

## ARIZONA CONSERVATION REQUIREMENTS

### Management Plans

The Arizona Groundwater Management Code establishes the legal framework for conserving water in Arizona's most populous areas.

To help achieve its goals, each AMA implements management plans corresponding to five management periods. The five management periods are as follows:

- First Management Period: 1980-1990
- Second Management Period: 1990-2000
- Third Management Period: 2000-2010
- Fourth Management Period: 2010-2020
- Fifth Management Period: 2020-2025

Among other things, the management plans establish conservation requirements for municipal, agricultural and industrial water users. In each successive management plan, water conservation and management requirements will become increasingly stringent.

The Arizona Department of Water Resources develops the conservation requirements with assistance from water users in the AMAs. Currently, ADWR is developing its Third Management Plan.

## MUNICIPAL CONSERVATION REQUIREMENTS

Municipal water conservation requirements apply to water providers, cities, towns, private water companies, and irrigation districts that provide water for non-irrigation uses. The goal of the municipal conservation program in all AMAs is to promote efficient water use.

### Total Gallons Per Capita Per Day Program

The primary conservation program focuses on reducing per capita water use, which is measured in gallons per capita per day (GPCD). For each management plan period, water providers in the AMA are assigned a GPCD target. GPCD is calculated by taking the total water supplied by the provider and dividing that number by the population served and the number of days in the year. By design, GPCD's are expected to be lowered over time, helping to promote greater water conservation and efficiency of use.

For the First Management Plan, each provider was assigned a GPCD target based on their 1980 water use, future water demand projections and the potential savings from water conservation measures commonly used in the Western states.

For the Second Management Plan, each municipal provider was assigned a GPCD target based on an extensive analysis of the water use in the provider's service area and the potential water use reduction due to implementation of appropriate conservation measures. Water providers are expected to meet the final GPCD requirement at the end of the Second Management period.

### Alternative Water Conservation Programs

The municipal conservation program for the Second Management Period (1990-2000) consists of three regulatory alternatives to the GPCD program. These programs give water providers the opportunity to apply for a conservation program designed to achieve equivalent conservation levels in lieu of a GPCD target.

**Alternative Conservation Program:** This alternative provides flexibility by establishing a limit on groundwater use, a GPCD target consisting of residential water use only, and requirements addressing specific non-residential uses.

**Non-Per Capita Conservation Program:** Factors such as industrial development and changing population characteristics impact the ability of many providers to meet their GPCD targets. In 1992, the legislature established

this alternative to the GPCD regulatory program. This program requires municipal providers to eliminate groundwater use and to implement reasonable conservation measures. It is important to note that opportunities exist for the provider to pump water if the provider replaces pumped water through groundwater recharge.

**The Institutional Provider Program:** A program geared toward water providers who serve 90% or more of their water to institutions such as military bases, schools or prisons. Efficiency under this program is measured similarly to the Alternative Conservation Program; through a residential GPCD measure and effective implementation of non-residential conservation measures.

#### Small Water Providers

A small provider supplies less than 250 acre-feet of water per year for non-irrigation purposes.

Small providers are required to:

- minimize waste of all water supplies
- maximize efficiency in outdoor watering
- encourage reuse of water supplies
- reduce total GPCD usage.

#### Roadway Medians

Along new publicly owned medians or roadside areas served by municipal providers, groundwater may only be used for watering specific low water use plants. The Department maintains a list of approved low water use plants for each AMA. Each list contains over 250 plant species. The lists are available at the AMA offices.

#### Turf Facilities

The management plans restrict water use at turf facilities larger than 10 acres in size, such as golf courses, schools, parks, cemeteries and common areas of homeowners' associations. The amount of water that turf facilities can use on an annual basis is specific by a formula in the plans. The municipal restrictions for turf facilities are the same as those that apply to industrial facilities.

#### Artificial Lakes and Pools

The First Management Plans contain restrictions on the use of groundwater in artificial lakes. A 1987 State law (The "Lakes" bill) restricts the use of both groundwater and surface water in lakes, ponds and swimming pools within AMAs.

In general, new lakes in AMAs cannot be larger than 12,320 square feet unless certain exemptions apply. For example, the lakes may be filled with effluent. However, special permits are available from the ADWR that allow new lakes to be filled with poor quality groundwater or other water sources on an interim or emergency basis. Lakes built before January 1, 1987 and lakes located in certain public facilities, such as parks, can continue to use groundwater. Golf course lakes are also exempt from the law because they are regulated by the management plans.

Private residential swimming pools cannot be larger than Olympic size (12,320 square feet). Resorts, motels and country clubs can have several pools, but only one pool can be larger than Olympic size; but not larger than one acre in size.

#### Distribution System Requirements

Each large municipal water provider must maintain its distribution system and properly meter and account for all deliveries. Water losses may not exceed 10%. Small providers must maintain their systems such that losses do not exceed 15%.

#### How the Requirements Affect Individual Residents

ADWR's conservation requirements apply to the water provider that delivers to residential users. To meet requirements, the provider may develop incentive programs and establish water restrictions that keep water use within limits.

Most water companies have implemented rate structures that charge more per gallon as water use increases (increasing block). Others are developing public education campaigns explaining the need for conservation and encouraging residents to save water in many ways, such as landscaping with low water use plants and installing low flow shower heads.

## AGRICULTURAL CONSERVATION REQUIREMENTS

Agriculture accounts for most of Arizona's annual water consumption, since nearly all crops grown in the state must be irrigated. The Groundwater Code limits the amount of groundwater that may be used by agriculture to irrigate crops in Active Management Areas (AMAs) by:

- Prohibiting the development of new irrigated acreage. Only lands which were legally irrigated with groundwater between 1975-1979 may continue to be irrigated with groundwater. Such lands received an Irrigation Grandfathered Right. Only holders of the right may withdraw, receive and use groundwater for growing crops on two or more acres of land within an AMA.
- Providing for the development of conservation requirements that limit the amount of groundwater farmers can use for irrigation. This is accomplished via compliance with irrigation water duties and maximum annual groundwater allotments.

### Definitions

The following defines terms and explains the process DWR used to establish conservation requirements for farms.

- Irrigation acres: The acres of a farm that were legally irrigated at any time between 1975-1979. These acres are described on the Certificate of Irrigation Grandfathered Right.
- Water Duty Acres: The highest number of irrigation acres, taking land rotation into account, that were actually irrigated during any one year between 1975 and 1979. The water duty acres for a farm may be equal to or less than the irrigation acres.
- Water Duty: The amount of water per year, expressed in acre-feet, reasonably necessary to irrigate the crops historically grown on a given farm. In calculating the water duty for the first management period, the Department assumed the use of reasonable conservation methods on the farm. For the second management period, the Department assumed the application by the year 2000 of methods designed to achieve maximum conservation consistent with prudent long-term farm management practices within areas of similar farming conditions.
- Intermediate Water Duty: The irrigation water duties expected to be reached at specified intervals during a management period. The Code allows one or more intermediate water duties, allowing for incremental investments in conservation methods. For the second management period, the Department established an intermediate water duty for 1992 and another for 1995.
- Maximum Annual Groundwater Allotment: The quantity of water in acre feet obtained by multiplying the water duty acres for a farm by an intermediate or final irrigation water duty for the farm.

### Calculating the Water Duty and Groundwater Allotment

The irrigation water duty and maximum annual groundwater allotment for each farm are based upon the following:

1. The average irrigation requirement of the crops grown from 1975 through 1979 on a farm as it existed when the original certificate of irrigation grandfathered right was issued. The average irrigation requirement reflects the amount of water needed per acre to satisfy the consumptive use and other water needs of the crops.
2. The irrigation efficiency assigned to the farm. The assigned irrigation efficiency represents the percentage figure used in computing the amount of water per acre allotted to the farm over and above the average irrigation requirement of the crops. The percentage is based on data analysis indicating water application rates per acre farmed, as well as the assumption of the implementation of sound irrigation management techniques and the level of conservation technology specified by the Groundwater Code for each management period.

### Administrative Review Of Water Duties

Irrigation Grandfathered Rightholders were able to request an administrative review within 90 days of notice of their water duty and maximum annual allotments. Many water duties were adjusted on the basis of slope, limiting soils, water quality, or if high yield alfalfa was grown during the historic period of 1975-1979. Also, the water duties for citrus crops were adjusted to reflect the difficulties associated with making physical improvements to existing citrus orchards without damaging the trees.

### The Flexibility Account

The Groundwater Code permits an irrigation grandfathered rightholder to borrow or bank groundwater from year to year, which allows for varying climatic and agricultural marketing conditions. The Department maintains an operating flexibility account for each farm. Adjustments are based on annual water withdrawal and use reports filed by the farmer. A farmer may borrow from his flexibility account up to 50 percent of the maximum annual groundwater allotment. At any time, a farmer may use groundwater in an amount equal to the credit balance in his flexibility account.

There is no limit to the amount of credits that can be accrued. The Code permits irrigation grandfathered rightholders to purchase or sell flexibility account credits earned during the previous calendar year to irrigation grandfathered rightholders within the same irrigation district. Farms outside of irrigation districts cannot buy or sell flexibility account credits.

### Exemptions

Not all farms are required to comply with the conservation requirements outlined above. A 1994 amendment to the Groundwater Code exempted farms of less than 10 acres and not part of a larger farming operation from the conservation, annual reporting and conveyance-notification requirements. Although these rights total approximately 49% of the irrigation grandfathered rights, they account for only 4% of the total water use in the agricultural sector.

## INDUSTRIAL CONSERVATION REQUIREMENTS

Although industrial water users within AMAs generally account for less of the total demand picture than municipal or agricultural water users, the source water to meet industrial needs is often 100% groundwater.

Mines, electric power plants, sand and gravel facilities, cattle feedlot operations, dairies, and turf-related facilities make up most of Arizona's industrial water use. General industrial use requirements apply to all industrial use categories.

The First and Second Management Plans contained specific conservation requirements for turf-related facilities, dairy operations, cattle feedlot operations, sand and gravel facilities, metal mining facilities, and electric power plants. The requirements were based on the "use of the latest commercially available conservation technology consistent with reasonable economic return."

**Turf-Related Facilities:** Turf-related facilities include schools, parks, cemeteries, golf courses and common areas of home owners associations. ADWR regulates facilities that contain ten or more acres of water intensive landscaping.

Annual water allotments are calculated for each turf-related facility based on the number of acres of turf, low water use landscaping and lake surface area. New facilities have limitations on the acres of turf and the surface area of lakes that are eligible to receive an allotment.

**Mines:** Existing metal mining industries that use, or intend to use, 500 acre-feet or more per year are governed by specific conservation requirements. New mining facilities must meet additional requirements designed to minimize water waste.

**Power Plants:** The management plans contain requirements for large-scale power plants producing 25 or more megawatts of electricity. Plants must achieve a specified number of "cycles of concentration," a measure of the degree to which cooling water is recycled. As water is recycled, salt concentrations increase due to evaporation and fresh water must be added. Maximizing cycles of concentration saves water.

**Sand and Gravel Operations:** Sand and gravel operations that use, or intend to use, more than 100 acre-feet of water per year must construct disposal ponds or install clarifiers to collect and reuse runoff and drainage water.

**Cattle Feedlots:** The cattle industry uses water for livestock drinking water, dust control, feed mixing, fire protection, and other purposes. The greatest opportunity for water conservation is dust control. Conservation requirements for feedlots are based on water use per head of cattle.

**Dairies:** Dairies use water for cooling, cleaning, livestock drinking water and other purposes. Milk cows require more water for drinking than replacement animals. Also, the number of times per day that the cows are milked contributes to water use. Conservation requirements for dairies are based on water use per cow depending on whether the cow is lactating or not. Conservation potential at a dairy can be determined by the degree to which water is reused or recycled.

**Other Industries:** The First and Second Management Plans require all other industrial users to recycle water to the maximum extent feasible. The plans also require minimizing waste and prohibit the use of water for single-pass heating and cooling systems. Effluent use is encouraged when available and economically feasible.

In addition, new large cooling users, and new large landscape users have separate conservation requirements under the "other" industrial user category in the second management plans.

### COMPLIANCE AND ENFORCEMENT PROGRAM

Once conservation requirements have been established for the major water users within the AMA, it becomes imperative that a process be established to ensure that the requirements will in fact be met. The Arizona Department of Water Resources has developed a compliance and enforcement program associated with the provisions of the Groundwater Code and the management plan.

This compliance and enforcement program is comprised of a number of elements. First there is an annual reporting requirement associated with each water rightholder. Annual water withdrawal and use reports are filed by rightholders and are reviewed by ADWR staff. A significant number of audits are conducted.

As a result of the audits conducted, a certain percentage of the water users that have conservation requirements associated with them are found to be out of compliance. Once that occurs, ADWR sends out a notice of non-compliance, conducts post audit meetings with the water users and attempts to negotiate a settlement for the overusage of water.