

1.1 INTRODUCTION

In January 2011, the Arizona Department of Water Resources (ADWR) published the *Water Demand and Supply Assessment 1985-2025, Prescott Active Management Area (Assessment)*, a compilation and study of historical water demand and supply characteristics for the Prescott Active Management Area (PRAMA) for the years 1985-2006. The Assessment calculated seven water supply and demand projection scenarios through the year 2025. ADWR conducted the Assessment in preparation for promulgation of the *Fourth Management Plan for the Prescott Active Management Area (4MP)* as required by the *1980 Groundwater Management Code (Code)*. After publication of the Assessment, ADWR presented a summary of the document at the Groundwater Users Advisory Council (GUAC) for the PRAMA, a five-member council appointed by the Governor to represent the groundwater users in the area and advise the director of ADWR and the Statewide Active Management Area (AMA) director on matters relating to water management within the AMA. ADWR also received and reviewed comments and proposals from the Yavapai County Water Advisory Committee (WAC) and the Citizens Water Advocacy Group (CWAG) during the development of the 4MP for the PRAMA. The 4MP is effective from January 1, 2017 through 2020. The Fifth Management Plan (5MP) will be developed to cover the period from 2020 through 2025.

The management plans assist ADWR in achieving the management goal of each AMA. The statutorily established management goal of the PRAMA is to attain safe-yield, on an AMA wide basis, by the year 2025. Achievement of safe-yield requires that there is a long-term balance between the amount of groundwater pumped from the PRAMA annually and the amount of water naturally and artificially recharged in the PRAMA annually. Groundwater withdrawals in excess of natural and artificial recharge lead to groundwater overdraft. The Code identifies management strategies, such as conservation programs for all major water using sectors, to reduce total groundwater withdrawals in the AMAs and replacing groundwater use with renewable water supplies. Management plans also include optional programs to encourage use of renewable supplies and water management assistance programs. Enforcement provisions and monitoring programs are also included in the management plans. A description of ADWR's overall water management approach for the PRAMA is in this management plan's conclusion.

The statutory management plan process requires ADWR to conduct formal public hearings after completion of the proposed management plan (A.R.S. § 45-570). In these hearings, ADWR presents information in support of the proposed plan and a summary of any GUAC comments on the draft management plan. Before the plan is adopted, the director prepares a written summary and findings of matters considered at the hearing and may adopt the plan as presented or with modifications.

The Assured Water Supply (AWS) Rules, in addition to the management plans, also limit use of groundwater. The Underground Water Storage, Savings and Replenishment Program focuses on use of renewable water supplies and is an important vehicle for achievement of the AMA management goals and ADWR's water management objectives.

1.2 THE ASSURED WATER SUPPLY PROGRAM

The AWS program was created by the Code to preserve groundwater resources and promote long-term water supply planning in the AMAs. AWS statutes and rules limit the use of groundwater by new residential and commercial subdivisions. Every person proposing to subdivide land within an AMA must demonstrate the availability of a 100-year water supply.

In 1995, ADWR adopted the AWS Rules to implement the AWS Program. Under the AWS Rules, developers can demonstrate a 100-year supply by satisfying the criteria described below and either obtaining a Certificate of Assured Water Supply (CAWS) for a new subdivision, from ADWR or by obtaining a written commitment of service from a water provider for which ADWR has issued a Designation of Assured Water Supply (DAWS) for a municipal water provider's water service area.

An AWS demonstration must include proof of the following criteria: 1) that the water supplies will be of adequate quality; 2) that the water supplies will be physically, legally, and continuously available for the next 100 years; 3) that any groundwater use will be consistent with the management goal for the AMA; 4) that any groundwater use will be consistent with the management plan for the AMA; and 5) that the developer or water provider has the financial capability to construct the necessary water storage, treatment and delivery systems. The Arizona Department of Real Estate will not issue a public report that allows the developer to sell lots within an AMA without an AWS demonstration. For more information on the AWS Program, please visit the ADWR website at www.azwater.gov/AzDWR/WaterManagement/AAWS.

ADWR issued a determination in 1999 that the PRAMA was no longer in a state of safe yield. As a result, the AWS Rules require use of primarily renewable supplies, such as reclaimed water, for any new DAWS or CAWS issued in the PRAMA. However, the AWS Rules do allow a certain volume of groundwater to be used. These groundwater allowances are a mechanism to help municipal providers transition from groundwater to renewable supplies.

When a DAWS or CAWS is issued, a groundwater allowance account is established. ADWR credits additional allowable groundwater to these accounts based on a number of factors. The AWS Rules allow for a limited volume of groundwater to be pumped based on formulas for each AMA in the AWS Rules. The amounts of water that may be added to the groundwater allowance account are reduced over time, to zero in 2025 in the PRAMA. Through special legislation, the City of Prescott has an additional groundwater allowance in its DAWS for certain subdivisions that had been preliminarily platted but not finally platted, when the original DAWS for the City of Prescott was issued.

The AWS Rules also allow applicants for a DAWS or CAWS in the PRAMA to add to their groundwater allowance by using grandfathered groundwater right extinguishment credits. Extinguishment credits are issued by the Department when a grandfathered groundwater rightholder extinguishes either: 1) a type 1 non-irrigation grandfathered right, 2) a type 2 non-irrigation grandfathered right, or 3) an irrigation grandfathered right through a process described in the AWS Rules. The extinguishment credits are calculated differently for each AMA. An applicant for an AWS determination that acquires extinguishment credits can pledge those credits to demonstrate that all or a portion of the applicant projected groundwater use is consistent with the AMA's management goal.

The AWS requirements are only one important tool to help attain the management goal of the AMA. Because the AWS requirements only apply to new subdivisions, additional programs or tools are likely to be required to bring the AMA into safe-yield.

1.3 THE UNDERGROUND WATER STORAGE, SAVINGS AND REPLENISHMENT PROGRAM

Prior to the adoption of the Code, more groundwater was pumped from Arizona's aquifers than naturally recharged back into the aquifers. This imbalance resulted in significant depletion of some aquifers.

Replacing groundwater use with renewable water supplies and recharging renewable water underground reduce this aquifer imbalance. Artificial recharge is also a means of storing available renewable water supplies for future use. Artificial recharge is an increasingly important tool in the management of Arizona's water supplies, particularly in meeting the goals of the Code.

The Arizona Legislature established the Underground Water Storage and Recovery Program in 1986 to allow persons with supplies of renewable water in excess of their demands to store that water underground for recovery at a later time. In 1994, the Legislature enacted the Underground Water Storage, Savings, and Replenishment Act, which further refined the program. Under this program, a person wishing to store, save, replenish, or recover water must secure permits from ADWR. For more information on the Underground Water Storage, Savings and Replenishment Program, please visit the ADWR website at www.azwater.gov/AzDWR/WaterManagement/Recharge.

In many cases, permitted artificial recharge under the Underground Water Storage, Savings and Replenishment Program requires a certain percentage of the recharged volume to be made non-recoverable in order to benefit the aquifer. These required non-recoverable volumes are called *cuts to the aquifer*. The cuts apply to the storage of water for long-term storage credits. They do not apply to water that is stored and recovered annually. In the PRAMA, due to the type of recharge that has occurred and is projected to occur in the future, the total cuts are insignificant as compared to the Phoenix, Pinal and Tucson AMAs. There are only two years in which a cut to the aquifer occurred in the PRAMA. In 2003 and 2004, a combined volume of less than 1,000 acre-feet was accounted as a non-recoverable cut to the aquifer.

1.4 GOVERNMENTAL AND INSTITUTIONAL SETTING

In the PRAMA water management activities are carried out by a number of entities. City, county, and regional government functions include retail water delivery, flood control, wastewater management, water quality management, planning and zoning. Several user groups, advisory committees, citizens' groups and other organizations are involved in developing legislative and policy guidelines and educational programs relating to water resources use and conservation. The GUAC for each AMA advises the Statewide AMA director and agency director on issues relating to groundwater management in the AMA.

The Arizona Water Protection Fund (AWPF) was established in 1994 to provide grant money for projects that protect or restore the state's rivers, streams, and associated riparian habitats. The AWPF may be used to purchase Central Arizona Project (CAP) water or reclaimed water for these purposes. The AWPF Commission, with the ADWR director serving as a nonvoting ex-officio member, oversees the grants process. AWPF staff is located within ADWR.

At the state level, the Arizona Department of Environmental Quality (ADEQ) regulates water quality. Through recent legislation (amending provisions of the Water Quality Assurance Revolving Fund or WQARF), ADWR and ADEQ jointly participate in specified activities related to protection of groundwater quality and remediation.

The Arizona Corporation Commission (ACC) regulates the activities of private water companies, particularly rate-setting. The Arizona Department of Real Estate works with ADWR to assure that new subdivisions comply with the AWS requirements.

Federal water management activities in the Prescott area include the US Bureau of Reclamation's appraisal level study referred to as the Central Yavapai Highlands Water Resources Management Study (CYHWRMS). The purpose of the CYHWRMS is to describe and analyze water supply alternatives to satisfy unmet water demand in the study area. It is unknown whether a subsequent feasibility study will follow the CYHWRMS appraisal level study. If alternate water supplies are identified in the appraisal study, and the alternative requires some federal infrastructure, the participants may decide to conduct a feasibility study.

Additional federal water management activities include the Environmental Protection Agency's Superfund and National Pollutant Discharge Elimination System permit programs. The United States Geological Survey (USGS) works independently, and in conjunction with ADWR, in the collection and analysis of hydrologic data in support of improving and understanding the hydrologic system of the Upper and Middle Verde River watersheds. The USGS also completed the Northern Arizona Regional Groundwater Flow Model, through cooperation with the Yavapai County WAC. Lastly, the USGS, ADWR, and Yavapai County cooperatively operate the Yavapai County flood warning system.

1.5 PRAMA WATER MANAGEMENT ISSUES

The PRAMA will continue to face many water management challenges in the fourth fifth management periods. These include:

- *Physical Availability of Groundwater within the PRAMA*

The volume of groundwater within the PRAMA considered to be "physically available" under the AWS Rules is close to being fully allocated to AWS determinations. It is possible that during the fourth or fifth management period full allocation of the PRAMA groundwater will be reached. At that time, additional development in the PRAMA will need to be based on either: (1) imported water supplies; (2) direct use of renewable supplies; or (3) underground storage and recovery of renewable water supplies.

- *Consistency with the AMA Goal under the AWS Rules*

The AWS Rules reduce the volume of groundwater allowance granted to new subdivisions to zero by 2025. Most applicants for a CAWS rely on extinguishment credits to meet the requirement of consistency with the management goal for the 100 year subdivision water demand (minus the groundwater allowance, if any). However, the volume of extinguishment credits that may be generated within the PRAMA is finite, and the maximum potential volume of extinguishment credits also reduces each year under the AWS Rules. If all active grandfathered groundwater rights in the PRAMA had been extinguished in the year 2012, the total volume of extinguishment credits available in the PRAMA would have been about 2,250 acre-feet per year. When all AMA extinguishment credits are exhausted, the options for new subdivision growth would be to avoid use of AMA groundwater by using imported water supplies or renewable water supplies directly, or through the use of AMA long-term or annual storage credits to meet the "consistency with goal" criterion for water withdrawn within the AMA.

- *Financial Capability under the AWS Rules*

Insufficient infrastructure exists in the PRAMA for additional underground storage and recovery projects and water distribution systems, including regional wastewater collection systems. Financing for such construction is needed. If additional renewable supplies will be used for new development, applicants will need to demonstrate the financial capability to construct the necessary infrastructure. Applicants would also have to demonstrate the physical, legal, and continuous availability, as well as water quality, of the renewable or imported supply.

- *Limitations of the Management Plan Authority*

The regulatory element of the 4MP includes conservation requirements for the municipal, industrial, and agricultural water use sectors. Although conservation is an effective means of managing available water supplies, it is insufficient by itself to bring the PRAMA to safe-yield. Individual water user choices, city and county ordinances, and regional cooperative water management efforts may result in additional progress toward safe-yield but are outside ADWR's authority to require or enforce, except through AWS determinations.

The PRAMA is currently in overdraft. Currently, there is insufficient management plan authority, infrastructure, or financing in place to ensure that safe-yield will be achieved by the year 2025. Surface water is being stored and recovered on an annual basis, but surface water supplies are susceptible to drought and potentially to long-term climate change. An agreement between Salt River Project (SRP) and the City of Prescott provides that some portion of the surface water supply in Watson and Willow Lakes remains in reservoir storage for recreational and other purposes, restricting the use of the full supply even during times of extreme drought. Arizona surface water laws prevent long-term storage of most surface water supplies. Reclaimed water is being stored for long-term storage credits or used directly for landscape and turf irrigation. The feasibility of water supply augmentation through rainwater harvesting is being studied and may be implemented in the future. However, a significant number of lots that were platted prior to the 1999 Declaration of the PRAMA being in an overdraft situation may still develop within the PRAMA and use groundwater without any investment in renewable water supplies. Importation of water supplies from outside the PRAMA or other water management techniques to augment the AMA water supply are critical to the PRAMA achieving its safe-yield goal.

1.6 PRAMA 4MP PROGRAMS

The 4MP primarily addresses water conservation, underground storage and recovery, and water management assistance for the years 2017 through 2020. Statutory guidelines provided in A.R.S. §§ 45-567, 567.01 and 567.02 direct that the following components shall, or may, be included in the 4MP:

- Irrigation water duties or intermediate irrigation water duties for Agricultural users
- Historic cropping program for Agricultural users
- Agricultural Best Management Practices Program
- A Non-Per Capita Conservation Program for Municipal Providers
- A Total Gallons Per Capita per Day (GPCD) Program for Municipal Providers
- Monitoring and distribution system requirements for Municipal Providers
- Additional conservation requirements for non-irrigation uses

In addition, ADWR has updated the water quality assessment that was included in the Third Management Plan (3MP) for the 4MP. The assessment discusses how ADWR proposes to manage the AMA's water supplies pursuant to the Code, the 4MP, the AWS Rules, and the Underground Water Storage, Savings and Replenishment Program. The regulatory requirements for groundwater users and water distribution systems are printed in italics for easy reference and are located at the ends of Chapters 4, 5, 6 and 8.

1.7 CONCLUSION

The 4MP outlines the region's water management needs and presents ADWR's blueprint for working with water users to achieve the PRAMA's water management goals and objectives. Continued commitment from ADWR and the public is necessary to reduce dependence on groundwater and achieve the statutorily established water conservation goals. With the support of the community, ADWR can respond to changing water issues and needs while maintaining technical assistance and regulatory programs that ensure a dependable water supply for Arizona's future.