

# **Building Strong Collaborative Relationships for a Sustainable Water Resources Future:**

**STATE OF ARIZONA**

SUMMARY OF STATE WATER PLANNING

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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

## STATE OF ARIZONA

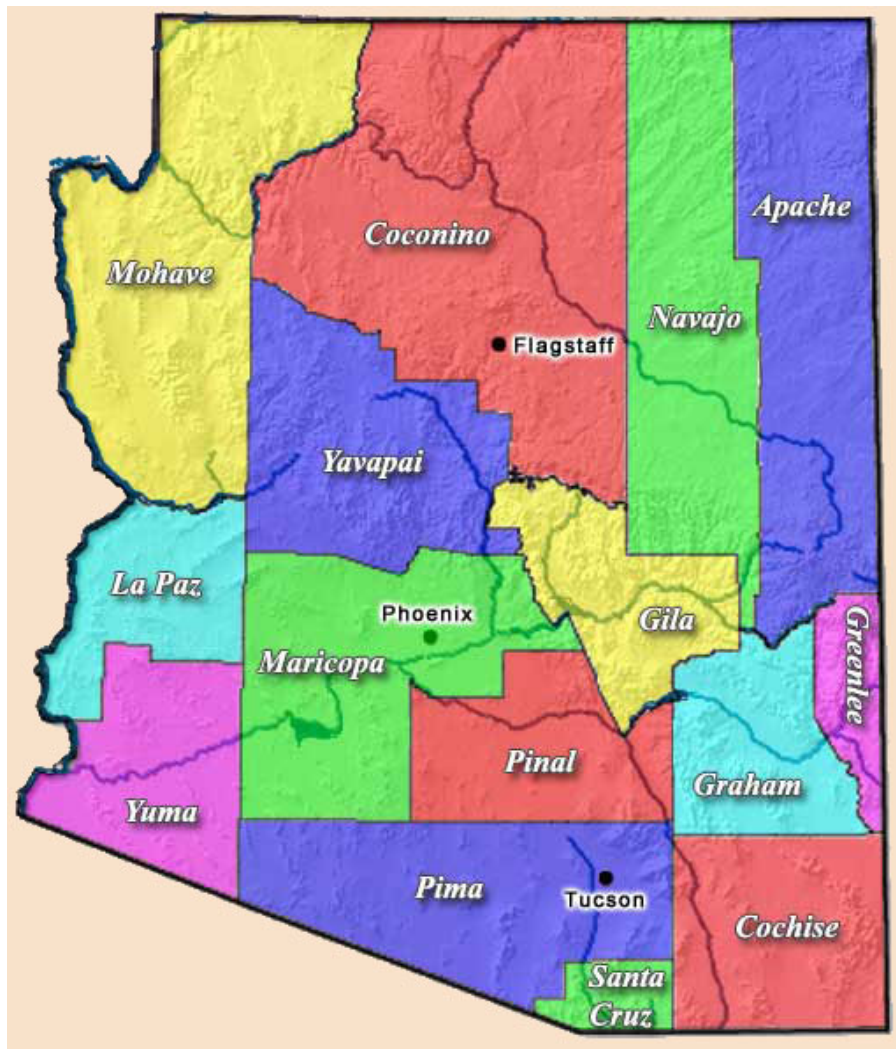


Figure 1. Arizona Interactive County Map “Check Your Water Supply”

<http://www.azwater.gov/CkWaterSupply/>

### 1. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

The agency responsible for overseeing the state water policy is the Arizona Department of Water Resources (ADWR). ADWR manages the water supply within the state and represents the state on local, regional, national, and international water issues. The offices and divisions within ADWR are:

- Office of the Director
- Legal Division
- Office of Information Technology
- Hydrology Division

- Statewide Conservation and Strategic Planning Division
  - Colorado River Management
  - Regional Water Resources Planning
  - Community Water Planning
  - Adjudication and Planning Support
- Office of Water Engineering
  - Dam Safety Section
  - Flood Mitigation Section
  - Engineering Technical Support Section
- Water Management Division
  - Active Management Areas
  - Office of Assured/Adequate Water Supply
  - Water Management Support Section
- Administrative Service Division

The programs within ADWR include: Adjudications and Settlements; Active Management Areas (Prescott, Phoenix, Pinal, Tucson, and Santa Cruz) and Irrigation-Non Expansion Area (Joseph City, Douglas, and Harquahala); Assured and Adequate Water Supply; AZ Water Banking Authority; Colorado River Management; Conservation; Compliance and Enforcement; Dam Safety and Flood Mitigation; Drought; Hydrology/Subsidence; Recharge; Rural Programs; Water Protection Fund; Surface Water Rights; and Wells.

The Arizona Department of Environmental Quality (ADEQ) Water Quality Division (WQD) is the responsible agency for water quality. ADEQ was established by the Arizona Environmental Quality Act of 1985 to administer environmental protection programs. The director of the WQD is Joan Card.

Key contact information is provided below:

Arizona Department of Water Resources

Herb Guenther, Director

Tom Carr, Assistant Director, [tg carr@azwater.gov](mailto:tg carr@azwater.gov)

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Phoenix, AZ 85012

(602) 771-8426

<http://www.azwater.gov/dwr/default.htm>

Water Quality Division

Joan Card, Director

1110 W. Washington St.

Phoenix, AZ 85007

(602) 771-2303

<http://www.azdeq.gov/index.html>

The key contacts within the ADWR are included at the following location:

<http://www.azwater.gov/dwr/Content/ContactUs/DeptOrganization/default.htm>.

## 2. STATE/REGIONAL WATER PLANNING STATUS

Arizona has no comprehensive statewide water resources plan. Rather strategic planning has been established around areas of significance such as the Colorado River or regional areas with dense populations and/or high water use – agriculture. Appraisal level studies that will lead to feasibility studies are either underway or completed for Coconino Plateau, Upper San Pedro and Verde River Groundwater Basins. These areas have growing populations and water uses that have created environmental issues and water rights conflicts that threaten the long-term sustainability of the cities and towns. Droughts leading to shortages for communities along the Colorado River and within central Arizona are predicted. These areas represent the majority of irrigated agriculture, urban and industrial development. For the central Arizona cities and the tribes that receive CAP water, the State plans and implements shortage protection programs that include projects to recharge and store excess Colorado River water in aquifers for future uses. In addition to the state efforts for shortage planning, all community water systems state-wide are required to prepare drought and emergency water resources plans. While there is no traditional comprehensive statewide water resources plan published, the state pursues regional planning efforts in a coordinated and focused way to address the most critical long-term water needs. The legislation governing water resources in Arizona are included in the 1) Arizona Administrative Code – Title 12: Natural Resources, Chapter 15: Department of Natural Resources ([http://www.azsos.gov/public\\_services/Title\\_12/12-15.htm](http://www.azsos.gov/public_services/Title_12/12-15.htm)) and 2) Arizona Revised Statutes – Title 45: Waters (<http://www.azleg.state.az.us/ArizonaRevisedStatutes.asp?Title=45>).

### Arizona Revised Statutes, Title 45 – Waters

The Arizona Revised Statutes (ARS) have most recently been revised on January 1, 2009 to include the most updated information from the 48<sup>th</sup> Legislature. The chapters included in Title 45 include:

- Chapter 1 – Administration and General Provisions
  - Article 1: Department of Water Resources
  - Article 3: Bodies of Water
  - Article 4: Public Nature and Use of Surface Water
  - Article 5: Appropriation of Water
  - Article 6: Rights to Water
  - Article 7: Water Rights Registration
  - Article 8: Reservoirs and Canals
  - Article 9: General Adjudication of Water Rights
  - Article 10: Registration of Stockponds
  - Article 11: Exportation of Water From This State
  - Article 12: Water Conservation Plumbing Requirements
  - Article 13: Colorado River Water Use Fee
  - Article 14: Community Water System Planning and Reporting Requirements
- Chapter 2 – Groundwater Code
  - Article 1: Administration
  - Article 2: Active Management Areas
  - Article 3: Irrigation Non-Expansion Areas

- Article 4: Groundwater Rights and Uses in General
- Article 5: Grandfathered Groundwater Rights in Active Management Areas
- Article 6: Groundwater Rights and Uses Within Service Areas
- Article 7: Groundwater Withdrawal Permits
- Article 8: Transportation of Groundwater
- Article 8.1: Withdrawals of Groundwater for Transportation to Active Management Area
- Article 9: Management
- Article 10: Wells
- Article 11: Financial Provisions
- Article 12: Enforcement
- Article 15: Certificate of Groundwater Oversupply
- Chapter 3.1 – Underground Water Storage, Savings, and Replenishment
  - Article 1: General Provisions
  - Article 2: Storage Facility Permits
  - Article 3: Water Storage Permits and Recovery Well Permits
  - Article 3.1: Indian Water Rights Settlements
  - Article 4: Accounting
  - Article 5: Permit Application Procedures, Financial Provisions and Enforcement
  - Article 6: State Demonstration Projects
- Chapter 4 – Water Exchanges
  - Article 1: General Provisions
  - Article 2: Enrollment of Water Exchange Contracts
  - Article 3: Permits for Water Exchanges
  - Article 4: Water Exchanges Pursuant to Notice
  - Article 5: Enforcement
- Chapter 6 – Dams and Reservoirs
  - Article 1: Supervision of Dams, Reservoirs and Projects
- Chapter 7 – Interstate Streams
  - Article 1: Lake Mead Contract
  - Article 2: Colorado River Compact
  - Article 3: Upper Colorado River Basin Compact
  - Article 4: Distribution of Federal Funds Derived From Colorado River
- Chapter 8 – Flood Control
  - Article 1: Cooperation by Counties, Cities and Towns With Federal Government
  - Article 2: Special Laws Pertaining to Particular Municipalities
  - Article 3: Flood Control Assistance
  - Article 4: Alternative Assistance
  - Article 5: Flood Control Loans
  - Article 6: Flood Warning Systems
- Chapter 9 – Weather Control and Cloud Modification
  - Article 1: In General
- Chapter 10 – State Water and Power Plan
  - Article 1: In General
- Chapter 11 – County Water Augmentation Authority
  - Article 1: Formation and Dissolution

- Article 2: Administration
- Article 3: Powers and Duties
- Article 4: Financial Provisions
- Article 5: Revenue Bonds
- Chapter 12 – Arizona Water Protection Fund
  - Article 1: General Provisions
  - Article 2: Financial Provisions
- Chapter 13 – County Water Authority
  - Article 1: Formation and Dissolution
  - Article 2: Administration
  - Article 3: Powers and Duties
  - Article 4: Construction Contract
  - Article 5: Financial Provisions
- Chapter 14 – Arizona Water Banking Authority
  - Article 1: General Provisions
  - Article 2: Arizona Water Banking Authority
  - Article 3: Water Bank Planning and Implementation
  - Article 4: Interstate Water Banking
  - Article 5: Indian Firming Measures
- Chapter 15 – Gila River Indian Community Water Settlement Program
  - Article 1: General Provisions
  - Article 2: Transportation of Underground Water and Stored Water Away from Eastern Protection Zones and Western Protection Zones
  - Article 3: Replenishment of Underground Water and Stored Water Withdrawn in Eastern Protection Zones and Western Protection Zones
  - Article 4: Dams Within Gila River Maintenance Area
  - Article 5: Irrigation of New Lands Within Gila River Maintenance Area
  - Article 6: Enforcement
- Chapter 16 – Tohono O’Odham Water Settlement Program
  - Article 1: General Provisions
  - Article 2: San Xavier Reservation Water Protection Program

### **Arizona Groundwater Management Code – Chapter 2 of ARS**

Arizona, pre-1980, dealt with surface water and groundwater separately. Surface water was governed by prior appropriations: “first in time, first in right”; whereas groundwater was determined by common law – belonging to the overlying land owner. The Arizona Groundwater Management Code (GMC) was created as a result of: 1) the water supply threat to mining and municipalities; 2) the threat of the federal government to halt the Central Arizona Project; and 3) severe overdraft conditions in several parts of the state. GMC was passed by the legislature in 1980 with the following three goals to be met by 2025:

- Control the severe groundwater overdraft occurring in many parts of the State
- Provide a means to allocate the State’s limited groundwater resources to most effectively meet the changing needs of the State
- Offset Arizona’s use of groundwater through renewable water supply development

The GMC created the Arizona Department of Water Resources and in doing so charged the ADWR with the following duties for securing long-term water supplies for Arizona communities:

- Implementing the Groundwater Management Code
- Registering all surface water and groundwater rights
- Supporting the adjudication of water rights within the state
- Ensuring the safety of non-federal dams
- Assisting local entities to manage floodplains
- Providing technical assistance to the state's water users
- Representing Arizona in interstate water discussions

The GMC, as a way to accomplish its goals, put the ADWR in charge of statewide provisions, Irrigation Non-Expansion Areas (INAs) and active management areas (AMAs). The statewide provisions include regulatory standards for wells and groundwater transport outside the AMAs.

INAs were established in rural farming areas where groundwater overdraft was less severe than AMAs. The objective of creating INAs was to prevent further declines of groundwater supplies primarily through prohibition of irrigation acreage expansion. These INAs include Josephs City, Douglas, and Harquahala. AMAs were established as the state's high water use areas.

Initially five active management areas for the major urban and agriculture areas were created. This urban area consists of 80% of the population, 70% of the groundwater overdraft, and 13% of Arizona's total land mass. A goal was developed for each AMA for the period between 1980 and 2025. The AMAs with their associated goals is listed below:

1. Pinal - protecting the agricultural economy for as long as feasible, while preserving water supplies for future non-agricultural purposes
2. Phoenix – reaching safe yield\* by 2025
3. Prescott – reaching safe yield\* by 2025
4. Tucson (was split to form Santa Cruz in 1994) – reaching safe yield\* by 2025
5. Santa Cruz – maintaining safe yield\* and preventing further decline of local water tables

*\*Safe-yield is defined as a groundwater management goal that attempts to achieve and thereafter maintain a long-term balance between the amount of groundwater withdrawn in an AMA and the amount of water recharged to the aquifer, through either rainfall or runoff percolating into the aquifer or artificially through recharge projects.*

The AMAs were established to provide long-term management and conservation of their limited groundwater supplies. Despite the AMA's being created under the groundwater code, the AMAs manage and balance surface water, recharged water, and reclaimed water resources in addition to the overdrafted groundwater that lead to the 1980 legislation. AMAs administer state laws, explore ways of augmenting water supplies to meet future needs, and routinely work to develop public policy in order to promote efficient use and an equitable allocation of available water supplies.

Under the legislation, a management goal, water supply program, limited agriculture growth, and a series of management plans are all required. An AMA management plan has been created for



each of the 3 decades since the GMC. The Third Management Plan for each of the AMAs is dated for the 2000 – 2010 period. The ADWR will soon be working on the Fourth Management Plan for the 2010 – 2020 period. (The Fifth Management Period will be only five years: 2020 – 2025). Each of the AMA Management Plans includes:

- Goals & objectives and background information
- Water supply and demand
- Conservation program for all water sectors (e.g. agriculture, municipal, industrial)
- Groundwater quality management program
- Augmentation and recharge program
- Water management assistance program
- Plan implementation program
- Water quality
- Water budget
- Future use strategies and alternative supplies

### **State Water and Power Plan – Chapter 10**

Chapter 10 of the ARS includes legislation about the State Water and Power Plan. According to ARS 45-1703.A, *a water and power plan for the state is established*. The water portion of this particular Plan consists of Colorado River water granted to Arizona by the U.S. Supreme Court in 1964. As a means of managing the Colorado River water, and to counteract the state’s 2.5 million acre-foot groundwater overdraft, the Central Arizona Project (CAP) was created. CAP is the 336 mile long aqueduct running from Lake Havasu to Tucson (note: while titled “state water and power plan” the legislation focused primarily on CAP and did not include other broad planning related processes and elements). This aqueduct provides water for agriculture in the Maricopa, Pinal, and Pima Counties; municipal water to the Phoenix and Tucson areas; and water to 12 different Native American Tribes. Cap also consists of the New Waddell Dam, Camp Dyer Diversion, and Havasu Intake Channel Dike.

### **Additional Legislation**

In 2007 the legislature passed State Bill 1575, the Water Adequacy Amendment, which among other things, provides clear authority for cities, towns and counties to adopt an ordinance requiring new subdivisions to obtain from the ADWR a determination of an adequate 100-year water supply in order to obtain final plat approval from the local platting authority. As a result, the Department is in the process of amending its existing Adequate Water Supply Rules as required by State Bill 1575. <http://www.azwater.gov/dwr/WaterManagement/Content/OAAWS/default.asp>

Additional statewide planning documents include the *Arizona Drought Preparedness Plan*, the *Arizona Water Atlas* and *Annual Water Use Report*.

### 3. WATER MANAGEMENT VISION AND GOALS

The mission/vision statement of ADWR is:

- To ensure a long-term, safe, sufficient and secure water supply for the State
- To develop public policies that promote the efficient use and equitable distribution of water in an environmentally sound manner
- To promote the management of floodplains and dams to reduce risk of loss of life and damage to property

### 4. SCOPE OF WATER RESOURCES PLANNING AND MANAGEMENT

Every fiscal year, the ADWR releases an Annual Report going through: Accomplishments, Agency Priorities, Arizona Groundwater Management Code, Agency Organization, Critical Challenges and Opportunities, and Conclusion on the status of the state's water resources. Table 1 is an overview of the annual average of the amount and source of water used between 2001 and 2003.

[http://www.azwater.gov/dwr/Content/Find by Category/About ADWR/ADWR Annual Report 2008.pdf](http://www.azwater.gov/dwr/Content/Find%20by%20Category/About%20ADWR/ADWR%20Annual%20Report%202008.pdf)

**Table 1. 2008 Annual Arizona Water Demand**

Water Source	Million Acre-Feet	Million Acre-Feet	% of Total
<b>SURFACE WATER</b>			
Colorado River		2.8	35.6%
CAP	1.6		20%
On-River	1.2		16%
In-State Rivers		1.4	17.8%
Salt-Verde	1.0		13%
Gila & Others	0.4		5%
<b>GROUNDWATER</b>		2.9	36.8%
<b>RECLAIMED WATER</b>		1.0	9.8%
<b>TOTAL</b>		8.1	100%

(Current use 2008 (one year assessment – spot in time assessment); personal communication Tom Carr March 2008) <http://www.azwater.gov/dwr/Content/Publications/files/supplydemand.pdf>

### Trends Impacting Water Resources

The State's Active Management Areas were established to provide long-term management and conservation of their limited groundwater supplies. In order to accomplish this, the AMAs: administer state laws, explore ways of augmenting water supplies to meet future needs, and routinely work to develop public policy in order to promote efficient use and an equitable allocation of available water supplies. The active management areas plans address water conservation for agriculture, municipal, and industrial as a means to attaining the 2025 goals. The Third Management Plan uses the previous two plans to reflect on progress while making projections and strategies for the next plan.

### Agriculture

Each of the 5 AMA Third Management Plans has an agriculture conservation chapter. The introduction begins with the methods of conserving water such as improving on-farm water management practices, utilizing renewable supplies, and reduction of irrigated acreage due to urban development. The Plan then details the statutory provisions required by the GMC, the maximum groundwater allotments, the agriculture conservation program components, non-regulatory water resources management strategies (such as effluent use), and future directions. The conservation and reporting requirements follow by an appendix of various crops and their water use. Tables 2 to 5 and Figure 2 show the agriculture use compared with municipal and industrial use for various years including 1995.

### Municipal

Municipal water use includes residential, commercial, governmental, industrial, and construction. It does not include water used for irrigation. The goals outlined in the Municipal Conservation Program Chapter of the Third Management Plan are: (1) gradually reduce per capita water consumption; (2) encourage the use of the best available water conservation practices; and (3) maximize the efficient use of all water supplies including the direct use of reclaimed water. Artificial recharge is becoming a more widely used water storage method. The Plan details statutory provisions required by the GMC, relationship of sector to achievement of management goal, assured water supply program, First and Second Management Plans, municipal program issues, Third Management Plan municipal conservation program, incentives for the use of renewable supplies and remediated groundwater, non-regulatory efforts, and summary and conclusion.

### Industry

By definition of GMC, industrial users are groundwater users, although renewable supplies may be used in addition to groundwater. Efficient use of groundwater and the replacement of groundwater with renewable sources are listed as the methods for attaining the industrial goal in the Third Management Plan. The Plan details water use by the subsector, First and Second Management Plan, program development, issues and Third Management Plan development, program description, non-regulatory efforts, future directions, and subsector conservation requirements.

### Conservation

Conservation programs and education are highly utilized in Arizona. *A Summary of Water Conservation Programs in Active Management Areas* was released by ADWR in March 2007 covering the incentives and services, ordinances, educational programs, and outreach programs provided to the customers of municipal service providers within the AMAs. This summary assists municipal providers in providing conservation programs as well as documents the ongoing conservation programs of municipal providers.

<http://www.azwater.gov/dwr/WaterManagement/Content/AMAs/files/2007Conserv.Summary.pdf>

## **Table 2. Phoenix Water Use 1985 – 1995**

Sector	1985		1990		1995	
	Total Use (acre-feet)	% of AMA	Total Use (acre-feet)	% of AMA	Total Use (acre-feet)	% of AMA
Agricultural <sup>1</sup>	1,622,039	69	1,260,186	60	1,333,885	58
Municipal <sup>2</sup>	657,191	28	782,474	37	869,962	38
Industrial	73,485	3	73,767	3	83,088	4
<b>TOTAL</b>	<b>2,352,715</b>		<b>2,116,427</b>		<b>2,286,935</b>	

<sup>1</sup> Includes Indian Agriculture use

<sup>2</sup> Includes Indian Municipal & Industrial use, deliveries to Palo Verde Nuclear Generating Facility, and exempt wells

**Table 3. Santa Cruz Water Use 1985 – 1995**

Sector	1985		1990		1995	
	Total Use (Acre-feet)	% of AMA	Total Use (Acre-feet)	% of AMA	Total Use (Acre-feet)	% of AMA <sup>2</sup>
Agricultural	8,960	62	11,603	61	12,884 <sup>1</sup>	62
Municipal	4,027	28	6,068	32	6,674	32
Industrial	1,393	10	1,328	7	1,363	7
<b>TOTAL</b>	<b>14,380</b>	<b>100</b>	<b>18,999</b>	<b>100</b>	<b>20,921</b>	<b>100</b>

<sup>1</sup> 1995 agricultural data do not include the water usage of exempt small rights; rights <10 acres in size were deregulated in 1994.

<sup>2</sup> Numbers may not add up to 100 due to rounding.

NOTE: Municipal water use associated with exempt wells (wells that pump less than or equal to 35 gallons per minute) is not shown.

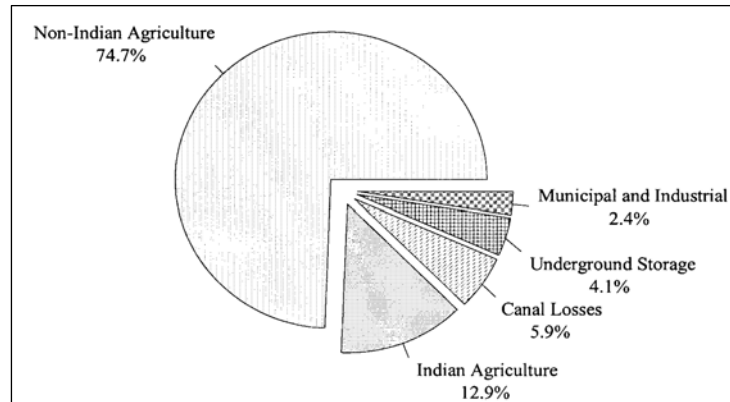
**Table 4. Tucson Water Use 1985 - 1995**

Sector	1985		1990		1995	
	Total Use (Acre-feet)	% of AMA	Total Use (Acre-feet)	% of AMA	Total Use (Acre-feet)	% of AMA
Agricultural	114,450	40	93,801	34	97,180 <sup>1</sup>	31
Municipal	115,735	40	129,444	48	154,894	50
Industrial	55,744	20	48,743	18	60,204	19
<b>TOTAL</b>	<b>285,929</b>	<b>100</b>	<b>271,988</b>	<b>100</b>	<b>312,278</b>	<b>100</b>

<sup>1</sup> 1995 agricultural data do not include the water usage of exempt small rights; rights <10 acres in size were deregulated in 1994.

NOTE: Municipal water use associated with exempt wells (wells that pump less than 35 gallons per minute) is not shown.

NOTE: Agricultural use includes canal losses.



**Figure 2. Pinal Water Use 1995**

### Funding

ADWR offers grants and funding for the following: [Phoenix AMA Water Management Assistance Program](#), [Tucson AMA Water Management Assistance Program](#), and [Water Protection Fund](#).

The Water Management Assistance Programs offer The Water Protection Fund as an annual source of monies for the development and implementation of measures to protect water of sufficient quality and quantity to maintain, enhance, and restore rivers and streams and associated riparian habitat.

Water Supply Development Revolving Fund, approved by House Bill 2692, allows funding in the form of loans and grants to water providers for water supply development, including planning and design; purchasing or refinancing debt obligations for water providers; purchasing insurance for local bond obligations; paying costs to administer the fund; and providing linked deposit guarantees through third party lenders for water providers who have adopted a water adequacy requirement or who are within an AMA.

## **5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT**

The Statewide Water Advisory Group (SWAG) was created by the ADWR director, Herb Guenther, to advise the ADWR regarding programs for water resources development and management that are needed to provide a reliable future water supply throughout Arizona and to address water issues that have come to the attention of the Legislature and Governor. In 2007, the SWAG got 3 bills sponsored and passed in the in the state House of Representatives (HB 2300 – Water District; Upper San Pedro, HB 2484 – Contamination; Well Impacts, HB 2692 Water Supply Development Revolving Fund) and 1 bill sponsored and passed by the state Senate (SB 1575 Water Adequacy Amendments).

Table 5. Prescott Water Use 1990 – 1997

Year	Municipal Use (acre-feet)	Agricultural Use (acre-feet)	Industrial Use (acre-feet)	Total Use (acre-feet)
1990 Totals	8,633	6,932	444	16,009
Groundwater	8,289	6,032	444	14,765
Effluent	344	0	0	344
Surface Water	0	900	0	900
1991 Totals	9,379	9,391	486	19,256
Groundwater	8,667	5,943	486	15,096
Effluent	712	0	0	712
Surface Water	0	3,448	0	3,448
1992 Totals	9,406	7,790	443	17,639
Groundwater	8,756	4,613	443	13,812
Effluent	650	0	0	650
Surface Water	0	3,177	0	3,177
1993 Totals	10,372	10,809	500	21,681
Groundwater	9,595	6,460	500	16,555
Effluent	777	611	0	1,388
Surface Water	0	3,738	0	3,738
1994 Totals	10,745	8,087	533	19,365
Groundwater	10,044	6,134	533	16,711
Effluent	701	253	0	954
Surface Water	0	1,700	0	1,700
1995 Totals	11,091	9,217	555	20,863
Groundwater	10,303	5,316	555	16,174
Effluent	788	302	0	1,090
Surface Water	0	3,599	0	3,599
1996 Totals	12,571	8,164	688	21,423
Groundwater	11,635	6,629	688	18,952
Effluent	936	205	0	1,141
Surface Water	0	1,330	0	1,330
1997 Totals	12,366	7,572	626	20,564
Groundwater	11,594	6,260	626	18,480
Effluent	772	302	0	1,074
Surface Water	0	1,010	0	1,010

**Table 6. Agencies Assisting Arizona with Water Resources**

<b>Agency</b>	<b>Responsibility</b>	<b>URL</b>
University of Arizona Water Resources Research Center	Promotes understanding of critical state and regional water management and policy issues through research, community outreach and public education	<a href="http://ag.arizona.edu/AZWATER/">http://ag.arizona.edu/AZWATER/</a>
Office of the Arizona State Climatologist	Provide information regarding the state's climate in support of operational, educational, planning, and research endeavors	<a href="http://www.public.asu.edu/~aunjs/">http://www.public.asu.edu/~aunjs/</a>
ADEQ Water Quality	Protect and enhance public health and the environment by ensuring safe drinking water and reducing the impact of pollutants discharged to surface and groundwater	<a href="http://www.azdeq.gov/environ/water/index.html">http://www.azdeq.gov/environ/water/index.html</a>
Arizona State Lands Department – Water Rights Management Program	Water rights, claims, and well administration	<a href="http://www.land.state.az.us/programs/natural/water_rights.htm">http://www.land.state.az.us/programs/natural/water_rights.htm</a>
Arizona Secretary of State	Arizona Administrative Code – Title 12: Water Resources	<a href="http://www.azsos.gov/PUBLIC_SERVICES/Title_12/12-17.htm">http://www.azsos.gov/PUBLIC_SERVICES/Title_12/12-17.htm</a>
Arizona Game and Fish	Conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations	<a href="http://www.gf.state.az.us/">http://www.gf.state.az.us/</a>
Arizona Flood Warning and Drought Monitoring	Provide weather, precipitation and stream flow information in “real time” in order to monitor and assess the potential risk for flooding in areas within Arizona	<a href="http://data.afws.org/sui/frontPage.aspx">http://data.afws.org/sui/frontPage.aspx</a>
U.S. Bureau of Reclamation – Lower Colorado Region	Involved in the critical issue of water development in Arizona since 1902. Helped the state of Arizona move forward with its water management goals. Manages the lower Colorado River and water resource projects and programs in Arizona	<a href="http://www.usbr.gov/lc/region/g1000/lawofrvr.html">http://www.usbr.gov/lc/region/g1000/lawofrvr.html</a>  <a href="http://www.usbr.gov/lc/">http://www.usbr.gov/lc/</a>
Central Arizona Project	steward of central Arizona's Colorado River water entitlement and a collaborative leader in Arizona's water community	<a href="http://www.cap-az.com/">http://www.cap-az.com/</a>
Climate Science Applications Program	Develop and coordinate outreach activities and applied research between the climate research community at the University of Arizona and a wide group of climate science user groups throughout the Southwest.	<a href="http://ag.arizona.edu/climate/about/csap.htm">http://ag.arizona.edu/climate/about/csap.htm</a>
CLIMAS - Climate assessment for the Southwest	Assess the impacts of climate variability and longer-term climate change on human and natural systems in the Southwest	<a href="http://www.climas.arizona.edu/">http://www.climas.arizona.edu/</a>
National Oceanic and Atmospheric Administration	Employing new tools to accurately measure climate change... NOAA will install the last nine of the 114 stations as part of its new, high-tech climate monitoring network	<a href="http://weather.noaa.gov/weather/AZ_cc_us.html">http://weather.noaa.gov/weather/AZ_cc_us.html</a>
U.S. Geological Survey	Direct link to all kinds of water-resource information	<a href="http://az.water.usgs.gov/">http://az.water.usgs.gov/</a>
Western States Water Counsel	Purposes of the Council are: (1) to accomplish effective cooperation among western states in the conservation, development and management of water resources; (2) to maintain vital state prerogatives, while identifying ways to accommodate legitimate federal interests; (3) to provide a forum for the exchange of views, perspectives, and experiences among member states; and (4) to provide analysis of federal and state developments in order to assist member states in evaluating impacts of federal laws and programs and the effectiveness of state laws and policies	<a href="http://www.westgov.org/wswc/">http://www.westgov.org/wswc/</a>

## Public Involvement

Under the Statewide Water Conservation and Strategic Planning - Community Water Planning Program, a statewide strategy of water conservation, drought and long-term water supply planning is ongoing. Public outreach is mainly in the form of conservation education and



incentive programs, assistance with the drought and water supply plans, and a requirement to annually report water uses. Through the Rural Program, ADWR, over the past four years, has provided substantial planning assistance to rural areas with expanding populations, limited groundwater resources and unique environmental features. ADWR assists citizen organizations and local governments by providing technical information and analysis, administrative support and advice on water issues. In cooperation with the USGS, the state has invested several million dollars to assess groundwater conditions and develop groundwater models for the Coconino Plateau, Verde River, Upper San Pedro and other groundwater basins throughout the state. In cooperation with the US BOR, the state has completed, or has underway appraisal studies of the water resources problems and water importation options for several of the basins. Two of the areas, the Upper San Pedro and Coconino Plateau, have requested feasibility studies that may lead to large scale augmentation projects. The USGS reports and USBOR reports are published and available on those agencies WEB sites.

Active formal and ad hoc groups are used throughout the state to keep the public informed and involved. Many of the groups are sponsored by the counties and other local governments.

## **6. PLAN IMPLEMENTATION STRATEGY**

Arizona maintains a proactive approach to addressing the state's water resource needs. The ADWR 2007-2008 Annual Report states:

*ADWR's groundwater management structure within the AMAs has received national and international acclaim. In more recent times, additional praise has been focused on ADWR's leadership in underground storage and recovery (recharge) programs, drought planning and response, protection of the State's rights to Colorado river water, the establishment of the Arizona Water Banking Authority (AWBA), and the Assured Water Supply (AWS) Program that requires proof of a 100-year water supply before a subdivision plat can be approved by a platting entity in an AMA or in a city, town or county outside on an AMA that has adopted a mandatory water adequacy ordinance.*

[http://www.azwater.gov/dwr/Content/Find\\_by\\_Category/About\\_ADWR/ADWR\\_Annual\\_Report\\_2008.pdf](http://www.azwater.gov/dwr/Content/Find_by_Category/About_ADWR/ADWR_Annual_Report_2008.pdf)

## **7. OUTCOMES ASSESSMENT PROCESS**

The sustainability of Arizona's groundwater resources and the minimization of ground water mining impacts are one of the primary objective and determination of successful water supply management. Programmatic goals, objective and legal authorities and responsibilities guide the Department in planning and implementation and addressing multistate and international water management and challenges.

## **8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS**

AMAs have focused on helping ensure that Arizona's ground water resources are sustainable. This is one of the most significant challenges facing Arizona. Balancing water supply and demand is the key objective with aquifer storage and recharge a major tool to help increase groundwater storage and supply. Population growth in the urbanized areas of Phoenix, Tucson



are important challenges, as well as growth in areas outside of AMAs including the South Central Verde Valley (Sedona area), Flagstaff and the Coconino Plateau, and Upper San Pedro River areas? Creation of the AMAs and overall water scarcity have resulted in transfers from agriculture to municipal and industrial uses, limited agricultural water use, and limited opportunities for adding additional agricultural lands.

The cornerstones of the GMC are (1) no new irrigation of land, (2) the establishment of groundwater rights that limit uses and allow for mandatory reductions in use through conservation, and (3) land cannot be subdivided and sold unless the land has an assured water supply for 100 years. The Assured Water Supply rules have been the most important tool for the creation of a sustainable water supply for municipal uses within the AMAs. The rules that implement the Assured Water supply regulations require that all cities and developers provide renewable water supplies for their communities. The results have been (1) the development of water supply programs to obtain renewable water supplies at the city level, (2) the creation of the Central Arizona Groundwater Replenishment District to recharge groundwater withdrawals by subdivisions and cities, (3) the development of recharge laws and programs including the Arizona Water Banking Authority, and (4) the development of the CAP water supply for municipal uses.

The Rural Watershed Initiative funds the outreach and community relationships throughout Arizona outside of the AMAs. The state has funded several hydrologic studies in cooperation with the USGS and the USBR to describe water supply conditions and to appraise the water resources problems statewide.

Environmental issues associated with the endangered species act in riparian areas add additional demands on limited resources. This has been especially challenging as drought has been at varying levels of severity for the last 14 years.

The Colorado River and its tributaries are one of the last and most significant sources of renewable supplies for Arizona and this has resulted in conflict both within the state and between that parties of the Colorado River Compact who also rely are the waters of the Colorado River. Looking forward smaller and rural towns will face challenges in finding and developing sustainable supplies. Augmentation and maximizing supplies including desalination join cooperation with Mexico and maximizing CAP management efficiencies provide opportunities and challenges to meet future needs. Indian water rights will also need to be considered. (Personal Communication, Tom Carr, Arizona Department of Water Resources, March 3, 2009)

## **9. REFERENCES**

Much of the language and information in this summary comes directly from reports published by the Arizona Department of Water Resources and specific references are provided throughout the document.