

# FIRST MANAGEMENT PLAN

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## DOUGLAS ACTIVE MANAGEMENT AREA



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The Department held multiple stakeholder workshops that served as a public stakeholder process for the development of the First Management Plan of the Douglas Active Management Area. These workshops assessed conservation programs and developed reasonable and functional conservation strategies for the first management period and beyond. The Department thanks everyone who attended and participated in these workshops.

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## EXECUTIVE SUMMARY

### INTRODUCTION

The Management Plans provide regulatory structures and information to assist achieving the groundwater goals for each of the state's six Active Management Areas (AMAs). Arizona's 1980 Groundwater Management Act (GMA) created the Arizona Department of Water Resources (Department or ADWR) and put in place structures for water management that were purposed to curb the severe groundwater overdraft occurring in several parts of the state. The GMA requires a management plan in each AMA for each management period. These plans contain the conservation programs that guide each AMA toward the management goal by reducing groundwater withdrawals. The successive periods and plans, which are a strength of the GMA, enable the plans to evolve over time, adapt to incorporate the information and experience gained over time, and to respond to changing technologies and circumstances. With the addition of the Douglas AMA (DAMA), the Department has endeavored to take into consideration the opinions and desires of stakeholders within the Douglas basin. In doing so, the Department has sought with this first Management Plan to contribute to a sustainable future for the residents of the DAMA.

### DEVELOPMENT OF THE 1MP

The Douglas AMA First Management Plan (1MP) is unique compared to the original AMAs and their management plans, but also utilizes tried and true methods of conservation which have been demonstrated to work in the other AMAs. As the first subsequent Active Management Area, DAMA has considerable significance and is setting many precedents. The input received from stakeholders in the Douglas basin has been invaluable in the construction of the 1MP. Multiple public workshops and brainstorming sessions were held with the residents of the Douglas basin, and their input taken into consideration to create a unique management plan that reflects the unique characteristics of this first subsequent AMA. Certain programs in other Management Plans were not included within the 1MP; no public desire was expressed for the implementation of those programs within the basin. During the first meeting of the Groundwater Users Advisory Council (GUAC) on May 23, 2024, the Department received further input regarding issues specific to the DAMA.

Between the December 1, 2022 designation of Douglas as an AMA and the publication of this management plan, the Department has participated in eight meetings with Douglas stakeholders regarding the management goal and 1MP development. These meetings have involved discussions regarding agricultural, municipal, and industrial conservation

requirements. The Department worked extensively to develop sensible and functional conservation strategies for the 1MP.

## **1MP STRUCTURE**

The regulatory chapters of AMA management plans contain descriptive or explanatory narratives, to enhance the understanding of conservation programs for stakeholders. For easy reference, the italicized legally enforceable language detailing the requirements of each sector and program is located at the end of each appropriate chapter. Each sector has various programs in which a given user might participate; users can find detailed descriptions of the regulatory and reporting requirements for their conservation programs in their respective chapters.

Two agricultural conservation programs exist for the DAMA 1MP: the Base Program and the Integrated Farm Program. Details of these agricultural conservation programs can be found in Chapter Four. Two municipal conservation programs are included in the 1MP: the Municipal Conservation Program, and a new program called the Integrated Water Resources Plan. The Integrated Water Resources Plan is a new program designed to guide large municipal providers in sustainable strategic planning for future growth and supply changes. Information on the municipal conservation programs can be found in Chapter Five. The industrial conservation program consists of requirements for all industrial users. There are additional requirements for several subsectors, each with corresponding conservation programs. Details of the industrial conservation programs can be found in Chapter Six. In addition to these sector-specific requirements, there is general regulatory language regarding recharge in Chapter Three and regarding well spacing in Chapter 7.

## **1MP PROMULGATION, IMPLEMENTATION, AND POTENTIAL MODIFICATIONS**

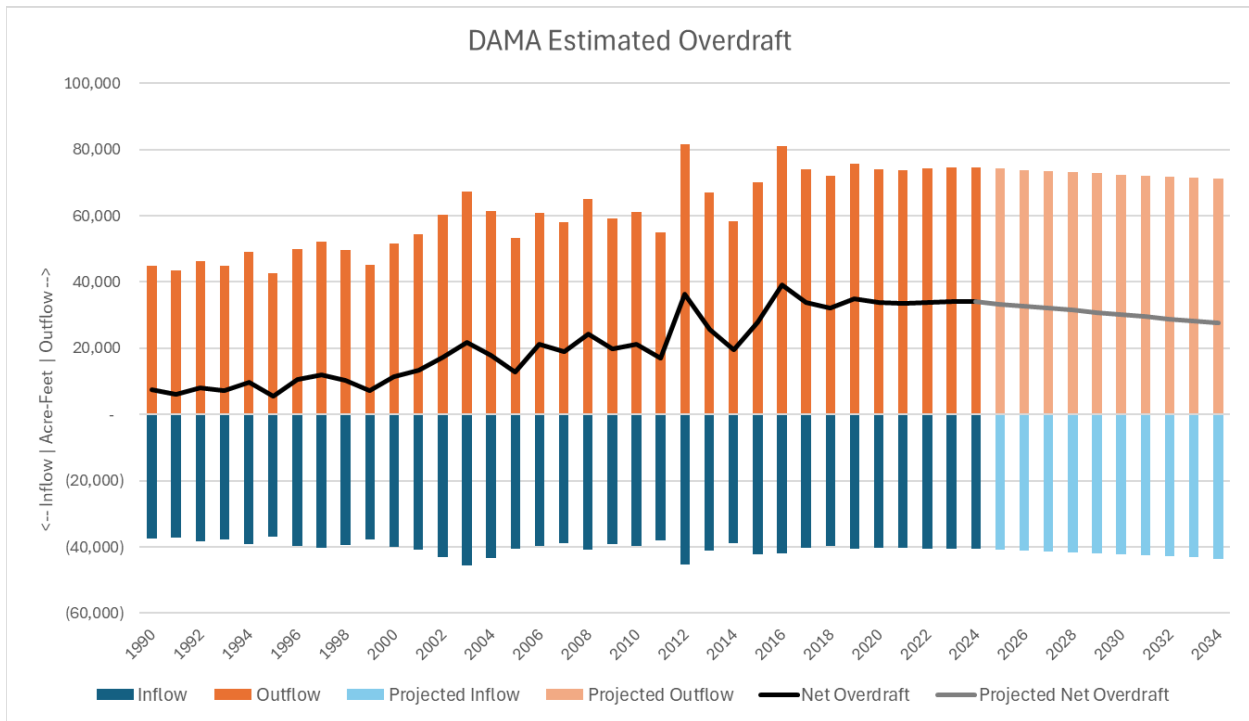
The statutory management plan promulgation process requires the Department to conduct a formal public hearing after completion of the proposed management plan (A.R.S. § 45-570). In this hearing, the Department presents information supporting the proposed plan and a summary of comments provided by the GUAC on the draft management plan. The Department also receives public comment on the proposed plan. Within 30 days after the hearing, the Director of ADWR prepares a written summary of, and the findings concerning, matters considered at the hearing and may adopt the plan as presented or with modifications. All requirements in the 1MP become effective on January 1, 2027, and will remain in effect until the requirements in the 2MP take their place.

Upon notice of a 1MP irrigation water duty or conservation requirement, a person may apply for a variance from or seek administrative review of the water duty or conservation requirement. In general, a variance gives a person additional time (not to exceed five years) to comply with an irrigation water duty or conservation requirement, while an administrative review can result in an adjustment to the requirement until new requirements go into effect. At any time after the management plans are adopted, the plans may be modified pursuant to the same public hearing and comment procedure required for adoption of the plan (A.R.S. § 45-572(A)). The Director may modify an irrigation water duty or conservation requirement established in the plan “only if the Director determines that extraordinary circumstances, errors, or mistakes justify the modification” (A.R.S. § 45-572(A)).

## **MANAGEMENT GOAL**

The DAMA management goal states, “The management goal of the DAMA is to support the general economy and welfare of water users in the basin by reducing the rate of aquifer depletion by an amount established in the first management plan and by additional reductions established in each subsequent management plan every 10 years thereafter”. With the conservation programs outlined in chapters four, five, and six, the Department aims to reduce each year’s groundwater overdraft by an average of 640 acre-feet, to achieve a reduction in annual overdraft of 6,400 acre-feet by the end of the first ten-year period. Conservation programs such as The Base Program, Integrated Water Resources Plan, and the Industrial Conservation Plan are just some of the programs that will bring DAMA closer to its goal by reducing the amount of groundwater withdrawn; artificial recharge and utilization of effluent can also offset groundwater pumping and further contribute to achievement of the goal.

**Figure ES-1: DAMA Estimated Overdraft**



## DOUGLAS AMA FUTURE

The DAMA is the first Active Management Area established in Arizona by local election, and the first established since the original AMAs that were created by the GMA. This is highly significant and is indicative of the urgency and importance of groundwater conservation in Arizona. Establishing new conservation requirements is not an easy task, and for the stakeholders of the Douglas AMA, this Management Plan is no exception. The Department has been dedicated to having open lines of communication open with the stakeholders of Douglas during the development of this Management Plan and will continue to do so in the coming years to help create a more sustainable water future in the Douglas basin.

## CHAPTER ONE: HYDROLOGY

### 1.1 QUANTITY

#### 1.1.1 INTRODUCTION

The Douglas Active Management Area (DAMA) covers 949 square miles in Cochise County of southeastern Arizona and consists of a single groundwater basin, the Douglas Basin (Figure 1-1). Land use in the basin is primarily rural, with concentrations of large-scale agriculture areas and communities. Groundwater is the only reliable source of water supply. The most populous community in the DAMA is Douglas with a 2022 population of about 15,600. Smaller communities include Elfrida, McNeal, and Bisbee. The population of the DAMA in 2022 was about 25,000.

#### 1.1.2 GEOGRAPHIC SETTING

The Douglas Basin lies in the basin and range physiographic province. The topography is characterized by broad, gently sloping alluvial basins separated by north-to-northwest trending fault block mountains. The DAMA has an average elevation of 7,300 feet above mean sea level (amsl) in the mountains and about 4,000 feet amsl in the basin.

The major watercourses in Douglas Basin are Whitewater Draw, Gadwell Canyon, Glance Creek, Silver Creek, and Leslie Creek. These water courses are all ephemeral and flow in response to heavy precipitation – except for a small perennial stretch of Whitewater Draw 2 miles north of the U.S.-Mexico border at Douglas, which receives steady baseflow from groundwater.

#### 1.1.3 CLIMATE

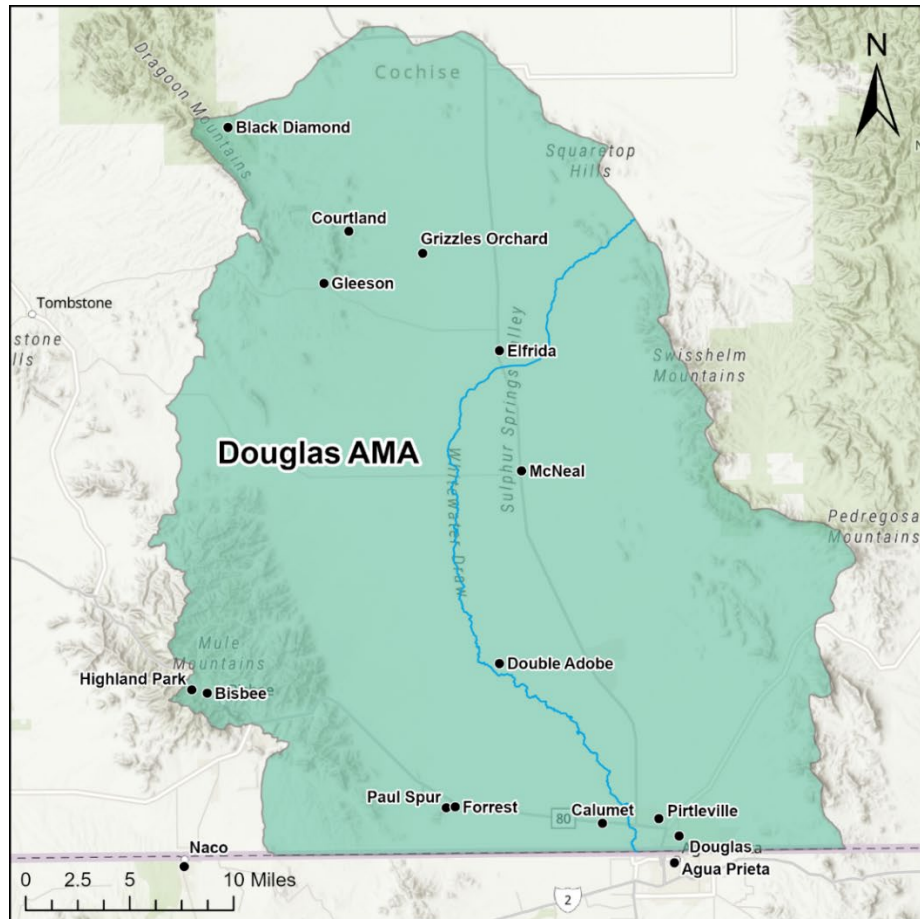
The DAMA has a cold, semi-arid climate with cool winters and warm summers. Precipitation varies within the DAMA and is dependent on altitude.

The weather station at Douglas-Bisbee International Airport is at 4,110 feet amsl and measures the average high and average low temperatures for the month of June to be 96°F to 60°F and 61°F to 28°F in December. Extreme temperatures of 110°F in June and -4°F in December have been recorded. Annual precipitation ranges from 12 to 14 inches at the lowest elevations to as much as 19 inches of rain and 6.3 inches of snow in Bisbee at an elevation of 5,539 feet asml.

Severe to exceptional drought conditions have been present across at least three-quarters of Cochise County for 28% of the time between 2000 and early 2024. Continuing drought conditions place additional stress on groundwater without any other reliable water source

in the Douglas Basin. The Department monitors drought conditions across Arizona and publishes drought monitoring reports and maps that are available on the Drought Status website.<sup>1</sup>

**Figure 1-1: Douglas Active Management Area Map**



Esri, NASA, NGA, USGS, County of Yavapai, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, CONANP, Esri, TomTom, Garmin, Foursquare, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS, Esri, USGS

**Legend**

**Active Management Areas**

- Douglas AMA
- Phoenix AMA
- Pinal AMA
- Prescott AMA
- Santa Cruz AMA
- Tucson AMA
- Whitewater Draw



<sup>1</sup> <https://www.azwater.gov/drought/drought-status>



#### 1.1.4 HYDROGEOLOGY

Several factors influence groundwater conditions in the Douglas Basin. These include groundwater inflow and outflow, depth to groundwater, aquifer withdrawals and recharge, surface water conditions, and groundwater quality at different locations. These factors can vary spatially and over time within the basin.

The primary occurrence of groundwater in the DAMA is in basin-fill sediments. The alluvial basin-fill deposits that underlie much of the DAMA are heterogeneous and primarily consist of permeable gravel and sand, with interbedded, low permeability clays. Conglomerate and basin-intruding volcanics can locally predominate around mountain fronts. The sediment is thickest in the central area of the basin, along Whitewater Draw in McNeal, and thinnest near the mountain fronts on the east and west of the basin. The gravel and sand sediments grade into clay toward the north-south axis of the basin. Bedrock consisting of volcanic, granitic, metamorphic, and sedimentary rocks underlies the basin-fill sediments. The bedrock units have minimal groundwater storage and production capacity and are not considered to be water-bearing.

Groundwater conditions change over time due to natural and human-induced fluctuations in the amount of water added or removed from the system. Because groundwater flows very slowly, the effects of pumping and recharge can alter the shape of the water table for long periods. Naturally or artificially recharged water can create a mound underground, while groundwater pumping can create a cone of depression in the water table. Significant changes in water level elevations occurred after the development of more effective well technology in the 1940s. The new well pumps allowed greater volumes of groundwater to be withdrawn than previously possible, which started a period of increased groundwater pumping, primarily for agricultural use, that continues today.

#### 1.1.5 GROUNDWATER CONDITIONS AND LAND SUBSIDENCE

Groundwater conditions in an aquifer can be monitored by collecting water level measurements from wells. With a sufficient network of wells, water levels are interpolated across the entire aquifer. The water level in an aquifer reflects the cumulative inflow and outflow stresses applied to the aquifer. Groundwater level measurements also provide important information on long- and short-term water level trends and aquifer storage changes.

The Arizona Department of Water Resources (the Department) Hydrology Division’s Field Services Unit collects water level data using conventional field methods (electric sounders or steel tapes) and pressure transducers at automated sites. Water level data collected by the Department is stored in the Department’s Groundwater Site Inventory (GWSI) database and is available on the Department’s Arizona Groundwater Site Inventory website<sup>2</sup>.

The Department uses water level data to produce water elevation maps, depth-to-water maps, and water level change reports. Water level change reports, and maps showing groundwater conditions are available on the Department Hydrology Publications website<sup>3</sup>.

Land subsidence has occurred across Arizona since the 1940s (Robinson, G.M., and Peterson, D.E., 1962) due to groundwater pumping. Land subsidence in Arizona is generally due to compaction of the alluvium caused by a declining water table. The community of Elfrida and the surrounding area are identified as a center for land subsidence and several earth fissures, with additional earth fissures existing at the northern boundary of the DAMA. Since 1992, the area subsided by six to 10 inches. The Department monitors land subsidence across Arizona and publishes subsidence monitoring reports and maps that are available on the Hydrology Publications website<sup>4</sup>.

### 1.1.6 GROUNDWATER RECHARGE AND DISCHARGE

Groundwater recharge components in the DAMA include: 1) mountain-front recharge, 2) recharge from the infiltration of natural runoff, or stream recharge, 3) underflow into the basin (see Appendix 1x for definition), 4) incidental recharge, and 5) small quantities of incidental urban recharge. Further information on mountain-front recharge, stream recharge, and underflow can be found in Appendix A of the Overdraft, Safe-Yield, and the Management Goals in Arizona’s Active Management Areas Report (Safe-Yield Report)<sup>5</sup>. Table 1-1 also includes the net natural recharge components over time; additional data can be found on the Overdraft Data Dashboard on the Department website<sup>6</sup>. For this plan, incidental recharge is defined as water that percolates to the regional aquifer after being used for agricultural, industrial, or municipal purposes. Artificial recharge is defined as water that is recharged at constructed or managed recharged projects permitted by the

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<sup>2</sup> <https://azwatermaps.azwater.gov/gwsi>

<sup>3</sup> <https://www.azwater.gov/hydrology/e-library>

<sup>4</sup> <https://www.azwater.gov/hydrology/e-library>

<sup>5</sup> <https://www.azwater.gov/ama/management-plans>

<sup>6</sup> <https://www.azwater.gov/ama-data>

Department (see Appendix 1x for definition). No constructed or managed recharge facilities exist in DAMA at the time this management plan was prepared. Historically, the largest recharge sources to the DAMA regional aquifer have been mountain-front recharge and ephemeral stream recharge after precipitation events.

Groundwater is discharged from the DAMA’s regional aquifer through pumpage, underflow out of the basin, and evapotranspiration (ET). Groundwater pumping represents the largest source of outflow from the DAMA. Underflow out of the DAMA occurs at the boundary between the United States and Mexico; groundwater flows south into Mexico. ET losses primarily occur along riparian corridors of Whitewater Draw south of McNeal.

### 1.1.7 DAMA WATER QUANTITY INFORMATION AND UPDATES

The Department nor any other department or agency has developed a comprehensive groundwater model within the DAMA.

**Table 1-1 Douglas AMA Rates of Annual Net Natural Recharge (AF/Year)**

	GROUNDWATER RECHARGE INFLOW (ACRE-FT/YEAR)			GROUNDWATER DISCHARGE OUTFLOW (ACRE-FT/YEAR)			NET RECHARGE (ACRE- FT/YEAR)
	Mountain Front Recharge (1)	Ephemeral Stream Recharge (2)	Underflow In from Wilcox, AZ (3)	Riparian Evapotranspiration (4)	Discharge to Streams (5)	Underflow Out to Mexico (6)	
Predevelopment (1940)	20,000	2,000	4,900	8,000	300	1,400	17,200
Postdevelopment (1941-1983)	13,800	2,000	4,900	8,000	300	1,400	11,000
Postdevelopment (1984-2021)	19,400	2,000	4,900	8,000	300	1,400	16,600

- 1) Coates & Cushman (1955), derived by Department staff from PRISM, soil, and stream data at mountain fronts (post-development)
- 2) Coates & Cushman 1955)
- 3) Department Wilcox Model (2018)
- 4) Derived by Department staff from PRISM and stream data
- 5) Coates & Cushman (1955)
- 6) Coates & Cushman (1955)

\*Multiple data sources were combined to produce the best available estimate of natural water balance components representative of the DAMA. Natural water budget components were derived from existing literature produced by the Department and the USGS, the Wilcox Groundwater Model developed by the Department and is available on the Department website (<https://www.azwater.gov/hydrology/groundwater-modeling/adwr-models>).

## CHAPTER 2: SUPPLY & DEMAND

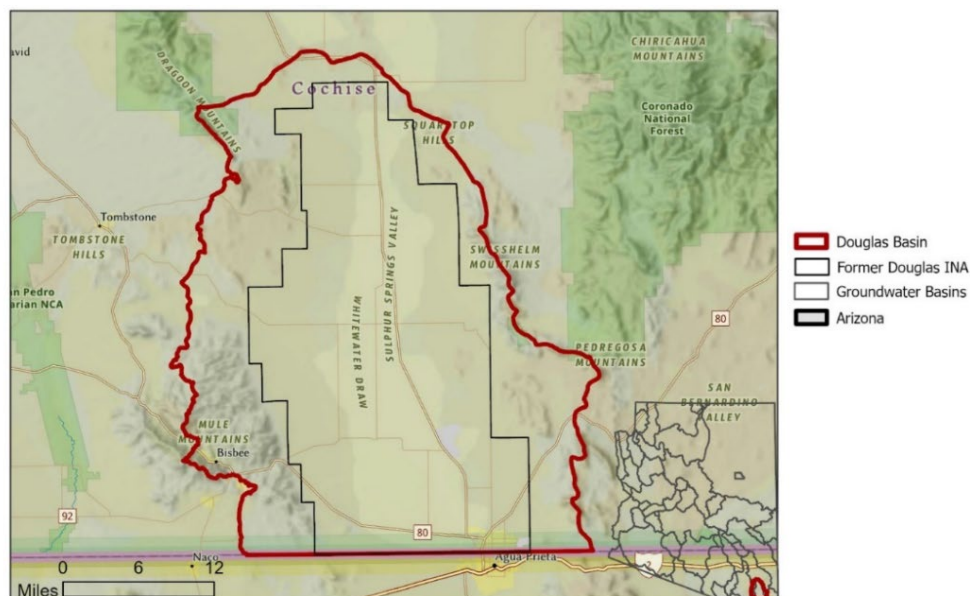
### 2.1 INTRODUCTION

The Arizona Department of Water Resources (the Department) published the 2023 Supply and Demand Assessment for the Douglas water basin in December 2023. The Supply and Demand Reports (SDRs) are a duty of the Director of the Arizona Department of Water Resources (the Department) required by statute, as stated in A.R.S. § 45-105(B)(14):

“Not later than December 1, 2023 and on or before December 1 of each year thereafter, prepare and issue a water supply and demand assessment for at least six of the fifty-one groundwater basins established pursuant to section 45-403. The director shall ensure that a water supply and demand assessment is completed for all groundwater basins and initial active management areas at least once every five years. The director may contract with outside entities to perform some or all of the assessments and those outside entities shall be identified in the assessment.”

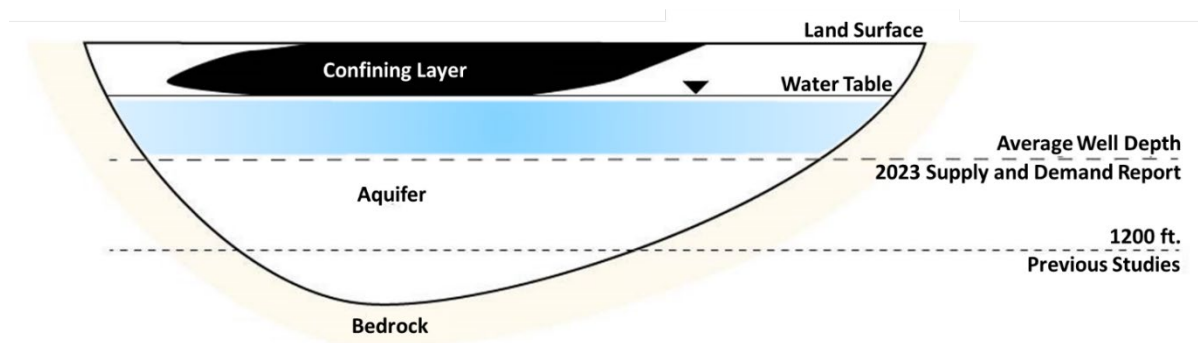
In 2023, seven basins were chosen as the first to be assessed: Butler Valley, Harquahala Irrigation Non-Expansion Area (INA), McMullen Valley, Tiger Wash, Douglas Active Management Area (AMA), Willcox, and San Bernardino Valley. The SDRs are used to inform the Water Infrastructure Finance Authority (WIFA) on funding decisions in the future (see A.R.S. § 49-1304(A)(14)). In addition, the SDRs may also be used in future planning work at the Department and have received interest from members of the Governor’s Water Policy Council (the “Council”) and other stakeholders.

**Figure 2-1: Map of the Douglas**



The Douglas AMA, which is located within the Douglas Basin, encompasses approximately 950 square miles. The former Douglas Irrigation Non-expansion Area (INA) was fully contained in the Douglas AMA but did not cover the entire area. In 2022, when the Douglas Active Management Area (AMA) was established by local election, the boundaries of the regulated area were expanded to encompass the entirety of the basin. The AMA lies within Cochise County, bounded on the east by the Swisshelm, Pedregosa, and Perilla Mountains, and on the west by the Mule and Dragoon Mountains. The lowest elevation in the AMA is 3,900 feet above sea level near, where the primary drainage of the basin, Whitewater Draw, crosses the international boundary with Mexico (Rascona, 1993).

**Figure 2-2: Diagram of a typical Basin and Range aquifer, not to scale.**



*This diagram does not represent the actual geology of the Douglas AMA and is only for illustrative purposes. The dashed lines represent different depths used to calculate storage which can make a significant difference to the estimated volume of water. The blue shaded area represents the saturated volume calculated in the 2023 Supply and Demand Report.*

The Douglas AMA is predominantly dependent on groundwater. The primary aquifer in the Douglas AMA is basin-fill alluvium, with the upper portion of the basin consisting of gravel, sand, and silt and the deeper portion of the basin consisting of conglomerate, gravel, and sand (ADWR, 2009; ADWR, 2016; Rascona, 1993). The basin-fill is hydraulically connected and considered a single aquifer system that is unconfined to semi-confined (ADWR, 2009; ADWR, 2016; Rascona, 1993). In the southeast corner of the basin, some basalt (volcanic) flows are present (Rascona, 1993). Groundwater flows south towards Mexico and towards areas where pumping is concentrated (ADWR, 2009; ADWR, 2016). There are two areas in the basin where high densities of wells pumping groundwater have created cones of depression, or places where the water table has been lowered due to significant groundwater withdrawals. One of these areas is located north of Elfrida, where there is extensive agriculture. The other area is located in the southern portion of the basin, near the city of Douglas (ADWR, 2009; ADWR, 2016). The only significant source of surface water in the basin, Whitewater Draw, is an ephemeral stream. Ephemeral

streamflow only occurs during seasonal flooding events and provides limited surface water volumes. Effluent, however, is a major water source in the basin. The effluent supply is generated by a local wastewater treatment plant along with an industrial user.

**Table 1. Total groundwater available in storage during the baseline data period in the Douglas AMA.**

	1990	2005	2022
<b>Groundwater Available in Storage</b>	8,883,700	8,502,000	7,754,700

All values in AF.

After completing a baseline analysis from 1990 to 2022, the Department estimates that there is insufficient annual supply to meet annual demand. Analysis results show that a negative balance of supply and demand exists every year, meaning more water leaves the basin than enters. The negative balance is attributed to agriculture, which makes up an average of 87% of the demand in the Douglas AMA during the baseline period. The lowest imbalance was **-13,670 AF** in 1991, which was also the year with the second smallest agricultural withdrawal and relatively high volumes of mountain-front recharge and agricultural incidental recharge.

**Table 2. Summary of baseline supply data for the Douglas AMA.**

WATER TYPE	COMPONENT	YEAR		
		1990	2005	2022
<b>Effluent</b>	Industrial Demand Reuse	132	186	118
<b>Annual Groundwater</b>	Streamflow Infiltration*	338	3,844	59
	Incidental Recharge	11,523	14,747	14,496
	Mountain-Front Recharge	11,014	3,035	12,125
	Net Underflow	-2,239	-3,575	-4,634
<b>Surface Water</b>	Streamflow Available for Diversion	38	427	7

All values in AF. "Negligible" is defined as a value less than 0.1 but not zero.

\* The average value of the estimated streamflow infiltration values is approximately 739.15 AF, indicating a general central tendency for the values, which include a mix of smaller and larger quantities, ranging from around 40 AF to over 4900 AF.

Between 1990-2022, three AF of water left the basin for every one AF of supply. This rate of overdraft resulted in a total storage decrease of about 1,129,000 AF from 1990 to 2022. The estimated water available in storage at the end of the baseline period is 7,754,700 AF. This volume represents the amount of water in storage at a depth of 356 feet, or the

average depth of a well in the Douglas AMA. If the water table was lowered to this depth, approximately 59% of existing wells in the average depth range would become dry.

**Table 3. Summary of total demand and supply values from 1990-2022 in Douglas.**

	1990	2005	2022
Supply	20,805	18,664	22,170
Demand	-37,505	-50,450	-67,494
Balance	-16,700	-31,785	-45,324
Resulting Water Available in Storage	8,883,700	8,502,000	7,754,700

*Negative numbers in the total/balance row indicate that the amount of water listed is being withdrawn/leaving the basin annually. All values are in AF.*

## 2.2 OVERVIEW OF DEMAND AND SUPPLY BY WATER USE SECTOR

### 2.2.1 MUNICIPAL SECTOR

An estimated 23,852 people live within the Douglas AMA, with the majority residing within the city of Douglas. Other population centers include Elfrida, McNeal, and a portion of the city of Bisbee. Bisbee straddles the Douglas and Upper San Pedro groundwater basins. Although Bisbee’s municipal water demand is included in this assessment, the city’s water supply is sourced entirely from the Upper San Pedro basin, so that demand is not subtracted from the supplies available in the basin in this report. In 2024, the Arizona Revised Statutes were amended to confirm that this transportation of Upper San Pedro groundwater to Bisbee was allowable, as reflected in A.R.S. §45-555.01.

Municipal providers serve an estimated 20,308 residents in the basin. The primary municipal water providers are the City of Douglas and the Elfrida Water Improvement District. The Bisbee Douglas International Airport also falls under the definition of a municipal provider.

All other residential use is considered residential non-provider use, which is residential use not supplied by a municipal provider but instead by a domestic well or non-public water system. The primary non-residential municipal uses in the basin are schools and RV parks. Lost and unaccounted for (L&U) water use, the total quantity of water from any source that enters a water distribution system during a calendar year minus the total quantity of deliveries of water from the water distribution system during the calendar year, is also included as a part of this report.

### **2.2.1.1 RESIDENTIAL PROVIDER**

Estimated residential provider annual demand increased from 1,231 AF in 1990 to 1,913 AF in 2008. Since then, estimated residential demand has decreased to 1,859 AF in 2022, due to population fluctuations and increased per capita water use efficiency.

### **2.2.1.2 RESIDENTIAL NON-PROVIDER**

Residential non-provider use reached a peak demand of 330 AF in 2009 and has remained steady since that time, estimated at 324 AF in 2022.

### **2.2.1.3 NON-RESIDENTIAL**

Estimated non-residential use peaked in 2008 at 1,010 AF, decreasing to 903 AF in 2022 due to changes in population and the openings and closures of non-residential facilities throughout the baseline period.

### **2.2.1.4 LOST AND UNACCOUNTED FOR**

L&U was highest in 2008 when it was estimated at 442 AF, decreasing slightly to an estimated 418 AF in 2022.

## **2.2.2. INDUSTRIAL SECTOR**

Industrial demand is defined as the amount of water used by an industrial facility, such as a golf course, dairy, feedlot, power plant, mine, or paper mill. Industrial water use in the Douglas AMA includes cattle feedlots, mining, grazing (on Bureau of Land Management (BLM) allotments and State Land leases), one peaking power plant, sand and gravel facilities, turf (one golf course, parks, schools, and one homeowner's association (HOA)).

### **2.2.2.1 FEEDLOTS**

Total annual feedlot water demand has decreased year over year, from 235 AF in 1990 to 143 AF in 2022, as the sole feedlot in the basin has reduced the number of cattle raised.

### **2.2.2.2 GRAZING**

There are about 1106 grazing cattle in the basin. Annual water consumption is approximately 19 AF, remaining stable over the last 30 years.

### **2.2.2.3 MINING**

Water demand by the mining sector in the basin decreased dramatically between 1990 and 2000, when the Freeport Sierrita Reduction Works facility closed. This might change in the future as a new mineral extraction permit has been filed. There are no active mines



in the basin; the other mining facilities located there are either closed or are currently inactive. A cement and limestone processing facility in Douglas is still active, and water use has varied dramatically at this facility over time. Current water use is estimated around three AF per year.

#### **2.2.2.4 POWER**

The Douglas AMA has one peaking power plant that operates periodically to meet demand in emergency situations. Due to infrequent use of the power plant, water use is limited and is estimated to be below one AF per year. Most of the power used in the basin is generated externally, with the Douglas Fairview power station only generating power on an as-needed basis in high-demand situations. The implementation of technology is expected to eliminate water use for power generation in the Douglas AMA. This decrease will be driven by the transition from water-intensive fossil fuels to more efficient renewable energy.

#### **2.2.2.5 SAND AND GRAVEL**

There are five sand and gravel facilities in the Douglas AMA that process and supply concrete, decorative rock, marble, limestone, crushed rock, and sand and gravel. Current water use is estimated at 268 AF per year across all five facilities.

#### **2.2.2.6 TURF**

The Douglas AMA has a small number of industrial turf facilities, primarily golf courses. Others include public parks, schools, and community centers. Water use for industrial turf irrigation is currently estimated to be 602 AF per year.

### **2.2.3 AGRICULTURAL SECTOR**

Agricultural demand is water applied to two or more acres of land, to produce plants or parts of plants, for sale for human consumption or use as feed for livestock, range livestock, or poultry. As of 2016, according to the United States Geological Survey (USGS), roughly 22,000 acres were dedicated to farmland in the Douglas AMA. This sector accounts for roughly four percent of all private industry jobs in Cochise County (Duval et al., 2020). Commonly cultivated crops in the region include alfalfa, cotton, corn, and pecans. USGS provided the estimated annual withdrawal amounts. In instances where USGS estimated withdrawals were not available, the Department developed estimates using a three-year average. Agricultural water demand in the Douglas AMA has approximately doubled from 32,500 acre-feet (AF) in 1990 to 61,469 AF in 2022.

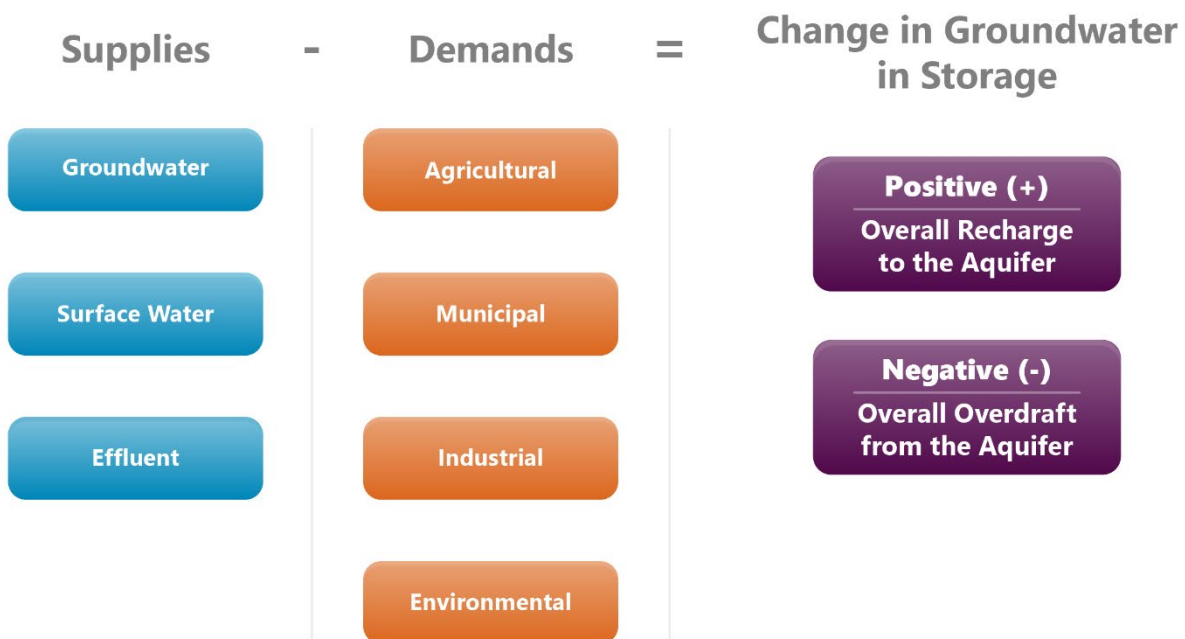
## 2.2.4 ENVIRONMENTAL DEMAND

The Department quantified estimated environmental use in the Douglas AMA in this report as evapotranspiration in stream areas. Evapotranspiration is the loss of water from the land through the transpiration of plants and evaporation from the soil and surface water bodies. However, this is not inclusive of all environmental uses. Evapotranspiration fluctuates based on available precipitation and streamflow. The estimated volumes of evapotranspiration in the Douglas AMA for the period evaluated ranged from a low of 921 AF in 2022 to a high of 6,140 AF in 2012.

## 2.3 CURRENT WATER BUDGET

The Department estimates the annual water budget each year by adding and/or subtracting from estimated aquifer storage. If supply exceeds demand, the difference is added to the aquifer storage. Likewise, if demand exceeds available supply, the difference is then subtracted from estimated aquifer storage. This process provides checks and balances and enables a baseline assessment of available stored groundwater.

**Figure 2-3: Douglas AMA water budget, including all available supplies and demands.**



Under baseline conditions, the Department estimates an insufficient annual supply to meet annual demand. Analysis reveals a consistent negative balance of supply and

demand each year, with more water leaving, than entering, the basin. Attributed to this negative balance is agriculture, consuming an average of 87% of demand in the Douglas AMA. The lowest imbalance during the period was **-13,670 AF** in 1991, which was also the year with the second smallest agricultural withdrawal and relatively high volumes of mountain-front recharge and agricultural incidental recharge.

**Table 4. Summary of baseline supply data for the Douglas AMA.**

WATER TYPE	COMPONENT	YEAR		
		1990	2005	2022
<b>Effluent</b>	Industrial Demand Reuse	132	186	118
<b>Annual Groundwater</b>	Streamflow Infiltration	338	3,844	59
	Incidental Recharge	11,523	14,747	14,496
	Mountain-Front Recharge	11,014	3,035	12,125
	Net Underflow	-2,239	-3,575	-4,634
<b>Surface Water</b>	Streamflow Available for Diversion	38	427	7

All values in AF. "Negligible" is defined as a value less than 0.1 but not zero.

Between 1990-2022, 3 AF of water left the basin for every 1 AF of supply. This rate of overdraft resulted in a total storage decrease of about 1,129,000 AF from 1990 to 2022. The estimated water available in storage at the end of the baseline period is 7,754,700 AF. This volume represents the amount of water in storage at a depth of 356 feet, the average well depth in the Douglas AMA. If the water table was lowered to this depth, approximately 59 percent of existing wells in the average depth range would dry up, failing to meet current and future water needs.

**Table 5. Total groundwater available in storage during the baseline data period in the Douglas AMA.**

	1990	2005	2022
<b>Groundwater Available in Storage</b>	8,883,700	8,502,000	7,754,700

All values in AF.

**Table 6. Summary of total demand and supply values from 1990-2022 in Douglas.**

	1990	2005	2022
<b>Supply</b>	20,805	18,664	22,170
<b>Demand</b>	-37,505	-50,450	-67,494
<b>Balance</b>	-16,700	-31,785	-45,324
<b>Resulting Water Available in Storage</b>	8,883,700	8,502,000	7,754,700

Negative numbers in the total/balance row indicate that the amount of water listed is being withdrawn/leaving the basin annually. All values are in AF.

## 2.4 CONCLUSION

Agriculture accounts for 87 percent of demand in the Douglas AMA, with more than 18,000 acres in current cultivation. Municipal and industrial activities in the basin also contribute substantially to water use. Despite significant volumes of mountain-front recharge replenishing groundwater supplies, groundwater in storage decreases yearly in the Douglas AMA. Incidental recharge from agriculture replenishes some groundwater supplies, but there is insufficient recharge to balance current and future demand in this region.

## ACRONYMS AND DEFINITIONS

### ACRONYMS

Acre-Foot	AF
Active Management Area	AMA
Arizona Department of Agriculture	AZDA
Arizona Department of Environmental Quality	ADEQ
Arizona Department of Water Resources	ADWR
Arizona Revised Statutes	A.R.S.
Arizona State Mine Inspector	ASMI
Bureau of Land Management	BLM
Community Water System	CWS
Consumptive Use	CU
Drainage Area Ratio	DAR
Gallons Per Capita per Day	GPCD
Irrigation Efficiency	IE
Irrigation Non-Expansion Area	INA
Lost and Unaccounted For	L&U
National Interagency Fire Center	NIFC
People per Household Unit	PPHU
Supply and Demand Report	SDR
United States Department of Agriculture	USDA
United States Geological Survey	USGS
Water Infrastructure Finance Authority	WIFA

## DEFINITIONS

<b>Acre-foot (AF)</b>	The amount of water it takes to cover one acre of land to the depth of one foot, approximately 325,851 gallons.
<b>Active Management Area (AMA)</b>	A geographic area that has been designated pursuant to A.R.S. § 45-411 as requiring active management of groundwater or, in the case of the Santa Cruz AMA, active management of any water, other than stored water, withdrawn from a well. Subsequent active management areas may be designated through local initiative or by the Director of the Department.
<b>Agricultural Water Use</b>	Agricultural Water Use means the same as “irrigate” under A.R.S. § 45-402(18) which is defined as the water applied to two or more acres of land to produce plants, or parts of plants, for sale for human consumption or use as feed for livestock, range livestock, or poultry.
<b>Aquifer</b>	A geologic formation that contains sufficient saturated materials to be capable of storing water and transmitting water in useable quantities to a well
<b>Aquifer Recharge</b>	Water added to the aquifer through seepage and infiltration, either naturally or artificially. Water may be stored artificially (recharged) pursuant to a permit issued under A.R.S. § 45-831.01, the Underground Water Storage, Savings and Replenishment Program.
<b>Aquifer Storage</b>	Water stored underground, either naturally or artificially. Water may be stored artificially (recharged) pursuant to a permit issued under A.R.S. § 45-831.01, the Underground Water Storage, Savings and Replenishment Program.
<b>Baseline</b>	A starting dataset, survey, or study to which future datasets, surveys, and studies can be compared.
<b>Capacity Factor</b>	The unitless ratio of the electrical energy produced by a generating unit in a given period of time compared to the electrical energy that could have been produced at continuous full power operation during the same period.
<b>Census Blocks</b>	A geographic area bounded by visible and/or invisible features shown on a map prepared by the U.S. Census Bureau. A block is the smallest geographic entity for which the Census Bureau tabulates decennial census data.

<b>Community Water System (CWS)</b>	A public water system, as defined in A.R.S. § 49-352(B), that serves at least fifteen service connections used by year-round residents of the area served by the system or that regularly serves at least twenty-five year-round residents of the area served by the system. A person is a year-round resident of the area served by a system if the person's primary residence is served water by that system.
<b>Confined Aquifer</b>	An aquifer that is sandwiched between two layers of relatively impermeable materials.
<b>Consumptive Use (CU)</b>	The part of the water demand that becomes unavailable for future use because the water is evaporated or consumed by the use. Consumptive use also refers to diversions from the mainstream of the Colorado River minus the returns.
<b>Domestic Well</b>	A small-capacity water production well typically used to provide water for domestic purposes.
<b>Drought</b>	A sustained natural reduction in precipitation that results in negative impacts to the environment and human activity.
<b>Ephemeral Stream</b>	A stream or part of a stream that flows only in direct response to precipitation; it receives little or no water from springs, melting snow, or other sources; its channel is always above the water table.
<b>Evapotranspiration</b>	Loss of water from the land through transpiration of plants and evaporation from the soil and surface water bodies.
<b>Groundwater</b>	Water under the surface of the earth regardless of the geologic structure in which water is stored or travels. Groundwater does not include water flowing in underground streams with ascertainable beds and banks.  The Maricopa County Superior Court will likely draw legal distinctions between groundwater and surface water as part of the general stream adjudications proceedings. Such legal distinctions may differ from traditional hydrologic characterizations of groundwater and surface water and may affect the Department's classification of available water in future reports.
<b>Groundwater Basin</b>	An area which may be designated to enclose a relatively hydrologically distinct body or related bodies of groundwater which shall be described horizontally by surface description.
<b>Groundwater Flow Model</b>	A digital computer model that calculates a hydraulic head field for the modeling domain using numerical methods to arrive at an approximate solution to the differential equation of groundwater flow.

<b>Incidental Recharge</b>	The percolation of water to the water table after the water has been used. Components of incidental recharge include recharge that occurs from septic tanks, turf watering and effluent discharge.
<b>Industrial Demand</b>	Water used by an industrial facility, such as a golf-course, dairy, feedlot, power plant, mine, or paper mill.
<b>Industrial Demand Reuse</b>	A water supply source used to meet industrial demand and later reused for a secondary beneficial use.
<b>Inflow</b>	All water that enters a hydrologic system. Examples include mountain-front and stream channel recharge, artificial and incidental recharge and baseflow and underflow into a system.
<b>Land Subsidence</b>	The lowering of the land-surface from changes that take place underground.
<b>Lost and Unaccounted For Water (L&amp;U)</b>	The total quantity of water from any source that enters a water distribution system during a calendar year minus the total quantity of deliveries of water from the water distribution system during the calendar year.
<b>Municipal Demand</b>	All non-agricultural and non-industrial uses of water supplied by a city, town, private water company, irrigation district, domestic water improvement district, water cooperative, or private domestic well.
<b>Municipal Provider</b>	A city, town, private water company or irrigation district that supplies water for municipal use.
<b>Non-Public Water System</b>	Water systems that serve less than 15 service connections or 25 people.
<b>Non-Residential Use</b>	Municipal water use that is not used for residential purposes. May include commercial, institutional, recreational, or transitory uses.
<b>Outflow</b>	All water that leaves a hydrologic system. Examples include cultural water demand, phreatophyte use and underflow and baseflow out of the system
<b>Overseeded Area</b>	For a calendar year, an area of land planted with any cool-season grass species that grows over a dormant warm-season grass species during the fall-winter period.
<b>Perennial Stream</b>	A stream or part of a stream with surface flow throughout the year, drying only during periods of drought.
<b>Public Water System</b>	Pursuant to A.R.S. § 49-352(B), a water system that: <ul style="list-style-type: none"> <li>a) Provides water for human consumption through pipes or other constructed conveyances.</li> </ul>

	b) (b) Has at least fifteen service connections or regularly serves an average of at least twenty-five persons daily for at least sixty days a year.
<b>Residential Use; Non-Provider</b>	Residential use not supplied by a municipal provider.
<b>Residential Use; Provider</b>	Residential use supplied by a municipal provider.
<b>Sand and gravel facility</b>	A facility that produces sand and gravel. For purposes of this definition, the annual water use shall include all water used by the facility regardless of the nature of the use.
<b>Saturated Thickness</b>	The difference between the top and bottom elevations of an aquifer. Typically, the elevation of the bedrock subtracted from the elevation of the water table.
<b>Saturated Volume</b>	The saturated thickness multiplied by the area of the aquifer. This volume includes the aquifer material and the water filling its pores.
<b>Surface Water</b>	<p>The waters of all sources, flowing in streams, canyons, ravines, or other natural channels, or in definite underground channels, or in definite underground channels, whether perennial or intermittent, floodwater, wastewater or surplus water, and of lakes, ponds, and springs on the surface.</p> <p>The Maricopa County Superior Court will likely draw legal distinctions between groundwater and surface water as part of the general stream adjudications proceedings. Such legal distinctions may differ from traditional hydrologic characterizations of groundwater and surface water and may affect the Department's classification of available water in future reports.</p>
<b>Treated Wastewater</b>	Water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated as a sewage system, disposal plant or wastewater treatment facility.
<b>Turf Acres</b>	An area of irrigated landscaping that is not part of a private residence. May include grass, ground cover, trees, gardens, low water use landscaping, or ornamental water surface area.
<b>Water Table</b>	The top of the water surface in the saturated part of a non-confined aquifer.
<b>Well</b>	A well is a manufactured opening in the earth through which water may be withdrawn or obtained from beneath the surface of the earth. Wells exempted pursuant to A.R.S. <u>§ 45-591.01</u> are not included in this definition for purposes of this report.

For additional definitions, please see the ADWR dictionary:

<https://www.azwater.gov/adwr/dictionary>



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## CHAPTER 3: UNDERGROUND WATER STORAGE, SAVINGS, AND REPLENISHMENT PROGRAM

### 3.1 INTRODUCTION

The purpose of the Underground Water Storage, Savings & Replenishment (Recharge) Program is to encourage the development, delivery, use, and storage of renewable water supplies now and in the future. The Recharge Program, in combination with the *First Management Plan for the Douglas Active Management Area* (1MP) conservation program efforts, is intended to support achievement of the water management goal for the Douglas Active Management Area (DAMA). Increasing the use of renewable water supplies, primarily reclaimed<sup>7</sup> water, in lieu of pumping groundwater is an important component to preserving future DAMA groundwater supplies.

For the purposes of this chapter, “augmentation” means increasing the availability and use of renewable water supplies, such as reclaimed water, in lieu of groundwater. “Recharge” means storage of excess renewable water supplies (non-groundwater) for future use & intent to replenish the aquifer pursuant to the Underground Water Storage, Savings and Replenishment Act (A.R.S. § 45-801.01, *et seq.*). Although the Arizona Department of Water Resources (the Department) does not have the ability to implement an augmentation program, the Department recognizes the need to pursue and obtain additional water supplies in the future. During the first management period, the Department will encourage the development, efficient use, and recharge of renewable water supplies in the DAMA. Recharge provides a cost-effective means of utilizing available renewable water supplies that cannot currently be used directly. The Recharge Program is an effective tool to mitigate local water supply problems, depending on where storage and recovery activities occur.

### 3.2. RECHARGE AND RECOVERY OVERVIEW

Recharge statutes and the 1MP provisions provide the regulatory framework in which water may be stored and recovered. The statutes and the 1MP, when read together, establish a number of objectives. These objectives include:

- To protect the general economy and welfare of the state by encouraging the use of renewable water supplies instead of groundwater, through a flexible and

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<sup>7</sup> In the DAMA 1MP, the term “reclaimed water” has the same definition as effluent in A.R.S. § 45-101.

- effective regulatory program for the underground storage, savings, and replenishment of water;
- To allow for the efficient and cost-effective management of water supplies by allowing the use of storage facilities for filtration and distribution of renewable water instead of constructing renewable water treatment plants and pipeline distribution systems;
  - To reduce overdraft and achieve the management goals of the Active Management Areas (AMAs);
  - To store water underground for use during seasonal peak demand periods and for use during periods of shortage;
  - To augment the local water supply to allow future growth and development.

Since the inception of the Recharge and Recovery Program in Arizona in 1986, recharge and recovery have become increasingly flexible over time with regard to storage and recovery locations and the number and types of programs available. Increased flexibility and complexity introduced emerging local water challenges that may include: affected water tables, water quality, physical availability, and third-party impacts. While these affects present potentially positive or negative consequences, impact to recharge and recovery facilities is imminent. An effective 1MP program is crucial to maximize benefits and minimize harm, for the State of Arizona and for this critical area.

### 3.2.1 PRIMARY PROGRAM COMPONENTS

Persons who elect to undertake recharge-related activities must obtain the necessary permits from the Department. There are three recharge-related permit categories: (1) Storage Facility Permits, composed of constructed or managed Underground Storage Facility (USF) permits and Groundwater Savings Facility (GSF) permits; (2) Water Storage (WS) permits; and (3) Recovery Well (RW) permits. For a detailed description of each of these permits, please see the Recharge program page on the Department's website: <https://azwater.gov/recharge>. Storage facility permits allow entities to operate either a facility that stores water in an aquifer (USF) or a facility that receives renewable water in-lieu of pumping groundwater (GSF). Permitted facilities recharge reclaimed water and/or surface water. Water storage permits approve water storage at a USF or GSF. Recovery well permits are required for an entity to recover any stored water.

Rights to recover stored water may be exercised annually or long-term. Any recoverable water recovered within the same year in which it was stored is referred to as annual recovery. If the water is not recovered annually, it may be credited to a long-term storage account, except for decreed and appropriative surface water, which can only be recovered

annually. The account holder may recover the water at any point in the future, if certain conditions are met. No time limit exists on the right to recover long-term storage credits. Long-term storage credits may be transferred to another entity if that entity can meet the same provisions for earning credits as the storer, pursuant to A.R.S. § 45-802.01(23). In addition, once the water is recovered, it retains the same legal characteristics it had before storage.

In many cases, a certain percentage of the volume of water stored is made non-recoverable by statute to benefit the aquifer. These required non-recoverable volumes are termed "cuts to the aquifer" and are taken from storage of reclaimed water at managed facilities. "Cuts to the aquifer" do not apply to water that is stored and recovered annually, with the exception of reclaimed water stored at managed facilities.

### 3.2.2 STORAGE AND RECOVERY SITING CRITERIA

The benefits to water management through the Recharge Program depend on where the water is stored and recovered. For storage and recovery, unless stored water is recovered by the storer within the area of impact, the recovery is only allowed if the requirements in A.R.S. § 45-834.01(A) are met including that "[t]he director determines that recovery at the proposed location is consistent with the management plan and achievement of the management goal for the active management area.",). Recovery of stored water *within* the area of impact of the stored water is always considered consistent with the management plan.

Although the statute ties recovery outside the area of impact to the consistency requirements of the plan, the locations of storage and recovery of water are inherently linked. Both must be considered when determining whether the future recovery meets the requirement for consistency with the management plan and management goal of the AMA. Outside the area of impact, it cannot be determined whether recovery is consistent with water management objectives of the AMA, unless the storage location is also considered. Water management benefits to the AMA depend greatly on whether water recovered from an existing well was stored in a remote area of the AMA or in a large pumping center of the AMA. Therefore, the criteria to determine whether the recovery location is consistent with the management plan and goal for the AMA must also consider where water was stored.

Storage and recovery locations are important factors in addressing local and regional supply problems, particularly in critical areas, and in attempting to reduce the rate of aquifer depletion in an AMA. For example, the future water supplies of the AMA may be diminished if water storage occurs in a remote location having no foreseeable future

demand for the stored water, and if recovery occurs outside the area of impact of storage. Recovery outside the area of impact of water storage could aggravate problems if the area of recovery is already experiencing significant groundwater level declines. If storage occurs in an area experiencing high water levels and recovery occurs away from the area of impact, water storage will contribute to those high-water levels. If dewatering is required as a direct result of water storage or savings, either the storage facility's operational plan should be adjusted to minimize impacts or the storer may not be issued credits.

The Management Plan siting criteria provides protection of groundwater supplies already committed for an assured water supply from an entity that desires to recover water outside the area of impact. These siting criteria also link future use benefits to determinations under the AWS Program. If storage occurs in an area that has an issued demand through a Designation or Certificate of AWS, then it is deemed to contribute to groundwater supplies to be used in the future. If the storage does not meet these criteria, such as if it were located in a remote area with no issued demands from a Designation or Certificate of AWS, it must be determined by the director to otherwise be beneficial to the AMA, if recovery is to occur outside the area of impact of storage.

Recovery from within the area of impact is not required to meet management plan consistency requirements. Recovery may occur outside the area of impact of the storage only if the director determines that the recovery location is consistent with the management plan. A.R.S. § 45-834.01(A). Therefore, recovery must continue to be consistent with management plan criteria, even after the recovery well permit has been issued.

## **3.3 RENEWABLE WATER SUPPLIES ASSESSMENT**

### **3.3.1 EFFLUENT**

Although direct human consumption of treated effluent is not expected during the first management period, the potential for greater use of effluent for other direct non-potable uses remains, as well as indirect potable reuse through storage and recovery. Storage of effluent underground can improve its quality while preserving it in the AMA for future use. Direct use of effluent, and storage and recovery, recycles our water supplies. When effluent is captured and reused, the original source water is used more than once, and may cycle through the system multiple times prior to its full consumption. This increases the value of effluent as a resource in the DAMA.

The main source of effluent in the DAMA comes from the City of Douglas Wastewater Treatment Plant (WWTP). This effluent is discharged directly across the US-Mexico International border to Agua Prieta, Sonora. The effluent is used primarily for crop irrigation in Mexico (U.S. Environmental Protection Agency, Region IX, 2014). Due to the historic commitment to deliver the effluent to Mexico, the availability of effluent for recharge may be a challenge.

Several factors may limit the ability to directly use all of the effluent generated in the DAMA. First, the quality of most treated effluent is insufficient to directly introduce it into potable water supply systems. Direct use, therefore, is limited to non-potable uses including agricultural irrigation, turf watering, and some industrial applications. Second, effluent generation is directly related to indoor water consumption and tends to be higher in the winter months due to winter seasonal visitors. However, users of effluent for agricultural irrigation and turf watering purposes have high summer and low winter water demands. Third, infrastructure is lacking to treat and deliver effluent supplies for direct use within the AMA. It is likely that additional treatment facilities will be needed to treat increased amounts of wastewater as the population increases. Placement of these additional treatment facilities in areas where the effluent can be used within the AMA to offset groundwater use are crucial to meeting future water needs of the AMA. Underground recharge of effluent allows it to be stored during low demand periods and later recovered during high demand periods. Recharge also allows the possibility of indirect potable use of effluent through recovery wells.

### **3.3.2 SURFACE WATER**

The surface water in the DAMA consists of one intermittent stream, Whitewater Draw, along with small ephemeral washes. Whitewater Draw drains the 950 square mile DAMA in a southerly direction, continuing to flow across the US-Mexico border and is renamed Rio Agua Prieta after crossing the border as part of the Yaqui River. Whitewater Draw only flows during summer monsoon season and winter snowmelt. A small amount of incidental recharge may result from streambed infiltration from the Whitewater Draw and other ephemeral washes in the basin (U.S. Environmental Protection Agency, Region IX, 2014).

## **3.4 CONCLUSION**

The Recharge Program encourages the development and use of renewable water supplies now and into the future of the DAMA. The Recharge Program is intended to support achievement of the reduction of groundwater by increasing and promoting the use of renewable water supplies, primarily reclaimed water. The efforts to increase the use of

renewable water supplies will require partnerships with DAMA entities that are willing to make necessary changes, and support efforts to improve groundwater conditions.

### **3.5 RECHARGE AND RECOVERY REQUIREMENTS**

#### ***3-501 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), the following words and phrases used in sections 3.1 through 3.4 of this chapter shall have the meaning set forth below, unless the context otherwise requires:

1. "1MP" means the First Management Plan for the Douglas Active Management Area
2. "2MP" means the Second Management Plan for the Douglas Active Management Area
3. "ADWR" means the Arizona Department of Water Resources
4. "Area of Impact" means, as projected on the lands surface, the area where the stored water has migrated or is located.
5. "Effluent recovered outside the area of impact" means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered outside the area of impact of storage. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
6. "Effluent" is water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to title 49, chapter 2 as prescribed in A.R.S. § 45-101.
7. "Effluent recovered within the area of impact" means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the area of impact of storage. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
8. "Storage Facility" means a groundwater savings facility or an underground storage facility.
9. "Water storage" means adding water to an aquifer or saving water in an aquifer pursuant to permits issued under this chapter.

#### ***3-502 Storage and Recovery Siting Criteria***

During the first management period, for the purposes of A.R.S. § 45-834.01(A)(2) recovery of stored water at a location is consistent with the management plan and achievement of the management goal for the active management area:

- A. If recovery will occur within the area of impact of the stored water, regardless of whether the recovery well permit applicant was the storer of the water; or

- B. If recovery will occur outside of the area of impact of the stored water, all of the following three criteria are met:

1. The water storage that resulted in the right to recover water:

- a. Is contributing to groundwater supplies that are accessible to current groundwater users or that have been committed to establish a Designation, Certificate, or Analysis of Assured Water Supply pursuant to A.R.S. § 45-576 or rules adopted thereunder so long as the areas in which water is stored are not experiencing shallow depth to water conditions; or
- b. Is a component of a remedial action project under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") or Title 49, Arizona Revised Statutes, except projects for which groundwater is withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03, and the Director has determined that the remedial action will contribute to the objectives of this chapter or the achievement of the management goal for the active management area; or
- c. Is otherwise determined by the Director to have contributed to the objectives of this chapter or the achievement of the management goal for the active management area.

2. Either:

- a. At the time of the application, the maximum projected depth to water at the location of the recovery well after 100 years does not exceed the general 100-year depth-to-static water level for the active management area specified by Arizona Administrative Code ("A.A.C.") R12-15-716 after considering: (1) the maximum proposed withdrawals from the recovery well; (2) withdrawals for current, committed, and projected demands associated with determinations made under A.R.S. § 45-576 that are reliant on the water which the recovery well will withdraw; and (3) withdrawals for other current or projected demands that are reliant on the water which the recovery well will withdraw; or
- b. The recovery will be undertaken within the applicant's service area and the applicant is a municipal provider designated as having an assured water supply.

3. The recovery well is:

- a. Located in an area experiencing an average annual rate of decline that is less than 4.0 feet per year; or



- b. A component of a remedial action project under CERCLA or Title 49, Arizona Revised Statutes, except projects for which groundwater is withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03, and the Director has determined that the remedial action will contribute to the objectives of this chapter or the achievement of the management goal for the active management area; or
- c. Likely to contribute to the water management objectives of the geographic area in which the well is located, as determined by the Director.

### ***3-503 Storage of Non-Recoverable Water***

During the first management period, water storage that is designated as non-recoverable is consistent with the active management area's Recharge Program if one of the following criteria is met. The water storage:

1. Is contributing to groundwater supplies that are accessible to current groundwater users or that have been committed to establish a Designation, Certificate, or Analysis of Assured Water Supply pursuant to A.R.S. § 45-576 or rules adopted thereunder so long as the areas in which water is stored are not experiencing problems associated with shallow depth to water; or
2. Is a component of a remedial action project under CERCLA or Title 49, Arizona Revised Statutes, except projects for which groundwater is withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03, and the Director has determined that the remedial action will contribute to the objectives of this chapter or the achievement of the management goal for the active management area; or
3. Is otherwise determined by the Director to contribute to the objectives of this chapter or the achievement of the management goal for the active management area.

## **CHAPTER 4: AGRICULTURAL CONSERVATION PROGRAM**

### **4.1 INTRODUCTION**

The Agricultural Conservation Program for the First Management Plan for the DAMA sets the regulatory requirements applicable to all agricultural users within the Douglas groundwater basin required by law. Pursuant to A.R.S. § 45-452, with certain narrow exceptions, only land associated with a Certificate of Irrigation Grandfathered Right (IGFR) can be legally irrigated with groundwater within an Active Management Area (AMA). To irrigate means to grow crops for sale, human consumption, or livestock or poultry feed by applying water on two or more acres (A.R.S. § 45-402(18)). IGFRs are issued by the Arizona Department of Water Resources (ADWR) based on acreage irrigated during the five-year period before the August 30, 2022 call for the election (August 30<sup>th</sup>, 2017-August 30<sup>th</sup>, 2022). Water duties and allotments are calculated for each IGFR based on the crop type grown during the same period. Each Certificate of Irrigation Grandfathered Right describes the legally irrigatable acres. A key component of the Groundwater Code prohibits new acres from being put into agricultural production.

### **4.2 AGRICULTURAL CONSERVATION PROGRAM DESCRIPTION**

The Agricultural Conservation Program is designed to assist agricultural users with increasing water conservation to progress toward the AMA's goal to support the general economy and welfare of water users in the basin by reducing the rate of aquifer depletion.

The following section describes the Agricultural Conservation Program for the First Management Plan for the Douglas AMA.

The Douglas AMA has two conservation program options for IGFR holders, the Base Program and the Integrated Farm Program. The Base Program is the default program. If certain requirements are met, however, the owner of an IGFR may opt into the Integrated Farm Program. The Agricultural Conservation Program also contains irrigation distribution system conservation requirements for irrigation districts and private water companies distributing groundwater for irrigation use. Each of the programs contain the conservation and reporting requirements described below.

The conservation requirements specified in this chapter are designed to reduce the withdrawals of groundwater and become effective on January 1, 2027. This chapter contains summaries and descriptions of the general requirements for each conservation

program. The full, legally enforceable details of each requirement can be found in the italicized section.

#### **4.2.1 THE BASE PROGRAM**

Consistent with A.R.S § 45-564, each IGFR owner and any persons entitled to withdraw or use groundwater pursuant to an irrigation grandfathered groundwater right will be regulated under the Base Program, unless an application for regulation under the Integrated Farm Program is approved by the Director during the first management period. A.R.S. § 45-564 provides water duty calculations.

The irrigation acres, water duty acres, assigned irrigation efficiency, irrigation water duty, and maximum annual groundwater allotment for each IGFR in the DAMA will be set forth as rights are issued in the document entitled "Supplement 1," which will be available on ADWR's website.

##### **4.2.1.1 FLEXIBILITY ACCOUNTS**

IGFR owners in the Base Program are able to accrue credits and debits from year to year allowing for varying climatic and market changes, pursuant to A.R.S. § 45-467. ADWR manages an open flexibility account annually for each IGFR. In the Base Program, flexibility account credits are not limited, but a negative balance cannot exceed 50 percent of the annual allotment or the IGFR violates the conservation program's requirement. Flexibility account credits may be used at any time to offset allotment overages. Under certain conditions, IGFR owners regulated under the Base Program may transfer, convey, or acquire flexibility credits pursuant to A.R.S. § 45-467.

The State of Arizona has developed incentives to increase the use of non-groundwater supplies. To incentivize effluent use, A.R.S § 45-467 excludes it from consideration in determining the amount of debit to be registered to a farm's flexibility account. Any person using groundwater on a farm pursuant to an IGFR may use an unlimited amount of effluent on the farm without debiting any of the effluent against the farm's flexibility account.

##### **4.2.1.2 AGRICULTURAL CONSERVATION PROGRAM CALCULATIONS AND FORMULA COMPONENTS**

The irrigation water duty is the primary component of both the Base Program and the Integrated Farm Program and is used to determine the maximum annual groundwater allotment for each IGFR. This section describes the calculation and formula components used to determine the maximum annual groundwater allotments.

### ***Calculation of Maximum Annual Groundwater Allotments***

The maximum annual groundwater allotment for each IGFR is determined by multiplying the irrigation water duty by the water-duty acres. These calculations are governed by A.R.S. § 45-465.

### ***Calculation of Irrigation Water Duties***

The irrigation water duty is the amount of water reasonably required per acre to annually irrigate the historic crops grown on a farm unit during August 30, 2017, through August 30, 2022. The IGFR application process determined the list of crops historically grown in this region. ADWR calculates the irrigation water duty for each IGFR using the following formula:

$$\text{Irrigation Water Duty} = \frac{\text{Total Irrigation Requirements per Acre}}{\text{Assigned Irrigation Efficiency}}$$

The irrigation water duty is calculated by dividing the total water required to produce the historically grown crops by the assigned irrigation efficiency. Each component of the formula is discussed below.

### ***Assigned Irrigation Efficiencies***

<b>Acres</b>	<b>Set Irrigation Efficiency</b>
10-99	80%
100-499	83%
500+	85%

### ***Total Irrigation Requirement***

The total irrigation requirement for each farm unit equals the amount of water needed to satisfy the sum of irrigation requirements for any crop grown between August 30, 2017, and August 30, 2022. For each crop, the irrigation requirement (IR) equals the sum of water to meet the crop consumptive use (CU), plus any other needs the crop may have (ON), plus a leeching allowance (LA). Any effective precipitation (EP) is subtracted from the sum. The calculation is seen below.

$$IR = CU + ON + LA - EP$$

COMPONENT	DEFINITION
<b>Consumptive Use (CU)</b>	The consumptive use requirement of a crop is the amount of water used in transpiration and building of plant tissue, together with the amount of water evaporated from adjacent soil during the growing season. Appendix 4A lists the consumptive-use requirement for each crop historically grown in the region.
<b>Other Needs (ON)</b>	Water required by certain crops for purposes other than consumptive use is referred to as "other needs" water. Examples of "other needs" include additional water for certain vegetable crops for germination, cooling and quality control. ADWR makes adjustments for those crops that have "other needs." Appendix 4A lists the "other needs" requirements for crops historically grown in the DAMA.
<b>Leaching Allowance (LA)</b>	<p>In some situations, a crop may require additional water for leaching or deep percolation. A leaching allowance may be necessary to prevent salts from accumulating in the crop root zone when high levels of total dissolved solids (TDS) are present in the irrigation water. If the accumulated salts in the soil profile are not leached below the root zone, soil salinity will increase and eventually inhibit plant growth and yields.</p> <p>The procedure ADWR uses to calculate the leaching allowance for a crop is shown by the following equation:</p> $LA = \frac{AE}{0.85} \left[ CU \left[ \left[ \frac{1}{1 - \frac{EC_w}{5EC_e - EC_w}} \right] - 1 \right] \right]$ <p>Where, LA = leaching allowance for the crop;  AE = assigned irrigation efficiency for the farm unit;  CU = consumptive use requirement of the crop;  ECw = electrical conductivity of the irrigation water (expressed in millimhos per centimeter); and  ECe = tolerance of the crop to soil salinity as indicated by the electrical conductivity of the soil saturation extract (expressed in millimhos per centimeter).</p> <p>As most of the irrigation water in the DAMA is of adequate quality for irrigation purposes, ADWR does not include leaching allowances in the calculation of irrigation requirements for crops grown in the DAMA. If an IGFR had an irrigation water supply with an ECw value greater than 1.5 millimhos per centimeter (a concentration of approximately 1,000 milligrams per liter of TDS), the owner of the IGFR may apply to ADWR for an administrative review to seek a leaching allowance as discussed in Chapter 7 of this plan.</p>

<b>Effective Precipitation (EP)</b>	<p>Effective precipitation is defined as the amount of precipitation occurring before and during the growing season that is available for plant growth. Because precipitation is minimal and varies considerably by year and location in the DAMA, effective precipitation is difficult to quantify and is not subtracted from the total irrigation requirements for the crops historically grown. Technologies such as soil-moisture sensors can increase efficiency by allowing farmers to skip irrigation when precipitation events are sufficient.</p>
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#### 4.2.2 INTEGRATED FARM PROGRAM

The Integrated Farm Program enables the owner/operator of IGFRs to combine allotments and apply groundwater anywhere within the combined boundary of the IGFRs. This allows the combined IGFRs to file under a single annual report. The maximum annual groundwater allotment is calculated as described in section 4.2.1.2 of this chapter. The total sum of the combined annual allotments for IGFRs participating in the program will receive a cut of 5% to the aquifer.

Under the Integrated Farm Program, the existing flexibility accounts of the participating IGFRs will be frozen. A new and separate flexibility account is created and accruals debits or credits according to the total combined allotment for the farm unit. The flex account is limited to debits/accruals totaling +/- 50% of the total allotment. Any farm unit exceeding a negative debit of 50% of the total allotment is out of compliance with program requirements. If the IGFRs in a single farm unit returns to the Base Program, the flexibility account of the farm unit will be proportionally divided among the IGFRs.

IGFR owners desiring to enroll into the Integrated Farm Program must satisfy the following:

- File an application with ADWR
- Submit a current map of the IGFRs to be included in the program
- Ensure IGFRs are in compliance with flexibility account provisions. If not, refer to section 4.2.1.1 of this Chapter
- If the applicant is leasing the land, a signed affidavit from the owner of each IGFR, for which the application is filed, stating that the owner agrees to regulation under the Integrated Farm Program.

The owner or lessee of the Integrated Farm Program enrolled IGFRs except under either of the following conditions:

- New owners of IGFRs may file a written request to the Director to withdraw from the Integrated Farm Program within 60 days after the conveyance of the IGFR has been completed. Once withdrawn, the new owner will be regulated under the Base Program.
- The owner(s) of IGFRs enrolled in the Integrated Farm Program may file a written request to the Director to withdraw IGFR(s) from the program. Upon approval, the IGFR(s) withdrawn would remain under the Integrated Farm Program until the following reporting year.

### **4.3 IRRIGATION DISTRIBUTION SYSTEM REQUIREMENTS**

The first management period includes irrigation distribution system requirements, consistent with A.R.S. 45-564, which provides for “additional economically reasonable conservation requirements for the distribution of groundwater by cities, towns, private water companies, and irrigation districts within their service areas.”

Irrigation distribution system requirements, including monitoring/reporting requirements, apply to irrigation districts and private water companies distributing any amount of water for irrigation use. Irrigation districts and private water companies are required to reduce their irrigation distribution system lost and unaccounted for water. The total lost and unaccounted-for water must be 10 percent or less of the total quantity of water withdrawn, diverted, or received during each year. These requirements are effective upon the commencement of operation or by the first compliance date of the 1MP, whichever is later.

### **4.4 OTHER REGULATORY EFFORTS**

Use of remediated groundwater and renewable supplies is encouraged in the DAMA. The Water Quality Assurance Revolving Fund (WQARF) Program provides incentives for the use of remediated groundwater to facilitate the treatment of contaminated groundwater. Mandatory criteria to qualify for this accounting are available in the legally enforceable provisions in section 4.5 of this chapter, entitled: Remedial Groundwater Accounting for Conservation Requirements. Effluent use is encouraged through calculation of the farm’s flex account as described in section 4.2.1.1.

## 4.5 AGRICULTURAL CONSERVATION, MONITORING AND REPORTING REQUIREMENTS

### 4-501 Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes (“A.R.S.”), the following words and phrases used in sections 4.1 through 4.4 of this chapter shall have the meanings set forth below, unless the context otherwise requires:

1. “1MP” means the First Management Plan for the Douglas Active Management Area
2. “2MP” means the Second Management Plan for the Douglas Active Management Area
3. “DAMA” means the Douglas Active Management Area
4. “ADWR” means the Arizona Department of Water Resources
5. “A.R.S.” means Arizona Revised Statutes
6. “Canal” means a waterway constructed for the purpose of transporting water to a point of delivery, including main canals and lateral canals.
7. “Effluent” is water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to title 49, chapter 2 as prescribed in A.R.S. § 45-101.
8. “Farm” has the same definition as prescribed in A.R.S. § 45-402.
9. “Farm Unit” has the same definition as prescribed in A.R.S. § 45-402.
10. “Flexibility Account” is an account maintained under A.R.S. § 45-467.
11. “IGFR” means an Irrigation Grandfathered Right as prescribed in A.R.S. § 45-402.
12. “Irrigation Acre” has the same definition as prescribed in A.R.S. § 45-402.
13. “Irrigation Distribution System” means a system of canals, flumes, pipes, or other works that are owned or operated by an irrigation district or private water company and used to deliver water for irrigation use.
14. “Irrigation Water Duty” has the same definition as prescribed in A.R.S. § 45-465 which, for the 1MP, is the total irrigation requirement to produce the crops historically grown, divided by the assigned irrigation efficiency, with reductions made in certain cases consistent with A.R.S. § 45-465.
15. “Maximum Annual Groundwater Allotment” means the maximum amount of groundwater which may be used per year for the irrigation of each irrigation acre in the farm that is calculated consistent with A.R.S. § 45-465.



16. "On-farm Seasonal Irrigation Efficiency" means the total water requirement to produce a crop divided by the total quantity of water actually applied to that crop during one growing season.
17. "Remedial Groundwater" means groundwater withdrawn pursuant to an approved remedial action project under the comprehensive environmental response, compensation, and liability act of 1980, as amended (P.L. 96-510; 94 Stat. 2767; 42 United States Code sections 9601 through 9657) or Title 49, Arizona Revised Statutes, but does not include groundwater withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03.
18. "Total Quantity of Lost and Unaccounted-for Water" or "Lost Water" means the total quantity of water from any source, including effluent, that enters an irrigation district's or private water company's irrigation distribution system during a calendar year less the total deliveries of water made by the irrigation district or private water company through its irrigation distribution system during the calendar year that are measured or estimated based on a generally accepted method of estimating water use.
19. "Water Duty Acres" has the same definition as prescribed in A.R.S. § 45-461.

#### ***4-502 Base Agricultural Conservation Program Requirements***

- A. Unless the owner of a Certificate of Irrigation Grandfathered Right ("IGFR") is regulated under the Integrated Farm Program described in section 4-503, the IGFR owner and any person who is entitled to use groundwater pursuant to that IGFR shall comply with this section.
- B. The IGFR owner and any person entitled to use groundwater pursuant to that IGFR shall comply with the irrigation water duty and maximum annual groundwater allotment assigned for the IGFR beginning January 1, 2027, and during each calendar year thereafter until the first compliance date of any subsequent conservation program. The irrigation acres, water duty acres, assigned irrigation efficiency, irrigation water duty, and maximum annual groundwater allotment for each IGFR in the Dougals Active Management Area ("DAMA") are set forth in the document entitled "Supplement I to the 1MP for the DAMA," which will be created as IGFRs are issued and will be available for inspection and copying at ADWR and on the ADWR Management Plans webpage.
- C. The IGFR owner and any person entitled to use groundwater pursuant to that IGFR may use the maximum annual groundwater allotment assigned for the right in Supplement I to irrigate only the irrigation acres to which the right is appurtenant.

- D. The IGFR owner and any person entitled to use groundwater pursuant to that IGFR shall not use water for irrigation purposes during a calendar year in an amount which exceeds the maximum annual groundwater allotment assigned for the right in Supplement I, except as provided by the flexibility account provisions of A.R.S. § 45-467 and any rules adopted by the Director.
- E. Pursuant to Arizona Administrative Code (“A.A.C.”) R12-15-1013, the IGFR owner and any person using groundwater pursuant that IGFR shall keep and maintain, for at least three calendar years following the filing of an annual report required by A.R.S. § 45-632, all records which may be necessary to verify the information and data contained in the annual report.

#### ***4-503 Integrated Farm Program Requirements***

- A. Application for Regulation under the Integrated Farm Program

An owner of an IGFR, or any person entitled to use groundwater pursuant to that IGFR may apply to be regulated under the Integrated Farm Program after the 1MP has been adopted until the first compliance date of a subsequent conservation program. One application may be filed for multiple IGFRs within the same basin and are farmed by the same owner or any person entitled to use groundwater pursuant to those IGFRs. An application for regulation under the Integrated Farm Program shall be on a form provided by the Director and shall include the following information:

1. The name, address, phone number, and email address of the applicant.
2. The certificate numbers of IGFRs for which the application is filed.
3. The name of the Farm or Farm Unit (if applicable).
4. If the applicant is not the owner of an IGFR for which the application is filed, a signed declaration from the owner of that IGFR stating that the owner agrees to regulation under the Integrated Farm Program until the effective date of any future conservation program, except as provided in subsection A, of this section.
5. A current farm plan map
6. A signed declaration from the owner or any person entitled to use groundwater pursuant to those IGFRs stating that the owner or any person entitled to use groundwater pursuant to those IGFRs agrees to the five

percent cut the aquifer from the total combined allotment for the integrated farm unit.

#### B. Criteria for Approval of Application

The Director shall approve an application for regulation under the Integrated Farm program if all of the following requirements are satisfied:

1. The application is found to be complete and correct. This includes, but is not limited to, meeting all the criteria listed in A (1)-A (6) of this section.
2. The applicant is in compliance with the Base Program flexibility account.

#### C. Integrated Farm Program Requirements

An owner of the IGFR(s), whose application has been approved for regulation under the Integrated Farm Program, and anyone entitled to use groundwater pursuant those IGFRs, shall comply with all of the following:

1. The irrigation water duty and maximum annual groundwater allotment established by the Director under this section, beginning with the calendar year after the IGFR owner is accepted into the Integrated Farm Program and continuing thereafter until first compliance date of a subsequent conservation program, except as provided in subsection F, of this section. The Director shall establish the irrigation water duty and maximum annual groundwater allotment in the same manner that the Director established the irrigation water duty and maximum annual groundwater allotment assigned for the IGFR in the Base Agricultural Conservation Program described in Section 4-502 for each IGFR accepted into the Integrated Farm Program. The total maximum annual groundwater allotment for the integrated farm unit shall be the sum of the individual IGFRs maximum total groundwater allotments minus a five percent cut to the aquifer.
2. The IGFR owner, or any person entitled to use groundwater pursuant to those IGFRs, may use the maximum annual groundwater allotment assigned to the integrated farm unit to irrigate only the irrigation acres to which the IGFRs are appurtenant.
3. The IGFR owner, or any person entitled to use groundwater pursuant to those IGFRs, may not use water for irrigation purposes during a calendar year in an amount which exceeds the maximum annual groundwater allotment assigned to the integrated farm unit, except as provided in the

flexibility account provisions of section D and any rules adopted by the Director.

#### D. Flexibility Account Provisions

Under the Integrated Farm Program, the flexibility account provisions of A.R.S. § 45-467 shall not apply to the individual IGFRs regulated under the Integrated Farm Program. Upon acceptance into the Integrated Farm Program, the balance in each IGFR's flexibility account at the time of acceptance into the Integrated Farm Program shall remain unchanged until water use on the IGFR is no longer regulated under the Integrated Farm program.

Under the Integrated Farm program, a new flexibility account will be created for the integrated farm unit. The flexibility account provisions of A.R.S. § 45-467 shall apply to newly created integrated farm unit owners and any person entitled to use groundwater under that integrated farm unit with the following modifications:

1. If the amount of water used to irrigate the integrated farm unit in any year is less than the maximum annual groundwater allotment established for the integrated farm unit pursuant to subsection C, paragraph 1 of this section, the amount of any credit registered to the farm's flexibility account pursuant to A.R.S. § 45-467 shall not exceed the difference between the existing balance in the account and a positive account balance of 50 percent of the maximum annual groundwater allotment. The Director shall not register a credit to the integrated farm unit's flexibility account in any year in which the account has an existing positive account balance equal to 50 percent of the maximum annual groundwater allotment.
2. If the amount of water used to irrigate the integrated farm unit in any year is more than the maximum annual groundwater allotment established for the integrated farm unit pursuant to subsection C, paragraph 1 of this section, the amount of any debit registered to the integrated farm unit's flexibility account pursuant to A.R.S. § 45-467 shall not exceed the difference between the existing balance in the account and a negative account balance of 50 percent of the maximum annual groundwater allotment. The Director shall not register a debit to the integrated farm unit's flexibility account in any year in which the account has an existing negative account balance equal to 50 percent of the maximum annual groundwater allotment.

3. If IGFR(s) are removed from the Integrated Farm Program pursuant to subsection F and G of this section, the integrated farm unit's flexibility account will be divided proportionally by water duty acres. The IGFR(s) being removed will add the proportioned flexibility account balance to the unchanged balance existing prior to their acceptance into the Integrated Farm Program.

#### E. Reporting Requirements

In addition to the information required to be submitted in the annual report required by A.R.S. § 45-632, the integrated farm unit owner, or any person entitled to use groundwater pursuant to that integrated farm unit, shall submit the following information on a form provided by the Director, regardless of whether an irrigation district files the annual report on behalf of the integrated farm unit owner:

1. The name, address, phone number, and email address of any person entitled to use groundwater under the integrated farm unit.
2. Pursuant to A.A.C. R12-15-1013, the person submitting the form shall keep and maintain, for at least three calendar years following the filing of the form, current and accurate records which may be necessary to verify the information and data contained in the form.

#### F. Requirement of New Lessee to Apply for Participation in Integrated Farm Program

1. Any person who acquires a leasehold interest in the land enrolled in the Integrated Farm Program shall file with the Director, an application to participate in the Integrated Farm Program prior to using water on the land. The application shall be on a form provided by the Director and shall contain the following information:
  - a. The applicant's name, address, telephone number, and email address.
  - b. The certificate number(s) of IGFR(s) for which the application is filed.
  - c. A certification that the applicant agrees to be regulated under the Integrated Farm Program while leasing the land.
  - d. Any other information required by the Director.

2. The Director shall approve an application to participate in the Integrated Farm Program filed under paragraph 1 of this subsection if the application meets all of the requirements set forth in subsection B of this section. If the Director denies the application and the Director's decision denying the application becomes final after exhaustion of all appeals, the applicant shall file a new application to participate in the Integrated Farm Program within 30 days after the Director's decision becomes final. In the new application, the applicant shall make a good faith effort to correct the deficiencies that the Director identifies with the first application. If the Director denies the new application, both the owner of the IGFR and the applicant shall be regulated under the Base Agricultural Conservation Program in section 4-502.

G. Duration of Regulation under the Integrated Farm Program

A person regulated under the Integrated Farm Program shall be regulated under the program until the first compliance date of a subsequent conservation program or until the 2MP, unless either of the following apply:

1. There is a new owner, and the new owner has submitted a written request to the Department to withdraw from the program. Requests must be written within 60 days after the conveyance.
2. The owner or any person who is entitled to use groundwater pursuant to the IGFR(s) enrolled with the Integrated Farm Program submits a written request to the Department detailing the IGFR(s) to be removed from the program. Any IGFRs withdrawn from the program will remain regulated under the Integrated Farm Program until the next reporting year.

***4-504 Conservation Requirements for Irrigation Distribution Systems***

A. Applicability

The irrigation distribution system conservation requirements set forth in subsection B below apply to irrigation districts and private water companies that distribute water for irrigation use.

B. Conservation Requirements

By January 1, 2027 or upon commencement of operation, whichever is later and continuing thereafter until the first compliance date of a subsequent conservation program or until the 2MP, each irrigation district and private water company

owning or operating an irrigation distribution system shall line and maintain all canals used to deliver water for irrigation use with a material that allows no more lost water than a well-maintained concrete lining, and ensure the total quantity of lost and unaccounted-for water of the distribution system is 10 percent or less of the total quantity of water from any source, including effluent, that enters its irrigation distribution system, calculated on either a calendar year basis or a three-year average basis based on that calendar year and the two preceding calendar years.

1. An irrigation district may be exempt from the requirement to line canals if the total quantity of lost and unaccounted-for water of the distribution system is 10 percent or less of the total quantity of water from any source, including effluent, that enters its irrigation distribution system, calculated on either a calendar year basis or a three-year average basis based on that calendar year and the two preceding calendar years.

#### ***4-505 Monitoring and Reporting Requirements for Irrigation Districts and Private Water Companies***

##### **A. Applicability**

The monitoring and reporting requirements set forth in subsection B below apply to irrigation districts and private water companies that distribute water for irrigation use.

##### **B. Monitoring and Reporting Requirements**

Beginning with calendar year 2027 or the calendar year in which the irrigation district or private water company commences service, whichever is later, and for each calendar year thereafter until the first compliance date of a future conservation program, each irrigation district and private water company owning or operating an irrigation distribution system shall submit in its annual report required by A.R.S. § 45-632, the following information as it applies to the irrigation district or private water company:

1. A map showing the irrigation distribution system, including those portions which have lined canals and those portions which have unlined canals, unless a current map is on file with the Department.
2. The number of miles of lined canals and unlined canals in the irrigation distribution system.

3. The total quantity of water from any source, including effluent, that entered the irrigation district's or private water company's irrigation distribution system during the calendar year.
4. The total quantity of water from any source, including effluent, delivered by the irrigation district or private water company through its irrigation distribution system to all water users during the calendar year.
5. An estimate of the irrigation district's or private water company's Total Quantity of Lost and Unaccounted-for Water for the calendar year.
6. The total quantity of water ordered by a municipal provider from the irrigation district and released by the irrigation district from a storage or distribution facility, but not accepted by the municipal provider or delivered to any other person.

#### ***4-506 Remediated Groundwater Accounting for Conservation Requirements***

##### **A. Accounting**

For the purposes of determining compliance with the conservation requirement established under this chapter, Remedial Groundwater used by a person subject to the conservation requirement shall be accounted for consistent with the accounting for surface water, subject to the provisions of subsections B through D of this section.

##### **B. Amount of Groundwater Eligible for Accounting**

For each approved remedial action project, the annual amount of groundwater eligible for the remedial groundwater accounting provided in subsection A of this section is the project's annual authorized volume. The annual authorized volume for a remedial action project approved on or after June 15, 1999, is the maximum annual volume of groundwater, which may be withdrawn pursuant to the project, as specified in a consent decree or other document approved by the United States Environmental Protection Agency ("EPA") or the Arizona Department of Environmental Quality ("ADEQ"). The annual authorized volume for a project approved prior to June 15, 1999, is the highest annual use of groundwater withdrawn pursuant to the project prior to January 1, 1999, except if a consent decree or other document approved by the EPA or ADEQ specifies the maximum annual volume of groundwater which may be withdrawn, pursuant to the project, the project's annual authorized volume is the maximum annual volume of



groundwater specified in that document. The Director may modify the annual authorized volume for a remedial action project as follows:

1. For an approved remedial action project associated with a treatment plant that was in operation prior to June 15, 1999, a person may request an increase in the annual authorized volume at the same time the notice is submitted, pursuant to subsection C of this section. The Director shall increase the annual authorized volume up to the maximum treatment capacity of the treatment plant if adequate documentation is submitted to the Director demonstrating that an increase is necessary to further the purpose of the remedial action project and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.
2. A person may request an increase in the annual authorized volume of an approved remedial action project at any time if it is necessary to withdraw groundwater in excess of the annual authorized volume to further the purpose of the project. The Director shall increase the annual authorized volume up to the maximum volume needed to further the purpose of the project if adequate documentation justifying the increase is submitted to the Director and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.
3. The Director shall modify the annual authorized volume of an approved remedial action project to conform to any change in the consent decree or other document approved by the EPA or ADEQ if the person desiring the modification gives the Director written notice of the change within 30 days after the change. The notice shall include a copy of the legally binding agreement changing the consent decree or other document approved by the EPA or ADEQ.

#### C. Notification

To qualify for the remediated groundwater accounting provided in subsection A of this section, the person desiring the accounting must notify the Director in writing of the anticipated withdrawal of Remedial Groundwater pursuant to an approved remedial action project under Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA") or Title 49, Arizona Revised Statutes, prior to the withdrawal. At the time the notice is given, the person desiring the accounting must be using Remedial Groundwater, pursuant to the approved remedial action project or must have agreed to do so through a consent decree or

other document approved by the EPA or ADEQ. The notice required by this subsection shall include all of the following:

1. A copy of the document approved by ADEQ or the EPA, such as the Remedial Action Plan ("RAP"), Record of Decision ("ROD") or consent decree, authorizing the remediated groundwater project. Unless expressly specified in the document, the person shall include in the notice the volume of remedial Groundwater that will be pumped annually pursuant to the project, the time period to which the document applies and the annual authorized volume of groundwater that may be withdrawn pursuant to the project.
2. The purpose for which the Remedial Groundwater will be used.
3. The name and telephone number of a contact person.
4. Any other information required by the Director.

#### D. Monitoring and Reporting Requirements

To qualify for the remedial groundwater accounting for conservation requirements as provided in subsection A of this section, Remedial Groundwater withdrawn pursuant to the approved remedial action project must be metered separately from groundwater withdrawn in association with another groundwater withdrawal authority for the same or other end use. A person desiring the remedial groundwater accounting for conservation requirements shall indicate in its annual report, under A.R.S. § 45-632, the volume of water withdrawn and used during the previous calendar year that qualifies for the accounting.

#### ***4-507 Audits of Conservation Requirements***

- A. The Department may elect to conduct audits of reports, records, and/or practices pursuant to the conservation requirements contained in sections 4-502 through 4-506 of this chapter. If an audit is conducted, a report of the audit will be sent to the audited person or entity as required by applicable law. (See, e.g., A.R.S. §§45-633(D), 880.01(D), 1061(D), and/or A.A.C. R12-15-1102(E)).

<b>APPENDIX 4A: DAMA CONSUMPTIVE USE AND OTHER NEEDS REQUIREMENTS BY CROP</b>	
<b>Crop</b>	<b>Consumptive Use (AF/Acre)</b>
Alfalfa	4.80
Corn	2.06
Wheat	2.78
Cotton	3.55
Barley	2.95
Grapes	3.23
Dry Beans	4.76
Pecans (with groundcover)	4.97
Pecans (without groundcover)	3.61
Pistachios	4.60
Sorghum	4.87
Watermelon	2.97
Oats	2.95
Herbs	1.42
Millet	2.66
Peppers	3.12
Potatoes	2.75
Rye	2.23
Sod/Grass seed	4.14
Triticale	2.41
Double Crop Barley & Corn	5.01
Double Crop Wheat & Corn	4.84

ADWR calculated consumptive use values independently, and incorporated into that calculation USGS crop coefficients, recent weather data, and previously reported Douglas INA water use values.

The Director may add additional crops to the list of DAMA Consumptive Use and Other Needs Requirements by Crop set forth in above by posting the modified list of consumptive use and other needs requirements by crop on the Department’s website and filing the modified list within the Department’s Active Management Area office. Any agricultural water user whose allotment is calculated based on the additional crops will be provided notice of that allotment and will have the opportunity to apply for a variance or administrative review.

## **CHAPTER 5: MUNICIPAL CONSERVATION PROGRAM**

### **5.1 INTRODUCTION**

The Municipal Conservation Program for the DAMA First Management Plan sets forth the regulatory requirements applicable to all municipal providers within the Douglas groundwater basin. Municipal water providers are cities, towns, private water companies, and irrigation districts that deliver groundwater for non-irrigation uses such as residential, commercial, governmental, industrial, and construction. Municipal water providers may also include well co-operatives, mobile-home parks, or improvement districts. The Department regulates providers which serve more than 250 acre-feet (AF) of water for non-irrigation purposes as large municipal providers. Those providers serving 250 AF or less annually are regulated as small municipal providers. Some municipal providers deliver untreated water for landscape/flood irrigation purposes only. The Department regulates providers that deliver 100 AF or more of untreated water annually for landscape/flood irrigation purposes as large untreated municipal providers. Providers that deliver less than 100 AF of untreated water annually for landscape/flood irrigation purposes are considered small untreated municipal providers and are included in the small municipal provider category.

The Municipal Conservation Programs for DAMA have been carefully curated to meet the needs of the municipal providers servicing the community. The large provider program is called the Integrated Water Resource Plan. The Integrated Water Resources Plan is a new program purposed to guide municipalities in sustainable strategic planning for future growth and supply changes. The conservation requirements contained in this chapter become effective January 1, 2027. The description of the program and the legal language pertaining to the program can be found in section 5.10.

### **5.2 MUNICIPAL CONSERVATION PROGRAM: SCOPE AND PURPOSE**

The Municipal Conservation Program for the DAMA 1MP is designed to assist municipal providers with increasing their water conservation and efficiency to progress toward reductions in withdrawals of groundwater and support the general economy and welfare of the basin.

#### **5.2.1 THE ASSURED WATER SUPPLY PROGRAM IN THE MUNICIPAL CONSERVATION PROGRAM**

Assured Water Supply (AWS) means that sufficient water of adequate quality will be physically, legally, and continuously available to meet the water needs of the proposed

use for at least 100 years, and that the projected use is consistent with the management goal for DAMA. The Act requires persons proposing to offer subdivided lands for sale or lease within an AMA to demonstrate that the proposed subdivision has an assured water supply according to A.R.S. § 45-576.

In 1995, The Department adopted rules to implement the assured water supply statute. The AWS Rules specify in detail what an applicant for a Certificate of Assured Water Supply or a Designation of Assured Water Supply must demonstrate. The Municipal Conservation Program sets forth the requirements for demonstrating that proposed use is consistent with the management plan for the AMA.

The current AWS Rules do not include specific provisions related to evaluating physical availability or consistency with the management goal in subsequent AMAs; as such, the Rules will be modified to include content specific to the DAMA.

### **5.3 MUNICIPAL CONSERVATION PROGRAMS**

The following section describes the Municipal Conservation Program components for the DAMA 1MP. This conservation program consists of the Integrated Water Resources Plan, which is required of all large municipal providers. This conservation program also includes a conservation program for small municipal providers, a program for large untreated providers, and requirements for the distribution of water for non-irrigation use by cities, towns, private water companies, and irrigation districts.

#### **5.3.1 INTEGRATED WATER RESOURCES PLAN (IWRP)**

The IWRP is a scenario planning program designed to increase water-use efficiency, promote reuse, and reduce the withdrawals of groundwater while anticipating potential challenges in the provider's service area. While regulated under the IWRP, a provider must plan for potential residential and non-residential demand.

##### **5.3.1.1 REGULATED PARTIES- INTEGRATED WATER RESOURCES PLAN REQUIREMENTS**

All Large Providers in the DAMA must submit an IWRP containing the information required in Section 5.10 of this chapter no later than July 1, 2026. A new large municipal provider, including a small municipal provider the deliveries for which expand to qualify as a large municipal provider during the first management period, must submit an Integrated Water Resources Plan within six months after receiving notice of its conservation requirements as a large municipal provider from the Director.

### 5.3.1.2 GENERAL REQUIREMENTS

Large municipal providers regulated under the IWRP must also comply with individual user requirements, municipal distribution system requirements, and monitoring and reporting requirements. Conservation requirements for individual users in the 1MP are located in section 5.10 of this chapter. The IWRP shall contain service area characteristics, supply descriptions, residential and non-residential demands, future infrastructure improvements, and scenarios estimating water supply and demand for potential growth. If there are any changes to the plan, the large municipal provider must submit an updated plan to the Director. All detailed requirements for the IWRP are provided in section 5-503 of this chapter.

## 5.4 LOST AND UNACCOUNTED-FOR WATER

All municipal providers must limit the total amount of lost and unaccounted-for water in their distribution systems. All large municipal providers must limit the amount of lost and unaccounted-for water to no more than 10 percent of the total quantity of water, calculated on an annual and three- year average. All small municipal providers must limit the amount of lost and unaccounted-for water to no more than 15 percent of the total quantity of water, calculated on an annual and three-year average. The calculation and details are outlined in section 5.10 of this chapter.

## 5.5 CONSERVATION REQUIREMENTS FOR NEW MUNICIPAL PROVIDERS

A new municipal provider is defined as a city, town, private water company, or irrigation district that begins serving water to customers for non-irrigation use after January 1, 2027. Based on the amount of water served to customers annually, the new municipal provider would either be categorized as large or small. A large municipal provider serves more than 250 AF of water for non-irrigation purposes, annually. A small municipal provider serves 250 AF or less. Any additional large municipal providers will be assigned under the Integrated Water Resources Plan Program. If a small provider serves over 250 AF for three out of five years, the provider will be notified of the transition to a large municipal provider and the new conservation requirements of the program. Additionally, The Department requires the collection of residential and non-residential water use data during the base year and the total amount of water withdrawn, diverted, or received by the provider in the service area.

## **5.6 CONSERVATION REQUIREMENTS FOR CONSOLIDATED MUNICIPAL PROVIDERS AND PROVIDERS THAT ACQUIRE OR CONVEY A PORTION OF A SERVICE AREA**

If two or more municipal providers consolidate their service areas and the consolidated provider qualifies as a large municipal provider, it will be regulated under the Integrated Water Resources Plan Program. If the conveying or acquiring a portion of a service area or if the provider continues or qualifies as a large municipal provider, it will be regulated under the Integrated Water Resources Plan Program.

## **5.7 CONSERVATION REQUIREMENTS FOR LARGE UNTREATED WATER PROVIDERS**

A large untreated water provider must limit its deliveries of untreated water during a year to an amount calculated by multiplying the number of gross acres of land to which it serves untreated water by an average application rate of four AF per acre. A gross acre is the entire acre, including associated structures, but not including any acres regulated as a turf-facility. A large untreated provider also must meet the individual user requirements, distribution system requirements, and the monitoring and reporting requirements.

## **5.8 CONSERVATION REQUIREMENTS FOR SMALL MUNICIPAL PROVIDERS**

For the first management period and continuing until the first compliance date of a subsequent conservation program, small providers will be required to minimize waste of all water supplies, maximize efficiency in non-residential watering, encourage reuse of water supplies, and improve water-use efficiency as feasible. Small Providers must comply with a maximum of 15 percent of lost and unaccounted-for water, as well as the regulatory requirements of all municipal providers.

## **5.9 REGULATORY REQUIREMENTS FOR ALL MUNICIPAL PROVIDERS**

The following requirements have been established for all municipal providers: individual user requirements, distribution system requirements, and monitoring and reporting requirements.

### **5.9.1 INDIVIDUAL USER REQUIREMENTS**

An individual user is a person who receives water from a municipal provider for non-irrigation use. Either the individual user or the municipal provider serving the individual

user is responsible for complying with the individual user requirements outlined in the appropriate subsector program in Chapter 6 of this plan.

### **5.9.2 DISTRIBUTION SYSTEM REQUIREMENTS**

Lost and Unaccounted-for Water is defined as the total water from any source, except direct use effluent, withdrawn, diverted, or received in a year, minus the total amount of authorized deliveries made by the municipal provider in that year. Lost and unaccounted-for water includes line leakage, meter under-registration, evaporation or leakage from storage ponds or tanks, system and hydrant leaks or breaks, and illegal connections.

All municipal providers are required to meet an efficient lost and unaccounted-for water standard in their service area. Lost and unaccounted-for water is determined for each municipal provider based on the total quantity of metered and unmetered water deliveries and the total water withdrawn, received, or diverted by the municipal provider for each calendar year, excluding direct-use effluent. Small providers must maintain a lost and unaccounted-for water at or below 15 percent. Large municipal providers are required to maintain their system not to exceed 10 percent lost and unaccounted-for water. Large untreated water providers are required to either line all canals used to deliver untreated water to the provider's delivery points with a material that allows for no more lost water than a well-maintained concrete lining or operate and maintain its distribution system to limit lost and unaccounted-for water at or below 10 percent.

In the first management period and continuing until the first compliance date of a subsequent conservation requirement, the Department will allow providers to exclude water from the lost and unaccounted-for water calculation that is metered or estimated using approved estimating procedures and used pursuant to the other regulatory requirements such as well purging and line flushing. Providers may also exclude estimated water uses such as construction (truck loads for dust control) or fire services, but all other uses of water within a distribution system must be metered. Appendix 5A provides a complete list of uses that are considered in the lost and unaccounted-for water calculation and those uses which can be estimated to determine volume.

### **5.9.3 MONITORING AND REPORTING REQUIREMENTS**

All municipal providers are required to annually report to The Department:

1. Information on the total quantity of water withdrawn, received, or diverted that enters the groundwater distribution system during the year.
2. Total quantity of water used within the service area and the total volume of water delivered for various municipal purposes.



3. Total number of housing units by unit type within the service area from December 31 of the previous calendar year to December 31 of the reporting year.
4. All movements of water made by the provider during the year, including water accepted from another entity (received) that was subsequently sent (delivered) to be stored at a GSF, Underground Storage Facility and stored water that was recovered during the year, whether annual or long-term credit recovery, regardless of the water type.
5. Volume of water ordered from an irrigation district that was released by the irrigation district from a storage or distribution facility but not accepted by the municipal provider or delivered to any other person.
6. An updated water-service area and distribution system map delineating all distribution lines greater than four inches, all treatment works, and all well sites.
7. All wells operated by the municipal provider, regardless of the type of water withdrawn from the well.

Large providers are required to separately measure and report the amount of water delivered via the providers groundwater distribution system each month for: irrigation uses, residential uses (separated by single family and multifamily), and non-residential uses (separated by water-use categories, including turf-irrigated facility use, commercial use, industrial use, government use, construction use, surface water treatment, and other uses).

## **5.10 MUNICIPAL CONSERVATION, MONITORING, AND REPORTING REQUIREMENTS**

### ***5-501 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, unless the context otherwise requires, the following words and phrases used in this chapter shall have the following meanings:

1. "1MP" means the First Management Plan for the Douglas Active Management Area
2. "2MP" means the Second Management Plan for the Douglas Active Management Area
3. "DAMA" means the Douglas Active Management Area
4. "A.A.C" means the Arizona Administrative Code
5. "ADWR" or "the Department" means the Arizona Department of Water Resources
6. "A.R.S." means Arizona Revised Statutes
7. "Canal" means a waterway constructed for the purpose of transporting water to a point of delivery, including main canals and lateral canals.

8. "Common area" means a recreational or open-space area or areas owned and operated as a single integrated facility and maintained for the benefit of the residents of a housing development.
9. "Construction use" means a use of water for construction purposes, including the use of water for dust control, compaction and preparation of building materials on construction sites.
10. "Direct use effluent" means effluent that is transported directly from a facility regulated pursuant to Title 49, Chapter 2, Arizona Revised Statutes, to an end user. Direct use effluent does not include effluent that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes.
11. "Effluent" is water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to title 49, chapter 2 as prescribed in A.R.S. § 45-101.
12. "Effluent recovered within the area of impact" means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the area of impact of storage. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
13. "Effluent recovered outside the area of impact" means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered outside the area of impact of storage. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
14. "Exterior water use" means non-residential or residential uses of water for landscaping, pools, evaporative cooling systems, decorative fountains and other outdoor uses of water.
15. "Groundwater distribution system" means a system of pipes, canals or other works within a municipal provider's service area which are owned and operated by the provider to collect, store, treat or deliver groundwater for non-irrigation use, regardless of whether other types of water are also present in the system.
16. "Housing unit" means a group of rooms or a single room occupied as separate living quarters. A Housing unit includes a single-family home, a patio home, a townhouse, a condominium, an apartment, a permanently set-up mobile home or a unit in a multifamily complex. A Housing unit does not include a mobile home in an overnight or limited-stay mobile home park or a unit in a campground, motel, hotel or other temporary lodging facility. A Housing unit may be occupied by a family, a family and unrelated persons living together, two or more unrelated persons living together or by one person.

17. "Individual User" means a person receiving groundwater from a municipal provider for non-irrigation uses to which specific conservation requirements apply, including turf-related facilities, large-scale cooling facilities and publicly owned rights-of-way.
18. "Large municipal provider" means a municipal provider serving more than 250 acre-feet ("AF") of water for non-irrigation use during a calendar year.
19. "Large-scale cooling facility" means a facility which has control over cooling operations with a total combined cooling capacity greater than or equal to 1,000 tons. For the purposes of this definition, the minimum cooling tower size which shall be used to determine total facility cooling capacity is 250 tons. A large-scale cooling facility does not include a large-scale power plant that utilizes cooling towers to dissipate heat.
20. "Large untreated water provider" means a municipal provider that as of January 1, 1990 was serving untreated water to at least 500 persons or supplying at least 100 AF of untreated water during the calendar year. In addition, a municipal provider that entered into a written agreement between December 15, 1989 and September 21, 1991 to serve untreated water to a user, and that provided a copy of that agreement to the Director by June 22, 1992 is a large untreated provider upon serving untreated water to at least 500 persons pursuant to the service agreement or upon supplying 100 AF of untreated water during a calendar year pursuant to the agreement.
21. "Lost and unaccounted-for water" means the total quantity of water from any source that enters a municipal provider's groundwater distribution system during a calendar year less the total quantity of authorized deliveries of water from the groundwater distribution system during the calendar year that are metered deliveries or deliveries that the municipal provider accounts for by a method of estimating water use approved by the Director.
22. "Lost water" means untreated water from any source that enters an untreated water distribution system and is lost from the system during transportation or distribution due to seepage, evaporation, leaks, breaks, phreatophyte use or any other cause.
23. "Low Water Use & Drought Tolerant Plants List" means the list of low water use and drought tolerant plants.
24. "Multifamily housing unit" means a mobile home in a mobile-home park and any permanent housing unit having one or more common walls with another housing unit located in a multifamily residential structure, and includes a unit in a duplex,

- triplex, fourplex, condominium development, town-home development, or apartment complex.
25. "Municipal distribution system" means a system of pipes, canals or other works within a municipal provider's service area that are owned and operated by the provider to collect, store, treat or deliver water for non-irrigation use.
  26. "Municipal provider" means a city, town, private water company or irrigation district that supplies water for non-irrigation use.
  27. "New Individual User" means an individual user that begins receiving water from a municipal provider after adoption of the 1MP.
  28. "New large municipal provider" means a municipal provider that begins serving more than 250 AF of water for non-irrigation use during a calendar year after January 1, 2027.
  29. "Remedial Groundwater" means groundwater withdrawn pursuant to an approved remedial action project under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 *as amended* (P.L. 96-510; 94 Stat. 2767; 42 United States Code sections 9601 through 9657) ("CERCLA") or Title 29, Arizona Revised Statutes, but does not include groundwater withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03.
  30. "Residential use" means a non-irrigation use of water related to the activities of a single-family or multifamily housing unit or units, including exterior water use.
  31. "Service area" has the definition prescribed by A.R.S. § 45-402.
  32. "Service area population" means the number of people residing in housing units connected to distribution lines maintained by the municipal provider within its service area that are being served as of December 31 of the applicable year.
  33. "Service connection" means a coupling of a municipal provider's distribution system and its customer's water system.
  34. "Single-family housing unit" means a detached dwelling, including mobile homes not in mobile home parks.
  35. "Small municipal provider" means a municipal provider that supplies 250 AF or less of water for non-irrigation use during a calendar year.
  36. "Turf-related facility" means any facility, including a school, park, cemetery, golf course or common area of a housing development, with a water-intensive landscaped area of 10 or more acres.
  37. "Untreated water" means water that is not treated to improve its quality and that is supplied by a municipal provider through a distribution system other than a potable water distribution system.

38. "Untreated water municipal distribution system" means a municipal distribution system operated by a large untreated water provider for the purpose of delivering untreated water for non-irrigation use.
39. "Water-intensive landscaped area" means, for a calendar year, an area of land which is watered with a permanent water application system and planted primarily with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists, and the total surface area of all bodies of water filled or refilled with water from any source, including effluent, that are an integral part of the landscaped area. Bodies of water used primarily for swimming purposes are not an integral part of a landscaped area.

#### ***5-502 Large Municipal Providers – Conservation Program***

- A. All Large Municipal Providers shall comply with the Integrated Water Resources Plan beginning on January 1, 2027, and continuing thereafter until the first compliance date for any subsequent municipal conservation program requirement.
- B. All municipal providers shall comply with Individual User requirements, distribution system requirements, and applicable monitoring and reporting requirements as prescribed in sections 5-507, 5-508, and 5-509.

#### ***5-503 Large Municipal Provider Integrated Water Resources Plan***

##### A. Integrated Water Resources Plan

Beginning with the calendar year specified in subsection (A) and continuing until the first compliance date for any subsequent municipal conservation requirement, a large municipal provider regulated under the Integrated Water Resources Plan shall withdraw, divert, or receive water from any source for non-irrigation use during a year meeting the Integrated Water Resources Plan strategies.

- A. Large Municipal Provider Integrated Water Resources Plan- Submittal Date
  - i. A large municipal provider shall submit an Integrated Water Resources Plan to the Director no later than July 1, 2026.
  - ii. A new large provider shall submit an Integrated Water Resources Plan to the Director no later than six months after the notice of large provider conservation requirements.
- B. Compliance with Integrated Water Resources Plan

The Director shall determine if a large municipal provider is in compliance with its Integrated Water Resources Plan for a calendar year pursuant to the metrics provided in subsection A of this Section.

A. Integrated Water Resources Plan- Contents: Review, Approval, or Disapproval

- a. An Integrated Water Resources Plan required by subsection (A) of this Section shall contain the following information:
  - i. A description of the providers' service area characteristics and water use patterns.
  - ii. Details on the total number of service connections including residential and non-residential connections.
  - iii. Water use of residential and non-residential usage over time.
  - iv. Details on infrastructure improvements designed to help reduce the withdrawal of groundwater.
  - v. Potential future improvements with timelines to implement.
  - vi. Include a minimum of two scenarios estimating future water withdrawals, potential growth, and future conservation measures to reduce the withdrawal of groundwater.
1. Within 90 days after receiving a large provider's Integrated Water Resources Plan, the Director shall approve or disapprove the Integrated Water Resources Plan and send a written notice to the provider. The Director shall approve the Integrated Water Resources Plan if the Director determines that the plan contains information demonstrating that the provider will implement at least the minimum of the contents required in Section (A)(a) and that the conservation measures to be implemented are reasonable, relevant to the provider's service area characteristics and water patterns. If the Director disapproves the provider's Integrated Water Resources Plan, the Director shall include a written notice of the decision for the reasons for disapproval. A decision of the Director disapproving an Integrated Water Resources Plan is an appealable agency action pursuant to Title 41, Chapter 6, Article 10. With a decision of the Director disapproving an Integrated Water Resources Plan, the provider shall revise the plan to correct the deficiencies identified by the Director in the written notice and submit the revised plan to the Director.
2. The Integrated Water Resources Plan shall be submitted to the Director every five years with the minimum requirements required in Section (A)(a) and milestones passed from the previous Integrated Water Resource Plan submission. If milestones are missed or timelines change, the Provider shall submit an updated plan to the Director.

## ***5-504 Consolidation of Municipal Provider Service Areas; Acquisition of a Portion of Another Municipal Provider's Service Area***

### **A. Notification**

1. If two or more municipal providers consolidate their service areas into one service area, the consolidated provider shall notify ADWR of the consolidation within 30 days after the consolidation becomes effective.
2. If a municipal provider acquires a portion of another municipal provider's existing service area, both the acquiring provider and the conveying provider shall notify ADWR of the acquisition within 30 days after the acquisition becomes effective.

### **B. Regulation of Consolidated Provider**

1. If the consolidated provider is serving 250 AF or more to customers, they shall be regulated under the Integrated Water Resources Plan Conservation Program.
2. If the consolidated provider is serving 250 AF or less to customers, they shall be regulated under the Small Provider Conservation Program under Section 5-506.

### **C. Regulation of Acquiring Provider**

1. Except as provided in subsection B of this section, a large municipal provider that acquires a portion of another provider's existing service area shall continue to be regulated under the conservation program that the acquiring provider was regulated under immediately prior to the acquisition.

### **D. Regulation of Conveying Provider**

1. Except as provided in subsection B of this section, a large municipal provider that conveys a portion of its service area to another provider and qualifies as a large municipal provider after the conveyance shall continue to be regulated under the conservation program that the provider was regulated under immediately prior to the conveyance.

## ***5-505 Conservation Requirements for Large Untreated Water Providers***

### **A. Rate of Use Requirement**

Beginning on January 1, 2027, and continuing thereafter until the first compliance date for any subsequent municipal conservation program requirement, a large untreated water provider shall not serve untreated water, during a calendar year, in excess of the amount calculated as follows:

1. Determine the number of gross acres of land to which the provider delivers untreated water during the calendar year. Gross acres do not include those acres regulated as a turf-related facility under Section 5-507.
2. Multiply the number of gross acres determined in paragraph 1 of this subsection above by an average annual application rate of 4.0 AF of untreated water per acre.

**B. Compliance**

A large untreated water provider is in compliance with its rate of use requirement as set forth in subsection A of this Section for a calendar year if one of the following applies:

1. The amount of untreated water served by the provider during the calendar year does not exceed the amount of water calculated in subsection A of this Section; or
2. The aggregate amount of untreated water served by the provider during that calendar year and the preceding two calendar years divided by three does not exceed the sum of the amount of untreated water calculated in subsection A of this Section for those three years divided by three.

***5-506 Conservation Requirements for Small Municipal Providers***

- A. By January 1, 2027, or upon commencement of service of water, whichever is later, and continuing thereafter, a small municipal provider shall implement a program to achieve the following goals:
1. Minimize waste of all water supplies.
  2. Maximize efficiency in outdoor watering.
  3. Encourage reuse of water supplies.
  4. Increase overall water use efficiency as feasible.

***5-507 Individual User Requirements for Municipal Providers and Individual Users***

- A. Notification of Individual User by Municipal Provider



Beginning January 1, 2027, or upon commencement of service of water, whichever is later, and continuing thereafter, a municipal provider shall notify an individual user in writing of the applicable individual user requirements as set forth in this Section before commencement of service of water to the individual user.

## B. Individual User Requirements

The municipal provider or individual user responsible for compliance with the Individual User Requirements under subsection B of this Section shall comply with the following, as applicable:

1. The municipal provider or individual user shall serve water to, or use water within, a turf-related facility only in accordance with Section 6.2.1 of Chapter 6 of the 1MP and shall comply with the monitoring and reporting requirements set forth in Section 6.2.1.5 of Chapter 6, as though the individual user were an industrial user. The municipal provider/individual user responsible for compliance shall also comply with the conservation requirements contained in Section 6.2, if applicable, as though the individual user were an industrial user.
2. The municipal provider or individual user shall serve water to, or use water within, a large-scale cooling facility only if the municipal provider/individual user using water at the facility complies with all applicable conservation requirements and monitoring and reporting requirements contained in Section 6.2.4 of Chapter 6 of the 1MP as though the person was an industrial user. The municipal provider/individual user responsible for compliance shall also comply with the applicable monitoring and reporting requirements contained in Sections 6-509 and the conservation requirements contained in Section 6.2.4 of Chapter 6, if applicable, as though the individual user were an industrial user.
3. The municipal provider or individual user shall serve or use groundwater for the purpose of watering landscaping plants planted on or after January 1, 1987 within any publicly owned right-of-way of a highway, street, road, sidewalk, curb or shoulder which is used for travel in any ordinary mode, including pedestrian travel, only if the plants are listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA. The Director may waive this requirement upon request from the municipal provider or individual user if the municipal provider or individual user demonstrates to the satisfaction of the Director that plants listed in ADWR's Low Water Use &

Drought Tolerant Plants Lists for the DAMA, cannot grow in the publicly owned right-of-way because of high elevation or low-light conditions, such as a freeway underpass. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.

4. The municipal provider or individual user shall not serve or use groundwater for the purpose of maintaining a water feature installed after January 1, 2002 within any publicly owned right-of-way of a highway, street, road, sidewalk, curb or shoulder which is used for travel in any ordinary mode, including pedestrian travel. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.

#### C. Responsibility for Compliance with Individual User Requirements

Pursuant to A.R.S. § 45-571.02, beginning January 1, 2027, and continuing thereafter until the first compliance date for any subsequent conservation program requirement:

1. A municipal provider that has been given notice, in the manner prescribed in A.R.S. § 45-565(B) of a municipal conservation requirement that is substantially identical to an industrial conservation requirement is not required to comply with that municipal conservation requirement respecting an individual user to which one of the following applies:
  - a. The individual user was given written notice of the municipal conservation requirement by the Director in the manner prescribed in A.R.S. § 45-565(B) or A.R.S. § 45-571.01(B);
  - b. The individual user was reported by the municipal provider, on a form provided by ADWR and received by the Director at least ninety days before the adoption of the 1MP, as being an individual user to which the municipal conservation requirement applies.
  - c. The individual user was provided written notice of the municipal conservation requirement by the Director in the manner prescribed in subsection (1) (a) of this Section, except that the municipal provider shall comply with the municipal conservation requirement until the first date on which the individual user is required to comply with the requirement.

### ***5-508 Conservation Requirements for Municipal Distribution Systems***

- A. Beginning with calendar year 2027, or the calendar year in which the provider commences service of water, whichever is later, and continuing thereafter:
  1. A large municipal provider shall not operate a groundwater distribution system in a manner such that lost and unaccounted-for water (see Appendix 5A) exceeds 10 percent of the total quantity of water from any source that enters the provider's groundwater distribution system, as calculated on an annual or three-year average basis.
  2. A small municipal provider shall not operate its groundwater distribution system in a manner such that lost and unaccounted-for water (see Appendix 5A) exceeds 15 percent of the total quantity of water from any source that enters the provider's groundwater distribution system, as calculated on an annual or three-year average basis.
  3. A large untreated water provider that operates an untreated water municipal distribution system shall either:
    - a. Line all canals within its service area that are used to deliver untreated water to its delivery points with a material that allows no more lost water than a well-maintained concrete lining, and maintain such lining to minimize its lost and unaccounted-for water; or
    - b. Operate and maintain its untreated water municipal distribution system in a manner such that lost and unaccounted-for water does not exceed 10 percent of the total quantity of untreated water from any source withdrawn, diverted or received by the provider for non-irrigation uses on an annual or three-year average basis.

### ***5-509 Monitoring and Reporting Requirements for Municipal Providers and Individual Users***

- A. Beginning with calendar year 2027, or the calendar year in which the municipal provider commences service of water, whichever is later, and continuing thereafter:
  1. A municipal provider, regardless of the conservation program under which the provider is regulated, shall report the following in its annual report required by A.R.S. § 45-632:

- a. The total quantity of water from any source, including effluent, disaggregated by each source, withdrawn, diverted or received by the provider for non-irrigation use during the reporting year, as separately measured with a measuring device in accordance with paragraph 5 of this subsection.
- b. The total quantity of water from any source, including effluent, withdrawn, diverted, or received by the provider for irrigation use during the reporting year.
- c. The total quantity of effluent, disaggregated by potable direct use effluent, potable effluent recovered from within the area of impact, potable effluent recovered outside the area of impact, non-potable direct use effluent, non-potable effluent recovered from within the area of impact, and non-potable effluent recovered outside the area of impact served by the provider during the reporting year for non-irrigation use.
- d. The number of single-family housing units added to the provider's service area from December 31 of the previous calendar year to December 31 of the reporting year.
- e. The number of multifamily housing units added to the provider's service area from December 31 of the previous calendar year to December 31 of the reporting year.
- f. The total number of single-family housing units and multifamily housing units served by the provider as of December 31 of the previous year.
- g. The total quantity of water from any source, including effluent which was delivered to be stored at an underground storage facility or groundwater savings facility, or recovered annually or as long-term storage credits.
- h. The total quantity of water ordered by the municipal provider from an irrigation district and released by the irrigation district from a storage or distribution facility but not accepted by the municipal provider or delivered to any other person.

2. A large municipal provider shall separately measure and report in its annual reports required by A.R.S. §§ 45-468 and 45-632 for the calendar year, the total quantity of water from any source that enters its groundwater distribution system during the reporting year.
3. A large municipal provider shall separately measure and report in its annual reports required by A.R.S. §§ 45-468 and 45-632 for the calendar year, the total quantity of water from any source delivered via its groundwater distribution system each month for:
  - a. irrigation uses;
  - b. residential uses by category, including single-family and multifamily;
  - c. non-residential uses by category, including turf-related facility uses, commercial uses, industrial uses, government uses, construction uses and other uses.
4. A large municipal provider shall meter water deliveries to all service connections on its municipal distribution system, except connections to fire services, dwelling units in individual multifamily units, mobile homes in a mobile-home park with a master meter, and construction users.
5. A municipal provider shall make all water use measurements using measuring devices in accordance with ADWR's measuring device rules, R12-15-901, et seq., Arizona Administrative Code (A.A.C.).

An individual user shall comply with the monitoring and reporting requirements prescribed in Section 5-507.

### ***5-510 Remedial Groundwater Accounting for Conservation Requirements***

#### **A. Accounting**

Remedial groundwater used by a person subject to a conservation requirement established under this chapter shall be accounted for consistent with the accounting for surface water for purposes of determining the person's compliance with the conservation requirement, subject to the provisions of subsections B through D of this Section.

#### **B. Amount of Groundwater Eligible for Accounting**

For each approved remedial action project, the annual amount of groundwater that is eligible for the remedial groundwater accounting provided in subsection A of

this Section is the project's annual authorized volume. The annual authorized volume for a remedial action project approved on or after June 15, 1999 is the maximum annual volume of groundwater that may be withdrawn pursuant to the project, as specified in a consent decree or other document approved by the Environmental Protection Agency ("EPA") or the Arizona Department of Environmental Quality ("ADEQ"). The annual authorized volume for a project approved prior to June 15, 1999 is the highest annual use of groundwater withdrawn pursuant to the project prior to January 1, 1999, except that if a consent decree or other document approved by the EPA or ADEQ specifies the maximum annual volume of groundwater that may be withdrawn pursuant to the project, the project's annual authorized volume is the maximum annual volume of groundwater specified in that document. The Director may modify the annual authorized volume for a remedial action project as follows:

1. For an approved remedial action project associated with a treatment plant that was in operation prior to June 15, 1999, a person may request an increase in the annual authorized volume at the same time the notice is submitted pursuant to subsection C of this Section. The Director shall increase the annual authorized volume up to the maximum treatment capacity of the treatment plant if adequate documentation is submitted to the Director demonstrating that an increase is necessary to further the purpose of the remedial action project and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.
2. A person may request an increase in the annual authorized volume of an approved remedial action project at any time if it is necessary to withdraw groundwater in excess of the annual authorized volume to further the purpose of the project. The Director shall increase the annual authorized volume up to the maximum volume needed to further the purpose of the project if adequate documentation justifying the increase is submitted to the Director and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.
3. The Director shall modify the annual authorized volume of an approved remedial action project to conform to any change in the consent decree or other document approved by the EPA or ADEQ if the person desiring the modification gives the Director written notice of the change within 30 days after the change. The notice shall include a copy of the legally binding

agreement changing the consent decree or other document approved by the EPA or ADEQ.

### C. Notification

To qualify for the remedial groundwater accounting provided in subsection A of this Section, the person proposing the accounting must notify the Director in writing of the anticipated withdrawal of Remedial Groundwater pursuant to an approved remedial action project under CERCLA or Title 49, Arizona Revised Statutes, prior to the withdrawal. A municipal provider may submit notice on behalf of an individual user. At the time the notice is given, the person proposing the accounting must use Remedial Groundwater pursuant to the approved remedial action project or must have agreed to do so through a consent decree or other document approved by the EPA or ADEQ. The notice required by this subsection shall include the following:

1. A copy of a document approved by the EPA or ADEQ, such as the Remedial Action Plan ("RAP"), Record of Decision ("ROD") or consent decree, authorizing the remediated groundwater project. Unless expressly specified in the document, the person shall include in the notice the volume of Remedial Groundwater that will be pumped annually pursuant to the project, the time period to which the document applies, and the annual authorized volume of Remedial Groundwater that may be withdrawn pursuant to the project.
2. The purpose for which the Remedial Groundwater will be used.
3. The name and telephone number of a contact person.
4. Any other information required by the Director.

### D. Monitoring and Reporting Requirements

To qualify for the remedial groundwater accounting for conservation requirements as provided in subsection A of this Section, Remedial Groundwater withdrawn pursuant to the approved remedial action plan must be metered separately from groundwater withdrawn in association with another groundwater withdrawal authority for the same or other end use. A person desiring the remedial groundwater accounting for conservation requirements shall indicate in its annual report under A.R.S. § 45-632 the volume of groundwater withdrawn and used during the previous calendar year that qualifies for the accounting.

### 5-511 Audits of Conservation Requirements

- A. ADWR may elect to conduct audits of reports, records, and/or practices pursuant to the conservation requirements contained in sections 5-502 through 5-510 of this chapter. If an audit is conducted a Report of Audit will be sent to the audited person or entity as required by applicable law (see A.R.S. §§ 45-633(D), 880.01(D), 1061(D), and/or A.A.C. R12-15-1102(E)).

<b>APPENDIX 5A LOST AND UNACCOUNTED FOR WATER AND ALLOWABLE ESTIMATED USES</b>	
Lost and Unaccounted for Water Includes:	Water System Uses Include:
Leaks: Distribution Lines Sewer Lines Storage Tanks Storage Ponds Hydrants Other	Residential Metered Deliveries Non-Residential Metered Deliveries Standpipe Uses Fire Flow* Hydrant Meter Reading* Hydrant Flow Tests* Fire Sprinkler System Flow Tests* Construction*
Breaks: Distribution Lines Sewer Lines Mains Hydrants Other	Dust Control* Line Flushing (distribution, sewer, or treatment facility)* Street Cleaning* Storm Drain Flushing* Water Tests & Pressure Tests*
Measurement Errors: Meter Under-Registration Source Meter Errors Flumes/Weirs Errors	Well Purging*
Evaporation	
Illegal Connections/Water Theft	
Phreatophyte Uses	
*Estimates can be provided, using a method approved by the Director. Documentation must be submitted with annual report.	



## CHAPTER 6: INDUSTRIAL CONSERVATION PROGRAM

### 6.1 INTRODUCTION

The Industrial Conservation Program for the Douglas Active Management Area First Management Plan (DAMA 1MP) establishes the regulatory requirements applicable to all industrial users within the Douglas groundwater basin. An industrial user is a person who uses groundwater withdrawn pursuant to a Type 1 or Type 2 non-irrigation grandfathered right (GFR) or a withdrawal permit for an industrial use. These GFRs and permits (collectively referred to in this chapter as “industrial rights”) have annual volumetric groundwater allotments. Type 2 GFRs are issued by the Arizona Department of Water Resources (Department) based on amount withdrawn for non-irrigation purposes during the five-year period before the August 30, 2022 call for the election (August 30, 2017-August 30, 2022). Type 1 GFRs will be established as irrigation grandfathered rights that are retired from agricultural production to industrial use. However, total allowable groundwater use is reduced at the time of conversion of the Irrigation Grandfathered Right to a Type 1 Grandfathered Right. General Industrial Use (GIU) groundwater withdrawal permits are issued by the Department if water service cannot be secured from a municipal provider and if the use of surface water or effluent, or the purchase or lease of a GFR is not economically feasible. GIU Permits expire after a specified period of years.

An industrial user may receive groundwater from an irrigation district. An industrial user must obtain an industrial right if they intend to receive groundwater in excess of the volume associated with any grandfathered right or permit held by the user.

Other groundwater users exist that, although served by a municipal water provider, are subject to industrial conservation program requirements through the Municipal Conservation Program. These users include turf-related facilities, public rights-of-way, and large-scale cooling facilities that are not part of a large-scale power plant. These users are referred to in the Municipal Conservation Program as “individual users.”

Industrial groundwater users are subject to the general conservation requirements for all industrial users and may be subject to specific subsector conservation requirements. This chapter contains summaries and descriptions of the general conservation requirements for each subsector. Full legally enforceable details of each requirement can be found in the italicized section starting at 6.4.

Information on industrial water supplies and demands can be found in Chapter 2 of this plan.

## 6.2 INDUSTRIAL CONSERVATION PROGRAMS DESCRIPTION

The objective of the Industrial Conservation Programs is to achieve reductions in withdrawals of groundwater to contribute to the goal of the Active Management Area. The conservation requirements in this section apply to all industrial water users. In addition to included requirements, certain industrial users also are required to comply with conservation requirements specific to their type of water use, which is explained in more detail under other sections of this chapter.

The following industrial users are required to comply with the conservation requirements for all industrial users in this section, as well as conservation requirements for their specific type of water use in other sections of this chapter: turf-related facilities, sand and gravel facilities, large-scale power plants, large-scale cooling facilities, dairy operations, cattle feedlot operations, metal mining facilities, large landscape users, and other industrial users. All remaining industrial users are referred to in this section as “other industrial users” and are required to comply only with the conservation requirements for all industrial users in this section.

The Douglas AMA first management plan Industrial Conservation Program sets the regulatory requirements requiring all industrial users to avoid waste and to make diligent efforts to recycle water. Single-pass cooling or heating is not allowed unless the water is otherwise reused.

Industrial users that are not regulated as turf-related facilities or large landscape users, are required to use plants listed on the Department Low Water Use & Drought Tolerant Plants Lists for the DAMA for landscaping where feasible, and water with efficient irrigation systems. Irrigation efficiency is a source of major water savings independent of plants’ water needs. The Department encourages all facilities to irrigate efficiently regardless of the type of vegetation planted. Landscapes planted on or after January 1, 2022 in a public right-of-way, will not be serviced with groundwater unless the plants are on the DAMA Low Water Use & Drought Tolerant Plants. Industrial users are prohibited from serving groundwater to a water feature in the public right-of-way if installed after January 1, 2022. As such, water conservation plan is required for all users of Industrial Conservation Programs; the plan must be on file with the Department no later than January 1, 2027, or 180 days after receiving official notice of conservation requirements, whichever occurs later.

The conservation requirements contained in this chapter are designed to reduce withdrawals of groundwater and will become effective on January 1, 2027. This chapter contains summaries and descriptions of the general requirements for each conservation

program. The full, legally enforceable details of each requirement can be found in the italicized section starting at section 6.4.

## **6.2.1 TURF-RELATED FACILITY PROGRAM DESCRIPTION**

A turf-related facility is any facility, including schools, cemeteries, golf courses, or common areas within a housing subdivision, with 10 or more acres of water intensive landscaped area. Since "irrigation" is defined in the Act as water applied for the purpose of growing crops for sale or consumption, turf-related watering for recreational and aesthetic purposes is considered a non-irrigation water use rather than an irrigation use. Turf-related facilities apply water for growing turfgrass and other landscaping plants and for filling and maintaining water levels in bodies of water. Turf-related facilities, regulated under the Industrial Conservation Program, may obtain groundwater pursuant to Type 1 or Type 2 non-irrigation grandfathered rights or groundwater withdrawal permits.

The turf-related facility conservation program is based on a maximum annual allotment calculated for each facility. The turf conservation program also includes flexibility accounts and incentives for use of effluent. In addition, requirements include a water conservation plan, monitoring, and reporting.

For turf-related facilities, the conservation requirements apply to those facilities that are over 10 acres in size and use groundwater in a given year. Turf facilities that are golf courses with nine or more holes also have a distinct set of conservation requirements. Both conservation requirements are described in this section.

Turf-related facilities under the Industrial Conservation Program obtain groundwater pursuant to Type 1 or Type 2 non-irrigation grandfathered rights or groundwater withdrawal permits. In addition, turf-related facilities served groundwater by municipal water providers, known as "individual users," are not exempt from the conservation requirements set forth in this Section (see Chapter 5 of this plan for more information on individual users).

### **6.2.1.1 MAXIMUM ANNUAL WATER ALLOTMENT**

#### ***Base Allotment***

The core of the conservation program for turf-related facilities is the maximum annual water allotment. However, a facility is only required to comply with the maximum annual water allotment if it uses any amount of groundwater. The allotment is calculated differently for different types of facilities, but there is a direct relationship between the number of acres to which water is applied and the volume of the allotment. The total acreage of turf, low water use landscaped area, and water surface area is multiplied by an

acre-foot per acre (AF/acre) application rate to determine the allotment. Both turf acres and low water-landscaped areas must have permanent irrigation systems. Further definitions of both types of landscaping can be found in Section 6.4.

The allotment formula outlined below does not dictate the manner by which turf-related facilities use water within their facility. The facility manager has discretion regarding the use of the allotment within the facility. The formula provides a method for the Department to calculate an allotment for a diverse number of turf-related facilities and may not reflect the exact conditions in each facility. The allotment formula is intended to encourage efficient design, construction, water application, and to acknowledge limited overseeding practices.

Allotments for turf-related facilities that are not golf courses are structured to incentivize reductions in turf and water surface area, or water-intensive landscaped area, as defined in section 6.4. Allotments are calculated by multiplying acreage by the appropriate application rates shown in table 6-503-1.

In developing the water allotment formula for golf courses, the Department recognizes the need to simplify a complex formula, while including application rates based on analysis of current practices, such as overseeding, used on golf courses. The Department further recognizes the need to continue a standard established across previous Active Management Areas to encourage a reduction in water intensive footprints of five acres or less per hole or 90 acres or less for an 18-hole course. As such, the water allotment formula was designed with realistic application rates and to cap or restrict landscaping types by limiting the number of turf acres (both overseeded and non-overseeded), low water landscaped acres, and the water surface area for which an allotment is calculated.

Although the Department encourages golf course sizes of five acres per hole or less, it is not a requirement; golf courses may expand or develop any number of water-intensive landscaped acres. Water use, however, must not exceed the maximum annual water allotment. Allotments for all golf courses are calculated based on acres of turf, low water use landscaping, and water surface area. An allotment is calculated for each type of water-intensive landscaping and summed for a total maximum annual water allotment. Each type of water-intensive landscaping is subject to acreage limitations for the purposes of the allotment calculation, and acreage in excess of those limits may not receive an allotment.

The allotment formula for turf acres considers some level of overseeding practices and calculates a portion of the turf acres, up to 3.89 acres per hole at an overseeded rate of 6.035 AF/acre. The remaining acres of turf, up to five acres per hole, are calculated at a

lower, non-overseeded rate of 4.36 AF/acre. The allotment for low water use landscaping area is calculated at a rate of 0.74 AF/acre, up to one acre per hole. Allotments are calculated by multiplying acreage by the appropriate application rates shown in table 6-504-1.

The allotment for water surface area is based on the highest number of water surface acres in existence prior to 2022, which is calculated at a rate of 5.8 AF/acre. Water surface acres expanded after 1989, or any course built after 2022, are capped at an amount calculated by multiplying the application rate of 5.8 AF/acre by 0.14 surface acre per hole. Allotments for bodies of water entirely filled and refilled with direct use effluent or effluent recovered within the area of impact are not included in the 0.14 surface acres per hole cap.

### ***Allotment Additions***

Under certain circumstances, a turf-related facility may request an addition to its base allotment, which may be effective for different periods of time. The following sections describe allotment additions allowed in the 1MP.

#### ***Allotment Addition for the Establishment of a Newly Turfed Area***

An allotment addition is given to turf-related facilities for the establishment of newly planted turf if the total turfed area of the facility does not exceed the existing turfed area. The allotment addition is one acre-foot per acre of newly turfed area. For golf courses, the allotment addition is limited to five AF per number of holes within the newly turfed area. An amount calculated by multiplying the number of holes present within the newly turfed area by five AF of water. This allotment addition may be used for the purposes of renovation, so long as the newly turfed area does not increase the courses total turfed area.

#### ***Allotment Addition for Revegetation***

A revegetation allotment addition is available to facilities desiring to establish low water use or other site-adapted landscaping plants that need only temporary supplemental water application after the construction of a new or renovated facility. This allotment addition, of up to 0.74 AF/acre for up to a maximum of three calendar years, is quantified and granted on an individual basis through an application process. The quantity and duration of the allotment adjustment is determined through the Department's evaluation of each application. This adjustment is separate from the low water use landscaping component included in the maximum annual water allotment calculation. For golf courses, this addition is not affected by the allotment cap for low water use acreage.

### ***Allotment Addition for Filling Bodies of Water***

New turf-related facilities receive a one-time allotment addition to fill bodies of water used within the facility. The allotment addition is equal to the volume used for the initial filling of the body of water and is given only for the year in which the body of water is filled. Any facility may also apply for an allotment addition to refill a body of water, emptied for maintenance work to eliminate or reduce seepage losses. Allotment additions may only be granted for the year in which the body of water is refilled.

### ***Allotment Addition for Leaching***

When high levels of total dissolved solids are present in the water supply, a turf-related facility may require additional water for leaching or deep percolation to prevent salts from accumulating in the root zone. If salts accumulate in the soil, salinity may eventually reach levels toxic to turfgrass. If a facility's water supply has a concentration of 1,000 milligrams per liter of total dissolved solids (approximately 1.5 millimhos per centimeter of electrical conductivity) or greater, the turf-related facility may apply to The Department for an allotment addition for leaching.

#### **6.2.1.2 ADDITIONAL CONSERVATION REQUIREMENTS**

All turf-related facilities are required to submit an update to their water-conservation plan by July 1, 2026, or within 180 days after notification of the conservation requirements, whichever is later. The plan update must outline the water management practices and technologies the facility will utilize to maximize water use efficiency.

Turf-related facilities that include schools, parks, or common areas are required to design, construct, and maintain grounds in a manner that will minimize water-intensive landscaped areas consistent with reasonable use and enjoyment of the facility. Golf courses have a capped maximum annual allotment which assumes water-efficient design and management.

A turf-related facility that is a cemetery must limit the water-intensive landscaped area within any portion of the cemetery not in current in operation, nor substantially commenced, as of December 31, 2026, as such no more than 75 percent of the total cemetery operating area is landscaped with plants not listed on the Department Low Water Use & Drought Tolerant Plants Lists for the DAMA. This restriction does not apply to an expansion of a cemetery onto contiguous land that was under the same ownership as the cemetery as of December 31, 2026.

If changes are made to the size of a facility's turf acres, low water landscaped areas, or water body surface area, a turf-related facility must submit updated documentation as

outlined in section 6.4. A new maximum annual allotment will be calculated for the facility to reflect the current acres in existence.

All turf-related facilities that are not cemeteries were, and will continue to be, limited to a maximum area of 90 acres or to five acres per hole of water-intensive landscaping.

#### **6.2.1.3 EFFLUENT USE ADJUSTMENT**

In the DAMA, effluent is the only water supply expected to increase in availability throughout the 1MP. The relatively high nutrient content of effluent makes it an excellent supply for turf-related watering, as long as the nutrient load is carefully matched to plant needs and over-application of potential groundwater pollutants is avoided.

To encourage the maximum use of effluent on turf-related facilities during the first management period, the Department enacted an effluent incentive. While the maximum annual water allotment does not change under this incentive, each acre-foot of effluent used will be counted as 0.6 AF when compliance with the maximum annual water allotment is determined. This adjustment does not apply to effluent stored in a storage facility pursuant to a water-storage permit that is recovered outside the area of impact of the stored water.

#### **6.2.1.4 FLEXIBILITY ACCOUNT**

To compensate for fluctuating weather conditions, each turf-related facility receives a flexibility account with credit and debit limits. In wetter years or through careful management, facilities can accrue credit balances of up to 20 percent of a facility's annual allotment. When weather conditions or water management decisions cause a facility's water use to exceed its allotment in any year, accrued credits are expended. If/when all credits are exhausted, a facility may accrue a debit balance up to 20 percent of the allotment. A violation will occur only when all credits have been exhausted and the debit maximum is exceeded. The Department recommends facilities exercise prudence in their use of conservation technologies and accumulation of flex credits during wet years to compensate for fluctuations in water demand during hot or dry years.

#### **6.2.1.5 MONITORING AND REPORTING REQUIREMENTS**

The conservation requirements for the first management period include monitoring and reporting requirements for all turf-related facilities. All turf-related facility water use is assumed to be for landscape watering purposes unless other water uses are metered separately. For example, if water for domestic uses at a park is not metered, it will count against the facility's allotment. This provision encourages facilities to install enough meters to ensure that turf-related watering is accurately reported.

## 6.2.2 SAND AND GRAVEL FACILITY PROGRAM DESCRIPTION

Regulated sand and gravel facilities are facilities that use more than 100 AF of water from any source in a calendar year. Sand and gravel facilities typically mine unconsolidated stream deposits to produce construction materials. The aggregate must be sorted according to grain size and washed to remove fine-grained particles. Aggregate washing accounts for the bulk of water use by sand and gravel producers. In addition to using water for washing, water is used for the following purposes: (1) to produce ready-mix concrete, bricks, blocks, and asphaltic concrete; (2) to control dust; (3) to wash the outside of vehicles; (4) to wash the inside of mixer drums; (5) to wash other equipment; (6) to cool equipment; (7) to cool material; and (8) for domestic purposes.

The 1MP includes requirements for recycling wash water to improve water use efficiency, which can be applied by all sand and gravel operations. In addition to recycling wash water, sand and gravel facility operators must implement two additional conservation measures included in the sand and gravel best management practices (BMP) program. There are two general BMP categories; one related to water used for dust control, and the other related to cleanup activities. The facility operator must choose the conservation measure to be implemented in each category from a list of approved measures. The measures chosen must be the most appropriate for the facility for the first management period.

Sand and gravel operators are required to evaluate water-saving methods and submit a conservation plan to The Department during the first management period. The conservation plan must be submitted to the Director by July 1, 2026. Sand and gravel facility operators will analyze conservation methods to identify those that result in a positive economic return. Operators are required to perform an economic feasibility analysis of three potential conservation practices: disposal pond surface area reduction, use of clarifiers, and the use of an alternative water supply to groundwater. The following potential costs and savings must be analyzed in the economic feasibility analysis:

- Labor (including planning, construction, operation, maintenance, and management time)
- Equipment (values amortized over the projected life of the equipment)
- Land value (including value of mineral reserves)
- Water costs (including pumping costs, well maintenance, and withdrawal taxes)
- Costs for chemicals and raw materials
- Fuel or energy costs
- Industrial wastewater disposal costs



- Changes in revenue caused by changing production rate, minimizing "downtime," or increasing the size of reserves
- Costs associated with regulatory permitting

### **6.2.3 LARGE-SCALE POWER PLANT PROGRAM DESCRIPTION**

The Department regulates power plants that produce or are designed to produce more than 25 megawatts of electricity. Three types of electric power plants are regulated in the 1MP: steam electrical plants, combustion turbine plants, and combined-cycle plants. All large-scale power plant facilities are required to submit an update to their water-conservation plan by July 1, 2026, or within 180 days after notification of the conservation requirements, whichever is later. The plan update must outline the water management practices and technologies the facility will utilize to maximize water use efficiency. Steam electrical plants use cooling towers to dissipate excess heat that builds up in the steam electrical generation process. Combustion turbine plants do not use steam to generate electricity. Rather than using steam to drive a turbine, combustion turbines use compressed air. Steam electric power plants use more water than combustion turbine plants. A combined-cycle power plant uses a combination of these two methods to generate electricity.

Regardless of whether the plant is a steam electric power plant, a combustion turbine plant, or a combined-cycle plant, the major consumptive use of water at electrical plants is evaporation from cooling towers. Because of the large volume of water used in towers to condense steam, conservation requirements for the electric power plants require facilities to achieve a high level of efficiency in cooling tower operation. Some large-scale power plants such as combustion turbine plants utilize cooling towers for dissipation of heat for auxiliary loads. These are regulated in this subsector, but the conservation requirements are similar to the Large-scale Cooling Facility Program. For all types of power plants regulated in the 1MP, the Department encourages the use of zero liquid recharge and beneficial reuse of wastewater.

Water use associated with other methods of power production may be regulated in a similar manner to the above methods where appropriate. The Department will monitor methods of power production occurring within the AMA to determine whether requirements associated with additional methods are warranted for future conservation programs.

#### **6.2.3.1 STEAM ELECTRIC AND COMBINED-CYCLE POWER PLANTS**

The 1MP requires steam electric and combined-cycle power plants to achieve an annual average of 15 cycles of concentration in cooling towers. The cycles of concentration

requirement apply only when cooling towers are dissipating heat created during the generation of electricity. In addition to achieving 15 cycles of concentration, facilities must divert the maximum possible volume of on-site wastewater (other than blowdown water and sanitary wastewater) to the cooling process, so long as this steam does not have a negative impact on the cycles of concentration or any other environmental requirement.

Facilities may be granted adjustments to their full cycles of concentration requirements in cases where, due to the quality of recirculating water, adhering to the 15 cycles of concentration standard is likely to result in equipment damage or blowdown water exceeding environmental discharge standards. Cooling towers at power plants are exempt from cycles of concentration requirements during the first 12 months in which treated effluent constitutes more than 50 percent of tower water supply. After this period, facilities may request an adjustment to full cycles of concentration requirements for treated effluent-served towers based on the water quality of the treated effluent supply.

Facilities may apply to the Director to use alternative conservation technologies, in place of achieving 15 cycles of concentration, if the use of the proposed alternative technologies results in equal or greater water savings. Facilities may also request a waiver from conservation requirements on the basis that cooling tower blowdown water is completely reused. Facilities must periodically measure and annually report blowdown water volumes, make-up water volumes, and the chemical concentration of blowdown and make-up water. Facilities must also report the amount of electricity generated, periods of inactivity in generating electricity, and volume of water used for purposes other than electric power generation.

### **6.2.3.2 COMBUSTION TURBINE PLANTS**

Cooling towers associated with combustion turbine power plants with a capacity of 250 tons or more must comply with the following requirements:

- Fully operational cooling towers with 250 tons or more of cooling capacity must achieve at least one of the following criteria in recirculating water before blowing down:
  - 120 mg/L of silica, or
  - 1,200 mg/L of total hardness, or
  - 2,400 mg/L of total dissolved solids (TDS)
- If needed, a facility may apply for an alternative blowdown standard for any towers using effluent. During the initial 12-month period during which 50 percent or more of the water used by a tower is effluent, the tower is exempt from blowdown standards.

- If needed, a facility may apply for an alternative blowdown standard for any tower if compliance with blowdown requirements would likely result in damage to cooling towers or associated equipment or exceedance of environmental discharge standards because of the accumulation of limiting constituent other than silica, total hardness, or TDS.
- Facilities must record monthly and report annually the volumes of tower make-up water and blowdown water and the concentrations of silica, total hardness, TDS, or approved alternative constituent, in both make-up water and blowdown water.

#### 6.2.4 LARGE-SCALE COOLING FACILITY PROGRAM DESCRIPTION

The purpose of cooling tower operation is to cool water that has absorbed the heat load of a heat-generating process. Cooling towers are present at a variety of commercial, industrial, and institutional facilities. Large-scale cooling facilities are defined as facilities with an aggregate cooling capacity of a minimum of 1,000 tons. The minimum cooling unit that is added to create the aggregate total of 1,000 tons is 250 tons in size. Most large-scale cooling facilities are served by municipal water providers. These facilities are termed individual users. Water providers are responsible for the individual users' compliance with industrial conservation requirements unless they have notified The Department of the existence of the individual user as provided in section 5.9.1 of the Municipal Conservation Requirements (see Chapter 5 of this plan) or the Department has given the individual user notice of the conservation requirements, in which case the individual user is responsible for compliance. Large-scale cooling facilities served by their own wells are regulated directly by the Department and are responsible for complying with industrial conservation requirements.

#### 6.2.5 DAIRY PROGRAM DESCRIPTION

The Department regulates dairy operations that annually house a monthly average of 100 or more lactating cows per day. The majority of water use at dairy operations occurs for animal drinking needs, udder washing, barn cleanup, and animal cooling. All dairies are required to submit an update to their water-conservation plan by July 1, 2026, or within 180 days after notification of the conservation requirements, whichever is later. The plan update must outline water management practices and technologies each facility will utilize to maximize water use efficiency.

##### 6.2.5.1 ALLOTMENT-BASED REQUIREMENTS

The amount of water required by a dairy depends on the number of lactating cows and non-lactating animals housed at the dairy, the breed of cow, the dairy management practices, and the type and effectiveness of the water-use technology employed. Table 6-

3 summarizes daily water needs for each dairy process, assuming the use of appropriate water conservation technologies and practices.

<b>Table 6-1 Douglas AMA Water Needs at a Typical Dairy</b>		
<b>Operation</b>	<b>Water Use Allocation (gallons/day)</b>	
	<b>Lactating Cow</b>	<b>Non-Lactating Animal</b>
Drinking needs <sup>1</sup>	30	15
Udder washing - based on 72 minutes/day at 8 gallons/minute; 16 cows per milking (two per group). Varies with number of milkings per day. <sup>1</sup>	35	0
Barn cleanup and sanitizing. Varies with number of milkings per day. <sup>1</sup>	20	0
Animal cooling management option, site-specific	10	0
Calf barn cleanup	0	5
Milk cooling tower (if present)	5	0
Miscellaneous	5	0
<b>Total</b>	<b>105</b>	<b>20</b>

The water needs listed are based on two assumptions: (1) milking is done three times per day per lactating animal and (2) cooling is completed during the milking cycle for at least a portion of the herd.

The assumptions of Table 6-1 are the basis for the annual water allotments for dairies. When calculating the total annual allotment, lactating cows are allotted 105 gallons per animal per day (GAD) while non-lactating animals are allotted 20 GAD. The allotment is calculated annually and will vary with the monthly average of lactating cows and nonlactating animals per day present at the dairy each year.

Upon application, the Department may approve an additional allocation of water for a dairy operation above its annual allotment if the dairy operation demonstrates that one or more of the following conditions exist:

- Milking is being done more than three times daily
- Technologies that are designed to achieve industry health and sanitation objectives, such as the recommended pre-milking sanitation method, are being used

- Animal cooling technologies designed to increase milk production are being used

In consideration of weather variability, the Department has included a three-year averaging provision in the maximum annual water allotments in the first management period. The water use of three consecutive years can be averaged to determine if compliance with the 1MP allotment has been achieved.

### **6.2.6 CATTLE FEEDLOT PROGRAM DESCRIPTION**

The Department regulates cattle feedlot operations that annually house and feed an average of 100 or more beef cattle per day. Water is primarily used for animal drinking and dust control.

The conservation requirements for cattle feedlot operations in the 1MP include a maximum annual water allotment for each facility based on the assumed use of specific conservation technologies and a conservation plan. All cattle feedlots are required to submit an update to their water-conservation plan by July 1, 2026, or within 180 days after notification of the conservation requirements, whichever is later. The plan update must outline the water management practices and technologies the facility will utilize to maximize water use efficiency.

The formula to determine a feedlot's water allotment is based on the number of gallons of water reasonably required per animal per day. To determine this amount, three components of cattle feedlot water use are considered: (1) cattle drinking water requirements, (2) dust control watering requirements, and (3) other uses. The amount of water required for each component varies with the number of cattle processed by the feedlot. Cattle drinking water requirements include water intake, water spilled while drinking, and evaporation losses from watering tanks. Drinking water requirements are estimated to be 15 GAD. Dust control watering requires approximately 10 GAD. Other uses, including water used for feed mixing, health and environmental controls, system losses, and fire protection total 5 GAD. Total water requirements for a cattle feedlot operation are 30 GAD. These requirements are continued for the first management period.

### **6.2.7 MINING PROGRAM DESCRIPTION**

The Department regulates facilities that mine and process ores and use, or have the potential to use, more than 500 AF of water per year. If open-pit or underground mining methods are employed during the first management period, the legal requirements are included within this subsection.

The 1MP requirements also include the following provisions for in-situ mining:

- Long-range conservation plan
- Minimize water use to the extent practicable
- Comply with monitoring and reporting requirements

In-situ or “in-place” mining requires only a fraction of the water needs as compared to conventional mining techniques. In the first management period, mines will be required to evaluate water conservation practices and technologies that may be implemented at their facility and submit these evaluations to The Department in a long-range conservation plan.

In the first management period, there will also be an Alternative Mining Conservation Program (AMCP) for mining facilities. The AMCP is best management practice (BMP) based and will require mining facilities to choose two BMPs from a list of approved BMPs located in Appendix 6A. See section 6.4 for more information.

#### **6.2.8 NEW LARGE LANDSCAPE USER PROGRAM DESCRIPTION**

New large landscape users are industrial users with substantial water-intensive landscaped areas planted after January 1, 2027. The conservation program differentiates between two types of large landscape users: non-residential facilities that are hotels or motels and non-residential facilities that are not hotels or motels. If the facility is not a hotel or motel, conservation requirements apply to landscapable areas in excess of 10,000 square feet. If the facility is a hotel or motel, requirements apply to landscapable areas in excess of 20,000 square feet.

If a facility has 10 or more acres of water-intensive landscaped area, it is defined as a turf-related facility and is subject to specific conservation requirements discussed in section 6.4 of this chapter.

In addition to the requirements that apply to all industrial users, new large landscape users must limit the percentage of water-intensive landscaped area above a specified square footage. The facility must limit its water-intensive landscaped area to the greater of the following: 1) 10,000 square feet (20,000 square feet for hotels and motels) plus twenty percent of the area in excess of 10,000 square feet (20,000 square feet for hotels and motels); or 2) the total surface area of all bodies of water within the facility that qualify as water intensive landscaped area and that are allowed under the Lakes Bill, A.R.S. § 45-131, *et seq.*

Water-intensive landscaping includes not only high-water use plants such as turf but also bodies of water such as ponds. However, it does not include any area of land watered exclusively with direct use effluent or effluent recovered within the area of impact, bodies of water used primarily for swimming, bodies of water filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact. The bodies of water allowed under an interim water use permit pursuant to the Lakes Bill (see A.R.S. § 45-131 *et. seq*), If the body of water will be filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact after the permit expires. If the facility produces waste or grey water, which can be reused for landscape watering and if 100 percent wastewater is used to water the landscape, the requirements do not apply. For example, if there is sufficient cooling tower blowdown water and grey water available from the operations of a hotel, this wastewater could be used to water any amount of water-intensive landscaped area up to 10 acres. Once a water-intensive landscaped area equals or exceeds 10 acres in size, it is defined as a turf-related facility and is subject to regulation under that program.

### **6.2.9 NEW LARGE INDUSTRIAL OR COMMERCIAL USER PROGRAM DESCRIPTION**

New large industrial or commercial users in the 1MP are industrial users that use over 100 AF per year and commence use after January 1, 2027. In addition to the requirements that apply to all industrial users, new large industrial users must prepare and submit a water conservation plan to the Director. However, if the user is required to submit a conservation plan under another section of this chapter, it can combine and submit one plan.

The water conservation plan must show how much water conservation can be achieved at the facility. It must identify how water is used at the facility and what can be done to conserve it in major water use areas. The plan must also detail an employee water conservation education program at the facility and describe when conservation measures will be implemented.

## **6.3 REGULATORY AND NON-REGULATORY EFFORTS**

The DAMA first management plan contains incentives to increase the use of non-groundwater supplies. For example, the Department has included an effluent adjustment for turf-related facilities in the management plan. When determining a turf-related facility's compliance with its maximum annual water allotment within the DAMA, the Department will count each acre foot of effluent as 0.6 acre-feet of water. This adjustment does not apply to recovered effluent. In addition to the effluent adjustment, facilities using effluent may apply to the Department for an allotment addition to allow for leaching of slats below the root zone.

## 6.4 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPOSTING REQUIREMENTS FOR ALL INDUSTRIAL USERS

### 6-401 Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), unless the context otherwise requires, the following words and phrases used in this chapter shall have the following meanings:

1. "1MP" means the First Management Plan for the Douglas Active Management Area.
2. "2MP" means the Second Management Plan for the Douglas Active Management Area.
3. "DAMA" means the Douglas Active Management Area.
4. "ADWR" or "Department" means the Arizona Department of Water Resources.
5. "ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA" means the list of low water use and drought tolerant plants.
6. "Industrial process purposes" means water that is used by an industrial user directly in the creation or manufacture of a product.
7. "Industrial use" means a non-irrigation use of water not supplied by a city, town, or private water company, including animal industry use and expanded animal industry use.
8. "Industrial user" means a person who uses water for industrial uses.
9. "Effluent" has the same definition as prescribed in A.R.S. § 45-101.
10. "Remedial groundwater" means groundwater withdrawn pursuant to an approved remedial action project under Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA") or Title 49, Arizona Revised Statutes, but does not include groundwater withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03.
11. "Single-pass cooling and heating" means the use of water without recirculation to increase or decrease the temperature of equipment, a stored liquid, or a confined air space.
12. "Wastewater" means water that is discharged after an industrial or municipal use, excluding effluent.
13. "Publicly Owned Right-Of-Way" may include a highway, street, road, sidewalk, curb, or shoulder which is used for travel in any ordinary mode, including pedestrian travel. A publicly owned right-of-way does not include any portion of a residential lot that may extend into the right-of-way.



### **6-402 Conservation Requirements**

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing until the first compliance date for any subsequent industrial conservation requirement, an industrial user shall comply with the following requirements:

1. Avoid waste; use only the amount of water from any source, including effluent, reasonably required for each industrial use; and make diligent efforts to recycle water.
2. Do not use water for non-residential single-pass cooling or heating purposes unless the water is reused for other purposes.
3. Use low-flow plumbing fixtures as required by Title 45, Chapter 1, Article 12, Arizona Revised Statutes, or any applicable county or city code, whichever is more restrictive.
4. Use plants from the ADWR Low Water Use & Drought Tolerant Plants Lists for the DAMA for landscaping to the maximum extent feasible and to utilize a water-efficient irrigation system. Turf-related facilities and new large landscape users are exempt from this requirement.
5. For landscapes planted on or after January 1, 2022, groundwater may only be used to water landscaping plants within any publicly owned right-of-way if those plants are listed on ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA. If the industrial user demonstrates that plants listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA cannot grow in the publicly owned right-of-way because of high elevation or low-light conditions, such as a freeway underpass, the industrial user may request that the Director consider waiving this requirement.
6. Do not serve or use groundwater for the purpose of maintaining water features, including fountains, waterfalls, ponds, water courses, and other artificial water structures, installed after January 1, 2022 within any publicly owned right-of-way. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.

### **6-403 Monitoring and Reporting**

#### **A. Requirements**

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing until the first compliance date for any subsequent

industrial conservation requirement, an industrial user who uses water shall, except as provided for in subsection B below, include the following information in its annual report required by A.R.S. § 45-632:

1. The total quantity of water by source, including effluent, withdrawn, diverted, or received during the reporting year for industrial process purposes, as measured with a measuring device in accordance with ADWR's measuring device rules. Arizona Administrative Code ("A.A.C.") R12-15-901, et seq.
2. The total quantity of water by source, including effluent, withdrawn, diverted, or received during the calendar year for purposes other than industrial process purposes, as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-901, et seq.
3. An estimate of the quantity of wastewater generated during the calendar year.
4. An estimate of the quantity of wastewater recycled during the calendar year.
5. A description of the primary purposes for which water from any source, including effluent, is used.
6. The number of acres of land that were planted with plants listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA during the calendar year as a result of removal of plants not on ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA. An industrial user regulated as a large landscape user under section 6.2.8 is exempt from this requirement.

#### B. Conservation Plan

No later than January 1, 2027, or 180 days after receiving official notice of conservation requirements, whichever occurs later, an industrial user shall prepare and submit to the Director for approval a conservation plan that contains an accurate and detailed description of the conservation efforts required in the subsection below. The industrial user shall remain in compliance with this requirement pursuant to the 1MP until the first compliance date for any subsequent industrial conservation requirement.

- A. Detailed description of existing conservation technologies and methods used and future plans for the adoption of additional conservation technologies and methods
- B. Best management practices currently implemented and future plans for additional best management practices
- C. A timeline that includes milestones for future conservation efforts
  - a. Annual water use reports shall include a description of progress or status of milestones.
  - b. If milestones are not being met, the conservation plan must be updated to reflect additional efforts and timelines and shall be submitted to the Director.

### C. Applicability

A new industrial user is subject to the requirements set forth in subsection A of this section if the user:

1. holds a Type 1 or Type 2 non-irrigation grandfathered right or a groundwater withdrawal permit in an amount more than 10 acre-feet ("AF") per year.
2. holds more than one such right or permit in the aggregate amount of more than 10 AF per year and withdraws more than 10 AF of groundwater during the calendar year pursuant to those right or permits.

An industrial user who holds a Type 1 or Type 2 non-irrigation grandfathered right or a groundwater withdrawal permit in the amount of 10 or fewer AF per year is exempt from the requirements set forth in subsection A of this section.

### D. Audits of Conservation Requirements

ADWR may elect to conduct audits of reports, records, and/or practices pursuant to the conservation requirements contained in any section or sections of this chapter. If an audit is conducted, a report of the audit will be sent to the audited person or entity as required by applicable law (See, e.g., A.R.S. §§ 45-633(D), 880.01(D), 1061(D), and/or A.A.C. R1215-1102(E)).

## **6-404 Remedial Groundwater Accounting for Conservation Requirements**

### **A. Accounting**

For the purposes of determining compliance with a conservation requirement established under this chapter, Remedial Groundwater used by a person subject to the conservation requirement shall be accounted for consistent with the accounting for surface water, subject to the provisions of subsections B through D of this section.

### **B. Amount of Groundwater Eligible for Accounting**

For each approved remedial action project, the annual amount of groundwater that is eligible for the remedial groundwater accounting provided in subsection A of this section is the project's annual authorized volume. For a remedial action project approved on or after June 15, 1999, the maximum annual volume of groundwater that may be withdrawn pursuant to the project, is as specified by the United States Environmental Protection Agency ("EPA") or the Arizona Department of Environmental Quality ("ADEQ") or in a consent decree or other approved document. The annual authorized volume for a project approved prior to June 15, 1999, is the highest annual use of groundwater withdrawn pursuant to the project prior to January 1, 1999, except that if a consent decree or other document approved by the EPA or ADEQ specifies the maximum annual volume of groundwater that may be withdrawn pursuant to the project, the project's annual authorized volume is the maximum annual volume of groundwater specified in that document. The Director may modify the annual authorized volume for a remedial action project as follows:

1. For an approved remedial action project associated with a treatment plant that was in operation prior to June 15, 1999, a person may request an increase in the annual authorized volume at the same time the notice is submitted pursuant to subsection C of this section. The Director shall increase the annual authorized volume up to the maximum treatment capacity of the treatment plant if adequate documentation is submitted to the Director demonstrating that an increase is necessary to further the purpose of the remedial action project and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.
2. A person may request an increase in the annual authorized volume of an approved remedial action project at any time if it is necessary to withdraw

groundwater in excess of the annual authorized volume to further the purpose of the project. The Director shall increase the annual authorized volume if adequate documentation justifying the increase is submitted to the Director and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.

3. The Director shall modify the annual authorized volume of an approved remedial action project to conform to any change in the consent decree or other document approved by the EPA or ADEQ if written notice of the change is given to the Director within 30 days after the change. The notice shall include a copy of the legally binding agreement changing the consent decree or other document approved by the EPA or ADEQ.

#### C. Notification

To qualify for the remedial groundwater accounting provided in subsection A of this section, the Director must be notified in writing of the anticipated withdrawal of remedial groundwater pursuant to an approved remedial action project under CERCLA or Title 49, Arizona Revised Statutes, prior to the withdrawal. At the time the notice is given, the person desiring the accounting must be using remedial groundwater pursuant to the approved remedial action project or must have agreed to do so through a consent decree or other document approved by the EPA or ADEQ. The notice required by this subsection shall include all of the following:

1. A copy of a document approved by ADEQ or the EPA, such as the Remedial Action Plan (RAP), Record of Decision (ROD) or consent decree, authorizing the remediated groundwater project. Unless specified in the document, the person shall include in the notice the volume of remedial groundwater that will be pumped annually pursuant to the project, the time period to which the document applies, and the annual authorized volume of remedial groundwater that may be withdrawn pursuant to the project.
2. The purpose for which the remedial groundwater will be used.
3. The name and telephone number of a contact person.
4. Any other information required by the Director.

#### D. Monitoring and Reporting Requirements

To qualify for the remedial groundwater accounting for conservation requirements as provided in subsection A of this section, remedial groundwater withdrawn pursuant to the approved remedial action project must be metered separately from groundwater withdrawn for the same or other end use. A person desiring the remedial groundwater accounting for conservation requirements shall indicate in its annual report under A.R.S. § 45-632 the volume of groundwater withdrawn and used during the previous calendar year that qualifies for the accounting.

## **6.5 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR TURF RELATED FACILITIES**

### ***6-501 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), and section 6-401 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-502 through 6-507 shall have the following meanings:

1. "Body of water" has the same meaning as prescribed by A.R.S. §45-131.
2. "Common area" means an area or areas that is owned and operated as a single integrated facility and that is used for recreational or open space purposes. A common area is maintained for the benefit of the residents of a housing development.
3. "Contiguous" means in contact at any point or part of the same master-planned community. Two parcels of land are contiguous even if they are separated by one or more of the following: a road, easement, or right-of-way.
4. "Direct use effluent" means effluent transported from a facility regulated pursuant to Title 49, Chapter 2, Arizona Revised Statutes, to an end user. Direct use effluent does not include effluent that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes.
5. "Effluent recovered within the area of impact" means effluent that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the stored effluent's area of impact. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
6. "Golf course" means a turf-related facility used for playing golf with a minimum of nine holes and including any practice areas.

7. "Hole" means a component of a golf course consisting at a minimum of a tee and a green. A practice area or driving range is not a hole.
8. "Landscape watering" means the application of water from any source, at a turf-related facility to a water-intensive landscaped area, a low water use landscaped area, and revegetation acres.
9. "Low water use landscaped area" means an area of land at least one acre in aggregate, located in a turf-related facility, that is watered by a permanent water application system within the landscaped area and planted primarily with plants listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA. Mature vegetation planted in a low water use landscape area must cover at least 30 percent of the area.
10. "Newly turfed area" means, for a calendar year, an area of land planted with a warm season grass species that was not planted with a warm-season grass species during the preceding calendar year.
11. "Non-ornamental turf acres" means an area of land within a turf-related facility that is watered with a permanent water application system and is used as a permanent athletic field or is otherwise a highly trafficked area that is not practical to convert into hard or low water use landscape.
12. "Non-overseeded" means an area of land not planted with a cool-season grass species that grows over dormant warm season grasses during the fall/winter period.
13. "Overseeded " means an area of land planted with a cool-season grass species that grows over dormant warm season grasses during the fall/winter period. The allotment is calculated based on an assumed number of acres and does not require annual overseeding.
14. "Park" has the same definition "public park" as prescribed in A.R.S. § 11-931(3), which is a park, parkway, trail, recreational area or playground established, maintained or administered by a county, city or town.
15. "School" means either: (A) any public or private institution established for the purposes of offering instruction to pupils in programs for preschool children with disabilities, kindergarten programs or any combination of elementary grades or secondary grades one through twelve, as set forth in A.R.S. § 15-101(22); or (B) any

accredited public or private postsecondary institution, where "accredited" has the same definition as A.R.S. § 15-1401(1).

16. "Total cemetery area" means an area of land being used for cemetery-related purposes, including any area of land covered by grave markers or by cemetery-related buildings, walks, pathways, and landscaping, but not including roads, parking lots, and any areas of land being held for future expansion of the cemetery.
17. "Total water surface area" means the total surface area of all bodies of water that are an integral part of the water-intensive landscaped area of a turf-related facility, but not including bodies of water used primarily for swimming purposes.
18. "Turf acres" means an area of land within a turf-related facility that is watered with a permanent water application system and planted primarily with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA. Turf acres may be overseeded or non-overseeded.
19. "Turf-related facility" means any facility, including cemeteries, golf courses under nine holes, golf courses over nine holes as defined by paragraph 5, parks, schools, or common areas within housing developments, with a water-intensive landscaped area of 10 or more acres.
20. "Water-intensive landscaped area" means, for a calendar year, the turf acres and the water surface acres within a turf-related facility.
21. "Water surface acres" are the number of acres of total water surface area, excluding the surface area of any bodies of water entirely filled and refilled with effluent. For purposes of this definition, a body of water allowed under an interim water use permit issued pursuant to A.R.S. § 45-133 shall be deemed to be filled and refilled entirely with direct use effluent or effluent recovered within the area of impact if the body of water will be filled and refilled entirely with direct use effluent or effluent recovered within the area of impact after the permit expires.

### ***6-502 Conservation Requirements for All Turf-Related Facilities***

#### **A. Maximum Annual Water Allotment**

Beginning with calendar year 2027 or the first full calendar year after commencement of landscape watering, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, a new industrial user who uses water at a turf-related facility shall not withdraw, divert, or receive water for landscape watering purposes



at the turf-related facility during a year in an amount that exceeds the turf-related facility's maximum annual water allotment for the year as calculated in section 6-505.

B. Conservation Plan

No later than January 1, 2027, or 180 days after receiving official notice of conservation requirements, whichever occurs later, an industrial user who uses water at a turf-related facility shall prepare and submit to the Director for approval a conservation plan for the facility that contains an accurate and detailed description of the conservation efforts required in the subsection 6-403 B. The industrial user shall remain in compliance with this requirement pursuant to the 1MP until the first compliance date for any subsequent industrial conservation requirement.

C. Limiting Water-Intensive Landscaped Area

1. Beginning on January 1, 2027, or upon commencement of landscape watering, whichever occurs later, and continuing until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a turf-related facility that is not a cemetery shall design, construct, and maintain the grounds of the facility in a manner that minimizes the water-intensive landscaped area and is consistent with the use of the facility. All of the facility's water-intensive landscaping shall be planted in those areas directly associated with the turf-related facility's primary purposes, and the total water-intensive landscaped area shall be limited to 90 acres, or for golf courses to five acres per hole. Turf-related facilities with greater than 90 acres of water-intensive landscape prior to January 1, 2027, are exempt from the limitation on water-intensive landscaped area but are encouraged to reduce water-intensive landscaped areas.

***6-503 Calculation of Maximum Annual Water Allotment for Turf-Related Facilities that are not Golf Courses***

- A. For each calendar year, the maximum annual water allotment for a turf-related facility that is not a golf course shall be calculated by multiplying the number of acres within the facility during the calendar year in each type of landscaping by the applicable application rate for each facility category, both listed in Table 6-1 and then adding together the products. The facility categories are defined by the

percent of water-intensive landscaped area. “High” facilities have more than 30 percent water-intensive landscaped area, while “Low” facilities have less than or equal to 30 percent water-intensive landscaped area.

**Table 6-503-1 Application Rates for Turf-Related Facilities that are not Golf Courses**

Facility Category	Type of Landscaping:	Application rate: (AF/acre/calendar year)
High (>30% water- intensive landscaped area)	1.Turf acres	4.15
	2.Total water surface area	6.2
	3.Low water use landscaped area	0.85
Low (≤30% water-intensive landscaped area)	1.Turf acres	4.45
	2.Total water surface area	6.2
	3.Low water use landscaped area	1.08

*Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing until the first compliance date for any subsequent industrial conservation requirement:*

B. The owner or operator of a new turf-related facility that is a park or school with greater than or equal to 30 percent water-intensive landscaped area may apply to the Director for an additional turf acres application rate of up to 4.45 acre-feet per acre per calendar year for non-ornamental turf acres. The Director may consider the following information when establishing the additional application rate for nonornamental turf acres:

1. Historical water-use and compliance of the facility;
2. Evidence demonstrating highly trafficked areas including as-builds, list of events occurring at the facility, visitor use statistics, or other similar documentation.

**6-504 Calculation of Maximum Annual Water Allotment for Golf Courses**

For each calendar year, the maximum annual water allotment for a golf course shall be calculated by multiplying the number of acres in existence within the facility by the applicable application rate for each category, subject to the limitations all listed in Table 6-504-1, and then adding together the products plus any allotment additions allowed under section 6-505.

The first 3.89 acres per hole of turf acres or the total number of turf acres in existence within the new facility, whichever is less, will be calculated at the overseeded application

rate listed in Table 6-504-1. The remaining turf acres in existence within the facility or turf acres in existence within the facility up to five acres per hole, whichever is less, will be calculated at the non-overseeded rate listed in Table 6-504-1. The number of turf acres used for the purposes of calculating the maximum annual allotment does not constitute a requirement related to overseeding. The total maximum annual allotment may be used within the facility as the facility operators deem appropriate, subject to the flexibility criteria in section 6-506.

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing until the first compliance date for any subsequent industrial conservation requirement:

**Table 6-504-1 Application Rates for Golf Courses**

TYPE OF LANDSCAPING:	APPLICATION RATE: (AF/ACRE/CALENDAR YEAR)	LIMITATION
1. Turf acres (Overseeded)	6.035	Up to and including 3.89 acres per hole
2. Turf Acres (Non-overseeded)	4.36	Between 3.89 and up to 5 acres per hole
3. Low water use landscaped area	0.74	Up to 1 acre per hole
4. Total water surface area	5.8	See footnote 1

<sup>1</sup> The number of acres of total water surface area in existence within the facility shall be limited to an area calculated by multiplying the number of holes present within the facility during the year by 0.14 acre per hole, or the facility's total water surface area in existence prior to 2022, whichever is greater.

### **6-505 Allotment Additions**

#### **A. Newly Turfed Area Establishment Addition**

For any year in which a warm-season turfgrass species is planted in an amount that does not increase total turfed area at a new turf-related facility, the facility may apply to the Director for an allotment addition of one acre foot of water per acre of newly turfed area. For golf courses, the newly turfed area establishment addition shall not exceed an amount calculated by multiplying the number of holes present within the newly turfed area by five acre-feet of water. This allotment addition may be used for the purposes of renovation.

## B. Revegetation Addition

The owner or operator of a turf-related facility may apply to the Director for an allotment addition to revegetate areas within or around the facility after initial construction or renovation. The Director may allow up to an additional 0.74 acre-feet of water per acre for up to three years if all of the following conditions apply to the acres for which the revegetation addition is sought:

1. The plants that are planted are listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the DAMA, or were adapted to the site prior to construction;
2. The aggregate area to be watered exceeds one acre and has at least 30 percent vegetative cover at maturity;
3. An allotment is not provided for the revegetation area under section 6-504; and
4. All of the water applied is measured and reported as part of the total water use of the facility.

## C. Body of Water Fill and Refill Addition

1. A turf-related facility shall receive a one-time body of water fill allotment addition equal to the volume of water used for the initial filling of any new body of water added after January 1, 2027, within the facility. The facility shall receive the allotment addition only for the calendar year in which the body of water is filled.
2. If a body of water at a turf-related facility is drained or partially drained to allow for repairs to reduce water losses, the owner or operator of the facility may apply to the Director for an addition to the facility's maximum annual water allotment in the amount of water necessary to refill the body of water. The Director shall grant the allotment addition only for the calendar year in which the body of water is filled if the Director determines that drainage of the body of water was necessary to allow for repairs to reduce water losses.

## D. Leaching Allotment Addition

The owner or operator of a turf-related facility may apply to the Director for an allotment addition for leaching purposes. The Director shall approve the application if the water supply used for landscape watering at the facility contains

at least 1,000 milligrams per liter of total dissolved solids and shall calculate the additional allotment as follows:

$$\left( \left( \frac{1}{1 - \left( \frac{EC_w}{5EC_c - EC_w} \right)} \right) - 1 \right) \times \left( \frac{CU}{0.85} \right)$$

Where:

ECw	=	Electrical conductivity of water used
Ece	=	Tolerance of the turfgrass species grown to the soil salinity in electrical conductivity of the soil saturation extract
CU	=	Consumptive use requirement for the turfgrass species

Any allotment addition granted under this subsection shall remain in effect until the water supply used for landscape watering at the facility contains less than 1,000 milligrams per liter of total dissolved solids or until the first compliance date of a subsequent conservation program.

E. Combined Allotments for Contiguous Facilities

The maximum annual water allotments for contiguous turf-related facilities under one ownership or operation may be combined. All or a portion of the combined maximum water allotment may be applied to any part of the contiguous facilities.

F. Nothing in this section shall be construed as authorizing the use of more groundwater or surface water than may be used pursuant to any groundwater or appropriable water rights or permits associated with the use. Nor shall this section be construed as authorizing the use groundwater or surface water in any manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.

## 6-506 Compliance with Maximum Annual Water Allotment

### A. Effluent Use Adjustment

For purposes of determining compliance with the maximum annual water allotment requirement, the Director shall count each acre foot of direct-use effluent or effluent recovered within the area of impact used at the facility for landscape watering purposes during the calendar year as 0.6 acre-foot of water.

### B. Flexibility Account

The Director shall determine if a turf-related facility is in compliance with its maximum annual water allotment through the maintenance of a flexibility account for the facility according to the following:

1. Beginning with the first full calendar year after commencement of landscape watering in the 1MP, a flexibility account shall be established for a turf-related facility with a beginning balance of zero.
2. Following each calendar year in which groundwater is withdrawn, diverted, or received for landscape watering purposes at the facility, the Director shall adjust the turf-related facility's flexibility account as follows:
  - a. Subtract the total volume of water from any source, including effluent as adjusted under subsection A of this section used by the facility for landscape watering purposes during that calendar year, from the facility's maximum annual water allotment for that year.
  - b. If the result in subparagraph a of this paragraph is positive, credit the flexibility account by this volume.
  - c. If the result in subparagraph a of this paragraph is negative, debit the flexibility account by this volume.
3. The account balance existing in a turf-related facility's flexibility account, after the adjustment provided for in paragraph 2 of this subsection is made, shall carry forward, subject to the following limitations:
  - a. The maximum positive account balance allowed in the flexibility account of a turf-related facility after any credits are registered pursuant to paragraph 2, subparagraph b of this subsection, shall be calculated by multiplying the facility's

maximum annual water allotment for the calendar year for which the credits are registered by 0.2. If the account balance exceeds the maximum positive account balance after the credits are registered, the balance carried forward shall be equal to the maximum positive account balance.

- b. The maximum negative account balance allowed in the flexibility account of a turf-related facility after any debits are registered pursuant to paragraph 2, subparagraph c of this subsection shall be calculated by multiplying the facility's maximum annual water allotment for which the debits are registered by -0.2. If the account balance exceeds the maximum negative account balance after the debits are registered, the balance carried forward shall be equal to the maximum negative account balance.

#### C. Compliance Status

If the adjustment to a turf-related facility's flexibility account at the end of a calendar year as provided for in subsection B, paragraph 2 of this section causes the account to have a negative account balance which exceeds the maximum negative account balance allowed in the flexibility account for the calendar year as calculated in subsection B, paragraph 3 of this section, the industrial users who use water at the facility are in violation of the facility's maximum annual water allotment for that calendar year in an amount equal to the difference between the facility's flexibility account balance and the maximum negative balance allowed in the facility's account for that year.

#### ***6-507 Monitoring and Reporting Requirements for Turf-Related Facilities***

- A. Beginning January 1, 2027, if turfed acres, low water use landscaped area, or water surface acres in a turf-related facility are added or removed, an industrial user shall submit to the Director documentation of the updated acres no later than 90 days after commencing of landscape watering those acres or receiving notice of these conservation requirements, whichever is later. The scale of the submitted documents, extent of turf acres, water surface acres, and low water use landscaped area must clearly be shown. The documentation must also include indication of the year the turf-related facility was established including labelling the year for any areas that were added after the initial construction. Documentation may consist of one or more of the following:

1. As-built plans certified by a registered professional such as a civil engineer, golf course designer, or landscape architect.
  2. Aerial photography at a scale no smaller than 1"=200'.
  3. A survey of the facility certified by a registered professional such as a civil engineer or land surveyor.
  4. Any other documentation upon approval by the Director.
- B. For calendar year 2027 or the calendar year in which landscape watering commences, whichever occurs later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a turf-related facility shall include in the annual report required by A.R.S. § 45-632 the following information, regarding the turf-related facility characteristics and water use during the calendar year:
1. The total quantity of water by source, disaggregated by source, including effluent, withdrawn, diverted, or received for landscape watering purposes at the facility, as measured with a measuring device in accordance with the Department's measuring device rules. A.A.C. R12-15-901, et seq.
  2. The total amount of effluent, disaggregated by direct use effluent, effluent recovered within the area of impact and effluent recovered outside the area of impact that was withdrawn or received for landscape watering purposes as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.
  3. The number of acres of total water surface area within the facility.
  4. The number of acres of low water use landscaped area within the facility.
  5. The number of acres of turf acres within the facility, not including newly turfed area.
  6. The number of acres of newly turfed area within the facility.
  7. The number of turf acres removed within the facility.
  8. The number of acres of total water surface area added or removed within the facility.
  9. The number of acres of low water use landscaped area added or removed within the facility.



10. If the facility is a golf course, the length of the course as measured from the back of each tee ground furthest from the associated green then down the center line of the hole to the center of the green.
11. The number of acres approved by the Director for a revegetation addition pursuant to section 6-505, subsection B, within the facility.
12. The quantity of water used to fill or refill a body of water within the facility for which an allotment addition is sought pursuant to section 6-505, subsection C.
13. The number of acres of overseeded area within the facility.
14. If the facility is a golf course, the number of holes within the facility.
15. If the facility is a golf course, the number of holes added within a newly turfed area.
16. An estimate of the quantity of water from any source, including effluent, used for each purpose other than landscape watering purposes at the facility. Any water used at the facility that is not measured separately from the water used for landscape watering shall be counted by the Director as water used by the facility for landscape watering for purposes of calculating the compliance with the maximum annual water allotment.

C. A single annual report may be filed for contiguous turf-related facilities that are under the same ownership or operation if the allotments for the facilities are combined. The annual report shall report water use and landscaped areas of the contiguous facilities as required in subsection B in this section.

## **6.6 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR SAND AND GRAVEL FACILITIES**

### ***6-601 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S.") and section 6-401 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-602 and 6-603 shall have the following meanings:

1. "Sand and gravel facility" means a facility that produces sand and gravel and that uses more than 100 AF of water from any source per calendar year. For purposes

of this definition, the annual water use shall include all water used by the facility regardless of the nature of the use.

2. "Rock out method" means agitating rock inside concrete truck mixer drums for the purpose of cleaning excess concrete from the drums.
3. "Wash water" means water used for washing or sorting sand, gravel, or other aggregates.

## **6-602 Conservation Requirements**

### **A. Standard Conservation Requirements**

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date of a subsequent conservation program, an industrial user who uses water at a sand and gravel facility shall comply with the following conservation requirements:

1. If sufficient land area for construction and operation of disposal ponds is available at a reasonable price, the industrial user shall construct disposal ponds at the sand and gravel facility. All wash water, water used for wet scrubbers at asphalt plants, runoff from cleanup operations and drainage from sand and gravel piles shall be discharged or diverted into the disposal ponds unless prohibited by state or federal environmental regulations. The disposal ponds shall contain a barge pump or sump pump of sufficient capacity, together with any necessary additional equipment, to assure the maximum reclamation of the water. The water shall be reclaimed and reused at the sand and gravel facility unless prohibited by state or federal regulations.
2. If sufficient land area for the construction and operation of disposal ponds is not available at a reasonable price, clarifiers shall be used at the sand and gravel facility for reclaiming wash water, water used for wet scrubbers at asphalt plants, runoff from cleanup operations and drainage from sand and gravel piles. The clarifiers shall be designed and operated to assure the maximum reclamation of water.
3. At least one of the following techniques or technologies designed to reduce water use for dust control shall be implemented at the sand and gravel facility:
  - a. The placement of binding agents on all haul roads;

- b. The paving of all haul roads;
- c. The placement of recycled asphalt on all haul roads;
- d. The placement of medium sized aggregate or “pea gravel” on all haul roads; or
- e. A technology or technique designed to reduce water use for dust control that demonstrates water savings equivalent to any of the technologies or techniques listed in subparagraphs a through d, and that has been approved by the Director.

The industrial user shall have sole discretion in determining whether to implement more than one of the above technologies.

- 4. At least one of the following techniques or technologies designed to reduce water use for cleaning shall be implemented at the sand and gravel facility:
  - a. Use of metered timers for truck washing and other cleanup activities;
  - b. Use of the “rock out method” of cleaning concrete from truck mixer drums;
  - c. Use of concrete set-arresting agent chemical applications to clean concrete from truck mixer drums; or
  - d. A technology or technique designed to reduce water use for cleaning that demonstrates water savings equivalent to any of the measures listed in subparagraphs A through C and that has been approved by the Director.

The industrial user shall have sole discretion in determining whether to implement more than one of the above technologies.

#### B. Substitute Conservation Requirements

- 1. An industrial user who uses water at a sand and gravel facility may apply to the Director to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section. The Director may approve the use of substitute conservation technologies if both of the following apply:

- a. The industrial user has submitted a detailed description of the proposed substitute technologies and the water savings that can be achieved by the use of those technologies, and
  - b. The Director determines that the proposed substitute conservation technologies will result in a water savings equal to or greater than the savings that would be achieved by the standard conservation requirements prescribed in subsection A of this section.
2. If the Director approves an industrial user's request to use conservation technologies other than the standard conservation requirements, the industrial user shall comply with the substitute conservation technologies beginning on the date determined by the Director and continuing until the first compliance date of a subsequent conservation program.

#### C. Conservation Plan

1. Not later than 180 days after receiving notice of these conservation requirements, an industrial user who uses water at a sand and gravel facility, including an industrial user who acquires ownership of an existing sand and gravel facility after the first compliance date after the 1MP as established, shall submit to the Director a conservation plan. The conservation plan must include the general industrial user conservation plan requirements and improvements to the efficiency of water use at the facility. The plan shall analyze the economic feasibility of implementing all of the following at the facility:
  - a. Disposal pond surface area reduction;
  - b. The use of clarifiers for recycling water;
  - c. Use of a renewable water supply if such a supply is available within a one-mile radius of the facility.
2. The economic analysis must analyze the potential costs and savings associated with the following:
  - a. Labor (including planning, construction, operation, maintenance, and management time);
  - b. Equipment (values amortized over the projected life of the equipment);

- c. Land value (including value of mineral reserves);
- d. Water costs (including pumping costs, well maintenance, and withdrawal taxes);
- e. Costs for chemicals and raw materials,
- f. Fuel or energy costs;
- g. Industrial wastewater disposal costs;
- h. Changes in revenue caused by changing production rate, minimizing "down-time" or increasing the size of reserves;
- i. Regulatory permitting costs.

### ***6-603 Monitoring and Reporting Requirements***

For calendar year 2027 or the calendar year in which the sand and gravel facility first commences using water, whichever is later, and continuing thereafter until the first compliance date of a subsequent conservation program, an industrial user who uses water at a sand and gravel facility shall include the following information in its annual report required by A.R.S. § 45-632.

1. The quantity of water reclaimed from disposal ponds or clarifiers during the calendar year, as measured with a measuring device in accordance with ADWR's measuring device rules. Arizona Administrative Code ("A.A.C.") R12-15-901, et seq.
2. The quantity of water from any source, including effluent, supplied to the wash plant during the calendar year, as measured with a measuring device in accordance with ADWR's measuring-device rules. A.A.C. R12-15-901, et seq.
3. The quantity of water from any source, including effluent, supplied to the asphalt plant during the calendar year, as measured with a measuring device in accordance with ADWR's measuring-device rules. A.A.C. R12-15-901, et seq.
4. The aggregate surface area of any disposal ponds.
5. The average depth of any disposal ponds.
6. The estimated quantity of water from any source, including effluent, used during the calendar year for:

- a. Industrial process purposes. Water used for industrial process purposes includes water used for sanitary waste disposal, but does not include water for cooling and cleaning purposes.
  - b. Non-domestic cooling purposes.
  - c. Non-domestic cleaning purposes. Water use for non-domestic purposes includes truck washing, truck mixer drum washing, or other non-domestic cleaning purposes.
  - d. Road dust control.
  - e. Landscape watering.
  - f. Other purposes.
7. The tonnage of material washed during the calendar year.

## **6.7 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR LARGESCALE POWER PLANTS**

### ***6-701 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S.") and section 6-401 of this chapter, unless the context otherwise requires, the following words and phrases shall have the following meanings:

1. "Blowdown water" means water discharged from a cooling tower recirculating water stream to control the buildup of minerals or other impurities in the recirculating water.
2. "Combined-cycle electric power plant" or "combined-cycle power plant" means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity by utilizing a combination of steam and combustion turbine power generation methods.
3. "Combustion turbine electric power plant" means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity by utilizing an internal combustion engine in which the expanding gases from the combustion chamber drive the blades of a turbine which turns a generator to produce electricity.

4. "Conservative mineral constituent" means a component of recirculating water in a cooling tower, the concentration of which is not significantly modified by precipitation, loss to the atmosphere, or the addition of treatment chemicals.
5. "Continuous blowdown and make-up" means patterns in cooling tower operation that include continuous blowdown and make-up or frequent periodic blowdown and make-up of recirculating water.
6. "Cycles of concentration" means the ratio of the concentration of total dissolved solids, other conservative mineral constituent, or electrical conductivity in the blowdown water to the concentration of this same constituent or electrical conductivity in the make-up water. This can be calculated by dividing the total makeup water by the total blowdown water.
7. "Fully operational cooling tower" means a cooling tower that is functioning to dissipate heat from a large-scale power plant that is generating electricity.
8. "Large-scale power plant" means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity including steam electric power plants, combustion turbine plants, and combined-cycle plants.
9. "Limiting constituent" means a chemical, physical, or biological constituent present in recirculating cooling tower water that, due to potential physical or biological factors or due to potential exceedance of any federal, state, or local environmental standards upon discharge as blowdown, should not be allowed to accumulate in recirculating cooling tower water above a certain concentration.
10. "Make-up water" means the water added to the cooling tower recirculating water stream to replace water lost to evaporation, blowdown, or other mechanisms of water loss.
11. "Effluent-served cooling tower" means a cooling tower served by a make-up water supply that on an annual average basis, consists of 50 percent or more effluent.
12. "Post-2022 power plant" means either:
  - a. A large-scale power plant that does not qualify as a pre-2023 power plant, and includes any expanded or modified portion of the power plant if the expansion or modification includes the construction or modification of one or more cooling towers, or
  - b. Any expanded or modified portion of a pre-2023 power plant if the expansion or modification includes the construction or modification of one

or more cooling towers and was not substantially commenced as of December 1, 2022.

13. "Pre-2023 power plant" means a large-scale power plant that either produced electric power as of December 1, 2022 or was substantially commenced as of December 1, 2022 and includes any expanded or modified portion of such a power plant if the expansion or modification was substantially commenced as of December 1, 2022 and included the modification or construction of one or more cooling towers.
14. "Steam electric power plant" means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity by utilizing the Rankin Steam Cycle in which water is heated, turns into steam and spins a steam turbine which drives an electrical generator.
15. "Substantially commenced as of December 1, 2022" means, with regard to the construction, expansion, or modification of a large-scale power plant, that all preconstruction permits and approvals required by federal, state, or local governments for the construction, expansion, or modification of the plant were obtained by December 1, 2022 or that a substantial capital investment in the physical on-site construction of the project was made within the 12 months prior to December 1, 2022.

#### ***6-702 Conservation Requirements for All Power Plants***

1. Plants should use zero liquid discharge systems where appropriate and economically feasible.
2. Users may apply to the Director for an adjustment to cycles of concentration requirements to address quality considerations related to direct reuse of blowdown or industrial wastewater.

#### ***6-703 Conservation Requirements for Pre-2023 Steam Electric Power Plants***

Beginning on January 1, 2027, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a pre-2023 steam electric power plant shall comply with the following requirements:

1. An annual average of seven or more cycles of concentration shall be achieved at fully operational cooling towers during periods when the steam electric power plant is generating electricity.



2. Blowdown water shall be discharged on a continuous basis, and make-up water shall be provided on a continuous basis.
3. The maximum amount of wastewater feasible, excluding blowdown water and sanitary wastewater, shall be diverted to the cooling process.

#### ***6-704 Conservation Requirements for Post-2022 Steam Electric Power Plants and for Combined-Cycle Power Plants***

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a post-2022 steam electric power plant or at a combined-cycle power plant shall comply with the following requirements:

1. An annual average of 15 or more cycles of concentration shall be achieved at fully operational cooling towers during periods when the power plant is generating electricity.
2. Blowdown water shall be discharged on a continuous basis, and make-up water shall be provided on a continuous basis.
3. The maximum amount of wastewater feasible, excluding blowdown water and sanitary wastewater, shall be diverted to the cooling process.

#### ***6-705 Cycles of Concentration Adjustment Due to the Quality of Recirculating Water***

- A. An industrial user who uses water at a steam electric power plant or at a combined-cycle power plant may apply to the Director for an adjustment to the cycles of concentration requirements set forth in section 6-706 or section 6-707, whichever is applicable, for any year in which compliance with the cycles of concentration requirements would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the quality of recirculating water. To apply for an adjustment to the cycles of concentration requirements based on recirculating water quality, an industrial user shall submit a request in writing to the Director that includes the following information:
  1. Historic, current, and projected water quality data for the relevant constituent(s).

2. Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded, whichever applies.
- B. The Director shall grant the request if it is determined that compliance with the cycles of concentration requirements would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the quality of recirculating water. Any cycles of concentration adjustment granted shall apply only while the quality of recirculating water would cause compliance with the cycles of concentration requirements to likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards.

***6-706 Exemption and Cycles of Concentration Adjustment Due to the Quality of Effluent Make-up Water Supplies***

- A. The cycles of concentration requirements do not apply to any effluent-served cooling tower at a steam electric power plant or at a combined-cycle power plant during the first 12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is effluent.
- B. Within 30 days after the 12-month exemption period expires, the industrial user who uses water at the steam electric power plant or at a combined-cycle power plant may apply to the Director for a cycles of concentration adjustment to lower the cycles of concentration requirement for the effluent-served cooling tower if compliance with the requirement would not be possible due to the presence of a limiting constituent in the effluent supplying the tower. To apply for an alternative cycles of concentration requirement to address such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:
1. The limiting constituent that is present in the effluent supplying the tower that results in the need to blowdown a greater annual volume of water than that is required.
  2. Documentation describing the concentration at which this limiting constituent(s) should be blown down, and the reason for the alternative cycles of concentration.

The Director shall grant the request if it is determined that the presence of a limiting constituent in the effluent supplying the cooling tower results in the need to blowdown a

greater annual volume of water than that is required. Any cycles of concentration adjustment granted pursuant to this paragraph shall apply only while the tower qualifies as an effluent-served cooling tower.

#### ***6-707 Substitute Conservation Requirements***

- A. An industrial user who uses water at a steam electric power plant or at a combined-cycle power plant may apply to the Director to use conservation technologies other than the standard conservation requirements prescribed in section 6-703 or section 6-704. The Director may approve the use of substitute conservation if both of the following apply:
  - 1. The industrial user has submitted a detailed description of the proposed substitute technologies and the water savings that can be achieved by the use of those technologies, and;
  - 2. The Director determines that the proposed substitute conservation technologies will result in a water savings equal to or greater than the savings that would be achieved by the standard conservation requirements prescribed in subsection A.
- B. If the Director approves an industrial user's request to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section, the industrial user shall comply with the approved technologies beginning on the date determined by the Director and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement.

#### ***6-708 Waiver of Conservation Requirements if Blowdown Water Goes to a Direct Beneficial Reuse***

- A. An industrial user who uses water at a steam electric power plant or at a combined cycle power plant may apply to the Director for a waiver of any applicable conservation requirements by submitting a detailed, long-term plan for direct beneficial reuse of 100 percent of the blowdown water outside the cooling circuit, including an implementation schedule. Reuse of blowdown water includes the discharge of blowdown water into pipes, canals, or other means of conveyance if the discharged water is transported to another location at the plant or off the plant for reuse.

- B. The Director shall grant a waiver request if it is determined that implementation of the plan will result in the beneficial reuse of 100 percent of blowdown water outside the cooling circuit. If a waiver request is granted, the industrial user shall implement the plan in accordance with the schedule submitted to and approved by the Director.

#### **6-709 Conservation Requirements for Combustion Turbine Electric Power Plants**

- A. Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a combustion turbine electric power plant shall comply with the following requirement:

Each fully operational cooling tower with greater than or equal to 250 tons of cooling capacity at the combustion turbine electric power plant facility shall achieve a cycles of concentration level that results in blowdown water being discharged at an average annual minimum of either 120 milligrams per liter (mg/L) silica, or 1,200 mg/L total hardness, or 2,400 mg/L total dissolved solids, whichever is reached first.

- B. Exemptions and Alternative Blowdown Standards
  - 1. An industrial user who uses water at a combustion turbine power plant may apply to the Director for a waiver of any applicable conservation requirements by submitting a detailed, long-term plan for direct beneficial reuse of 100 percent of the blowdown water outside the cooling circuit, including an implementation schedule. Reuse of blowdown water includes the discharge of blowdown water into pipes, canals, or other means of conveyance if the discharged water is transported to another location at the plant or off the plant for reuse.

The Director shall grant a waiver request if it is determined that implementation of the plan will result in the beneficial reuse of 100 percent of blowdown water outside the cooling circuit. If a waiver request is granted, the industrial user shall implement the plan in accordance with the schedule submitted to and approved by the Director.

- 2. The requirement of this section does not apply to any effluent-served cooling tower at a combustion turbine electric power plant during the first

12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is effluent.

Within 30 days after the 12-month period expires, the person using water at the effluent-served cooling tower may apply to the Director to use an alternative blowdown level from that required if compliance with the blowdown requirement would not be possible due to the presence of a limiting constituent other than silica, total hardness, or total dissolved solids in the effluent supplying the cooling tower. To apply for an alternative blowdown level to address such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:

- a. The limiting constituent other than silica, total hardness, or total dissolved solids that is present in the effluent supplying the cooling tower which results in the need to blowdown a greater annual volume of water than that required.
- b. Documentation describing the concentration at which this limiting constituent should be blown down and the reason for the alternative blowdown level.

The Director shall grant the request if it is determined that the presence of a limiting constituent other than silica, total hardness, or total dissolved solids in the effluent supplying the cooling tower results in the need to blowdown a greater annual volume of water than that required. Any alternative blowdown level granted pursuant to this paragraph shall apply only while the cooling tower qualifies as an effluent-served cooling tower.

3. A combustion turbine electric power plant may apply to the Director to use an alternative blowdown level from that required if compliance with the requirement would likely result in damage to cooling towers or associated equipment or exceedance of federal, state or local environmental discharge standards because of the accumulation of a limiting constituent other than silica, total hardness, or total dissolved solids in recirculating water. To apply for an alternative blowdown level for such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:

- a. Historic, current and projected water quality data for the relevant limiting constituent(s).
- b. Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded.

The Director shall grant the request if it is determined that compliance with the blowdown level set forth in this section would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the accumulation of a limiting constituent other than silica, total hardness, or total dissolved solids in recirculating water.

### ***6-710 Monitoring and Reporting Requirements***

#### **A. Monitoring and Reporting Requirements for Steam Electric Power Plants and Combined-Cycle Power Plants**

1. For calendar year 2027 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a steam electric power plant or at a combined-cycle power plant shall include in its annual report required by A.R.S. § 45-632 the following information:
  - a. Cooling capacity (in tons) of each cooling tower at the facility.
  - b. Frequency of use and use periods of each cooling tower at the facility.
  - c. Source of water providing make-up water to each cooling tower at the facility.
  - d. The percentage of effluent served to the tower during the year for each cooling tower at the facility that is exempt from cycles of concentration requirements pursuant to section 6-709, subsection A, or for which a cycles of concentration adjustment was granted pursuant to section 6-709, subsection B.

- e. For all fully operational cooling towers subject to cycles of concentration requirements:
  - i. The total quantity of blowdown water discharged from the cooling towers for each month or partial month when the facility was generating electricity during the calendar year.
  - ii. The total quantity of make-up water used at cooling towers for each month or partial month when the facility was generating electricity during the calendar year.
  - iii. The weighted average concentration of total dissolved solids or other conservative mineral constituent in make-up water and blowdown water at the cooling towers for each month or partial month when the facility was generating electricity during the calendar year, either:
    - 1. Determined by direct analysis, or
    - 2. Calculated based on average monthly electrical conductivity readings if the following conditions have been met: (a) correlations between electrical conductivity and total dissolved solids or between electrical conductivity and another conservative mineral constituent have been established over a period of one year or more in make-up and blowdown water and (b) documentation of these correlations has been provided to the Director.
- f. For each large-scale steam electric power plant or combined-cycle power plant that is exempt from cycles of concentration requirements or for which an adjusted cycles of concentration requirement was granted:
  - i. The total quantity of blowdown water discharged from the cooling tower for each month or partial month when the facility was generating electricity during the calendar year.
  - ii. The total quantity of make-up water used at the cooling tower for each month or partial month when the facility was generating electricity during the calendar year.

- iii. The weighted average concentration of total dissolved solids or other conservative mineral constituent in make-up water and blowdown water at the cooling tower for each month or partial month when the facility was generating electricity during the calendar year, either:
    - iv. Determined by direct analysis, or
    - v. Calculated based on average monthly electrical conductivity readings if the following conditions have been met: (a) correlations between electrical conductivity and total dissolved solids or between electrical conductivity and another conservative mineral constituent have been established over a period of one year or more in make-up and blowdown water and (b) documentation of these correlations have been provided to the Director.
  - g. All time periods when the facility was not generating electricity.
  - h. The amount of electricity generated each month or each partial month when the facility was generating electricity during the calendar year.
  - i. The estimated quantity of water from any source, including effluent, used during the calendar year for each purpose other than electric power generation purposes.
- B. Monitoring and Reporting Requirements for Combustion Turbine Electric Power Plants

For calendar year 2027 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a large-scale electric power plant that is a combustion turbine electric power plant shall include in its annual reports required by A.R.S. § 45-632 the following information for all cooling towers with 250 tons or more of cooling capacity at the facility:

1. Capacity in tons of each cooling tower.



2. For each cooling tower at the facility that is exempt from the requirements of 6-709 or for which an alternative blowdown level has been granted, the percentage of water served to the cooling tower during the year that was effluent.
  3. The quantity of water from any source, specified by source, that was used for make-up water on an annual basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-901, et seq.
  4. The quantity of water that was blown down on an annual basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring-device rules. A.A.C. R12-15-901, et seq.
  5. The average annual concentrations of silica, total hardness, total dissolved solids, or other approved limiting constituent established under section 6-709, in make-up and blowdown water during the calendar year, reported in mg/L or other measurement units, and either:
    - a. Determined by direct analysis; or
    - b. Calculated based on average monthly electrical conductivity readings for those portions of each month when cooling towers were fully operational if the following conditions have been met:
      - i. correlations between electrical conductivity and silica, between electrical conductivity and total hardness, between electrical conductivity and total dissolved solids, or between electrical conductivity and another approved limiting constituent, have been established over a period of one year or more in make-up and blowdown water; and
      - ii. documentation of these correlations has been provided to the Director.
- C. A single annual report shall be filed for a pre-2023 power plant and a post-2022 power plant that are contiguous and owned by the same owner. The report shall describe the combined operations of the pre-2023 and post-2022 power plants as required in subsection A of this section.

- D. All water measurements required in this section shall be made with a measuring device in accordance with ADWR's measuring-device rules. A.A.C. R12-15-901, et seq.

## **6.8 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR LARGESCALE COOLING FACILITIES**

### ***6-801 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S.") and section 6-701 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-802 and 6-803 shall have the following meanings:

1. "Blowdown water" means water discharged from a cooling tower recirculating water stream to control the buildup of minerals or other impurities in the recirculating water.
2. "Conservative mineral constituent" means a component of recirculating water in a cooling tower, the concentration of which is not significantly modified by precipitation, loss to the atmosphere, or the addition of treatment chemicals.
3. "Cycles of concentration" means the ratio of the concentration of a conservative mineral constituent or electrical conductivity in the blowdown water to the concentration of this same constituent or electrical conductivity in the make-up water.
4. "Fully operational cooling tower" means a cooling tower that is functioning to dissipate heat.
5. "Large-scale cooling facility" means a facility which has control over cooling operations with a total combined cooling capacity greater than or equal to 1,000 tons. For the purposes of this definition, the minimum cooling tower size which shall be used to determine total facility cooling capacity is 250 tons. A large-scale cooling facility does not include a large-scale power plant that utilizes cooling towers to dissipate heat.
6. "Large-scale power plant" means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity.

7. "Limiting constituent" means a chemical, physical, or biological constituent present in recirculating cooling tower water that, due to potential physical or biological factors or due to potential exceedance of any federal, state, or local environmental standards upon discharge as blowdown, should not be allowed to accumulate in recirculating cooling tower water above a certain concentration.
8. "Make-up water" means the water added back into the cooling tower recirculating water stream to replace water lost to evaporation, blowdown, or other mechanisms of water loss.
9. "Effluent-served cooling tower" means a cooling tower served by a make-up water supply that on an annual average basis consists of 50 percent or more effluent.

### **6-802 Conservation Requirements**

#### **A. Conservation Requirements for Large-Scale Cooling Facilities**

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a large-scale cooling facility shall comply with the following requirements:

Each fully operational cooling tower with greater than or equal to 250 tons of cooling capacity at the facility shall achieve a cycles of concentration level that results in blowdown water being discharged at an average annual minimum of either 120 mg/L silica, 1,200 mg/L total hardness, or 2,400 mg/L total dissolved solids whichever is reached first.

#### **B. Exemptions and Alternative Blowdown Standards**

1. The requirement set forth in subsection A of this section does not apply to a large-scale cooling facility in any year in which 100 percent of facility blowdown water is beneficially reused.

The requirement does not apply to any effluent-served cooling tower at a large-scale cooling facility during the first 12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is effluent.

After the 12-month period expires, the person using water at the effluent-served cooling tower may apply to the Director to use an alternative blowdown level from that required if compliance with the requirement would not be possible due to the presence of a limiting constituent other than silica, total hardness, or total dissolved solids in the effluent supplying

the tower. To apply for an alternative blowdown, an industrial user shall submit a request in writing to the Director which includes the following information:

- a. The limiting constituent other than silica, total hardness, or total dissolved solids that is present in the effluent supplying the tower which results in the need to blow down a greater annual volume of water than that required under subsection A of this section.
- b. Documentation describing the concentration at which this limiting constituent should be blown down, and the reason for the alternative blowdown level.

The Director shall grant the request if it is determined that the presence of a limiting constituent other than silica, total hardness, or total dissolved solids in the effluent supplying the cooling tower results in the need to blowdown a greater annual volume of water than that required. Any alternative blowdown level granted shall apply only while the tower qualifies as an effluent-served cooling tower.

2. An industrial user may apply to the Director to use an alternative blowdown level from that required if compliance with the blowdown requirement would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the accumulation of a limiting constituent other than silica, total hardness, or total dissolved solids in recirculating water. To apply for an alternative blowdown level for such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:

- a. Historic, current, and projected water quality data for the relevant limiting constituent(s).
- b. Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded.

The Director shall grant the request if it is determined that compliance with the required blowdown level would likely

result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the accumulation of a limiting constituent other than silica, total hardness, or total dissolved solids in recirculating water.

### ***6-803 Monitoring and Reporting Requirements***

For calendar year 2027 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a large-scale cooling facility shall include in its annual report required by A.R.S. § 45-632 the following information for all cooling towers with 250 tons or more of cooling capacity at the facility:

1. Capacity in tons of each cooling tower.
2. Number of days per month that each cooling tower was fully operational.
3. For each cooling tower at the facility that is exempt from cycles of concentration requirements under section 6-802 or for which an alternative blowdown level has been granted, the percentage of water served to the tower during the year that was effluent.
4. The quantity of water from any source, specified by source, which was used for makeup water on a monthly basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring-device rules, Arizona Administrative Code ("A.A.C.") R12-15-901, et seq.
5. The quantity of water which was blown down on a monthly basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R12-15-901, et seq.
6. The average monthly concentrations of silica, total hardness, total dissolved solids, or other approved limiting constituent established under section 6-802, in make-up and blowdown water for those portions of each month when cooling towers were fully operational during the calendar year, reported in mg/L or other measurement units established, and either:
  - a. Determined by direct analysis; or
  - b. Calculated based on average monthly electrical conductivity readings for those portions of each month when cooling towers were fully operational if the following conditions have been met:

- i. correlations between electrical conductivity and silica, between electrical conductivity and total hardness, between electrical conductivity and total dissolved solids, or between electrical conductivity and another approved limiting constituent established, have been established over a period of one year or more in make-up and blowdown water; and
- ii. documentation of these correlations has been provided to the Director.

## **6.9 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR DAIRY OPERATIONS**

### ***6-901 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), unless the context otherwise requires, the following words and phrases used in sections 6-902 through 6-904 of this chapter shall have the following meanings:

1. "Dairy animal" means a lactating cow or a non-lactating animal present at a dairy operation.
2. "Dairy operation" means a facility that houses a monthly average of 100 or more lactating cows per day during a calendar year as calculated in 6-902.
3. "Dairy wastewater" means any water that has been put to a beneficial use at the dairy operation, including water containing dairy animal wastes.
4. "Lactating cow" means any cow that is producing milk that is present on-site at a dairy operation and receives water through the dairy operation's watering system.
5. "Non-lactating animal" means a calf, heifer, mature dry cow, bull, or steer that is present on-site at a dairy operation and receives water through the dairy operation's watering system.

### ***6-902 Maximum Annual Water Allotment Conservation Requirements***

#### **A. Maximum Annual Water Allotment**

Beginning on January 1, 2027, or upon commencement of water use, whichever occurs later, continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user shall not withdraw, divert, or receive water for use at a dairy operation during a calendar

year in a total amount that exceeds the dairy operation's maximum annual water allotment for the year as calculated in subsection B below.

## B. Calculation of Maximum Annual Water Allotment

A dairy operation's maximum annual water allotment for a calendar year shall be determined as follows:

1. Calculate the average daily number of lactating cows and non-lactating animals that are present during the calendar year. The average daily number of lactating cows and non-lactating animals present during the calendar year shall be calculated as follows:
  - a. Determine the total number of lactating cows and non-lactating animals present at the dairy operation on the last day of each month during the calendar year.
  - b. For each category of animal, add together the total number of such animals present at the dairy operation on the last day of each month during the year in question and then divide the result by 12. The quotient is the average daily number of lactating cows and nonlactating animals present during the calendar year.
2. Calculate the dairy operation's maximum annual water allotment for the calendar year as follows:
  - a. Multiply the average daily number of lactating cows ("CL") present during the calendar year by 105 gallons per animal per day ("GAD") and then convert to acre-feet ("AF") per year as follows:

$$\text{CL} \times 105 \text{ GAD} \times \text{d/yr} = \text{Maximum annual water allotment for lactating cows (AF per year)}$$
$$325,851 \text{ g/af}$$

Where: CL = Average daily number of lactating cows

GAD = Gallons per animal per day

g/af = Gallons per acre-foot

d/yr = Days in the year

The result is the dairy operation's maximum annual water allotment for lactating cows for the calendar year.

- b. Multiply the average daily number of non-lactating animals present during the calendar year by 20 GAD and then convert to AF per year as follows:

$$\text{AN} \times 20 \text{ GAD} \times \text{d/yr} = \text{Maximum annual water allotment for non-lactating animals (AF per year)}$$

325,851 g/af

Where: AN = Average daily number of non- lactating animals

GAD = Gallons per animal per day

g/af = Gallons per acre-foot

d/yr = Days per year

The result is the dairy operation's maximum annual water allotment for non-lactating animals for the calendar year.

- a. Add the dairy operation's maximum annual water allotment for nonlactating animals for the calendar year as calculated in subparagraph b of this paragraph and the dairy operation's maximum annual water allotment for lactating cows for the calendar year as calculated in subparagraph a of this paragraph. The sum is the maximum annual water allotment for the dairy operation for the calendar year, except as provided in subparagraph d of this paragraph.
- b. Upon application, the Director may approve an additional allocation of water for the dairy operation consistent with industry health and sanitation objectives if the dairy operation requires more than its maximum annual water allotment because of one or more of the following:
  - i. Milkings per lactating cow occur more than three times daily;
  - ii. Technologies are used to achieve industry health and sanitation objectives that require additional water use; and



- iii. Technologies are designed and/or implemented for cooling lactating cows and non-lactating animals, which increase milk production.
- C. Nothing in this section shall be construed to authorize a person to use more water from any source than the person is entitled to use pursuant to a groundwater or appropriable water right or permit held by the person. Nor shall this section be construed to authorize a person to use water from any source in a manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.

### ***6-903 Compliance with Maximum Annual Water Allotment***

An industrial user who uses water at a dairy operation is in compliance for a calendar year with the dairy operation's maximum annual water allotment if the Director determines that either of the following applies:

1. The volume of water withdrawn, diverted, or received during the calendar year for use at the dairy operation, less the volume of dairy wastewater delivered from the dairy operation to the holder of a grandfathered groundwater right for a beneficial use, is equal to or less than the dairy operation's maximum annual water allotment for the calendar year; or
2. The three-year average volume of water withdrawn, diverted, or received for use at the dairy operation during that calendar year and the preceding two calendar years is equal to or less than the dairy operation's three-year average maximum annual water allotment for that calendar year and the preceding two calendar years. In calculating the three-year average volume of water withdrawn, diverted, or received for use at the dairy operation, the volume of dairy wastewater delivered from the dairy operation to the holder of a grandfathered right for a beneficial use shall not be counted.

### ***6-904 Monitoring and Reporting Requirements***

For calendar year 2027 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a dairy operation shall include the following information in its annual report as required by A.R.S. § 45-632:

1. The total quantity of water from any source, including effluent, withdrawn, diverted, or received during the calendar year for use by the dairy operation, as measured

with a measuring device in accordance with ADWR's measuring-device rules, Arizona Administrative Code ("A.A.C.") R1215-901, et seq.

2. The total quantity of water delivered during the calendar year to any uses other than the dairy operation from the well or wells which serve the dairy operation, as measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R12-15-901, et seq.
3. The total quantity of dairy wastewater delivered to grandfathered rights other than the dairy operation, as measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R-12-15-901, et seq.
4. The total number of lactating cows and non-lactating animals which were present on-site at the dairy operation on the last day of each month during the calendar year.

## **6.10 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR CATTLE FEEDLOT OPERATIONS**

### ***6-1001 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), unless the context otherwise requires, the following words and phrases used in sections 6-1002 and 6-1003 of this chapter shall have the following meanings:

1. "Beef cattle" means cattle or calves fed primarily for meat production.
2. "Cattle feedlot operation" means a facility that houses and feeds an average of 100 or more beef cattle per day during a calendar year as calculated in section 6-1002.

### ***6-1002 Maximum Annual Water Allotment Conservation Requirements***

#### **A. Maximum Annual Water Allotment**

Beginning on January 1, 2027, or upon commencement of water use, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user shall not withdraw, divert, or receive water for use at a cattle feedlot operation during a calendar year in a total amount that exceeds the cattle feedlot's maximum annual water allotment for the year as calculated in subsection B below.

## B. Calculation of Maximum Annual Water Allotment

A cattle feedlot operation's maximum annual water allotment for a calendar year shall be determined as follows:

1. Calculate the average daily number of beef cattle present during the calendar year. The Director shall calculate the average daily number of beef cattle present during the calendar year as follows:
  - a. Determine the total number of beef cattle present at the cattle feedlot operation on the last day of each month during the calendar year.
  - b. Add together the total number of beef cattle present at the cattle feedlot operation on the last day of each month during the year in question and then divide the result by 12. The quotient is the average daily number of beef cattle present at the cattle feedlot operation during the calendar year.
2. Multiply the average daily number of beef cattle ("CB") present at the cattle feedlot operation during the calendar year by a water allotment of 30 gallons per animal per day ("GAD"), and then convert to acre-feet ("AF") per year as follows:

$$CB \times 30 \text{ GAD} \times d/yr = \text{Maximum annual water allotment for the cattle}$$

325,851 g/acre-foot feedlot operation (AF/year)

Where: CB = Average daily number of beef cattle

GAD = Gallons per animal per day

g/acre-foot = Gallons per acre-foot

d/yr = Days in the year

## C. Compliance with Maximum Annual Water Allotment

An industrial user who uses water at a cattle feedlot operation is in compliance for a calendar year with the cattle feedlot operation's maximum annual water allotment if the Director determines that either of the following applies:

1. The volume of water withdrawn, diverted, or received during the calendar year for use at the cattle feedlot operation is equal to or less than the cattle

feedlot operation's maximum annual water allotment for the calendar year;  
or

2. The three-year average volume of water withdrawn, diverted, or received for use at the cattle feedlot operation during that calendar year and the preceding two calendar years is equal to or less than the cattle feedlot operation's three-year average maximum annual water allotment for that calendar year and the preceding two calendar years.
- D. Nothing in this section shall be construed to authorize a person to use more water from any source than the person is entitled to use pursuant to a groundwater or appropriable water right or permit held by the person. Nor shall this section be construed to authorize a person to use water from any source, including effluent, in a manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.

### ***6-1003 Monitoring and Reporting Requirements***

For calendar year 2027 or the calendar year in which water use is first commenced at the cattle feedlot operation, whichever occurs later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a cattle feedlot operation shall include the following information in its annual report required by A.R.S. § 45-632:

1. The total quantity of water from any source, including effluent, withdrawn, diverted, or received during the calendar year for use at the cattle feedlot operation as measured with a measuring device in accordance with ADWR's measuring-device rules. A.A.C. R12-15-901, et seq.
2. The total number of beef cattle that were present on-site at the cattle feedlot operation on the last day of each month during the calendar year.

## **6.11 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR METAL MINING FACILITIES**

### ***6-1101 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes ("A.R.S."), unless the context otherwise requires, the following words and phrases shall have the following meanings:

1. "Abandoned tailings impoundment" means a tailings impoundment that the owner/operator of a metal mining facility does not plan to use for additional disposal of tailings.
2. "Alternative water supply" means a water source other than groundwater of drinking water quality.
3. "Decant water" means water removed from the stilling basin of a tailings impoundment either by gravity flow into a decant tower or by pumping.
4. "Heap and dump leaching" means the extraction of minerals using acid solutions applied to metallic ores that have been removed from their original location and heaped or dumped in a new location.
5. "In situ leaching" means the extraction of metallic ores using acid leaching of ores that are not moved from their original natural location.
6. "In situ leaching sites" mean those portions of metal mining facilities at which in situ leaching and associated copper recovery operations occur, including surface applications of acid leaching solutions and deep well injection of acid leaching solutions.
7. "Large-scale metal mining and processing facility" means an industrial facility at which mining and processing of metallic ores is conducted and that uses or has the potential to use more than 500 AF of water per reporting year. For the purposes of this definition, the annual water use or potential annual water use includes all water from any source, including effluent, used or projected to be used within or by the facility, regardless of the nature of the use.
8. "Mill concentrator" means the structure at open-pit metal mines within which metallic ore is crushed and the flotation process is used to remove minerals.
9. "Mill circuit" means the flow of water used in the process of crushing ore, recovering copper at the mill concentrator, and transporting and disposing of tailings, and includes recovery of water at the tailings impoundments for reuse in the mill concentrator.
10. "Post-2023 metal mining facility" means either:
  - a. A large-scale metal mining and processing facility that does not qualify as a pre-2022 metal mining facility, including any expanded or modified portion of the facility, or

- b. Any expanded or modified portion of a pre-2022 metal mining facility if the expansion or modification includes one or more new tailings impoundments, new mill circuits, or new leaching facilities, and was not substantially commenced as of December 1, 2022.
11. "Pre-2022 metal mining facility" means a large-scale metal mining and processing facility at which the mining and processing of metallic ores was occurring as of December 1, 2022, or that was substantially commenced as of December 1, 2022, and includes any expanded or modified portion of such a facility if the expansion or modification includes one or more new tailings impoundments, new mill concentrator circuits, or new wells, and was substantially commenced as of December 1, 2022.
  12. "Seepage water" means water that has infiltrated from tailings impoundments into the material underlying the tailings impoundments.
  13. "Substantially commenced as of December 1, 2022" means, with regard to the construction, expansion, or modification of a large-scale metal mining and processing facility, that the owner or operator of the facility had obtained all pre construction permits and approvals required by federal, state, or local governments for the construction, expansion, or modification of the facility by December 1, 2022, or had made a substantial capital investment in the physical on-site construction of the project in the 12 months prior to December 1, 2022.
  14. "Tailings" means the slurry of water and fine-grained waste rock material remaining after minerals have been removed in the mill concentrator and excess water has been recovered and returned to the mill concentrator.
  15. "Tailings impoundment" means the final disposal site for tailings generated in the milling circuit.

### ***6-1102 Conservation Requirements for Pre-2022 Metal Mining Facilities***

Beginning on January 1, 2027, or upon commencement of water use, whichever is later and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a pre-2022 metal mining facility shall comply with the following requirements:

#### **A. Management of Tailings Density**

The industrial user shall transport tailings to the tailings impoundment area at the maximum density possible consistent with reasonable economic return; but,

beginning with calendar year 2027, the three-year average density of the tailings during transport shall be 48 percent solids by weight or greater during the period consisting of the reporting year and the previous two years. The Director may reduce the density required for a period of time if the industrial user demonstrates that, due to the shutdown of ore processing or tailings transport equipment or due to the density of ore being mined, the density requirement cannot be achieved.

#### B. Management of Pre-sliming/Interceptor Wells

The industrial user shall comply with one of the following:

1. Deposit a layer of tailings immediately up-slope from the free water level in each tailings impoundment. The tailings layer shall be 12 inches or more in thickness and shall minimize soil surface permeability.
2. Drill interceptor wells down-gradient from each tailings impoundment. The interceptor wells shall be designed, located, and operated in such a manner as to intercept the maximum amount of seepage water possible from each tailings impoundment. Water recovered from the interceptor wells shall be reused at the mining facility.

#### C. Management of Water in Tailings Impoundments

The industrial user shall minimize the free water surface area in each tailings impoundment by complying with all of the following:

1. Manipulate tailings that have been disposed of in a tailings impoundment, and manage new disposal of tailings in an impoundment, to create stilling basins that increase the rate of recovery of decant water from the stilling basins, and to minimize the free water surface area of stilling basins.
2. Use decant towers, barge pumps, or sump pumps to recycle water from each tailings impoundment back to the mill concentrator.
3. Expand decant tower barge pumping capacity where necessary to increase the capacity to recycle water from each tailings impoundment back to the mill concentrator.
4. Use, to the maximum extent possible, tailings impoundment water, rather than pumping additional groundwater.

#### D. Capping Abandoned Tailings Impoundments

The industrial user shall cap each abandoned tailings impoundment in a manner that minimizes the quantity of water used for dust control purposes and/or revegetation.

#### E. Heap and Dump Leaching

The industrial user shall apply water to heap and dump leaching operations in a manner that minimizes water use to the extent practicable, consistent with reasonable economic return.

#### F. Additional Conservation Measures

An industrial user who uses water at a metal mining facility shall comply with six of the following eight conservation measures at those portions of the facility that do not qualify as in situ leaching sites:

1. When revegetating abandoned mine-related areas, utilize drought-tolerant vegetation.
2. Utilize multiple decant towers or reclaim pumps in single impoundments to increase decant or reclaim rate.
3. Convert piping to materials equal or greater in strength to high density polyethylene piping to increase density of transported tailings.
4. Harvest and reuse storm water runoff on site.
5. Reuse pit dewatering water.
6. Reduce evaporation from free-standing water surfaces in addition to evaporation reduction from stilling basins.
7. Reduce water used for dust control by reducing the number and extent of haul trips, using road binders, converting to conveyors for material transport, or using another dust control measure that reduces water use.
8. Reduce water used for delivery of acid/water solution for heap or dump leaching operations by using delivery methods that use less water than sprinkler delivery.
9. Alternative conservation technologies approved by the Director before the submission of the conservation plan.



### ***6-1103 Conservation Requirements for Post-2022 Metal Mining Facilities***

Beginning on January 1, 2027 or upon commencement of operations at the facility, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a post-2023 metal mining facility shall comply with conservation requirements applicable to pre-2022 metal mining facilities as prescribed in section 6-1102 subsections C through F, and the following additional requirements:

#### **A. Management of Tailings Impoundments**

The industrial user shall design and construct any post-2023 tailings impoundments to maximize recovery of water from the stilling basins and to minimize seepage water. Any interceptor wells down gradient of tailings impoundments shall be constructed to maximize recovery of seepage water.

#### **B. Management of Tailings Density**

The industrial user shall design, construct, and operate any post-2023 mill concentrators and their associated tailings transport systems to achieve the maximum tailings densities possible consistent with reasonable economic return, but the average annual density of tailings during transport shall not be less than 50 percent solids by weight.

#### **C. Management of In-Situ Leaching**

The industrial user shall utilize water for in-situ leaching in a manner that minimizes water use to the extent practicable, consistent with reasonable economic return.

### ***6-1104 Conservation Requirements for Alternative Mining Conservation Program ("AMCP")***

#### **A. Criteria for Approval of Application**

A new industrial user who uses water at a large-scale metal mining and processing facility may apply for regulation under the AMCP by submitting an application on a form provided by the Director. The Director shall approve an application for regulation under the AMCP if the Director determines that the applicant will implement their required standard best management practices ("BMP") described in Appendix 6A, unless a substitution of a standard BMP under subsection D of this section is approved. The Director shall approve a substitution of a standard BMP in accordance with subsection D of this section, if it is determined that the applicant

will implement the substitute BMP or BMPs in addition to any remaining standard BMPs.

#### B. Compliance with Best Management Practice Program

Beginning on a date established by the Director and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user accepted for regulation under the AMCP shall implement at least two of the standard BMPs from each of the six BMP categories listed in Appendix 6A (except where an exclusion applies), unless the Director approves a substitution of a standard BMP. If the Director approves a substitution of a standard BMP, the industrial user shall comply with the substitute BMP or BMPs in addition to any remaining required standard BMPs. Industrial users accepted for regulation under the AMCP shall also comply with the industrial user conservation requirements listed in section 6.2.7 and provide an annual water conservation report to the Department.

#### C. Substitution of Best Management Practices

1. The Director may allow an industrial user applying for the AMCP to replace a standard BMP listed in Appendix 6A with a substitute BMP if it is determined that the standard BMP cannot be achieved, and that implementation of the substitute BMP will result in water use efficiency equivalent to that of the standard BMP. To apply for a substitution of a standard BMP, the industrial user shall include in its application for the AMCP an explanation of why the standard BMP is not achievable and a description of how the substitute BMP will result in water use efficiency equivalent to that of the standard BMP.
2. An industrial user regulated under the AMCP may apply to the Director for a substitution of an existing BMP that is no longer appropriate for the industrial user's mining facility. The Director may allow the industrial user to replace the existing BMP with a substitute BMP if the Director determines that the substitute BMP will result in water use efficiency equivalent to that of the existing BMP.

#### D. Five Year Review of Best Management Practices

Five years after an industrial user is accepted for regulation under the AMCP, the Director shall review the industrial user's BMPs to determine whether any changes in the BMPs are warranted. If the Director determines that any of the existing BMPs

are no longer appropriate due to an expansion of the mining facility or a change in management practices at the facility, the Director shall notify the industrial user in writing of that determination and the Director and the industrial user shall make a good faith effort to stipulate to a modification of the BMPs so that they are appropriate for the expanded facility or the change in management practices.

If the Director and the industrial user are unable to stipulate to a modification to the BMPs within 180 days after the Director notifies the industrial user of the determination that one or more of the existing BMPs are no longer appropriate, or such longer time as the Director may agree to, the industrial user shall no longer be regulated under the AMCP, but shall thereafter be required to comply with the requirements listed in sections 6-1102 or 6-1103.

If the Director and the industrial user stipulate to a modification of the BMPs, the industrial user shall comply with the modified BMPs by a date agreed upon by the Director and the industrial user and shall continue complying with the modified BMPs until the first compliance date for any subsequent industrial conservation requirement.

#### E. Change in Ownership of Mining Facility

1. If an industrial user regulated under the AMCP sells or conveys the mining facility to which the BMPs apply, the new owner of the mining facility shall continue to be regulated under the AMCP until January 1 of the first calendar year after acquiring ownership of the mining facility. Except as provided in paragraph 2 of this section, beginning on January 1 of the first calendar year after acquiring ownership of the mining facility, the new owner shall comply with the requirements set forth in sections 6-1102 or 6-1103. The new owner may at any time apply for regulation under the AMCP.

If the new owner submits a complete and correct application for regulation under the AMCP prior to January 1 of the first calendar year after acquiring ownership of the mining facility, the new owner shall continue to be regulated under the AMCP until the Director makes a determination on the application. If the Director denies the application, the new owner shall be required to comply with the requirements listed in sections 6-1102 or 6-1103 immediately upon notification of the denial or January 1 of the first calendar year after acquiring ownership of the mining facility, whichever is later. If the Director approves the application, the new owner shall continue

to be regulated under the AMCP until the first compliance date for any subsequent industrial conservation requirement

### ***6-1105 Alternative Conservation Program***

An industrial user who uses water at a metal mining facility may apply to the Director to use conservation technologies other than the technologies prescribed in sections 6-1102 and 6-1103, whichever is applicable. The Director may approve the use of alternative conservation technologies if it is determined that both of the following apply:

1. The industrial user has filed with the Director a detailed description of the proposed alternative technologies and the water savings that can be achieved by the use of these technologies.
2. The industrial user has demonstrated to the satisfaction of the Director that the latest commercially available conservation technology consistent with reasonable economic return will be used.

### ***6-1106 Modification of Conservation Requirements for Metal Mining Facilities***

- A. An industrial user who uses water at a metal mining facility may apply to the Director to modify conservation requirements prescribed in sections 6-1104 and 6-1105, whichever is applicable, for any year in which compliance with the conservation requirements would likely result in violation of any federal, state, or local environmental standards or regulations. To apply for a modification of conservation requirements, an industrial user shall submit a request in writing to the Director that includes the following information:
  1. Documentation describing the conservation requirement(s) for which compliance with this requirement is likely to result in violation of environmental standards, and the environmental standards that are likely to be violated.
  2. The proposed modification to the conservation requirements.
- B. The Director shall grant a request for modification of conservation requirements if the Director determines that compliance with the conservation requirements would likely result in a violation of any federal, state, or local environmental standards or regulations.

### ***6-1107 Preparation of a Long-Range Conservation Plan for Metal Mining Facilities***

By January 1, 2027, or three months prior to commencement of operations at the facility, whichever is later, an industrial user who uses water at a metal mining facility shall submit to the Director an updated long-range water conservation plan that includes the general industrial user conservation plan minimum requirements in section 6-403 and describes the existing or planned design, construction, and operation of the facility, including a description of the ore type, method of mining, and method of metal extraction. The plan shall include an evaluation of the use of the latest commercially available conservation technology consistent with reasonable economic return. Prior to submitting the plan, the industrial user shall analyze the feasibility of applying the following conservation practices or technologies at the mine and shall report the results in the plan:

1. Using alternative water sources for mining and metallurgical needs, including determining the source and volume of the alternative water sources being analyzed.
2. Reducing tailings impoundment evaporation through the application of the latest commercially available technologies for minimizing evaporation from the impoundments and through the application of improved tailings management.
3. Minimizing water use for dust suppression through the use of road binders, conveyors, paved haul roads, and other available dust control mechanisms.
4. Increasing tailings densities to 55 percent solids or greater by weight.

The industrial user may include any additional conservation techniques or technologies in the plan. The plan shall include a schedule of the approximate dates for implementation of any conservation practices or technologies that the industrial user intends to implement.

### ***6-1108 Monitoring and Reporting Requirements for Metal Mining Facilities***

#### **A. Water Measurement and Reporting**

For calendar year 2027 or the calendar year in which the facility commences operation, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user who uses water at a metal mining facility shall include in its annual report required by A.R.S. § 45-632 the following information:

1. The quantity of water from any source, including effluent, used during the calendar year for each of the following purposes: dust control, tailings

revegetation, domestic use, and transportation of tailings to tailings impoundments. The quantity of water used for dust control and tailings revegetation shall be separately measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R12-15-901, et seq. The quantity of water used for domestic use and transportation of tailings to tailings impoundments may be estimated.

2. The quantity of make-up water from any source, including effluent, used during the calendar year for each of the following purposes: equipment washing, leaching operations, and milling operations, as separately measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R12-15-901, et seq.
3. The quantity of water from any source, including effluent, reclaimed during the calendar year from each of the following: tailings impoundments and pit dewatering. These quantities shall be separately measured with a measuring device in accordance with ADWR's measuring-device rules, A.A.C. R-12-15901, et seq.
4. The tons of ore milled during the calendar year.
5. The tons of ore stacked to heap and/or dump leach during the calendar year.
6. The tons of ore vat leached during the calendar year.
7. The tons of material mined during the calendar year.
8. The tons of mineral produced from mill circuits and from leach circuits during the calendar year.
9. The average gallons of water consumed per ton of mineral produced during the calendar year.
10. The average percentage of solids by weight in tailings transported to the tailings impoundments during the calendar year and in each of the previous two years.
11. The average annual depth of water at the deepest portion of the stilling basin(s).

12. Copies of aerial photos of tailings impoundments, with scale indicated, for use by ADWR in determining the wetted surface area of the tailings impoundments.
13. A description of the additional conservation measures applied at the metal mining facility as prescribed in section 6-1107.

B. Contiguous Facilities

A single annual report may be filed for a pre-2023 metal mining facility and a post-2022 metal mining facility that are contiguous and owned by the same owner. The combined operations of the metal mining facilities shall be described pursuant to reporting requirements specified in subsection A of this section.

## **6.12 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR NEW LARGE LANDSCAPE USERS**

### ***6-1201 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes (“A.R.S.”) and section 6-1101 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-1202 and 6-1203 of this chapter shall have the following meanings:

1. “Direct use effluent” means effluent transported from a facility regulated pursuant to Title 49, Chapter 2, Arizona Revised Statutes, to an end user. Direct use effluent does not include effluent that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes.
2. “Landscapable area” means the entire area of a lot less any areas covered by structures, parking lots, roads, or any other area not physically capable of being landscaped.
3. “New large landscape user” means a non-residential facility that has a water-intensive landscaped area in excess of 10,000 square feet and that has landscaping planted and maintained after August 30, 2022 or bodies of water, other than bodies of water used primarily for swimming purposes, filled and maintained after August 30, 2022, or both. The following facilities are excluded from this definition: schools, parks, cemeteries, golf courses, common areas of housing developments and public recreational facilities.

4. "Effluent recovered within the area of impact" means effluent that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the area of impact of storage. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.
5. "Water-intensive landscaped area" means, for the calendar year in question, all of the following areas within a non-residential facility:
  - a. Any area of land that is planted primarily with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for DAMA and watered with a permanent water application system, except any area of land that is watered exclusively with direct use effluent or effluent recovered within the area of impact.
  - b. The total water surface area of all bodies of water within the facility, except bodies of water used primarily for swimming purposes, bodies of water filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact, and bodies of water allowed under an interim water use permit pursuant to A.R.S. § 45-133 if the bodies of water will be filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact after the permit expires.

### ***6-1202 Conservation Requirements***

- A. Conservation Requirements for New Large Landscape Users that are not Hotels or Motels

Beginning on January 1, 2027, or upon commencement of water use, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, the water-intensive landscaped area within a new large landscape user that is not a hotel or motel shall not exceed the greater of the following:

1. an area calculated by adding 10,000 square feet plus 20 percent of the facility's landscapable area in excess of 10,000 square feet; or
2. the total water surface area of all bodies of water within the facility that are allowed under A.R.S. § 45-131, et seq., and that qualify as water-intensive landscaped area.



B. Conservation Requirements for New Large Landscape Users that are Hotels or Motels

Beginning on January 1, 2027, or upon commencement of water use, whichever is later and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, the water-intensive landscaped area within a new large landscape user that is a hotel or motel shall not exceed the greater of the following:

1. an area calculated by adding 20,000 square feet plus 20 percent of the facility's landscapable area in excess of 20,000 square feet; or
2. the total water surface area of all bodies of water within the facility that are allowed under A.R.S. § 45-131, et seq., and that qualify as water-intensive landscaped area.

C. Waiver of Conservation Requirements for the Use of 100 Percent Wastewater

The conservation requirements set forth in subsections A and B of this section shall not apply to a new large landscape user in any year in which all of the water used for landscaping purposes within the facility is wastewater.

***6-1203 Monitoring and Reporting Requirements***

For calendar year 2027 or the calendar year in which the facility first begins to use water, whichever is later, and continuing thereafter until the first compliance date for any subsequent industrial conservation requirement, an industrial user that applies water to a new large landscape user shall include the following information in its annual report required by A.R.S. § 45-632:

1. The total quantity of water from any source, including effluent, withdrawn, diverted, or received for use on the facility during the reporting year for landscape watering purposes, including bodies of water filled or refilled during the calendar year, as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-90,1 et seq.
2. The total amount of landscapable area within the facility.
3. The total amount of water-intensive landscaped area at the facility broken down into the area planted primarily with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for DAMA (except any area watered exclusively with direct use effluent or effluent recovered within the area of impact) and the surface area of all bodies of water (except bodies of water used primarily for swimming

purposes, bodies of water filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact, and bodies of water allowed under an interim water use permit if the bodies of water will be filled and refilled exclusively with direct use effluent or effluent recovered within the area of impact after the permit expires).

## **6.13 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR NEW LARGE INDUSTRIAL AND COMMERCIAL USERS**

### ***6-1301 Definitions***

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-1201 of this chapter, "new large industrial user" as used in section 6-1302 means an industrial user that begins using more than 100 acre-feet ("AF") of water per year for industrial purposes after January 1, 2027.

### ***6-1302 Conservation Requirements***

- A. Not later than 180 days after receiving notice of these conservation requirements, or within 180 days after the end of the first calendar year in which the facility first uses more than 100 AF of water for industrial purposes, whichever is later, a new large industrial and/or commercial user shall submit to the Director a plan to improve the efficiency of water use by the facility. The plan shall:
  1. Specify the level of water conservation that can be achieved assuming the use of the latest commercially available technology consistent with reasonable economic return;
  2. Identify water uses and conservation opportunities within the facility, addressing water used for the following categories as appropriate: landscaping; space cooling; process-related water use, including recycling; and sanitary and kitchen uses;
  3. Describe an ongoing water conservation education program for employees; and
  4. Include an implementation schedule.
- B. If a person required to submit a plan under subsection A of this section is required to submit a conservation plan under another section of this chapter, the person may combine the plans into a single conservation plan.

**APPENDIX 6A  
ALTERNATIVE MINING CONSERVATION PROGRAM (AMCP)  
BEST MANAGEMENT PRACTICES**

**WATER USE CATEGORY 1. DUST CONTROL**

Exclusion: Underground operations only required to choose one BMP.

**BMP 1.1** Use compaction aids like soil agglomerates to minimize the use of groundwater for dust suppression.

**BMP 1.2** Use road binders or seal high-traffic roads to minimize dust production.

**BMP 1.3** Reduce the number and extent of haul trips.

**BMP 1.4** Convert to conveyors for material transport.

**BMP 1.5** Use alternative water supplies (e.g., reclaimed process water, municipal effluent, etc.) for dust suppression.

**BMP 1.6** Use of another dust control measure not in this category that reduces water use (e.g., chemical suppressants).

**BMP 1.7** Reduce groundwater use for dust control covering stockpiles

**BMP 1.8** Implement progressive reclamation or cover inactive tailings in a manner that minimizes the quantity of water used for dust control purposes.

**BMP 1.9** Use automated systems that apply dust control based on live conditions (operating level, ore moisture content, road moisture content etc.).

**WATER USE CATEGORY 2. PROCESSING & CONVEYANCE**

**BMP 2.1** Employ techniques to optimize tailings particle size to balance mineral recovery and reduce tailings entrainment.

**BMP 2.2** Eliminate heap leaching or reduce water used for heap or dump leaching operations by prioritizing the use of delivery methods that use less water than a sprinkler delivery system (e.g., converting existing sprinkler systems to high efficiency drip or installing high-efficiency drip systems in new facilities).

**BMP 2.3** Use dewatering water (e.g., underground working or open pit) for mining and metallurgical processing needs.

**BMP 2.4** Use alternative water supplies (e.g., reclaimed process water, municipal effluent, etc.) for mining and metallurgical processing needs.

**BMP 2.5** Eliminate or reduce pass through water within each process before passing to another process.

**BMP 2.6** Keep fine process materials under control during operations by using techniques such as particle recovery and/or other methods that reduce water consumption.

**BMP 2.7** Modify conveyance system or tailings thickeners to increase the density of tailings.

**BMP 2.8** Convert piping to materials equal or greater in strength to high density polyethylene piping to increase density of transported tailings.

### WATER USE CATEGORY 3. TAILINGS STORAGE FACILITY MANAGEMENT

Exclusion: This category not applicable to heap and leach operations or operations that utilize dry stack tailings.

**BMP 3.1** Reduce water use by using alternative technologies that thicken or dewater tailings.

**BMP 3.2** Deposit a layer of tailings immediately up-slope from the free water level in each tailings impoundment to minimize losses and improve water recovery.

**BMP 3.3** Deposit tailings in a manner that minimizes the free water surface area in each tailings impoundment to optimize/increase the rate of recovery of decant water from the stilling basins.

**BMP 3.4** Increase water recovery by installing drains in the tailings storage facility.

### WATER USE CATEGORY 4. REDUCE SYSTEM AND EVAPORATION LOSSES

**BMP 4.1** Visually inspect water distribution systems monthly for leaks to ensure leaks are promptly identified and repaired.

**BMP 4.2** Conduct a comprehensive inspection or audit of water storage and distribution systems every three years, assess opportunities for upgrades and evaluate preventative maintenance options.

**BMP 4.3** Use of low-volume spray nozzles on conveyors and chutes.

**BMP 4.4** Redesigned bin liners and chutes that minimize spillage and water waste at ore processing facilities.

**BMP 4.5** Keep filters on recycled water pumps clean from scale build-up and debris to increase pump efficiencies.

**BMP 4.6** Separate metering of freshwater and reclaimed systems.

**BMP 4.7** Reduce unregulated evaporation losses through use of covers, or other evaporation controls on open water reservoirs, sumps, etc.

**BMP 4.8** Reduce evaporation losses by using high-efficiency drip systems on leach pads.

**BMP 4.9** Use a chemical suppressant on the tailings surface to minimize the wetted surface area and subsequent evaporation.

**BMP 4.10** Angle exhaust on haul trucks so it is not pointed at ground, to reduce evaporation from haul roads.

**BMP 4.11** Maintain a site water balance to assist in prioritizing conservation and reuse efforts.

**BMP 4.12** Measure evaporation losses (evaporation buoys) in conveyance systems and mitigate these losses in a manner consistent with reasonable economic return.

### WATER USE CATEGORY 5. COOLING SYSTEMS

**BMP 5.1** Use of adiabatic cooling system for cooling towers.

**BMP 5.2** Use high efficiency motors for cooling systems.

**BMP 5.3** Increase cooling cycles (For example if current cycle is three, increase from three to six) or optimize existing high-efficiency cooling systems.

**BMP 5.4** Do not use water for single pass cooling or heating purposes unless the water is reused for other purposes.

**BMP 5.5** Recycle cooling water for other purposes.

**WATER USE CATEGORY 6. RECYCLED AND RECLAIMED WATER**

**BMP 6.1** Install a water treatment unit to reuse water for processing.

**BMP 6.2** Harvest and reuse storm water runoff on site.

**BMP 6.3** Install gray water systems for on-site use.

**BMP 6.4** Reuse water recovered from the tailings storage facility drains or recovered from high-efficiency tailings thickeners within the mining facility.

**BMP 6.5** Drill interceptor wells down-gradient from each tailings impoundment. The interceptor wells shall be designed, located, and operated in such a manner as to intercept the maximum amount of seepage water possible from each tailings impoundment to be reused at the mining facility.

**BMP 6.6** For post-2022 mining facilities design and construct tailings impoundments to maximize recovery of water from the stilling basins and to minimize seepage water. Any interceptor wells down gradient of tailings impoundments shall be constructed to maximize recovery of seepage water.

**BMP 6.7** For pre-2023 facilities, expand decant tower barge pumping capacity where necessary to increase the capacity to recycle water from each tailings impoundment back to the mill concentrator.

**BMP 6.8** For post-1984 facilities, use decant towers, barge pumps, or sump pumps to recycle water from each tailings impoundment back to the mill concentrator.

**BMP 6.9** Utilize multiple decant towers or reclaim pumps in single impoundments to increase decant/reclaim rate.

**BMP 6.10** Reuse, to the maximum extent possible, tailings impoundment water, rather than pumping additional groundwater.

**BMP 6.11** Develop an Alternative Water Supply Analysis (including source and volume) potentially available to the metal mining operation.

## CHAPTER 7: IMPLEMENTATION AND COMPLIANCE

### 7.1 INTRODUCTION

This chapter describes the process the Arizona Department of Water Resources will follow when implementing, determining compliance with, and enforcing the First Management Plan (1MP) requirements for the Douglas AMA. The plan elements will be carried out in accordance with the Department's overall regulatory approach. The following topics are discussed in the order listed:

Notice of Conservation Requirements and Compliance Dates

Variance and Administrative Review Process

Plan Modification Procedures

Groundwater Use Reporting Requirements

Monitoring and Audit Procedures

Compliance Approach

### 7.2 NOTICE OF CONSERVATION REQUIREMENTS - COMPLIANCE DATES

Consistent with A.R.S. § 45-564(B), the Department shall mail written notice of the irrigation water duties and conservation requirements established in the plan to the persons required to comply with the requirements within 30 days of the adoption of the 1MP. A person who receives notice of an irrigation water duty or conservation requirement established in the 1MP must begin complying with the requirement by the date specified in the notice, unless the person applies for and is granted a variance from or an administrative review adjustment to the requirement, as explained in section 7.3 (A.R.S. § 45-564(C)). A person who receives such a notice, shall comply with the requirement until the first compliance date of a substitute irrigation water duty or conservation requirement or until the legislature determines otherwise.

The Director may give written notice of a conservation requirement at any time to a person with a right or permit to withdraw, distribute, or use groundwater that was not in existence when the management plan was adopted. The person given written notice must comply with the conservation requirement no later than the compliance date specified in the notice unless the person applies for and is granted a variance (A.R.S. §§ 45-571.01(B) and (D)).

## 7.3 VARIANCE AND ADMINISTRATIVE REVIEW PROCESS

Even with the general flexibility of the regulatory programs, the 1980 Groundwater Management Act (Act) recognizes that certain individual conservation requirements may pose hardship in certain circumstances. To allow relief in these situations, the Act provides for an administrative review and variance process. The emphasis in this process is on the impact of a particular conservation requirement as it is applied to an individual water user. Administrative reviews and variance processes are fact-intensive inquiries and are considered on a case-by-case basis.

Upon receipt of a notice of a 1MP irrigation water duty or conservation requirement, a person may apply for a variance from or seek administrative review of the water duty or conservation requirement. In general, a variance gives a person additional time (not to exceed five years) to comply with an irrigation water duty or conservation requirement, while an administrative review takes place. The administrative review can result in an adjustment to the requirement for that management period. Each of these processes is described below.

### 7.3.1 VARIANCE

If a person requires additional time to comply with a new irrigation water duty or conservation requirement, the person may apply for a variance. An application for a variance must be filed within 90 days of the receipt of the notice of the irrigation water duty or conservation requirement (A.R.S. § 45-574(A)). The Director may grant a variance for up to five years upon a showing that “compelling economic circumstances” will prevent the person from complying with the new irrigation water duty or conservation requirement by the compliance date specified in the notice. A person granted a variance must continue complying with any existing irrigation water duty or conservation requirement during the variance period, unless the Director establishes a schedule of intermediate water duties or conservation requirements to be reached at specified intervals during the variance period (A.R.S. § 45-564(C)).

### 7.3.2 ADMINISTRATIVE REVIEW

If a person believes that an error or omission was made in calculating the person’s irrigation water duty or conservation requirement, or that the person's irrigation water duty or conservation requirement is unreasonable because of circumstances unique to the person, the person may request an administrative review of the irrigation water duty or conservation requirement. If granted, an administrative review can result in a permanent adjustment for the duration of the management period to the irrigation water

duty or conservation requirement. An application for administrative review must be filed within 90 days of the date of the notice of the irrigation water duty or conservation requirement if the application is based on circumstances in existence as of the date of the notice (A.R.S. § 45-575(A)).

At any time while a 1MP irrigation water duty or conservation requirement is in effect, the person required to comply with the water duty or conservation requirement may seek administrative review of the person's irrigation water duty or conservation requirement based on a claim that "extraordinary circumstances not in existence as of the date of notice that was given 30 days after adoption of the management plan" justify an adjustment to the irrigation water duty or conservation requirement. The Director may adjust the irrigation water duty or conservation requirement based on clear and convincing evidence that extraordinary circumstances not in existence as of the date of notice make it unreasonable to require compliance with the irrigation water duty or conservation requirement (A.R.S. § 45-575(B)).

In determining whether extraordinary circumstances make it unreasonable to comply with an irrigation water duty or conservation requirement, the Director will consider, among other things, whether conditions that came into existence after the date of notice are significantly different from those conditions in effect at the date of notice.

Examples of extraordinary circumstances may include the following situations: changes in water quality that necessitate altering water application rates for irrigation grandfathered rights or turf-related facilities; changes in technology or economics that are significantly different from the Department's projections or assumptions; and changes in federal, state, and local laws and regulations that prevent compliance with irrigation water duties or conservation requirements.

## **7.4 PLAN MODIFICATION PROCEDURES**

At any time after the 1MP is adopted, the plan may be modified pursuant to the same public hearing and comment procedures required for adoption of the plan (A.R.S. § 45-572(A)). The Director may modify an irrigation water duty or conservation requirement established in the plan "only if the Director determines that extraordinary circumstances, errors, or mistakes justify the modification" (A.R.S. § 45-572(A)). Within 30 days of a modification of an irrigation water duty or conservation requirement, the Department must give written notice of the modification to the persons required to comply with the modified requirement (A.R.S. § 45-564, R.S. § 45-572(B)). The person may request a variance from or an administrative review of the modified irrigation water duty or



conservation requirement within 90 days of the date of the notice (A.R.S. §§ 45-572(B) and (C)).

## **7.5 GROUNDWATER USE REPORTING REQUIREMENTS**

The Act contains several provisions that enable the Department to acquire needed information on water use. This information is used to evaluate compliance with the Act and the Department rules, permits, and management plans. The water use monitoring and reporting requirements, which are summarized below, are also designed to give water users the data needed to assess their progress in attaining conservation requirements. Over the last decade, the Department has shifted to a more interactive, web-based reporting format. Each year, right holders are sent a one-page letter in January reminding them of the requirement to report by March 31. A hard copy of the annual report is still available; however, water users are encouraged to report online. Holders of several types of water rights and authorities may now file their reports using the Department's Online Annual Reporting Tool.

The Department also has devoted significant efforts towards increasing the availability of public records from The Department's website, including well queries, pumpage queries, imaged records, and interactive mapping tools. All of these are designed to not only answer public questions but allow water users access to their own information filed with the Department to help them better manage their own water portfolio and comply with the Department requirements.

### **7.5.1 WATER MEASUREMENT**

The Act requires persons withdrawing groundwater from non-exempt wells in AMAs to measure those withdrawals using a water-measuring device approved by the Director (A.R.S. § 45-604). However, some small irrigation and non-irrigation users are exempt from the measuring-device requirements as outlined in sections B, C, and D of A.R.S. § 45-604. The Department has adopted rules requiring the use of an approved device, or a combination of devices and methods, for measuring rates and volumes of groundwater withdrawals for the calculation of the total annual volume of groundwater withdrawn (A.A.C. R12-15-901, et seq). Persons subject to the measuring-device requirements must maintain the accuracy of the device within specific standards.

### **7.5.2 RECORDS AND ANNUAL REPORTS**

The Act requires most persons who own or lease a right or permit to withdraw, receive, or use groundwater to file an Annual Water Withdrawal and Use Report with the Director for each right or permit they hold. All persons required to file annual reports must

maintain current and accurate records of water withdrawn, delivered, received, and used (A.R.S. § 45-632).

Persons withdrawing groundwater from exempt wells and most non-irrigation customers of cities, towns, private water companies, and irrigation districts are exempt from record keeping and reporting requirements. Persons receiving water pursuant to a grandfathered right, a groundwater withdrawal permit, or assigned and noticed of individual user requirements must comply with records keeping and reporting requirements. Pursuant to A.R.S. § 45-563.02, small right holders are exempt from those provisions.

The Department staff may conduct audits or other verification processes, and additional documentation may be required upon request of right holders or those who withdraw, receive, or use groundwater. This may include reviews of documentation and/or site visits.

## **7.6 MONITORING AND AUDIT PROCEDURES**

The Department has the authority to determine compliance with Act, Management Plan, and rule requirements. This authority is described below.

### **7.6.1 MEASURING DEVICES**

The Department monitors compliance with the measuring-device requirements through review of Annual Water Withdrawal and Use Reports, field investigations, and evaluations of energy use. Before field visits, the Department generally contacts well owners to ask for their cooperation and presence during the inspection. Standardized procedures and equipment are used to test the accuracy of measuring devices (A.A.C. R12-15-901, et seq.).

Exempt well users are encouraged to assist the Department in collecting accurate groundwater data by reporting water well levels through GWSI or through the third-party water-level portal annually.

### **7.6.2 IRRIGATION ACREAGE AND WATER USE MONITORING**

The Department monitors irrigated acreage and irrigation water use using annual reports, crop records, energy-use records, aerial photography, and satellite-based remote sensing data. These procedures are also used to determine the accuracy of annual water use reports and to detect illegal irrigation. The Department investigates any potential discrepancies or violations identified using these methods.

### 7.6.3 ANNUAL REPORT REVIEWS AND AUDITS

The Department reviews all annual water withdrawal and use reports. This is the Department's primary means for determining compliance with conservation requirements, measuring requirements, and groundwater use limitations.

The Department may conduct official audits of right holders to check the accuracy of annual reports and to verify suspected problems. An audit is a detailed review by the Department staff of a person's water-use records and/or facility processes. Each person audited is requested to attend the audit. Audits ensure overall compliance with the Act and the Management Plan. A Report of Audit must be sent to the audited person or entity within 30 days of the audit (A.R.S. §§ 45-633(D), 880.01(D), 1061(D); A.A.C. R12-15-1102(E)).

### 7.6.4 INSPECTIONS

The Act allows the Department to enter property where wells or other facilities that are used for the withdrawal, transportation, or use of groundwater are located. This authority allows The Department to inspect facilities and lands subject to Act provisions and obtain data or access to records relating to the withdrawal, use, or transportation of groundwater (A.R.S. § 45-633).

The Department is generally required to give persons reasonable notice of inspections unless entry is sought solely to inspect a measuring device. For inspections related to the Act, recharge facilities, bodies of water and water exchanges, a Notice of Inspection is not required if reasonable grounds exist to believe that such notice would frustrate enforcement, or where entry is sought for the purpose of inspecting water-measuring devices required pursuant to A.R.S. §§ 45-604 and 45-871.01.

## 7.7 COMPLIANCE APPROACH

The Department has developed a compliance program approach that includes education, assistance, and flexibility. To attain compliance with water resource management requirements, the Department employs a variety of strategies, including education, compliance monitoring, investigation, and enforcement. Additionally, public knowledge of The Department compliance efforts may be the most significant factor in achieving a high rate of voluntary compliance and serves as a disincentive for future violations. The Department often works with those in violation of their management plan requirements to identify a method to achieve future compliance, and the Department may also levy civil penalties as a result of enforcement actions.

### 7.7.1 DETERMINATION OF COMPLIANCE

The mandatory conservation programs in the 1MP are designed to achieve reductions in groundwater withdrawals and use. Consequently, the persons given notice of irrigation water duties and conservation requirements established in the plan are required to comply with those irrigation water duties and conservation requirements only in those years in which they withdraw, distribute, or receive groundwater. The following two sections describe how the Department determines compliance with conservation requirements when groundwater is used.

Many water providers deliver a mix of water types. In order to determine compliance with conservation requirements, the Department must adopt a set of policies for commingled systems. The Department is continuing to develop policies for “volumetric” accounting. Generally, a water provider delivering different types of water through a commingled system cannot determine which type of water a customer received. Therefore, the provider is generally required to account for all deliveries to its customers on a volumetric basis. This allows the provider to compute the percentage of each type of water delivered in a given year and apply that same percentage to the water delivered to each customer, regardless of the type of water actually received by the customer. Individual circumstances may warrant individual consideration; however, The Department is continually reviewing its policies on volumetric accounting to recognize necessary exceptions.

### 7.7.2 MAXIMUM ANNUAL WATER ALLOTMENTS REQUIREMENTS

The 1MP establishes maximum annual water allotments for irrigation grandfathered rights, turf-related facilities, dairies, and cattle feedlots. The requirements are analogous to maximum annual water allotments in that they limit the amount of water that may be used during a year to a specified volume. A person’s compliance with a maximum annual water allotment is generally determined by comparing the total amount of water used by the entity during the year with the amount of water allowed by the allotment. However, the use of water in excess of the allotment during a year does not necessarily mean that the person is out of compliance for the year. To account for weather variations and other factors that may result in the use of more water in some years than others, The Department determines compliance either through the operation of a flexibility account or through a three-year averaging method, depending on the type of use.

Generally, if the total amount of water used during the year is less than the allotment for the year, In the Base Program, flexibility account credits are not limited but a negative balance cannot exceed 50 percent of the annual allotment or the IGFR will be in violation of the conservation program requirement.

For dairies and cattle feedlots subject to maximum annual water allotments, compliance is determined through a three-year averaging method. Under this method, the user will be in compliance with its allotment for any year in which its water use exceeds its allotment if the total amount of water used during that year and the previous two years does not exceed the sum of allotments for those three years.

If an irrigation grandfathered right or turf-related facility uses water during a year in an amount which causes its flexibility account to exceed its maximum negative account balance, or if a dairy or cattle feedlot uses water during a three-year period in an amount that exceeds the sum of the allotments for those three years, a violation occurs, but only to the extent of the groundwater included in excess. The Department determines the amount of groundwater in the excess by a process known as “stacking.” This process was approved by the court in *Arizona Municipal Water Users Ass’n v. Arizona Dep’t of Water Resources*, 181 Ariz. 136, 888 P.2d 1323 (App. 1994). Note, the Act authorizes The Department to count the groundwater conservation requirements for municipal water distribution systems (See also *Ariz. Water Co., v. Ariz. Dep’t of Water Resources*, 208 Ariz. 147, 91 P.3d 990 (2004)).

Under the stacking process, water from all sources used by a person during a year, with certain exceptions, is counted when comparing the person’s water use to the maximum annual water allotment. However, groundwater is counted last. The process of counting groundwater last is called stacking because the groundwater is added to, or stacked on top of, the non-groundwater sources. Groundwater use is counted last - the amount of any water used by a person in excess of its allotment will be comprised, at least partially, of groundwater.

### **7.7.3 SPECIFIC CONSERVATION MEASURES**

The following industrial users are required to comply with conservation measures specific to their type of use instead of maximum annual water allotments compliance will be determined by ascertaining whether they implemented their specific conservation measures in the manner required by the management plan, rather than by comparing their water use to a volumetric allotment. They are out of compliance if they fail to implement the conservation measures in the required manner.

All industrial users, including those subject to maximum annual water allotments, are required to comply with the conservation measures established for All Industrial Users in Chapter Six of this plan. These conservation requirements include general requirements to avoid waste and make efforts to recycle water. They also include more specific requirements relating to low water use landscaping, landscaping, water features in

publicly owned rights of way, and single pass heating and cooling. In addition to these requirements, Chapter Six of this plan requires that all industrial users submit a water conservation plan to the Director.

The Department encourages agricultural and industrial water users to invite The Department staff to conduct an informal inspection to proactively identify compliance concerns and the necessary steps for improvement.

#### **7.7.4 THE ENFORCEMENT PROCESS**

When The Department's monitoring program identifies a potential violation or when a third-party complaint is received about the activities of another user, an investigation is conducted to obtain the facts.

An investigation may involve a field inspection by the Department staff or an audit at The Department's office after notice to the potential violator. The Department may request that the individual produce relevant records for the inspection or audit. Based on the investigation, the Department will determine whether there has been a violation and, if so, what course of action to take.

Where the violation is minor and does not require corrective action, The Department may bring the compliance action to a close with an advisory letter upon discontinuance of the violation. For more serious violations where there is reason to believe a person is violating or has violated a statute, permit, rule, or management plan provision, enforcement action may be taken by The Department.

The Department attempts to respond to all instances of non-compliance. Every non-compliance action is not necessarily met with an identical response, but rather a response that the Department determines is proportionate to a particular violation and considers the specific circumstances of each case.

Potential enforcement actions and penalties for failure to comply with Arizona Revised Statutes Title 45, Chapter 2, Groundwater Act are described below:

Pursuant to A.R.S. § 45-635(A)(1): A person who is determined, pursuant to section 45-634, to be in violation of this chapter or a permit, rule, regulation or order issued or adopted pursuant to this chapter may be assessed a civil penalty in an amount not exceeding...one hundred dollars per day of violation not directly related to illegal withdrawal, use or transportation of groundwater.

Pursuant to A.R.S. § 45-636(A): Unless otherwise specified, a person who knowingly violates or refuses to comply with a provision of this chapter or a permit, rule, regulation

or order issued or adopted pursuant to this chapter is guilty of a class 2 misdemeanor. A person who, after notice of this chapter or a permit, rule, regulation or order issued or adopted pursuant to this chapter is guilty of a separate offense for each day of violation.

Additional enforcement mechanisms are generally reserved for violators not amenable to the previously mentioned mechanisms. They include contested hearings, cease and desist orders, and civil penalties of up to \$10,000 per day for violations directly related to illegal withdrawals, transportation, or use of groundwater (A.R.S. §§ 45-634 and 45-635).

Extremely serious cases may also be referred for criminal prosecution if persons knowingly violate or refuse to comply with the Act; or with a permit, rules, or order issued or adopted under the Act (A.R.S. § 45-636).

## **7.8 EDUCATION AND ASSISTANCE**

The Department informs water users of their conservation and reporting requirements as described in section 7.6.2 of this chapter. The Department also educates water users by explaining how the requirements were derived and how the user can achieve those requirements. This is done through advisory committees, detailed program descriptions contained in reports and issue papers, public presentations, the publication of this management plan, and individual meetings with interested users. AMA staff are available to assist with specific questions at (602) 771-8585. The following sections provide additional information on available resources and participation opportunities.

## **7.9 STAKEHOLDER PROCESSES AND OPPORTUNITIES FOR PUBLIC ENGAGEMENT**

Arizona has a long and successful history of engaging stakeholders and coordinating with local experts to collaboratively and effectively manage the State's groundwater resources. While often challenging and contentious, this deliberate and iterative stakeholder participation ensures Arizona's innovative water management strategies can be improved, refined, and implemented, while still achieving reductions in withdrawals of groundwater. In addition to the current and potential future stakeholder engagement and planning processes described below, the Department conducted an extensive public process for the development of the 1MP through the Management Plan workshops, with participation from each of the three sectors. In that process, and in the others detailed below, The Department prioritizes transparency and posts many meeting materials online. Public meeting information, including meeting recordings and materials and upcoming meeting details, can be found on the Department's Public Meetings page (<https://www.azwater.gov/public-meetings>).

### 7.9.1 FUTURE STAKEHOLDER PROCESSES

Moving forward, the Department intends to continue our collaborative approach to water resource management. Long-term scenario planning and projection development are likely to feature prominently in future stakeholder engagement endeavors, which will allow The Department to more nimbly respond to the changing hydrologic conditions of a warmer and drier Arizona. This process will remain open to the public, and as envisioned, will require the continued participation of stakeholders and interested parties. Additional details will be made available on the Department's website as they are available.

### 7.9.2 GROUNDWATER USER ADVISORY COUNCIL

The Act established a five-member, Governor-appointed Groundwater Users Advisory Council (GUAC) for each AMA. Members are appointed to six-year terms to represent groundwater users in their respective AMA and are appointed based upon their knowledge of, interest in, and experience with problems relating to the development, use and conservation of water. Each Council provides advice and recommendations to the AMA Director on the groundwater management programs and policies within the AMA. (A.R.S. § 45-420).

GUAC meetings are open to the public and all previous meetings are recorded and available on the Department website. Members of the public have an opportunity at each meeting to address the Council during the call to the audience. Meeting dates and agendas, posted in advance of each meeting, and additional information can be found on the Department's GUAC webpage (<https://www.azwater.gov/ama/guac-meetings>).

### 7.9.3 COMPLIANCE STATUS INQUIRIES

Annual flexibility account balance information is available to all affected users allowing them to monitor their compliance status. Irrigation grandfathered right holders who have exceeded the debit limits of their flex accounts, or who are close to exceeding them are notified of their status and given the opportunity to reduce water usage or purchase flex credits to avoid an enforcement action. However, irrigation grandfathered right holders regulated under the Integrated Farm Program may not purchase flex credits. Some information can be found as live queries on the Department's website (<http://infoshare.azwater.gov/docushare/dsweb/View/Collection-90>), and right holders or operators can request additional information at [earp@azwater.gov](mailto:earp@azwater.gov) or by calling 602-771-8585.



## 7.10 IMPLEMENTATION, COMPLIANCE, AND SUPPORT

### *Well Spacing Requirements for the Douglas Active Management Area*

Within the Douglas AMA, any person proposing to drill a new well, non-exempt well, or a non-exempt replacement well in a new location may be required to include with the application a hydrologic study demonstrating that withdrawals from the proposed well will not result in local water tables experiencing a long-term decline. The rules, and references to the applicable statutes, can be found in [Arizona Administrative Code Title 12, Chapter 15, Article 13](#).

## CHAPTER 8: WATER STRATEGIES

### 8.1 INTRODUCTION

The 1980 Groundwater Management Act (GMA or Act) recognized the importance of water and the significance of groundwater use, and overuse, to the “general economy and welfare of this state and its citizens” (A.R.S. § 45-401(A)). The GMA created the Active Management Areas (AMAs), management goals for each area, and a series of five management plans to assist each in reaching its goal. The Douglas AMA is the sixth AMA in the State and is the first AMA to be established by election. The AMA was designated on December 1, 2022.

The GMA was visionary. The enactment was unique and creative in its approach to addressing groundwater depletion at the groundwater basin scale, using hydrologic boundaries for a cohesive regulatory structure and state and local coordination on issues and management approaches. The coordination and conservation strategies and programs that have been developed since the passage of the GMA have led to a stronger, more prosperous, and more sustainable Arizona. Further, with this long history of conservation efforts, Arizona has demonstrated a capacity to work collaboratively, creatively, and productively across sectors, which will be even more necessary as we work to address water challenges in a hotter, drier future.

The development of the DAMA First Management Plan was based on stakeholder participation. These discussions created innovative strategies necessary to meet the challenges facing the Douglas Basin. Examples of past and ongoing efforts for stakeholder collaboration include the creation of the first DAMA Groundwater Users Advisory Council and Management Plan workshops conducted in late 2023 and early 2024.

### 8.2 FIRST MANAGEMENT PLAN STRATEGIES

The First Management Plan is more modest in its conservation efforts, with continuing and intensifying efforts being made in subsequent Management Plans. Within the DAMA 1MP Agricultural chapter, there are programs such as the Base Program and the Integrated Farm Program. In the Municipal chapter, there is the statutorily required Assured Water Supply program as well as the Integrated Water Resource Plan for large providers. The industrial chapter includes descriptions of conservation programs that apply to all industrial users, as well as sub-sections for conservation requirements specific to water types and usage, such as turf programs.

The culmination of these programs assists in establishing a robust system of conservation measures that will serve the Douglas Active Management Area for years. These established requirements also established building blocks for future Management Plans and more ambitious measures to reduce the withdrawal of groundwater.

## **8.3 FUTURE: WATER MANAGEMENT ISSUES FOR THE 1MP AND BEYOND**

While significant uncertainties exist regarding the scale, timelines, and cumulative effects of changing hydrologic and climatic conditions, it is readily apparent that we are entering an era of limits. Some consensus exists around the types of issues that may be anticipated, and additional concerns may emerge in the future. Some of these issues have been discussed in the Governor's Water Policy Council and other forums. Addressing the full range of interconnected issues will require ongoing and collaborative focus in the years to come.

### **8.3.1 WATER SCARCITY AND SUPPLY CONSTRAINTS**

The intent of the GMA was to protect and stabilize the economy and improve the welfare of the state through the careful management of the State's groundwater resources. To accomplish this, goals were established for each of the AMAs, and the role of the management plans is to guide the AMAs to those goals. While significant progress has occurred in slowing and limiting groundwater mining in other AMAs, overdraft has continued, and the non-groundwater supplies that could otherwise offset groundwater use are experiencing increased competition and shortage due to drought and climatic conditions. The various types of water sources are profoundly and complexly linked. Constraints on non-groundwater sources lead to increases in groundwater utilization, which causes localized water level declines, subsidence, and fissures, and increasing difficulty in demonstrating physical availability for Assured Water Supply (AWS) determinations. While the stacking principle (see Chapter 7 for definition and discussion of stacking) allows some level of conjunctive resource management, the complex interconnectedness of groundwater and other supplies necessitates further conjunctive management of all water types as "one water". Increasingly, all water types are seen as valuable components of water resource portfolios.

#### ***Effluent***

Arizona has long been and remains a leader in the reuse of effluent. The management plans have encouraged and incentivized investment in advanced treatment and the infrastructure to utilize this resource beneficially. When it would have been easier and

cheaper to discharge to a streambed or wash, policies were adopted, agreements were brokered, infrastructure was built, and facilities were designed with a growing understanding of the value of the supply in mind.

Over time, with advances in treatment technologies and changes in regulations, it became apparent that effluent was more than a means to conserve or offset the use of potable supplies; it could be used for almost any purpose, and the supply was expected to increase over time. The advent of underground water storage and recovery and technology allowing for direct potable reuse of effluent (DPR) enabled and accelerated this change in perception. Water management strategies have increasingly moved to the “one water” approach, in which all supplies of water, including effluent, are understood as valuable components of a water portfolio. Existing incentives for the use of effluent are increasingly being scrutinized.

As competition has increased for effluent over time, conversations have intensified regarding how the uses of effluent might be prioritized. While the longstanding paradigm of “the right water for the right use” may still be useful, there are increasing calls for consideration of the “highest” use for that resource. Currently, significant portions of effluent supplies are used for power production, landscape irrigation, storage and recovery, and other uses. Effluent is also increasingly being considered a potential source of water for restoration or riparian uses and an additional source of potable supply. As all supplies become more constrained and as competition for effluent continues to increase, water managers are increasingly discussing strategies to prioritize the use of effluent, particularly with considerations of prioritizing those uses that would allow the water to be repeatedly recaptured and recycled to obtain the most uses out of each drop.

### ***Groundwater***

The risks associated with the overuse of groundwater have been long recognized in Arizona. Groundwater is the primary source of water within the Douglas AMA. There were multiple efforts prior to the GMA to regulate groundwater, and the risks of overdraft were well-accepted enough that they were written into the “Declaration of Policy” in the Groundwater Act: “(overdraft) is threatening to do substantial injury to the general economy and welfare of this state and its citizens...” (A.R.S. § 45-401(A)). To address this threat, the GMA set forth what was then seen as a comprehensive and proactive set of regulations with the goal of preserving groundwater.

The First Management Plan for Douglas creates sustainable and commonsense conservation requirements to reduce these withdrawals. These conservation measures have originated from conservation requirements that have proven to be successful in

other AMAs, as well as from input and thoughtful conversations from Douglas stakeholders. These measures and future management plans are purposed to further conserve groundwater for the future of the Douglas basin.

### ***Water Transfer and Importation***

As a general matter, outside of AMAs, groundwater may not be transported away from a groundwater basin. There are certain exceptions, which can be viewed in A.R.S. § 45-544(B), all of which are subject to the payment of damages to injured landowners. One exception allows transportation occurring as of January 1, 1993, to continue and expand so long as it is done by the same person for the same purpose. Another exception allows a city, town or private water company whose service area is in two adjacent basins and who served customers in both basins as of July 1, 1993, to transport groundwater between the basins. Another exception allows water to be transported for mineral extraction and processing. (There are additional exceptions for transportation from certain basins into initial AMAs that are not applicable here.) Groundwater may be transported away from AMAs in accordance with the following:

- Subject to certain limitations on use:
  - Pursuant to an Irrigation Grandfathered Right (IGFR)
  - Pursuant to a Type 1 Grandfathered Right (with additional limitations not relevant to the Douglas Groundwater Basin), Subject to the payment of damages to injured landowners
- Pursuant to Type 2 Grandfathered Right
  - By a city, town, private water company, or irrigation district within its service area
  - Pursuant to a groundwater withdrawal permit
  - From an exempt well

## **8.4 RECHARGE, RECOVERY, AND REPLENISHMENT**

The Arizona Recharge and Recovery Program was established in 1986 to allow surplus supplies of renewable water to be stored underground and later recovered for the storer's use. Under this program, the Department administers the permitting of and accounting for the recharge and recovery activities within the state (as described in section 3.2.1). Artificial recharge will continue to be an important tool in the management of Arizona's water supplies. However, continuing growth, water shortages, and increasing competition for renewable supplies will reduce the supplies available for underground storage and recovery.

In the Douglas AMA, only two types of renewable water supplies may be available for recharge: primarily effluent and, to a lesser extent, surface water. But these water supplies are very limited. Additionally, in order to capture, retain, use, and store surface water, a person must have a surface water right. (See the Department’s website for information on surface water rights and permitting.)

However, rainwater and stormwater can provide opportunities for the Douglas AMA to offset groundwater demand and potentially augment groundwater supplies, reducing overdraft, preserving groundwater, and helping sustain aquifer levels.

- For instance, flood control projects can be designed and constructed to slow down and detain fast-flowing stormwater, enabling it to percolate and increasing the volume of water that infiltrates.
- Designing new development to preserve natural hydrologic patterns—protecting ecosystems, maintaining existing drainage courses, limiting clearing and grading, and reducing impervious surfaces—protects natural recharge.
- Landscape and collection techniques that recreate pre-development hydrology can be incorporated into existing or planned urban environments, maintaining runoff on site and allowing stormwater to infiltrate. These measures can also reduce groundwater use for supplemental irrigation of urban landscapes.
- Rainwater collected from residential, commercial, industrial, and institutional rooftops can be stored in tanks and used to offset the demand for groundwater as well, whether for landscapes and gardens or uses such as toilet flushing.

The potential impact of such measures depends on the extent and type of measures that are implemented and available precipitation. The adoption of codes at the municipal and county level may be necessary to enable some of these strategies and could expedite their implementation.

## **8.5 NEXT STEPS**

The First Management Plan for the Douglas AMA begins the path towards reducing the withdrawals of groundwater in the Douglas basin, using tested statutory programs and conservation efforts unique to the stakeholders of Douglas. The creative collaboration between the Department and the stakeholders of Douglas is invaluable in making progress toward the AMA’s management goal.

Further Management Plans, generally written after a period of 10 years, will continue conservation efforts and further work to reduce the withdrawals of groundwater. Public

input—through public workshops, GUAC meetings, and other avenues--will be key to the development of future plans.

This plan and the conservation requirements set forth within are just one part of a set of tools that allow Arizona to manage its water supplies carefully. The management plans and the other existing tools have served Arizona well, but the scale and range of challenges looming ahead would have been unimaginable at the time those tools were created. There have been small updates to the framework of Arizona’s water management over time, but bigger, bolder water management moves will be required, and additional tools will need to be developed.

Water management strategies often focus on finding the “next bucket” of water to meet growing demands; however, options for that next supply are limited, and there is growing competition for those supplies. A renewed focus on the development and implementation of demand-side solutions will be necessary to balance the supply/demand equation.

Many assumptions within the existing frameworks will need to be evaluated in a reality with increasing scarcity: if Arizona is to address the overuse of groundwater and preserve that water for future generations, difficult decisions will need to be made. It’s unclear what might result from those considerations and prioritizations, but it is clear that difficult, non-parochial discussions will be needed to find innovative methods to move the state forward. Creative solutions are already being seen through considerations of regional collaboration and expanded agreements to leverage better and interconnect infrastructure. These creative and collaborative solutions are critical to Arizona’s long-term viability and success. They are prime examples of what Arizona has historically done best: coming together, making hard compromises, and finding a way to survive and thrive in an increasingly arid environment.