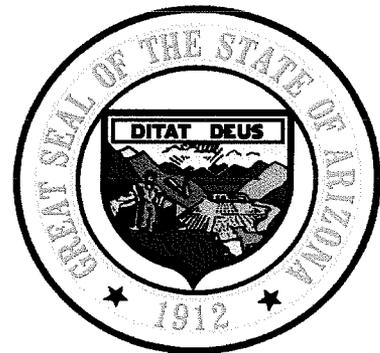


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**ARIZONA  
WATER  
BANKING  
AUTHORITY  
STUDY  
COMMISSION**

**DRAFT  
FINAL REPORT**



**NOVEMBER 1998**

**Transmittal Letter**

*The Arizona Water Banking Authority Study Commission*

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## **Introduction**

### **The Arizona Water Banking Authority Study Commission**

The Arizona Water Banking Authority Study Commission (Study Commission) was created by the Arizona Legislature in 1996 through the enactment of House Bill 2494. The Study Commission is ancillary to the Arizona Water Banking Authority (AWBA), which was created by the same legislation. The Study Commission's role is to assist the AWBA and the Legislature in evaluating the effectiveness of the powers and duties that were authorized by the enabling legislation, and then to suggest modifications as appropriate. As the Study Commission proceeded with its deliberations, it concluded that many issues related to the current and future activities of the AWBA also involve other governmental agencies including the Arizona Department of Water Resources (ADWR), the Central Arizona Water Conservation District (CAWCD), and the United States Bureau of Reclamation (USBR). Therefore, many of the Study Commission's recommendations are addressed directly to those agencies.

The Study Commission held its first meeting in September 1996 and generally met on a monthly basis through November 1998. In November 1997, the Study Commission issued an Interim Report of its activities which was transmitted to the Governor and the Legislature. The report was also widely distributed to the general public. Monthly progress reports were also made at the meetings of the AWBA.

This Final Report summarizes the various activities and studies of the Study Commission. The report also documents the Study Commission's final findings and recommendations as required by H.B. 2494.

### **Purpose of the Arizona Water Banking Authority Study Commission**

The Arizona Legislature charged the Study Commission with performance of the following tasks:

- (1) Study the existing powers and duties of the AWBA during its first year of operation and make recommendations regarding any necessary changes to the powers and duties.
- (2) Study the opportunities for additional water banking authority uses within Arizona and in cooperation with California and Nevada.
- (3) Identify appropriate mechanisms that will enable Indian communities that hold entitlements to Colorado River water to participate in water banking with the AWBA.
- (4) Make recommendations for continuation or modification of the tax collected pursuant to Arizona Revised Statutes section 48-3751.02 (*ad valorem* tax levied

by the CAWCD in Maricopa, Pinal and Pima counties that may be used for water banking purposes).

The Study Commission evaluated a variety of issues associated with each of these four general tasks.

### **Study Commission Members**

The AWBA Study Commission is comprised of fourteen members. Five of the members represent the AWBA board members and the other nine were appointed by Rita Pearson, the Director of the ADWR. The appointed members represent municipal and industrial water (M&I) users, agricultural water users including those that do not use the Central Arizona Project (CAP) facilities, persons interested in CAP issues, persons interested in Colorado River issues, persons from Indian communities and persons affiliated with environmental interests. All appointed members must be knowledgeable in water resources management in Arizona.

The following individuals served on the Study Commission:

- Rita Pearson, Chairman: Ms. Pearson is the Director of ADWR and Chairman of the AWBA.
- Mary Ann Antone: Ms. Antone is an elected representative from the Sif Oidak District to the Tohono O'odham Tribal Council Legislative Branch.
- Karen Barfoot: Ms. Barfoot is the Water Resources Advisor to the City of Chandler and is a member of the Arizona Water Resources Advisory Board.
- Cynthia Chandley, Esq.: Ms. Chandley is senior counsel and manager of land and water resources for the Phelps Dodge Corporation.
- Bill Chase: Mr. Chase serves on the board of the AWBA and is also the Water Resources Advisor for the City of Phoenix.
- Larry Dozier: Mr. Dozier is the Deputy General Manager of the CAWCD. Mr. Dozier serves on the Study Commission on behalf of Grady Gammage, Jr., Esq., who is the President of the CAWCD Board and a member of the AWBA.
- Tom Griffin: Mr. Griffin serves on the AWBA and is also the Chairman of the Mohave County Water Augmentation Authority.
- Gary Hansen: Mr. Hansen is the Water Resources Director for the Colorado River Indian Tribes.
- Mark Myers: Mr. Myers operates a private consulting practice in Tucson which focuses on multiple purpose projects related to land use, natural resources, water policy, and environmental policy.
- Paul Orme, Esq.: Mr. Orme is an attorney specializing in water and agricultural law issues. He is also a member of the Arizona Water Protection Fund Commission.
- Donald Pope: Mr. Pope is the manager of the Yuma County Water Users

Association.

- Lawrence Robertson, Esq.: Mr. Robertson is an attorney in private practice in Tucson who specializes in water, energy, municipal and public utility law.
- John Sullivan: Mr. Sullivan is an associate general manager for the Water Group at the Salt River Project (SRP) and is also a member of the Arizona Water Resources Advisory Board.
- Richard Walden: Mr. Walden serves on the AWBA and also operates farms in Arizona.

The ADWR and the AWBA provide staff support for the Study Commission.

### **Organization and Meetings**

The Study Commission began in September 1996 with an organizational meeting. The Study Commission decided that it would spend the first few months reviewing and discussing background information so that all members could work from a common knowledge base. Presentations were made concerning:

- Current powers and duties of the AWBA
- Arizona's uses of Colorado River water
- Interest by Southern Nevada Water Authority (SNWA) and California water users in water banking with the AWBA
- Laws governing the Colorado River
- Colorado River operations
- Colorado River water supplies and demands
- Priorities to Colorado River water within Arizona
- Interstate banking provisions
- Water banking activities and organizations in other states

Following this phase, the Study Commission established subcommittees to study and discuss the several critical issue areas. The subcommittees met frequently to identify issues, review studies and prepare recommendations. Each subcommittee prepared an interim report which was reviewed by the full Study Commission at meetings in September and October 1997.

The five subcommittees and their members are listed below.

#### Planning and Modeling Assumptions

Larry Dozier (Chairman), Karen Barfoot, Bill Chase, Mark Myers, Rita Pearson, Don Pope, and John Sullivan

#### Interstate and Intrastate Banking and Marketing Issues

Mark Myers (Chairman), Larry Dozier, Gary Hansen, Paul Orme, Larry Robertson, Tom

The Arizona Water Banking Authority Study Commission

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Griffin, Cynthia Chandley, Don Pope, Bill Chase, and Karen Barfoot

Water Banking Benefits Outside of the CAP Service Area

Tom Griffin (Chairman), Larry Dozier, Gary Hansen, Don Pope, Cynthia Chandley, and Bill Chase

Indian Issues

Mary Ann Antone (Co-chairman), Gary Hansen (Co-chairman), John Sullivan, Karen Barfoot, Cynthia Chandley, and Larry Robertson

Tax and Financial Issues

Larry Dozier (Chairman), Karen Barfoot, Bill Chase, Mark Myers, Don Pope, John Sullivan

The Study Commission issued its Interim Report to the legislature in November 1997. The report was distributed to the public in both complete format and in a summary booklet format. It was also available for review online on the AWBA Web page.

After completion of the Interim Report, the Study Commission determined that the appropriate process to complete its mission was to continue meeting in subcommittees until each subcommittee could propose final recommendations. This process lasted from about January 1998 through April 1998.

Starting in May 1998, the Study Commission began a series of monthly meetings to review the findings of the subcommittees and craft their final findings and recommendations. This final phase of the process went through several iterations where the subcommittee recommendations were reviewed and was either adopted or modified by the full Study Commission. Draft legislation was prepared for the recommendations that would require modification of existing statutes or would provide additional responsibilities for the AWBA. The Study Commission recommendations were approved by consensus and no voting was required.

The following table lists the meetings held by the Study Commission and the subcommittees.

<i>Date</i>	<i>Type of Meeting</i>
September 11, 1996	Full Study Commission
October 31, 1996	Full Study Commission
November 18, 1996	Full Study Commission
December 16, 1996	Full Study Commission

**The Arizona Water Banking Authority Study Commission**

<i>Date</i>	<i>Type of Meeting</i>
January 23, 1997	Full Study Commission
February 26, 1997	Indian Issues
February 27, 1997	Full Study Commission
March 26, 1997	Indian Issues - All Tribes
March 27, 1997	Full Study Commission
March 28, 1997	Indian Issues
April 15, 1997	Planning/Modeling Assumptions
April 16, 1997	Benefits Outside CAP Service Area
April 21, 1997	Indian Issues - Tohono O'odham
April 24, 1997	Inter/Intrastate Banking & Marketing
April 24, 1997	indian issues
May 15, 1997	Planning/Modeling Assumptions
May 21, 1997	Benefits Outside CAP Service Area
May 22, 1997	Indian Issues
May 22, 1997	Inter/Intrastate Banking & Marketing
May 30, 1997	Indian Issues - Fort McDowell
June 4, 1997	Planning/Modeling Assumptions
June 16, 1994	Indian Issues - Colorado River Tribes
June 26, 1997	Inter/Intrastate Banking & Marketing
June 26, 1997	Indian Issues
June 30, 1997	Benefits Outside CAP Service Area
July 14, 1997	Indian Issues - Yavapai-Apache
August 19, 1997	Benefits Outside CAP Service Area
August 27, 1997	Inter/Intrastate Banking & Marketing
August 27, 1997	Indian Issues
August 28, 1997	Planning/Modeling Assumptions
September 6, 1997	Indian Issues - Hualapai Tribe
September 10, 1997	Planning/Modeling Assumptions
September 12, 1997	Indian Issues - Gila River
September 25, 1997	Full Study Commission
October 23, 1997	Full Study Commission
December 4, 1997	Inter/Intrastate Banking & Marketing
December 11, 1997	Tax and Financial Issues

## ***The Arizona Water Banking Authority Study Commission***

<i>Date</i>	<i>Type of Meeting</i>
December 11, 1997	Indian Issues
January 21, 1998	Benefits Outside CAP Service Area
January 22, 1998	Inter/Intrastate Banking & Marketing
January 28, 1998	Indian Issues
February 4, 1998	Tax and Financial Issues
February 25, 1998	Inter/Intrastate Banking & Marketing
February 25, 1998	Indian Issues
March 18, 1998	Benefits Outside CAP Service Area
March 31, 1998	Inter/Intrastate Banking & Marketing
March 31, 1998	Tax and Financial Issues
March 31, 1998	Indian issues
May 5, 1998	Inter/Intrastate Banking & Marketing
May 5, 1998	Tax and Financial Issues
May 5, 1998	Indian Issues
May 18, 1998	Indian Issues
May 20, 1998	Benefits Outside CAP Service Area
June 11, 1998	Full Study Commission
July 20, 1998	Full Study Commission
August 25, 1998	Full Study Commission
September 23, 1998	Full Study Commission
October 8, 1998	Full Study Commission
November 13, 1998	Full Study Commission

### **Public Involvement**

Throughout the Study Commission's deliberations, public input and review was sought. All of the Study Commission's meetings were open meetings and the public was encouraged to attend and participate. All subcommittee meetings were conducted in an informal style and members of the public were provided the opportunity to freely participate in the discussions and provide input.

The Indian Issues Subcommittee conducted numerous meetings with representatives of Indian Tribes. Several meetings were held at Tribal Headquarters in order to provide briefings for Tribal Council members and to determine first hand how

Indian Communities felt they could participate in water banking activities. Study Commission members felt that the opportunity to visit the reservations and speak directly with Tribal Councils was extremely valuable and rewarding.

Following the completion of the Interim Report, an effort was made to seek additional public input regarding the Study Commission's progress. ADWR staff made presentations to each of the Active Management Area Groundwater Users Advisory Councils, the Mohave County Water Augmentation District, the Tucson Regional Water Planning Council, and at the monthly meeting of the AWBA. In addition, several hundred copies of the report summary were distributed to interested parties.

## **Background Information**

**Current authorities of the Arizona Water Banking Authority**

**Laws and relevant contract provisions pertaining to the Colorado River and the Central Arizona Project**

**Water banks in other western states**

## **Policy Issues, Findings, and Recommendations**

The Study Commission spent nearly two years investigating opportunities for the Arizona Water Banking Authority to further enhance water management activities in Arizona. They also gave careful consideration at the possibilities of creating partnerships with authorized entities in Nevada and California. During the course of these investigations a number of issues were identified and thoroughly discussed. Many of the issues are very broad and are of potential concern to numerous interest groups and stakeholders. Other issues are more narrowly focused and may affect a smaller set of stakeholders. The following discussion summarizes the deliberations of Study Commission. The issues and recommendations are generally grouped as they were identified by the five subcommittees, but often the issues were found to overlap.

### **□ Findings and recommendations regarding the potential for shortages to Arizona's Colorado River supply**

The Study Commission determined that the AWBA should use a consistent set of water planning assumptions to evaluate the availability of water supply to meet current and future demands for Colorado River water. These assumptions were used in the Colorado River System Simulation (CRSSez) computer model to quantify the potential future water shortages that may occur for existing municipal and industrial CAP subcontractors and others. The potential shortages represent the amount of water that will need to be banked to firm long-term water supplies. The output from the model also quantifies the potential amount of water that is excess to the projected annual demands and is consequently available for banking purposes. The Study Commission organized its work into two issue areas.

#### **Issue 1**

*What assumptions should the Arizona Water Banking Authority Study Commission make with respect to planning and modeling the Colorado River operations?*

The future availability of water from the Colorado River for Arizona is dependent on several key variables. These key variables are summarized as follows:

- Upper Colorado River Basin water demand build-up
- Lake Mead protection levels or shortage strategies
- Surplus declaration strategies
- Water demand reduction - shortage distribution strategy
- Yuma desalter operations

#### **Recommendation**

The Study Commission studied numerous iterations of model runs to determine the sensitivity of the key variables to water banking and marketing decisions. Based on the analysis of these studies, the Study Commission recommends that for planning purposes, the AWBA should use the following assumptions:

- For the Study Commission’s planning purposes, the Upper Colorado Basin water demand build-up is recommended to be a maximum of 4.8 million acre feet (maf) without losses. The projected build-up which the Upper Basin terms “anticipated” is listed as 4.6 maf without losses, and the remainder is termed “potential.” The 4.8 maf amount allows for some projected build-up beyond the “anticipated” amount.
- Lake Mead should be operated assuming that a shortage is declared to protect, with an 80% probability, the current SNWA intake level of 1050 feet. It should also be assumed that the lake level will never be allowed to drop below the level of the planned SNWA intake of 1000 feet.
- Assume a surplus strategy of spill avoidance based upon a presumed inflow from the Upper Basin of approximately 17 maf (70th percentile level of historic runoff).
- Assume a strategy that in a shortage year deliveries to the CAP and other Priority 4 water users will be allowed to use no more than 1 maf.
- Assume that the Yuma Desalting Plant will be operated, but also investigate the impact to Arizona if the Yuma Desalting Plant is not run.

The recommended assumptions are appropriate for the intended purposes of the Study Commission. These assumptions are not, however, necessarily appropriate for other purposes, such as determining Colorado River long-term reservoir operating criteria. Adoption of these assumptions for study purposes should not be interpreted as an official position by the State of Arizona or the ADWR regarding policies on reservoir operating criteria, development or use of water supplies by any other basin state, or operations of the Yuma Desalting Plant.

## **Issue 2**

*How much water should be stored by the Arizona Water Bank to protect against projected shortages?*

One of the purposes of the AWBA is to store water brought into Arizona through the CAP to protect Arizona M&I water users against future water shortages on the Colorado River and disruptions of operations of the CAP. The AWBA may distribute long-term storage credits earned by the AWBA to make water available to M&I users of Colorado River water in Arizona that are inside or outside of the CAWCD service area, in accordance with Arizona law.

The Study Commission discussed the potential need for a backup water supply during times of a CAP shortage. The subcommittee considered several options for the amount of water for the M&I users of Colorado River water that should be protected. For those M&I water users inside of the CAWCD service area, the protected amount might be one of three options.

<b>CATEGORY</b>	<b>AMOUNTS</b>
M&I allocations with adjustments by Indian water rights settlements and Cliff Dam replacement water	676 kaf/yr
M&I allocations plus 113 kaf of water which can be potentially leased from the Indian Communities	789 kaf/yr
Projected M&I demand for CAP water in 2040	838 kaf/yr

### ***Recommendation***

**If the AWBA provides shortage protection for an annual demand of 676,000 af, an estimated 3,029,000 af of recharge credits must be stored to meet the shortages to the CAP M&I through the year 2100. The Colorado River water users not in the CAWCD service area would need up to 575,000 af. The projected Indian shortages are estimated at 1,403,000 af.**

**If the AWBA provides shortage protection for an annual demand of 789,000 af, then an estimated 3,527,000 af of recharge credits must be stored to meet the shortages to the CAP M&I through the year 2100. The water users outside the CAWCD service area still need 575,000 af. The projected Indian shortages for non-leased water are estimated to be 923,000 af.**

If the AWBA provides shortage protection for an annual demand of 838,000 af, then an estimated 4,296,000 af of recharge credits need to be stored to meet the shortages to the CAP M&I through the year 2100. The water users outside the CAWCD service area still need 575,000 AF. The projected Indian shortages are estimated to be 948,000 af.

### ***Other Recommendations***

The Bureau of Reclamation should adopt criteria for Lower Basin Colorado River reservoir operations that clearly identify the circumstances when shortages will be declared. The criteria should also identify the volume of reduction Arizona priority 4 contractors should expect to take during the initial phase of the shortage reduction. The policy for determining shortage criteria must be developed in consultation with representatives of the basin states.

The Bureau of Reclamation should adopt a procedure for determining how shortages to priority 4 contractors will be shared between CAP contractors and non-CAP contractors. Before establishing this procedure, the Bureau should request the parties to negotiate mutually agreeable reduction sharing agreements.

The Bureau of Reclamation should clarify the method that will be used for determining how reduced deliveries to the CAP will be shared between M&I priority subcontractors and Indian priority contractors. The clarification must definitively rectify apparent conflicts between several contracts with Indian tribes and the 1983 record of decision issued by Secretary of the Interior Watt.

### **Findings and recommendations regarding funding for the AWBA and the taxing mechanism**

The Study Commission investigated the funding mechanisms available to the AWBA under its current statutory authorities. AWBA staff prepared preliminary projections of the revenues expected from these sources, and compared those revenues with the potential needs to accomplish currently authorized purposes. These projections indicate that generation of revenue will limit the volume of water banked over the twenty year period that the current revenue sources are in effect. The one exception to this general finding is that the four cent ad valorem tax in Maricopa County may provide more money than is needed than is required for the purpose of providing shortage protection to CAP M&I subcontractors within that county. Especially critical is the continuation of adequate appropriations from the state general fund since that revenue source can be used for the most purposes and is the most flexible.

The Study Commission considered three issues related to funding mechanisms.

### **Issue 1**

*Is the mechanism for the tax collected pursuant to A.R.S. §48-3715.02. (four cent ad valorem tax in Maricopa, Pinal, and Pima Counties) satisfactory? Should this tax provision be continued as currently drafted or should it be modified?*

In establishing the Arizona Water Banking Study Commission, the Legislature described four areas to be studied. One of the areas specifically identified was to make recommendations for continuation or modification of the tax collected pursuant to A.R.S. §48-3715.02. A.R.S. §48-3715.02 is a statutory reference located within Title 48 Chapter 22, which describes the authority and purpose of multi-county water conservation districts. The Central Arizona Water Conservation District (CAWCD) is the only district that has ever been established pursuant to these statutes.

The Arizona Water Banking Authority staff estimates that the revenues from the four cent property tax will account for over fifty percent of its funding and should total nearly seven million dollars per year. Clearly, if the tax were not levied by the CAWCD board or the board determines that the revenues were needed for CAWCD purposes, the water banking program would have to be scaled back significantly. The subcommittee discussed these risks, but concludes that the current method of levying the tax and transferring the funds to the Banking Fund is appropriate and does not need modification.

The decision on whether or not to levy the tax and how much of the four cents should be levied rests entirely with the board of directors of the CAWCD. Some may question the desire of an elected board to levy a tax assessment that the CAWCD must then transfer to another government entity. Normally this approach could be perceived to be risky because the CAWCD board may not be motivated to assess taxes where the District is directly responsible for the oversight of the expenditures. However, the Study Commission does not believe that the risk is high in this case because the statute limits the expenditure of the four cent tax to purchasing water for storage to protect CAP M&I subcontractors against future shortages or emergency outages. Since the funds can only be spent in this manner, the money will come back to CAWCD in the form of payment for water purchase. Furthermore, the president of the CAWCD board of directors is a member of the Water Banking Authority board and therefore has a vote on how the tax revenue will be spent.

If the CAWCD decides to retain the four cent revenue for payment of expenses, funding for water banking activities would be severely curtailed. The Study Commission does not believe that it is likely that CAWCD will vote to keep the revenue, but if it does, it will probably be used to avoid a rapid rate increase to CAP water users. This “rate shock” effect will be difficult for customers to respond to quickly, and could result in a

corresponding decrease in water orders as water users choose to use other, less expensive, water sources, such as groundwater. If this type of circumstance were to arise, the subcommittee feels that it would be more appropriate to use the four cent tax revenue to cushion the rate shock and allow continuation of direct use orders rather than to use the revenue for water banking purposes.

### ***Recommendation***

The Study Commission has reviewed the provisions of §48-3715.02 as was requested by the legislature. The Study Commission finds that the current mechanism which requires the tax to be levied by the CAWCD but revenues spent by the Water Banking Authority has worked well to date. While there is some risk that the Water Banking Authority program could be disrupted if the CAWCD would choose not to levy the tax, the Study Commission finds that risk is small. The Study Commission also believes that an appropriate tradeoff will be made if the CAWCD votes to retain the tax revenue, since the funds would be used to enhance direct delivery of CAP water, which should have a priority over water banking activities. The Study Commission recommends that the current provisions of §48-3715.02 be continued without modification.

### **Issue 2**

*How should Arizona water management objectives be considered in developing programs for interstate water banking on behalf of Nevada or California? In particular, in establishing the charges for interstate banking services, should the AWBA require out of state entities to participate in storage and recovery options that are most compatible with Arizona's groundwater management objectives, even if those options are more costly?*

### ***Recommendation***

The AWBA will recharge and recover water at specific sites for a broad range of water management objectives. Interstate water storage agreements for recharge and recovery should not necessarily reflect the lowest cost options for the participating states. Those agreements should recognize the need to meet Arizona's water groundwater management objectives, including provisions relating to management plans, set forth in A.R.S. §§45-401 through 45-704 (Groundwater Code) and rules, regulations, and policy guidelines adopted thereto. The cost of storage and recovery as established under A.R.S. §45-2471.C should reflect these opportunities as well as the public policy and general purposes of the Water Banking Authority as set forth in sections 45-2401.F.1 through 45-2401.F.5. Finally, the cost should take into account the individual water management priorities of different localities around Arizona.

### **Issue 3**

*Interstate water banking parties will be required to make payment in lieu of taxes since those parties do not pay property taxes. How should the appropriate amount of in lieu tax be determined?*

#### ***Recommendation***

**When dealing with in lieu tax charges for interstate banking activities, it is infeasible to base those charges on equivalent assessed value of communities in Nevada or California. The Study Commission believes that a fair equivalency can be derived by determining the amount of ad valorem tax paid per acre foot by non-Indian M&I and agricultural water users in the three county CAP service area. Due to natural fluctuations in deliveries, the tax collection should be compared to the average delivery over the previous three years. The resulting dollars per acre foot value should be used to assess the in lieu tax. The Study Commission recommends that A.R.S. §48-3715 be amended to reflect this approach.**

#### ***Other Recommendations***

**The Study Commission finds that the funding provided annually by the Legislature through appropriations from the general fund is critically important to success of the AWBA program. This funding source is the primary mechanism for the AWBA to participate in Indian water rights settlements and to meet the drought protection needs of Colorado River M&I water users located outside of the tri-county CAP service area. The Study Commission urges the Legislature to continue to provide adequate funding to the AWBA program, including the potential for increased levels of funding in the future.**

#### **Issues related to mechanisms and opportunities to enhance intrastate and interstate water banking activities.**

The Study Commission determined that a number of opportunities may exist for the AWBA to perform additional services that could assist water users in Arizona in meeting their needs for a reliable water supply. It also recognized that the program for banking water for interstate purposes could potentially be expanded in a variety of ways. In order

to address this category of issues, the Interstate and Intrastate Water Banking and Marketing Issues Subcommittee was formed. The subcommittee identified three primary issue areas.

### **Issue 1**

*Arizona and the United States Bureau of Reclamation should develop a policy and process for transferring entitlements between parties in Arizona (including transfers with Indian nations) and for leasing Colorado River water supply for more than one year. The policy should consider temporary and permanent agricultural land fallowing and marketing of water that is made available through Indian water rights and contracts.*

Water transfer issues, especially transfers from rural areas to urban areas, have been controversial in Arizona. In the 1980s, several urban municipal providers sought to augment their water supplies by purchasing rights to groundwater in rural basins. After several years of discussion and debate over the issues, the Arizona legislature enacted laws that prohibited future groundwater transfers from most of the state's basins.

While many of the same issues that arose in the groundwater transfer controversy may also exist with transfers of entitlements to Colorado River water, several transfers and leases have been completed in recent years. Water transfers and leases are directly overseen by the United States Bureau of Reclamation (USBR) through its responsibility to administer water contracts for Colorado River water on behalf of the Secretary of the Interior. Historically, the USBR has looked to the state, acting through the ADWR, to provide policy advice on whether the proposed transfer is in the public interest.

ADWR has developed policy statements for the transfer of CAP water from exchange contractors and for the relinquishment and transfer of CAP contracts within the CAP service area. ADWR has not developed a policy on the general transfer of Colorado River water entitlements for multiple years. Though not directly required by statute, an ADWR policy on transfers and leases of Colorado River water under Indian contracts or rights would help establish the terms under which such a transaction would be viewed favorably by the state.

The Study Commission has identified a number of opportunities for the AWBA to provide assistance in meeting the future water needs of water users within Arizona. Possibilities also exist to further assist California and Nevada. Because much of the demand for water is in central Arizona, and most of the higher priority water rights are located along the Colorado River, transferring and transporting non-CAP water may be an important component in solving future water supply problems. In recognition of this circumstance, the Study Commission believes a policy for transporting non-CAP water through the CAP aqueduct system should, therefore, be developed concurrently. The

ADWR, USBR, and CAWCD should coordinate their efforts to create such a policy.

### ***Recommendation***

**Before the AWBA or other private parties attempt further transfers involving Colorado River water, it would be very beneficial for the state and federal agencies to identify and establish policies and procedures regarding transfers. Additionally, since much of the demand for water is in central Arizona and most of the higher priority water rights are located along the Colorado River, a policy for transporting non-project water through the Central Arizona Project aqueduct system should be developed concurrently. These policies must be created in a coordinated manner by ADWR, USBR, CAWCD and AWBA. The Study Commission recommends that those agencies establish a priority for the development of such policies and procedures so transfer activity may proceed in a timely manner. With the policies established it will be possible to determine what role, if any, the AWBA can constructively play in water marketing activities.**

**The Study Commission recommends that the government agencies initiate an open public process to obtain input in developing the policy. The general sense of the Study Commission is that the transfer policy should be flexible and should not create bureaucratic hurdles which must be overcome before a market transaction can be accomplished. Water transfers should be between willing sellers (and leasers) and willing buyers and never accomplished through condemnation. The policy should also give full consideration to regional and local economic, social, or environmental impacts which may occur when transfers are based on the retirement or fallowing of agricultural land. The transfer policy should allow for creative approaches to minimize or mitigate impacts. It may also be advisable to provide minimum acceptable standards as an alternative.**

### **Issue 2**

*Should the benefits and services provided by the AWBA be expanded? If so, which services are most appropriate?*

The AWBA is currently authorized to provide four primary services: 1) Protect M&I uses of Colorado River water against droughts or other shortages by providing a backup supply; 2) enhance water management objectives of the state; 3) assist in the settlement of Indian water rights claims; and 4) assist water users in California and Nevada in meeting their future water supply needs. If authorized, the AWBA may be able to provide several more benefits and services.

The Study Commission identified and discussed the following types of services:

- Short term or interim supply services
  - Drought and shortage protection beyond current authority
  - Nonpermanent uses
  - Interim Supplies
  
- Long-term or 100-year assured water supply services
  - Long term credit averaging
  - Water supply supplementation
  - Water transfers and CAP allocations

### ***Recommendation***

The Study Commission was impressed by the opportunities that may be available for the AWBA to augment water supplies using banking mechanisms. There undoubtedly is a need both now and in the future for both short term and long term water supply services. Using water banking to create a pool of credits to be averaged or to fill in when low priority CAP allocations are unavailable will probably prove feasible and should be considered in the future. However, the Study Commission does not believe that the AWBA should be granted the authority to undertake these enterprises at the present time.

The Study Commission does recommend that the powers and duties of the AWBA be expanded to allow the “loaning” of long term storage credits that have been previously earned for authorized purposes. Over the twenty year period that

the majority of the funding for the AWBA has been statutorily authorized, it is anticipated that the AWBA will earn several million acre feet of long term storage credits. Most of those credits will not need to be recovered for many years. The Study Commission believes that a public policy benefit would be accomplished if some of these credits could be loaned to entities who may need supplemental or interim water supplies. The credits would be subject to full repayment. The borrower could either repay the AWBA with similar long term storage credits, or must pay the cost of replacement. The AWBA must establish rules regarding how it would administer the “loaning” function. Implementation of this recommendation will require authorizing legislation.

The Study Commission also recommends that the drought protection service provided by the AWBA be expanded. If the primary function of protecting against CAP M&I shortages can be accomplished within available revenues, remaining revenues may be used to secure additional credits could be earned to protect against other shortages to M&I water users of other surface water supplies. Studies indicate that within Maricopa County this situation may exist. The credits will be made available to the providers experiencing non-CAP surface water shortages in proportion to the amount of ad valorem taxes paid by taxpayers within the boundaries of the portion of the service area experiencing the shortage. Implementation of this recommendation will require authorizing legislation.

### **Issue 3**

*Should the AWBA be authorized to meet future needs for water supply by using techniques other than the long-term storage credit system?*

The AWBA is currently authorized to provide a variety of services by recharging excess Colorado River water that can be delivered through the CAP. Clearly, this banking approach must be considered a high priority considering the current availability of unused CAP water and the capacity of the CAP aqueduct system to deliver this water. The use of excess water results in a viable way to supplement Arizona’s long-term supplies. Water banks in other states provide a variety of other examples of other banking techniques. The subcommittee has identified four additional banking mechanisms that may have potential use in Arizona, including:

- Storage of supplies other than excess Colorado River water
- Water storage in surface reservoirs
- Land fallowing of senior rights
- Return flow credit development

## **Recommendations**

The Study Commission believes that many of the concepts discussed while investigating this issue have merit and may be worthy additions to the AWBA powers at some time in the future. However, at the present time there is too much uncertainty regarding how some of these techniques may be implemented.

The Study Commission does recommend that the AWBA be authorized to earn long term storage credits by purchasing effluent, to the extent such an action is compatible with its primary source of using excess Colorado River water delivered through the CAP. Legislative authorization will be required to implement this recommendation.

- Issues related to mechanisms and opportunities for the Arizona Water Banking Authority to provide additional benefits at locations within Arizona that are outside of the CAP service area.**

The Study Commission recognized that most of the water management benefits that H.B. 2494 authorizes will be located within the CAP service area in Maricopa, Pinal, and Pima Counties. The Study Commission did feel that there may be significant opportunities for other portions of the state to also benefit in water banking activities. The fast growing communities in Mohave County were especially identified as an area where the AWBA may play a significant future role. Some of the issues discussed by the Study Commission are related to providing clarification of how the AWBA can utilize its existing authorities while other look at additional opportunities.

The Water Banking Benefits Outside the CAP Service Area Subcommittee identified seven primary issue areas.

### **Issue 1**

*Determine the frequency and magnitude of potential shortages to those municipal and industrial water users of Colorado River water who are not Central Arizona Project subcontractors.*

The subcommittee reviewed computer modeling studies performed by ADWR staff that identified potential shortages through the year 2100. These studies also identified

a number of uncertainties on the method which may be employed to distribute shortages among various water users. Depending on the shortage sharing methods, the 100-year cumulative shortage to Colorado River area M&I water users could be as low as only 21,000 af or as high as 779,000 af.

### ***Recommendation***

**The Study Commission believes that providing adequate shortage protection for Colorado River M&I water users outside of the CAP service area is critical. Water providers located along the Colorado River corridor usually lack a backup supply because water withdrawn from wells within the floodplain area is generally considered to be river water rather than groundwater. Therefore, when shortage conditions exist, these providers may be faced with extremely damaging water supply reductions. The Study Commission concluded that predicting the frequency and magnitude of these potential shortages is very difficult at the present time but recommends using a conservative approach for planning purposes.**

**The Bureau of Reclamation should clarify the method that will be used for determining how reduced deliveries to non-CAP priority 4 contractors will be shared between M&I and agricultural contractors. The Bureau should seek the input of all contractors within this category in establishing the method.**

### **Issue 2**

*Should the AWBA be empowered to obtain and make available water supplies to new water providers or to supplement the supplies and allocations of existing providers in areas located outside of the CAP service area?*

Water providers along the Colorado River have expressed concerns that their current level of water allocation will be inadequate to accommodate all of the anticipated growth. The Mohave County Water Augmentation Authority was formed to address the need for supplemental water supplies.

Quantifying the need for supplemental supplies is difficult and subject to a variety of assumptions. One common method includes use of census figures to project future population. Those figures are then multiplied by a gallons per person per day rate. Other methods factor in land use patterns and zoning to estimate an ultimate water need.

ADWR developed information regarding current allocations and projected future needs for water providers located along the Colorado River. The ADWR study indicates that only Lake Havasu City, of the large municipal providers, is likely to exceed its contract

amounts by the year 2040, although many may be using a large portion of their allocations. ADWR acknowledges that the data base used for these estimates needs additional information and is in the process of updating its estimates.

The Study Commission believes that M&I water supply augmentation for the fast growing areas along the Colorado River corridor may be an appropriate additional role for the AWBA. Because of the location of the communities, most, if not all, water withdrawn or diverted will be considered Colorado River water. Priority 4 supplies of Colorado River water available for allocation along the Colorado River are limited to 164,652 af, and all but a few thousand acre feet have been allocated. It may, therefore, be difficult for new water providers to be established or for existing providers to obtain additional allocations.

While these problems are recognized, the Study Commission also concluded that it may be inappropriate, or at least premature, to give the AWBA the responsibility for supply augmentation if there will not be a need for such service for a long time. Before making a recommendation on this issue, the Study Commission would like to better determine if there is a need for additional M&I water and if so, if water providers have an interest in using the AWBA to develop those supplies.

### **Issue 3**

*Should the AWBA be empowered to store water at recharge sites that do not have direct access to excess water delivered through the Central Arizona Project?*

The AWBA's enabling legislation limits the AWBA to obtaining water for storage that can be delivered through the CAP. The legislation does not allow the AWBA to independently own, develop, operate or construct storage facilities. The limitation that water delivered to a storage site must be delivered through the CAP means that all water must be stored either in western Arizona along the aqueduct route or at a facility within the CAP service area. In order to recover the water for the benefit of water users outside of the CAP service area, an exchange and forbearance mechanism must be established with CAP water users. If the AWBA could store water at a site near the Colorado River, it may be possible to deliver water to water users without requiring the exchange and forbearance agreements.

Two proposals were developed for discussion purposes: recharge to increase Colorado River return flows, and recharge and capture. The feasibility of the proposals is dependent upon favorable site-specific hydrogeologic conditions.

Storing water along the Colorado River may have advantages if the recovered water could be delivered without negatively impacting other Arizona water users' rights to divert

Colorado River water. If water is stored for too long, that water will be lost to the Colorado River. Water storage must, therefore, either be for short periods of time or should not be initiated until much closer to the time frame when it would need to be recovered. Of the two storage methods identified by the Study Commission, it appears that the recharge and capture method is more practical and thus worthy of further investigation and study. The Study Commission recommends that this issue be investigated further, but only if a practical water recharge site can be identified.

#### **Issue 4**

*Identify the needs and opportunities for the AWBA to provide assistance for water supply enhancement or drought protection for M&I water users who are neither located within the CAP service area nor located along the Colorado River.*

Growth is occurring throughout the state and there is a need for water supply augmentation in certain areas that do not have direct access to the CAP or the Colorado River. Communities that may have ample long-term supplies may find that a local shortage could occur in times of drought. Another potential need for water could result from the ultimate determination of water rights through the adjudication process. The AWBA could be a supply source for obtaining substitute supplies by serving as a statewide water augmentation agency. One critical difficulty in attempting to develop water supplies for users who lack access to the CAP or the Colorado River is the feasibility of implementing water exchanges on in-state river systems.

At present, there are obstacles to getting water to rural municipalities. It is not currently feasible to implement water exchanges on certain in-state river systems. However, this does not mean that rural community problems should not be addressed.

The Study Commission recommends that further consideration be given to this issue during the next year. The following activities should be addressed:

- Study population and growth trends of the rural counties in Arizona. ADWR may be able to provide direct assistance as would other governmental entities.
- Analyze the state to determine which areas would be likely to suffer the greatest impact if drought conditions were to arise. These areas should be categorized and prioritized for further study as to possible exchange scenarios or infrastructure development.
- Continue to work with the USBR and the U.S. Fish and Wildlife Service to examine endangered species impacts with respect to exchanges.

## **Issue 5**

*Should the AWBA be empowered to provide water supply enhancement assistance for non-M&I uses within Arizona such as environmental enhancement projects?*

As use of water within Arizona increases, the competition for remaining supply also increases. The discussion of using banking mechanisms to supply water for uses other than M&I focused on two examples. First, water may be needed for environmental enhancement or endangered species mitigation programs. The second example was the federal government's need to obtain a replacement supply for the brine stream that is associated with the operation of the Yuma Desalting Plant. The USBR has indicated interest in using the AWBA as a partial solution to issues associated with operating the Yuma Plant.

The Study Commission believes that this issue merits further consideration but does not have a specific recommendation at this time. Future activities should involve further identification of potential environmental projects that could benefit from AWBA services. The USBR should be consulted directly regarding the range of interest that the federal government may have in using the AWBA to meet its short or long term needs.

## **Issue 6**

*Study and determine the mechanisms for forbearance and exchange which may be used to deliver Water Bank-developed supplies to water users outside of the CAP service area.*

The AWBA is currently authorized to store water on behalf of Colorado River M&I contractors outside of the CAP service area. However, storage of water must occur as a result of deliveries through the CAP. When the stored water is recovered, it must be made available to the water users located in the Colorado River area. It is highly unlikely that the water will be directly transported from central Arizona groundwater basins back to the Colorado River area communities. An exchange agreement must, therefore, be made. Water users who normally would be receiving Colorado River water through the CAP must be willing to accept the recovered water as a substitute supply. As an alternative to utilizing CAP forbearance as the method for firming those contracts outside the CAP service area, the CAP could agree to indemnify the other post-1968 domestic users. Instead of creating unused water by forbearance, CAP could agree up-front to accept their shortage reduction plus any reductions that would have applied to the other post-1968 domestic water users.

The Study Commission believes this is an important issue to make the AWBA more useful for Colorado River communities. The concepts that the Study Commission has identified for creating forbearance within Arizona appear to have merit, but they require

additional study and discussion over the next year.

## **Issue 7**

*Should M&I water users located outside of the CAWCD service area who receive credits from the AWBA to offset a water shortage be required to pay to have those credits replaced? Should the reimbursement rate be equal to what the bank originally paid for the credits or should it be at the rate in effect at the time the purchase of replacement water is needed?*

Arizona Revised Statutes (A.R.S.) section 45-2457.B establishes the mechanism for M&I users outside of the CAWCD service area to take advantage of the AWBA to firm their supplies against the potential of shortage. First, the statute requires the AWBA to reserve a reasonable number of long-term storage credits accrued with the general fund appropriation for the benefit of those users. The AWBA is then instructed to distribute those credits back to those users only if the water users need the water to offset a shortage. The AWBA collects reimbursement for the cost to the AWBA of replacing the long-term storage credits distributed. (Similar requirements exist for use of general fund credits used for M&I shortages within the CAWCD service area.)

Discussion on this issue in the Study Commission focused on the need to clarify the statutory language to make it clear that the reimbursement of funds would not be needed in the same year water was being withdrawn from the Water Bank to protect against shortages. If a Colorado River shortage was taking place, it would obviously be very difficult, and therefore very expensive for the AWBA to obtain a replacement supply. Mohave County representatives would like the statute clarified to show that the intent of the reimbursement provision is that the AWBA should wait until alternative sources are more readily available before obtaining a replacement.

The Study Commission has concluded that A.R.S. section 4524.57.B is ambiguous and should be amended to clarify that additional sources of water need not be purchased in the same year as when the supplies are withdrawn.

An additional issue is whether the replacement supply of water needs to be continued. The purchaser of water may be required to “pay back” the cost of the water but may not be required to actually replace the water. The Study Commission intends to further examine whether replacement is necessary. Concern was voiced, however, that a Colorado River community that has no backup supply may be extremely vulnerable in the future if the AWBA does not continuously restore drought protection supplies.

## **Recommendations**

**☐ Issues related to mechanisms and opportunities for Arizona Indian Communities to participate or benefit from Arizona Water Banking Authority activities.**

The identification of appropriate mechanisms to allow Arizona's Indian communities to participate in water banking activities is one of the primary areas for consideration by the Study Commission. The Study Commission is also very interested in identifying ways the AWBA can assist in the settlement of Indian water rights claims, which is an existing function of the AWBA. The Indian Issues Subcommittee addressed these and other related issues.

The subcommittee adopted an approach of working with individual Indian Communities to identify problems and needs that could be solved with water banking programs. The subcommittee found that meetings with the Tribes were rewarding, and a great deal of information was exchanged.

The Indian Issues Subcommittee organized their work effort around four issue statements.

**Issue 1**

*What are the respective water rights and supplies of the Arizona Indian tribes and how will they interact with the AWBA?*

While no two tribes have identical circumstances, the subcommittee concluded that several of the tribes may share common issues or opportunities to interact with the AWBA. The tribes were consequently categorized as follows:

- Tribes with a CAP allocation and an implemented settlement
  - Ak Chin Indian Community, Fort McDowell Indian Community, Salt River Pima-Maricopa Indian Community, and Yavapai-Prescott Indian Tribe.
- Tribes with a CAP allocation and full or partially negotiated settlements not yet implemented
  - San Carlos Apache Tribe and the Tohono O'odham Nation.
- Tribes with CAP allocation but no Indian water rights settlement
  - Gila River Indian Community, Pasqua Yaqui Tribe, Tonto Apache Tribe, and the Yavapai-Apache Nation.
- Tribes with adjudicated water rights but no CAP allocation
  - Cocopah Tribe, Colorado River Indian Tribes, Fort Mohave Indian Tribe, and the Fort Yuma-Quechan Tribe.
- Tribes without adjudicated water rights, settlements or CAP allocations
  - Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab-Paiute Tribe, Navajo

Nation, San Juan Southern Paiute Tribe, White Mountain Apache Tribe, and the Pueblo of Zuni.

### ***Recommendation***

#### **Issue 2**

*How can the AWBA assist in achieving implementation of Indian water rights settlements?*

The subcommittee discussed this issue extensively and found a number of feasible techniques that the AWBA may employ to assist in implementing water rights settlements. The primary techniques include:

- Provide a partial water supply including:
  - Shortage protection
  - Storage accounts
  - Supplementing other supplies
  - Use of alternate sources of water for use on the reservation
- Mitigate impacts of off-reservation groundwater overdraft
- On-reservation storage techniques

### ***Recommendation***

#### **Issue 3**

*How can the AWBA provide additional water supplies or marketing services to Indian communities?*

The Study Commission has identified a number of potential interactions between the AWBA and Indian communities which may be mutually beneficial but are not directly related to an Indian water rights settlement. Generally, these activities involve the AWBA providing water storage services for a tribe or the purchase of water by the AWBA from the tribe. Additional legislative authorization would be needed before these types of activities could be initiated. The four techniques identified are:

- Store unused Indian water for the tribe's benefit at off-reservation locations
- Purchase water from Indian tribes as a supply source for recharge
- Serve as an intermediary or facilitator in marketing Indian water to non-Indian water users
- Arrange land following agreements

The Study Commission believes that the measures relating to water marketing identified to date should continue to be investigated. Many of the ideas described may potentially be accomplished without the AWBA's involvement. It will, therefore, be necessary to determine whether the Indian communities believe that the AWBA could serve a beneficial function in facilitating marketing transactions. The Study Commission also recommends that special emphasis be placed on those concepts that would permit Indian communities to participate with the AWBA in banking activities related to interstate transactions with California and Nevada. These concepts should focus on the opportunities to store interstate water at sites on reservations and to provide a financial benefit to Indian communities as a result of water purchases for interstate purposes.

#### **Issue 4**

*What are some of the challenges facing Indian community participation in AWBA activities?*

The Study Commission identified variety of legal, institutional, physical, and cultural challenges which may impede Indian tribes from partnering with the AWBA. Many of these challenges were identified through the fact-finding meetings the Study Commission held with tribal council representatives. These challenges include:

- Lack of delivery infrastructure or exchange capability
- Difficulty for the AWBA to participate in settlement discussions
- Funding limitations
- Legal and policy questions about marketing
- Low demands for short-term water supplies
- Wheeling agreements through the CAP
- Sovereignty, trust, and regulatory issues
- Federal participation

The Study Commission concluded that numerous challenges will confront Indian community participation in water banking activities. The Study Commission recommends that the legal questions about marketing be explored in more detail. The Study Commission fully appreciates that the problems associated with Indian sovereignty, trust, and regulation may be very difficult to overcome. The Study Commission intends to focus on these issues in future discussions with the Indian communities to identify ways that meaningful partnerships may be established.

#### ***Recommendations***

- Long range planning and administrative issues**

## **Conclusions**