ASARCO

Ivan Makil, President, Salt River-Pima-Maricopa Indian Comm.
 Mark de Michele, President and CEO, APS (committee co-chair)
 George Miller, Mayor, Tucson
 Lew Murphy, former Mayor, Tucson
 C.M. Perkins, General Manager, Salt River Project
 Jack Pfister, ASU and former General Manager, SRP
 Karl Polen, Vice President of Finance, Robson Communities
 Ron Rayner, CAWCD Board, Maricopa County
 George Renner, CAWCD Board, Maricopa County
 Cindy Resnick, Minority Leader, Arizona State Senate
 Priscilla Robinson, Consultant and environmental activist
 Russ Schlittenhart, President, Cotton City Enterprises
 Governor Fife Symington (committee chair)
 Richard Walden, Farmers Investment Company



1992 Wrap-up

Time to clean out the file of fragmentary stories and not-quite-news items.

The story of the year is CAP underutilization. The runner-up was CAWCD's financial woes. Prospects for these to repeat as 1993 headline grabbers appear depressingly good.

Even before President-elect Clinton named Bruce Babbitt Secretary of Interior, there was speculation as to whether Betsy Rieke might be offered a policy-making position in Interior and whether she would leave ADWR to accept it. Other names being mentioned as possible Interior appointments include John Leshy, ASU water law professor, who currently is on leave working for Congressman George Miller of California. Leshy also has been heading Clinton's Interior Department transition team. Dale Pontius, former Babbitt chief of staff and water lawyer already is working in D.C. as Vice-president of American Rivers.

Sharon Megdal, Executive Director of the Santa Cruz Valley Water District, was one of two Arizonans invited to President-elect Clinton's economic summit in Little Rock.

At least one major Arizona bank reportedly has concluded that farms in central Arizona cannot make profits with water costs above \$35 per acre-foot, and based on this conclusion, is refusing to make loans to farmers in CAP agricultural districts. The farmers are turning to gins for loans, but their sources of funds may be drying up, too.

William Martin, the retired UA professor of agricultural economics who was seriously abused after he and co-author Robert Young wrote an article in 1967 predicting that Arizona farmers would be unable to afford CAP water, was given the opportunity to say "I told you so" in the November/December issue of *Arizona Farmer-Stockman*. Instead, Martin quoted from his earlier study that "you do not benefit a farmer by increasing a farmer's per unit costs of production." Martin concludes "It is not much help to say 'we told you so.'

Arizona's problem is what to do now. The hardest thing for Arizona's civic and governmental leaders to do will be to admit that building the CAP was unwise. Their decision now should be how to cut Arizona's losses — not how to throw good money after bad in an effort to use CAP water at any cost."

In another blast from the past, Roy Emrick, CAWCD board member from 1976 through 1984, submitted a letter to the editor of the *Arizona Daily Star* wherein he concludes that there is plenty of blame to share for CAP price increases. He concludes that "the price increase for CAP is just another one of the many costs of growth: traffic congestion, air pollution, water contamination and big-city class crime."

The proposal to settle the Navajo-Hopi land dispute through transferring large tracts of land to the Hopis involves land containing Flagstaff's principal water supply reservoir.

The City of Phoenix reportedly is

considering intervening in the Phoenix Agro Invest lawsuit challenging the 1991 Groundwater Transportation Act (see October *AWR*, p.5).

Several Pima County water interests, including the Towns of Oro Valley and Marana, the Cortaro-Marana and Flowing Wells Irrigation Districts, the Metropolitan Domestic Water Improvement District and Cañada Hills Water Company have agreed informally to form an interest group dubbed the Northwest Water Alliance. Each will approach its board of directors for permission to develop a Memorandum of Understanding. The stated objective is to insure rational water supply planning on the northwest side of Tucson.

CAP underuse may become a hot political issue in Arizona in 1994. Meanwhile, the HVID bailout story has taken on a life of its own. Reporters for Associated Press and a major east coast paper are working on articles for out-of-state consumption.



Lawrence Sullivan, Project WET (Water Education for Teachers) director, demonstrates a groundwater flow model to Tucson teachers. The three-dimensional sand tank models represent a vertical cross section of an aquifer. When charged with water, they become mini-aquifers complete with wells that pump water, a lake, a leaky lagoon and an artesian well. Project WET is part of the Water Resources Research Center's outreach program. (Photo: B. Tellman)



Guest Views

Three views on the current debate over how Arizona should deal with CAP water underutilization and finance issues are presented. The first is by Hugh Holub, an attorney specializing in water issues. The following material is from a speech he presented at the October 30 symposium of the Arizona Section of the American Water Resources Association.

The Central Arizona Project (CAP) was styled as an agricultural project principally because the federal government has not been in the business of financing huge aqueduct systems to divert and transport water hundreds of miles to western cities. The inclusion of agriculture in the CAP made it eligible as a reclamation project, with a much lower interest rate on repayment, than otherwise would have been the case.

What Arizona's agriculture is left with, however, is a project which is costing agriculture a lot more than it can afford, and threatening the bankruptcy of several central Arizona irrigation districts if things do not change.

Back when the CAP was being considered by Congress, the subsidization of agricultural water by municipal interests was discussed and analyzed. The rationale for M&I water interests paying more so that central Arizona farms got access to CAP water was: a) there would have been no CAP water availability to M&I interests but for the agricultural qualification for federal reclamation participation; and b) the groundwater agriculture saved by using CAP water would be available for municipal interests in times of shortage.

agricultural utilization of CAP water was essentially a holding pattern...

A third justification that goes back to the origins of the CAP is that if there was no way to divert and use Arizona's share of the Colorado River, California would continue to take Arizona's share

and we'd never see that water.

Thus the agricultural utilization of CAP water was essentially a holding pattern to get Arizona's entitlement to the Colorado River into the state, use it in the short run on farms, and preserve the water for municipal growth.

The essential problem with the CAP is that it makes a lot of sense in the long run, as projected urban growth outstrips any local water supply availability. But until that happens, and CAP water is actually needed, it is not surprising that municipal interests would seek ways to avoid higher CAP utilization and costs when they have less costly near-term alternatives.

Urban interests in Arizona have a tendency to look at farmers as competitors for water, and seek ways to take agricultural water away from farms without compensating farmers for having developed these water rights in the first place. There is absolutely no sense of history in this state as to who pioneered the place, and made urban development possible.

The main issue is whether Arizona's municipal interests will look beyond the short term subsidy issue to agriculture and look at their longer term interest in having access to 1.2 million acre feet of Colorado River water available on a long-term average basis.

We are at a crossroads with CAP where the agricultural interests which secured the CAP for us are threatened with elimination because their "rescue" is turning into their destruction. If the CAP ultimately will be a municipal and industrial water supply project, our cities will have to consider whether it ever was feasible for them to have built a \$3 billion project of aqueducts and flood control systems at local expense.

Dale Turner represented the Sierra Club at the fall symposium of the Arizona Section of the American Water Resources Association. The following is from his speech at the symposium.

I wish to make a simple suggestion about how to deal with CAP water: dump it in a swamp. I have in mind the largest wetland in the Sonoran Desert — the Cienega de Santa Clara in the delta of the Colorado River, in Mexico.

It was a huge marsh in 1875, when U.S. Navy Commander George Dewey mapped the shores of the Gulf of California. It was supplied in part by the very shallow water table of the delta, but got its primary supply from the regular floodwater of the Colorado.

a suggestion: dump CAP water in a swamp

Mexican officials had complained since the 1930s about the steadily shrinking amount of water in the Colorado River, and the sudden rise in salinity made it a serious international issue.

The U.S. Bureau of Reclamation sought a way to reduce salinity and increase flows in the river without reducing the allocations of any U.S. state. The centerpiece of the "definitive solution" was a giant desalination plant, drawing water from the Wellton-Mohawk saline drainage water and dumping leftover brine into a canal that would carry it 50 miles south to the Gulf of California.

The canal to the Gulf was completed and has carried the whole volume of Wellton-Mohawk drainage water since 1978. But the canal never reached the Gulf. Instead, it delivered about 140,000 acre-feet of water each year to the Cienega de Santa Clara.

Over the past 14 years, that small remnant marsh has been restored to its former glory and now covers approximately 50,000 acres. That makes it by far the largest wetland in the Sonoran Desert. The drainage water is too saline for most common agricultural crops but cattails and reeds have done fine and cover the area in dense stands. Bird life is thriving, as are the protecting swarms of mosquitos. The marsh now provides a home for one-quarter to one-half the total population of the endangered Yuma Clapper Rail, and hosts the largest single population of the endangered Desert Pupfish.

According to recent Bureau figures, when the Yuma Desalting Plant starts operating at full capacity it will remove three-quarters of the water flowing down the canal, thereby drying up much of the wetland. The water that does reach the marsh will have three times the current salinity, making it too salty for most of the vegetation and for many

of the other species present. This could be catastrophic for the wetland's current inhabitants.

The Bureau started up their plant this spring at one-third capacity and will likely keep it at that level for the next year because they can't get the funds to run it at full speed. It is unclear whether the habitat will be damaged by the effects of one-third capacity operation.

A very real option for CAP water is to leave it in the Colorado and let it flow all the way across the border. CAWCD is in a position to bargain with the Bureau, offering them a price that's good for both parties. This would be negotiations with a very familiar dance partner, and the water would not get into the spongy hands of California or Nevada. There would be no pumping costs for that water, and there could be a very real financial return.

A Response to the CAWCD's "White Paper" is offered by Roger Manning, Director of the Arizona Municipal Water Users Association.

On October 9, 1992, the Central Arizona Water Conservation District (CAWCD) and the Bureau of Reclamation released their "White Paper" proposal for the financial rescue of the Central Arizona Project (CAP) irrigation districts, primarily located in Pinal County, and the financial restructuring of the CAP itself. Unfortunately for the State of Arizona and the CAP, the process by which the White Paper was developed, the process by which it is being refined and its *single* proposal are all seriously flawed. As a result, it is unlikely that the White Paper can, realistically, form the basis of any consensus on solving the problems which confront Arizona and the CAP.

The White Paper was developed in a closed process between the CAWCD staff and the Bureau of Reclamation from which all CAP water users were excluded. In fact, the Arizona Department of Water Resources initially was excluded; only after breaking the door down was DWR grudgingly granted observer status with the understanding that the content of any of the discussions would not be divulged to any CAP water users. These same CAP water

users now are being visited by the CAWCD staff and the Bureau in order "to get their input" into the single proposal that the White Paper offers. Despite the fact that the almost universal reaction to the White Paper proposal has been negative at best, there appears to be some expectation on the part of the CAWCD staff and the Bureau that CAP water users, even though they have had no direct role in developing the proposal and currently have no way to evaluate its impacts, will in fact embrace some version of the single proposal contained in the White Paper.

The White Paper proposal is predicated on a number of critical, untested assumptions. The first assumption is that the CAWCD, through its tax payers, must assume the responsibility for the CAP irrigation districts' \$300 million distribution system debt in order to insure the long-term financial viability of the CAP itself. In other words, financially rescuing CAP irrigation districts is tantamount to financially rescuing the CAP. The White Paper, however, is devoid of any analysis or demonstration of the validity of this assumption or that the financial rescue of the districts does any thing more than guarantee the districts' creditors' investments. Further, there is no demonstration that this proposal will cause or lead to any increase in the use of CAP water by the districts or anyone else for that matter. To the contrary, a strong argument can be made that since this proposal presumes that CAP M&I water users also will become largely responsible for the CAP's fixed O&M costs, implementation of the proposal will, in fact, provide a disincentive to CAP water use in the M&I sector. How this outcome would result in the financial viability of the CAP totally escapes me.

A second critical assumption, and one which is clearly false, is that the CAWCD's tax payers and the municipal water rate payers are or will be willing to assume significant increases in property taxes or water rates when the CAP irrigation districts appear to be the primary beneficiaries. This assumption conveniently ignores the fact that within the urban areas, businesses, individuals and local governments are facing many of the same problems faced by CAP agriculture. A large number of urban residents currently believe that their

jobs and incomes may be eliminated at any time placing them at financial risk. Many businesses are facing situations where cost, including debt, exceed revenues. Most local governments are facing significant reductions in tax revenues leading to reductions in services and a review of their continued ability to service bonded debt without further drastic cuts in programs and services. For a person in this situation, any increase in costs could mean financial hardship at best and in many cases could lead to financial failure. To presume that people in these circumstances are prepared to increase their costs for the benefit of CAP irrigation districts is absurd.

The real political and economic challenge facing Arizona and the CAP is to openly recognize and accept the reality that CAP agriculture is unable to live up to its commitment to take CAP water and pay its associated costs, and is on the verge of defaulting on its financial obligations to the CAWCD, to the United States and to its private bond holders. If the districts ultimately avoid their cost obligations, they must recognize they have also given up their contractual rights to any CAP water and its associated value, financial or otherwise.

The White Paper is an ill-conceived approach to very real problems...

Having accepted this reality, those who maintain their commitment to the CAP and to fulfilling their financial obligations must restructure the project in such a way as to: 1) insure the short-term and the long-term financial viability of the CAP; 2) allocate the water resources of the CAP to the urban users who, through their taxes and water rates, will insure the CAP's viability; and 3) insure the least possible cost impacts on the tax payers and the water rate payers.

The White Paper, both as to process and as to its proposal, is an ill-conceived approach to very real problems of the CAP. The sooner we put the White Paper behind us and get on with solving the problems, the CAP and the State of Arizona as a whole will be better off.



Special Projects

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

Whither Goes CAP?

University of Arizona's agricultural economist Paul Wilson studied the current and possible future economic status of the non-Indian agricultural component of CAP. His analysis states that the CAP district feasibility studies — the basis for federal loan approval and the issuing of private securities by the districts — were flawed in three fundamental areas. Acreage farmed was overestimated; the crop mix was misinterpreted; and the attraction of groundwater as a CAP alternate was underestimated.

CAP feasibility studies projected that non-Indian agricultural water users would consume 60 to 80 percent of CAP water during the project's initial 10-30 years. Events proved otherwise. Because of poor agricultural conditions and the availability of less expensive water, 60 percent of the agricultural districts of central Arizona did not contract for CAP water.

The study states that the economic sustainability of CAP agriculture depends on numerous, interrelated factors that determine profit over a multi-year planning period. Influential variables include input and output prices, yield levels, government policies and programs, the supply and cost of credit, and biological factors (e.g. pests). That these factors are not stable creates an uncertain economic environment for the farmer.

Various economic interdependencies are also reviewed. The report stresses the economic interdependencies among CAP irrigation districts. Reductions in planted acreage due to bankruptcy or financing problems raises the implicit costs of water to other farmers and threatens the economic viability of their

water distribution organization.

Also important are the economic interdependencies between the nine CAP irrigation districts and the Central Arizona Water Irrigation Districts. The ability of CAWCD to meet its financial commitments with no increase in property taxes is closely linked to agriculture. This linkage is discussed by examining three issues: the take or pay provision; water sales; and OM&R and interest payments.

The financial status of CAP irrigation districts is then reviewed. The report stresses that the districts' financial obligations possibly represent the most significant interdependencies in the entire CAP system. For example, default or bankruptcy by a CAP irrigation district could result in Standard and Poors downgrading the rating on a county's new school district, fire district, road district and bonds. Lower ratings therefore could increase the interest cost to the county's taxpayers.

From the above analysis the study anticipates likely future events including continued lower than expected demand for CAP water, limited contracts for CAP water, and a one-third reduction in CAP planted acreage.

The study anticipates that CAP agriculture will attempt to shift as much of its CAP water allocation and associated debt as legally and economically as possible to other CAP water users, i.e., M&I and Indian. Without this shift bankruptcy threatens a majority of CAP districts. Economic adjustments in the agricultural sector will be substantial. Growers with the least debt, highest yields and low cost, high production wells will remain in business.

The report questions whether public funds are well spent to support an agricultural industry that is in a period of economic transition, from a dominant economic force in the state to one of partnership, albeit strained, with urban interests.

Copies of the report "An Economic Assessment of Central Arizona Project Agriculture" can be obtained for \$8 from Agricultural Sciences Communication, Publication Desk, University of Arizona, 715 N. Park Ave., 2nd floor, Tucson, AZ 85719, 602-621-7176.

DRASTIC Maps Developed for Use in Pinal County

DRASTIC maps have recently been developed for Pinal County by the Arizona Geological Survey. DRASTIC is a system developed by the U. S. Environmental Protection Agency for evaluating the potential for groundwater pollution.

The name DRASTIC is an acronym for the seven hydrogeologic parameters that are evaluated: Depth to water, Recharge to aquifer, Aquifer media, Soil media, Topography (slope), Impact of vadose (vadose media), and Conductivity (hydraulic) of aquifer.

Separate maps show the ranges of the values for each parameter. Polygons enclose areas where parameter values are within a range specified by the DRASTIC system, and a numerical rating is assigned to each polygon. The numerical rating represents degree of susceptibility to groundwater pollution. For example, aquifer vulnerability is presumed to be directly proportional to aquifer recharge rate, so a region with a high recharge rate is assigned a higher value on the recharge map than a region with a low recharge rate.

Pinal County has some of the largest earth fissures in the world. Because earth fissures can increase aquifer vulnerability, an earth fissure map was added to the DRASTIC system in Pinal County.

The eight maps were then overlaid and the values for each region were added. This provided the DRASTIC aquifer vulnerability index. While DRASTIC was originally designed for values to be plotted and calculated manually, in Arizona the maps are made using a Geographic Information System (GIS).

For additional information on the DRASTIC maps contact Wayne Hood, Arizona Department of Environmental Quality 1-800-234-5677 Ext. 4416.



Creative Way Devised to Restore Brawley Wash

The Soil Conservation Service (SCS) and the Pima Natural Resource Conservation District (PNRCD) are proposing a bold new approach to restoration of a seriously degraded desert wash in southern Arizona. Brawley Wash runs north through the Altar Valley east of the Tohono O'odham Nation and west of the Arivaca area. This area has been used for ranching for many years and is still largely used for that purpose. The watershed also includes the Buenos Aires National Wildlife Refuge. There are no perennial streams in the watershed.

Historically, the wash was a shallow, wide stream with large stands of sacaton grass reaching far into the surrounding area. According to ranchers' accounts, riparian trees were not common.

Several factors, including historic overgrazing of the wash and its tributaries, have contributed to the severe erosion. The channel is now deeply incised. SCS estimates that this erosion transports about 532 acre-feet of sediment north of Highway 86 annually. Whereas prior to 1900 floods were unknown, the incised channel now sends floodwaters as far downstream as Marana. Now that this erosion/flooding process has begun, each year the wash degrades further, reducing recharge in the area, damaging roads, and diminishing the riparian vegetation.

The introduction of exotic grass species was another factor in the elimination of the historic vegetation community. SCS believes the start of the large-scale change from grasslands to shrublands began in the 1920s. Several species toxic to cattle had moved far down in the watershed by the 1940s as forage species were slowly removed by cattle.

To stop this degradation and to restore the wash to something close to its former condition, SCS and PNRCD have issued a report and recommendation that a demonstration grade control structure be built and that vegetative management practices be implemented.

The structure would detain waters, slowing them down and allowing sediment to drop out and gradually fill the channel.

Benefits of this approach include better recharge in the area, less erosion downstream and development of alluvial soil on which vegetation can become re-established. If the initial demonstration structure succeeds, several more structures are proposed to deal with problems throughout the wash. Similar structures in the San Simon Valley near Safford have proven to be highly effective in rebuilding a degraded channel. Lush grass now thrives in a once highly eroded wash.

SCS and PNRCD recognize that a structure alone will not solve the problem. Revegetative efforts and grazing management practices that would include fencing off areas along the wash also are proposed.

Although this report was developed with the active involvement of all concerned parties (ranchers, State Land

Department, U.S. Fish and Wildlife Service and many others) and has widespread support, its implementation is far from certain. The estimated cost is about \$1 million, and there are no certain sources of funding. Innovative approaches towards putting together a funding package are being studied. These would include contributions of expertise from various agencies and in-kind contributions from landowners. SCS, for example, has offered almost a quarter million dollars worth of staff time and expertise to help with the design, etc.

If this project is implemented, monitoring the results will offer many opportunities for studies of renovation of a degraded watercourse. Long-term studies will be needed regarding reestablishment of vegetation and wildlife, as a basis for determining the value of this approach for other degraded washes.

For more information and a copy of the report, contact the Soil Conservation Service in Phoenix at 602-640-2549.



The eroded banks of Brawley Wash are measured. Brawley Wash runs north from Sonora, Mexico through the Avra-Altar Valleys toward Marana, Arizona. The Soil Conservation Service and the Pima Natural Resource Conservation District have issued a report recommending an innovative strategy to restore the wash. (Photo: USDA Soil conservation Service)



Publications

An Economic Assessment of Central Arizona Project Agriculture

Paul N. Wilson. The report reviews the current and possible future economic status of the agricultural subcontractors for CAP water and CAP agriculture's economic contribution to the surrounding communities in Arizona. The need for the study arose out of the discussions of the Governor's Task Force on CAP issues which met during the first six months of 1992. Concern was expressed by several task force participants that the task force not propose solutions to CAP issues (e.g. underutilization of CAP water) before obtaining a shared understanding of the nature and magnitude of the problems, particularly those facing agriculture. The report was submitted to the Office of the Governor and the Arizona Department of Water Resources.

Copies of the report can be obtained by sending a check for \$8 and a note requesting the publication to Agricultural Sciences Communication, Attention Publication Desk, The University of Arizona, 715 N. Park Ave., 2nd Floor, Tucson, AZ 85719; 602-621-7176 (See "Special Projects" section of this newsletter for more discussion of this publication.)

Water Resources Data for Arizona, Water Year 1991

F.C. Boner, R.G. Davis and N.R. Duet. This publication is a compilation of surface-water, chemical-quality, and groundwater data and was prepared in cooperation with the State of Arizona and other governmental agencies.

The report is available for examination at some local U.S.G.S. offices and is for sale to the public from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Climatic Variability and Flood Frequency of the Santa Cruz River, Pima County, Arizona

Robert H. Webb and Julio L. Betancourt. The hydroclimatology of the Santa Cruz River basin is examined with particular emphasis on storm types that cause floods.

This U.S.G.S. Water Supply-Paper 2379 can be purchased from Book and Open-File Report Sales, U.S. Geological Survey, Box 25425, Denver, CO 80225.

Crossing the Next Meridian: Land, Water, and the Future of the West

Charles F. Wilkinson. Interweaving legal history with examples of present-day consequences of the laws, both intended and unintended, the author traces the origins and development of the laws and regulations governing mining, ranching, forestry, and water use.

The book is available for \$25 from Island Press, Box 7, Covelo, CA 95428; 1-800-828-1302; FAX 707-983-6414.

Dividing the Waters

William Blomquist. This book chronicles the development of groundwater management in eight major southern California basins. The author finds these governance systems to function very successfully without centralized state control. The case studies shed light on the process by which institutional arrangements are developed, how they function, and why they work.

This publication is available for \$44.95 for cloth-bound and \$14.95 for paperback version from Institute for Contemporary Studies, 243 Kearny Street, San Francisco, CA 94108; 415-981-5353; FAX 415-986-4878.

Xeriscape: The Emerging Frontier

This educational video provides people living in semi-arid and arid regions with a look at practical alternatives to conventional landscaping ideas including the use of contemporary design techniques that utilize new varieties of low water use plants. The actual conversion of a conventional high water use residential landscape into a water efficient xeriscape is followed step-by-step. The seven xeriscape principles are discussed and applied as the film moves through the retrofit.

Copies of the video are available for \$30 from Agricultural Communications/Computer Support, Department of Agricultural Education, The University of Arizona, 715 N. Park Ave., Tucson, AZ 85719.

Arizona's Effluent Dominated Riparian Areas: Issues and Opportunities

Barbara Tellman. Part of the WRRC issue paper series, this publication discusses Arizona's riparian areas with flow depending largely on effluent. Among other topics, state and federal laws and regulations affecting that flow are examined, from the water quality and quantity standpoints.

Single copies are available free from the Water Resources Research Center, The University of Arizona, 350 N. Campbell, Tucson, AZ 85721; FAX 602-792-8518.

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

Arizona Department of Environmental Quality
 Arizona Department of Water Resources
 Central Arizona Water Conservation District
 Salt River Project
 Tucson AMA Water Augmentation Authority
 Tucson Water
 USGS Water Resources Division
 Water Utilities Association of Arizona

Their contributions help make continued publication of this newsletter possible.

December 1992 Arizona Water-Related Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Tucson CWAC	2 Tucson Stormwater	3 CAWCD Tucson, GUAC SCV Water Dist	4 ARWA Conf. Arizona's Aquifer SWCS Conf.	5
6 Casa del Agua	7 Yav. Flood Cont. <-- The Env-	8 ironmental Regula-	9 San Pedro Rural Infra- structure Mtg. tion Course -->	10 <-- Colorado <-- Hazardous &	11 Coronado RC&D River Water Users Special Waste -->	12 Association -->
13 Casa del Agua	14 <-- 6th Annual	15 Drainage Symp->	16 Pima Flood Cont.	17 PAC/Water Quality Pinal, GUAC	18 Phoenix, GUAC	19
20 Casa del Agua	21	22	23	24	25	26
27 Casa del Agua	28 Yav. Flood Cont.	29	30	31		

January 1993 Arizona Water-Related Events

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3 Casa del Agua	4 Yav. Flood Cont.	5 Tucson CWAC	6	7 CAWCD	8	9
10 Casa del Agua	11	12	13 <-- Water	14 Rights -->	15	16 Verde River Conf.
17 Casa del Agua	18	19	20 Pima Flood Cont.	21 PAG/Water Quality	22	23
24 Casa del Agua <-- Pollution 31	25 Yav. Flood Cont. Prevention III	26 Making it Pay! ->	27	28	29	30



Calendar of Events



RECURRING



Arizona Hydrological Society. 8 December, 7:30 p.m. Panel Discussion of Professional Registration for Hydrologists. Meetings held at Water Resources Research Center, 350 N. Campbell Ave., Tucson. Contact: Mike Block 602-792-1093.

Arizona Water Commission. December meeting not yet scheduled. Meetings held at ADWR, 15 South 15th Ave., Phoenix. Contact: Beverly Beddow 602-542-1553.

Casa Del Agua. Water conservation tours hourly, Sundays noon to 4:00 p.m., 4366 North Stanley, Tucson. Contact: 602-791-4331.

Central Arizona Water Conservation District. 1st Thursday of the month, 12:30 p.m. Central Arizona Project Board Rm, 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.

Phoenix AMA, GUAC. 18 December, 9:00 a.m. ADWR, Phoenix AMA Conference Room, 15 South 15th Ave., 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.

Pima County Flood Control District. 3rd Wednesday of the month, 7:30-9:30 a.m. Public Works Bldg., 201 N. Stone, Tucson. Contact: Carla Danforth, 602-740-6350.

Pinal AMA, GUAC. 17 December, 7:00 p.m. Pinal AMA Office, 1000 E. Racine, Conference Room, Casa Grande. Contact: Dennis Kimberlin 602-836-4857.

Prescott AMA, GUAC. No meeting for December. Prescott City Council Chambers, 201 South Cortez, Prescott. Contact: Phil Foster 602-778-7202.

Santa Cruz Valley Water District (formerly Tucson AMA Water Authority). 3 December, 7:30 a.m. Followed by joint meeting with Tucson AMA, GUAC at 9:00 a.m. Contact: Warren Tenney 602-326-8999.

Tucson AMA, GUAC. 3 December, 9:00 a.m. Joint meeting with the Santa Cruz Valley Water District at the Water Resources Research Center, 350 N. Campbell Ave., Tucson. Contact: Linda Stitzer 602-628-6758.

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.

DECEMBER



2 (Wed) Tucson Stormwater Management Study Public Meeting/Open House. 4:30 p.m. - 7:30 p.m. Tucson Main Library meeting room, 101 N. Stone. Contact: Freda Johnson, Rillito Consulting Group, 602-622-1933.

2-3 (Wed-Thu) Successful Tools for Environmental Negotiations 1992-1993. Washington, DC. Contact: RESOLVE, 1250 24th St., NW, Washington, DC 20037-1175.

2-4 (Wed-Fri) Bioremediation of Contaminated Soils and Sludges. Austin, TX. Contact: UT at Austin, College of Engineering, Continuing Engineering Studies, ECJ 10.324, Austin, TX 78712; 512-471-3506.

4 (Fri) 1992 Arizona Rural Water Association Annual Conference and Meeting: Reflections on Arizona's Water and Views Toward the Future. Phoenix. Contact: ARWA, 2600 N. Central Ave., Suite 630, Phoenix, AZ 85004; Doug Nelson 602-230-7771.

4 (Fri) Arizona's Aquifer Protection Permit Program. Sheraton Tempe Mission Palm. Contact: GeoSystems Analysis, 1708 East Spring St., Tucson, AZ 85719; 602-326-5848.

4 (Fri) Fifth Annual Soil and Water Conservation Society Fall Conference. Water Augmentation: Issues and Attitudes. Casa Grande, AZ. Contact: Ron Hemmer, SWCS, 1542 W. Verde Lane, Phoenix, AZ 85015; or, Doug Pease 602-839-4803.

7-9 (Mon-Wed) The Environmental Regulation Course. Denver, CO. Contact: Registration Dept., Executive Enterprises, Inc., 22 West 21st Street, New York, NY 10010; 800-831-8333.

7-10 (Mon-Thu) Air, Water & Waste Technologies Conference & Exposition. Detroit, MI. Cosponsored by the Michigan Water Environment Association, the Engineering Society, and the Solid Waste Association of North America. Contact: 313-995-4440.

9 (Wed) Rural Infrastructure Committee Meeting. 9:30 a.m. - 12:30 p.m., Department of Commerce, 15th Floor Conference Room, 3800 N. Central Ave., Phoenix. Contact: Rivko Knox 602-280-1300.

9 (Wed) Public Participation Sought on San Pedro River Management. VFW Hall, Benson, AZ. Contact: San Pedro Natural Resource Conservation District, 247 S. Curtis, Willcox, AZ 85643; Gail Getzwiller 602-586-2579.

10-11 (Thu-Fri) Hazardous and Special Waste Management Through the 20th Century. Doubletree Hotel, Tucson. Contact: Commission on the Arizona Environment, 1645 W. Jefferson, Suite 416, Phoenix, AZ 85007; 602-542-2104.

10-12 (Thu-Sat) **Colorado River Water Users Association 47th Annual Meeting.** Las Vegas, NV. Contact: CRWUA, P.O. Box 1058, Coachella, CA 92236; 619-398-2651.

11 (Fri) **WUAA Luncheon Meeting:** Mr. Frank Turek, of A.N. West, Inc will be speaking on ADWR's Assured and Adequate water supply designations. Water Utilities Association of Arizona. Los Olivos Executive Hotel, Phoenix. Contact: WUAA 234-1315.

11 (Fri) **Coronado Resource Conservation & Development Area, Inc. Annual Meeting.** VFW Hall, Benson, AZ. Contact: Coronado RC & D Area, Inc., 245 S. Curtis, Willcox, AZ 85643.

14-15 (Mon-Tue) **6th Annual Drainage Symposium.** Nashville, TN. Contact: ASAE, 2950 Niles Rd., St. Joseph, MI 49085-9659.

JANUARY

11-13 January (Mon-Wed) **Control, Containment and Remediation of Ground Water Contaminants.** San Antonio, TX. Contact: Environmental Education Enterprises Institute, 2764 Sawbury Blvd., Columbus, OH 43235; 614-792-0005.

13-14 January (Wed-Thu) **Water Rights: Legal and Engineering Aspects For Lawyers, Engineers, and Managers.** Las Vegas, NV. Engineering Continuing Education and American Water Works Association. Contact: UNLV, Division of Continuing Education, CED, 4505 Maryland Parkway, Las Vegas, NV 89154-1019; 702-739-3707.

16 January (Sat) **Verde River Watershed Conference.** Prescott, AZ. Contact: Cocopai Resource Conservation & Development Area Inc., 1633 South Plaza Way, Flagstaff, AZ 86001; 602-556-7504.

24-29 January (Sun-Fri) **Pollution Prevention III-Making it Pay!** San Diego, CA. Contact: Engineering Foundation 212-705-7835.

25 January (Mon) **Chris Stone, University of Southern California, Law, speaks on Global Environment & Global Morals.** College of Law Faculty Seminars. 4:00 p.m. UA Law school Faculty Library, Tucson. Contact: Lakshman Guruswamy 602-621-1373.

UPCOMING

4-6 February (Thu-Sat) **Riparian Management: Common Threads & Shared Interests.** Albuquerque, NM. University of Arizona, Water Resources Research Center. Contact: WRRRC, University of Arizona, 350 N. Campbell Ave., Tucson, AZ 85721.

10-14 February (Wed-Sun) **1993 Mountain States Ground Water Expo.** St. George, Utah. Contact: 801-996-2730.

16-18 March (Tue-Thu) **Water Quality Association Convention.** San Antonio, TX. Contact: AWQA, 6819 E. Diamond St., Scottsdale, AZ 85257; 602-947-9850.

21-24 March (Sun-Wed) **WATERSHED '93: A National Conference on Watershed Management.** Alexandria, VA. Contact WATERSHED '93, c/o The Terrene Institute, 1000 Connecticut Ave., NW, Suite 802, Washington, DC 20036; 202-833-8317.

2 April (Fri) **Carol Rose, Yale University, Law, speaks on Environmental Ethics.** College of Law Faculty Seminars. 4:00 p.m. UA Law School Faculty Library, Tucson. Contact: Lakshman Guruswamy 602-621-1373.



Announcements

Research/Education Funding Available

The Agriculture Department invites applications for studies in agriculture, forestry, and environmental sciences. Areas include water quality, plant responses to the environment, rural development, forest/rangeland/crop ecosystems and technical assessment. Deadlines range from December 7, 1992 to March 22, 1993. For information contact Proposed Services Branch, Awards Management Division, Cooperative State Research Services, USDA, Rm. 303, Aerospace Center, Washington, DC 20250-2200; 202-401-5048.

The Environmental Protection Agency invites preapplications for grants and cooperative agreements to design, demonstrate, and disseminate practices, methods, and techniques related to environmental education and training. Projects should improve environmental teaching, communication, information exchange, and partnerships, and motivate the general public to be more environmentally conscious. Federal funding will not exceed 75 percent of the total cost of a project. Applications for up to \$25,000 should be sent to EPA regional offices, and requests for larger amounts should be sent to EPA headquarters. The deadline is January 15, 1993. For additional information contact George Walker, EPA, Office of Environmental Education, Rm. 339, W. Tower Bldg., 401 M St. SW, Washington, DC 20460. 202-260-8619.

ADEQ Southern Regional Office Moves

As of December 9, the Southern Regional Office of ADEQ is located in the new State Office Building in Tucson. Its new address is: ADEQ/SRO; 400 W. Congress, Ste 433; Tucson, AZ 85701. The phone number is 602-628-6733.

Announcements cont. from page 15

Call for Papers

A conference on tailings and mine waste will be held November 29 - December 1, 1993 at Colorado State University, Fort Collins, Colorado. The latest information on mine and mill tailings and waste will be discussed, and a forum provided for discussion of current and future mining and environmental issues. The program includes issues related to tailings and mine waste management, reclamation and remediation, regulator framework, and public awareness. Submit a 250-word abstract by February 15, 1993 to Janet Lee Montera, Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523; 303-491-7425; FAX 303-491-7727.

Water Resource Information Via Phone

The National Water Information Clearinghouse is a useful resource serving state and local government officials, members of public interest groups, and concerned citizens who need information about water resources in their regions. Operated by the U.S. Geologic Survey, the clearinghouse provides non-technical users with access to a wide range of information. For assistance call the National Water Information Clearinghouse at 800-426-9000.

Water Information Network Established

An electronic information network has been established under the auspices of the U.S. Geological Survey and the Universities Council on Water Resources. Critical water resources and related research information will be gathered at a control location and posted for 24-hour-a-day access. The

staff and principal USGS clients who already are using the USGS A ViiON-based computer network will have automated access to the collected water information. Others not on the A ViiON system will dial in directly or via other networks for access. Information about on-going funded research activities will thus be more readily available.

UCOWR also is establishing an electronic bulletin board to provide current information on contracted research and brief abstracts of selected completed research and reports. Submitted information will be formatted for read-only bulletin boards. USGS staff and authorized users will dial into UCOWR's computer using an 800 number, TELNET, BITNET or commercial lines to review bulletin board material.

Xeriscape Conference Announced

The 7th Annual Xeriscape Conference, "CAP: Tapping the New Source; Issues and Answers for Landscaping With CAP Water" will be held March 12, 1993, from 8 a.m. to 4:30 p.m. at the Pima Community College Center for the Arts, which is located on the PCC West Campus, 2202 W. Anklam Road.

This year's conference will focus on Tucson's shift to using CAP water and how this surface water source will affect landscaping practices. The conference is designed to equip landscape designers, contractors, architects, and other landscaping professionals with the latest information on efficient irrigation system design, xeriscape landscaping principles, proper watering techniques (irrigation scheduling), irrigation system maintenance, and plant selection. College credit is available through the Pima Community College Landscape Technician Program. The fee for the conference is \$30 for general admission and \$15 for students. For additional information contact Melaney Seacat, Tucson Water 602-791-4331.

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