

FIFTH MANAGEMENT PLAN

PHOENIX ACTIVE MANAGEMENT AREA

2020-2025



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ADWR created a 5MP focused stakeholder forum called the Management Plans Work Group (MPWG). The MPWG and its five subgroups (agricultural, municipal, turf, safe-yield technical, and recharge) served as the public stakeholder process for the development of the 5MPs, with a goal to assess existing conservation programs and to develop reasonable and functional conservation strategies for the fifth management period and beyond. ADWR thanks everyone who attended and participated in the MPWG meetings.

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EXECUTIVE SUMMARY

INTRODUCTION

The Management Plans serve as a tool to assist in achieving the groundwater goals of each of the state's five Active Management Areas (AMAs). Arizona's 1980 Groundwater Management Act (GMA or Code) created ADWR and put in place structures for water management, intended to curb the severe groundwater overdraft occurring in several parts of the state. The GMA defined five management periods and instructs that there shall be a management plan in each AMA for each management period. These plans contain the conservation programs that are intended to guide each AMA to meet its management goal – and these conservation programs are to be designed to achieve reductions in groundwater withdrawals. The successive periods and plans are a particular strength of the Code, enabling the plans to evolve over time, adapting to incorporate the information and experience gained over time and to respond to changing technologies and circumstances.

A.R.S. § 45-563 (A)
"The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater."

5MP DEVELOPMENT APPROACH

Each set of management plans has been unique in management strategies and structure, and so too are the Fifth Management Plans (5MPs). This is in recognition of the indefinite timeline for the plans and in response to the availability of improved online tools. At the time of development, the 5MPs are the last management plans in statute. Statute specifies that the conservation requirements for the fifth management period shall remain in compliance until the legislature determines otherwise A.R.S. § 45-568. The Department has moved much of the data that was previously printed in a static form in the plans to an online format. This allows for current data to be easily accessible and interactive in new ways and also allows for data corrections and updates to be made, without the legal modification process.

The 5MP was designed to serve as a concise, descriptive, regulatory document with straightforward and transparent conservation programs that will result in reductions in withdrawals of groundwater. The strength of the plans rests on the collaborative process between stakeholders and the Department. In July 2019, ADWR created a 5MP focused stakeholder forum called the Management Plans Work Group (MPWG). The MPWG served as the public stakeholder process for the development of the 5MPs, with a goal to assess

existing conservation programs and to develop new management strategies for the fifth management period and beyond. ADWR held 38 meetings of the work group and its five subgroups, (agricultural, municipal, turf, safe-yield technical, and recharge) and worked extensively with stakeholders to develop reasonable and functional conservation strategies for the 5MPs.

Starting in April 2020, meetings were moved to an online format due to the COVID-19 pandemic. Due to the challenges of having nuanced discussions in an online forum, ADWR staff developed multiple methods and tools around the meetings to elicit and enable stakeholder communication, input, and engagement. Questionnaires and surveys following public meetings were introduced after the Department moved discussions online. The Department also included timed breaks throughout public presentations to allow time for questions and feedback. The Department developed the 5MP Concepts Webpage, which included stakeholder comments on the program proposals, as well as interactive data dashboards, graphics, and summaries of the corresponding work group meetings. Throughout the development of the 5MPs, ADWR staff also provided information and updates to and sought feedback from the Groundwater Users Advisory Council (GUAC) in each AMA.

A.R.S. § 45-568 (C)

“...all persons...shall comply with the applicable irrigation water duty or conservation requirements for the fifth management period not later than January 1, 2025 and shall remain in compliance until the legislature determines otherwise.”

A.R.S. § 45-421(1)
“The GUAC for each AMA advises the ADWR Statewide AMA Director and makes recommendations on groundwater management programs and policies for the AMA and provides comments to ADWR on draft management plans before they are promulgated.”

During the 5MP Agricultural Subgroup process, ADWR also received requests to reestablish the Agricultural Water Conservation Best Management Practices (BMP) Advisory Committee, which was initially established by executive order in 2002. In response to those requests, the Agricultural BMP Committee was continued in November of 2020 by Governor Doug Ducey's Executive Order 2020-55. The Committee was charged with advising ADWR's Director regarding the statutorily authorized Agricultural BMP Program and providing input to

the Director on the BMP Program as the 5MPs were finalized and promulgated. The BMP Advisory Committee held eight meetings to review and discuss the BMP Program for the 5MPs, resulting in a range of detailed updates to the BMPs, which will lead to increased efficiency.

5MP STRUCTURE

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

There are four agricultural conservation programs: three are statutorily mandated; one is optional under statute, and it is newly included in the 5MP. Three of the programs are allotment based, including the new optional program, and one is practice based. Details of the agricultural conservation programs can be found in Chapter 4.

There are two statutorily mandated conservation program options for large municipal providers: one is allotment based, and one is practice based. Information on the municipal conservation programs can be found in Chapter 5.

The industrial conservation program consists of requirements for all industrial users. There are additional requirements for several subsectors, each with corresponding conservation programs: turf-related facilities, large-scale power plants, large-scale cooling facilities, dairy operations, cattle feedlot operations, metal mining facilities, new large landscape users, and new large industrial users. Details of the industrial conservation programs can be found in Chapter 6.

5MP PROMULGATION, IMPLEMENTATION, AND POTENTIAL MODIFICATIONS

The statutory management plan promulgation process requires ADWR to conduct formal public hearings after completion of the proposed management plan (A.R.S. § 45-570). In these hearings, ADWR presents information in support of the proposed plan and a summary of any comments provided by the GUAC on the draft management plan. ADWR also takes public comment on the proposed plan. Before the plan is adopted, the Director of ADWR prepares a written summary of matters considered at the hearing and findings on those matters and may adopt the plan as presented or with modifications. All requirements in the 5MP become effective on January 1, 2025 and will remain in effect until the legislature determines otherwise.

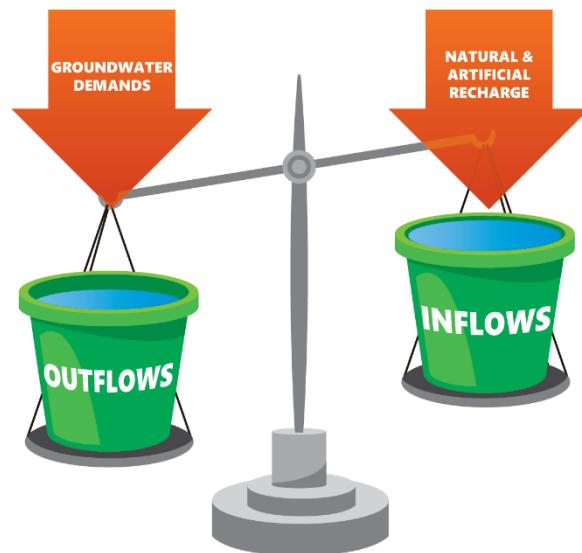
Upon notice of a 5MP irrigation water duty or conservation requirement, a person may apply for a variance from or seek administrative review of the water duty or conservation requirement. In general, a variance gives a person additional time (not to exceed five years) to comply with an irrigation water 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 5MPs 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)). Details on these processes can be found in Chapter 7.

MANAGEMENT GOAL

The statutory management goal of the Phoenix AMA (PhxAMA) is safe-yield by the year 2025 (A.R.S. § 45-562(A)). Safe-yield is defined as “a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area” (A.R.S. § 45-561(2)). Groundwater withdrawals in excess of natural and artificial recharge lead to groundwater overdraft -- meaning that to progress toward the goal of safe-yield, the AMA should be moving in a direction of balancing their inflows and outflows. Safe-yield is a condition where inflows and outflows are balanced and maintained in the long-term. Both pieces of this are equally important and equally challenging – achieving that balance and thereafter maintaining the balance requires close attention and response to changing conditions and demands over time. Each sector in the PhxAMA has a role in contributing to overdraft and a responsibility to reduce withdrawals of groundwater to make progress toward the management goal. The PhxAMA is not at safe-yield and will be unlikely to achieve and maintain safe-yield given the resources and tools that are currently available. ADWR has developed the Overdraft Data Dashboard (<https://new.azwater.gov/ama/ama-data>) to communicate the status of the safe-yield in those AMAs that have this goal, including the PhxAMA. Information regarding water supplies and demands in the PhxAMA and an analysis of the PhxAMA’s progress toward its goal can be found in Chapter 2.



THE RECHARGE AND ASSURED WATER SUPPLY PROGRAMS

As the state moves into a drier future and supplies become increasingly constrained, the Underground Storage and Recovery Program will play an increasingly important role in water management in the AMAs. In the development of the 5MPs, program staff and stakeholders were consulted in the development of strategies to facilitate that role. This resulted in the addition of some clarifying language to the plan to allow better implementation of existing requirements. For information on the Recharge Program, see Chapter 3 and visit the ADWR website (<https://new.azwater.gov/recharge>).

The Assured Water Supply (AWS) Program was created to preserve groundwater resources and promote long-term water supply planning in the AMAs. AWS statutes and rules limit the use of groundwater by new residential and commercial subdivisions. Every person proposing to subdivide land within an AMA must demonstrate the availability of a 100-year water supply. An AWS demonstration must include proof of the following criteria: 1) water supplies will be of adequate quality; 2) water supplies will be physically available for 100 years; 3) water supplies will be legally available for 100 years; 4) water supplies will be continuously available for 100 years; 5) any groundwater use will be consistent with the management goal for the AMA; 6) any groundwater use will be consistent with the management plan for the AMA; and, 7) the developer or water provider has the financial capability to construct the necessary water storage, treatment and delivery systems. For information on the AWS Program, visit the ADWR website (<https://new.azwater.gov/aaws>).

WATER MANAGEMENT ASSISTANCE, SUPPORT, AND COMPLIANCE

The Water Management Assistance Program (WMAP) provides financial and technical resources to assist water users in the development and implementation of conservation programs, facilitate augmentation and renewable water supply utilization, and obtain information on hydrologic conditions and water availability in an AMA. The WMAP is funded primarily from groundwater withdrawal fees collected from each person or entity withdrawing groundwater in an AMA from a non-exempt well (A.R.S. § 45-611 (C)). Programs funded by the WMAP help water users achieve efficient use of water supplies and assist the AMA to meet its water management goal. Recent projects funded through the WMAP and information on applying for funding through the program is available on the ADWR website (<https://new.azwater.gov/ama/wmap>).

In the PhxAMA, city, county, regional, federal agencies and tribal governments carry out water management functions, including retail water delivery, flood control, wastewater management, water quality management, and planning and zoning. Numerous user groups, advisory committees, citizens' groups, and other organizations provide input in

developing legislation, policies, guidelines, and educational programs relating to water use and conservation.

ADWR's compliance program approach focuses on assisting users to achieve regulatory requirements and provides a level of flexibility to accomplish and maintain compliance. ADWR employs a variety of strategies, including education, technical assistance, compliance monitoring, investigation, and, as necessary, enforcement.

ADWR works extensively to provide education, information, data, and support to both the regulated community and to the general public. Information about groundwater rights, annual reports, and AMA data, as well as technical resources and assistance, educational materials, guidance, and training opportunities are available online (<https://new.azwater.gov/ama/ama-data> and <https://new.azwater.gov/conservation>), through the customer support line (602-771-8585), and via email (earp@azwater.gov).

THE FUTURE AND PHOENIX AMA WATER MANAGEMENT CHALLENGES

While the PhxAMA has made improvements in managing its water supply, it will continue to face water management challenges in the fifth management period and beyond. These include meeting the safe-yield goal, physical availability of groundwater in the PhxAMA, increased competition for renewable supplies, and limitations of the management plan authority. As all supplies are experiencing increased constraints, including Colorado River shortage, reduced precipitation, and groundwater depletion issues like subsidence and limits on physical availability, additional and more robust management tools and strategies will be required to ensure resilient, long-term water supplies in the AMAs. Arizona is experiencing hotter temperatures, reduced and increasingly erratic precipitation, and more extreme weather events, and these changes are expected to continue. The contributions of the GMA, ongoing planning for and investment in Arizona's water supply future, and the role of conservation and innovation are important to recognize and celebrate, but as this "new normal" becomes less new, significant additional work and strategies will be needed to take Arizona into the future.

ADWR will continue to work with the regulated community as well as other stakeholders within the PhxAMA to identify challenges and develop and implement solutions to water management challenges through the fifth management period and beyond. To help facilitate that work, the Post-2025 AMAs Committee was created in October of 2019 as a committee of the Governor's Water Augmentation, Innovation, and Conservation Council (GWAICC) to evaluate the outcomes of the first 45 years under the Code and identify potential strategies for sound water management after 2025. The Committee works to identify issues and potential solutions to those issues. Information regarding these meetings and the issue papers and proposed solutions developed through this

process can be found on the Committee's page on ADWR's website (<https://new.azwater.gov/gwaicc/post-2025-amas-committee>). Discussion of the compounding effects of water supply constraints and of the future needs of the PhxAMA can be found in Chapter 8.

The framers of the GMA set forth aggressive goals for the AMAs, knowing full well that it would be challenging to achieve them, and more challenging still to maintain them. The water management path from 1980 to 2025 was intended to be iterative, evolving as we learned from our experience and as the AMAs rapidly changed over nearly half a century. The management periods and corresponding plans developed with the regulated community enabled ongoing evaluation, innovation, and adaptation. The framers of the Code did not expect 2025 to be the end. Even if the goals were achieved, they were to be thereafter maintained. This is a point at which we must take honest stock of where the AMAs are and where they need to be to ensure ongoing water resilience for central Arizona. In order to continue to successfully adapt and secure that water future for the next generations, our goals must be at least as bold as those set forth in 1980; and to achieve and maintain those goals, the 5MPs cannot be the last. Our work is far from done.

CHAPTER 1: HYDROLOGY

1.1 QUANTITY

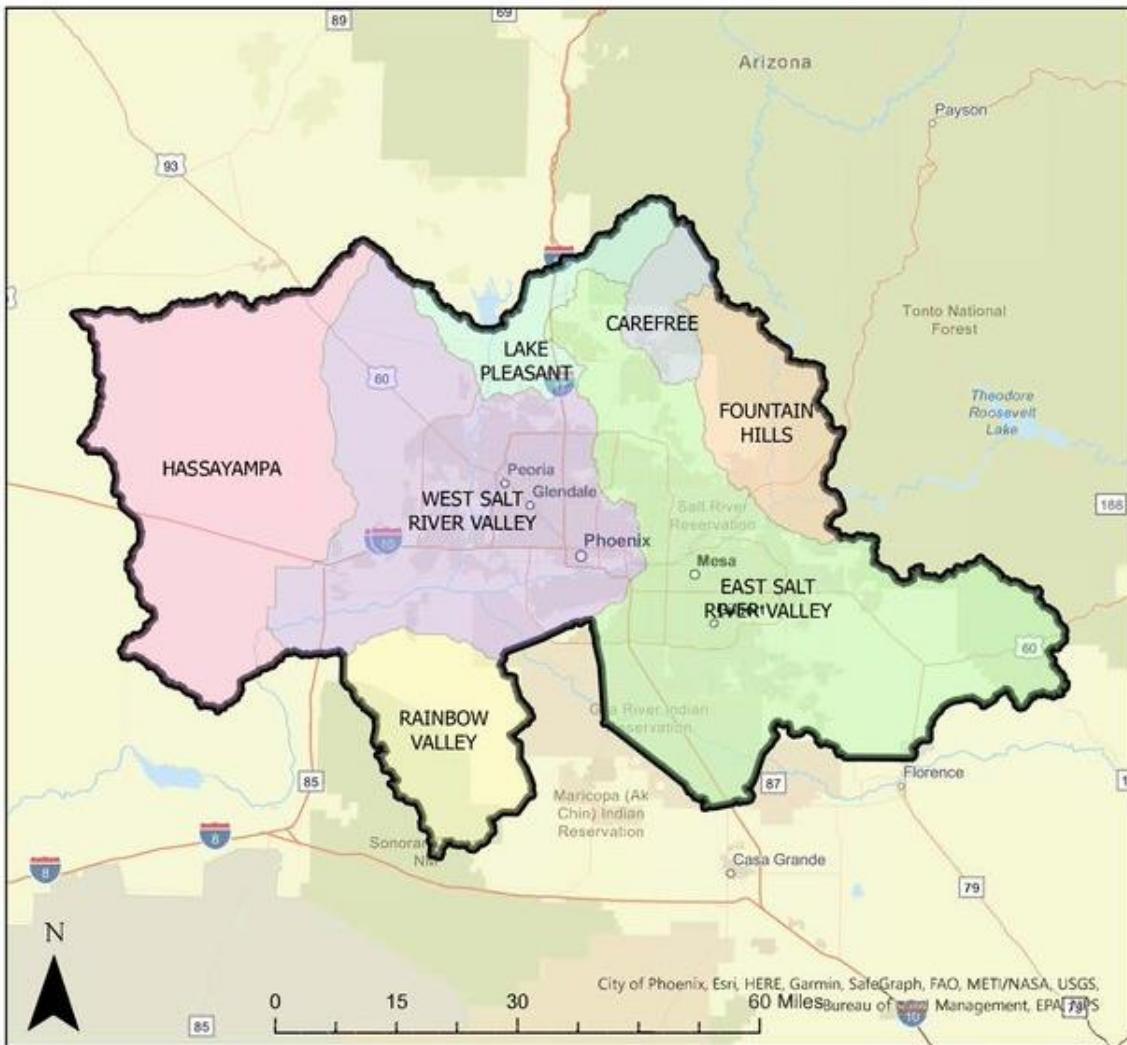
1.1.1 HYDROGEOLOGY

There are seven groundwater sub-basins in the Phoenix Active Management Area (PhxAMA): The East Salt River Valley Sub-basin, West Salt River Valley Sub-basin, Hassayampa Sub-basin, Rainbow Valley Sub-basin, Fountain Hills Sub-basin, Lake Pleasant Sub-basin, and Carefree Sub-basin (Figure 1-1). Each sub-basin has its own unique hydrologic properties (see Appendix 1A for definition), and a number of factors influence groundwater conditions in each. These include inflows and outflows (see Appendix 1A for definitions) of groundwater, depth to groundwater, withdrawals and recharge, surface water conditions, land subsidence (see Appendix 1A for definition), and quality of groundwater in different locations.

The primary sources of groundwater in the PhxAMA are basin-fill sediments. While the basin-fill sediments that underlie much of the AMA are extremely heterogeneous (see Appendix 1A for definition), three distinct water-bearing units are identified for most of the sub-basins of the PhxAMA: an upper alluvial unit (UAU), a middle alluvial unit (MAU), and a lower alluvial unit (LAU). Although conditions and circumstances vary across the PhxAMA, most groundwater is pumped from the MAU. In certain locations, large capacity wells in the basin-fill sediments can yield up to several thousand gallons of water per minute. Bedrock, consisting of various metamorphic and igneous rock, underlies the basin-fill sediments. The bedrock has little groundwater storage or production capacity and is not considered to be an aquifer.

Groundwater conditions change over time due to natural and human-induced fluctuations in the amount of water being added or removed. Because groundwater flows very slowly underground, the effects of pumping and recharge can alter the shape of the water table (see Appendix 1A for definition) for long periods of time. Water that is naturally or artificially recharged can create a mound underground, while pumping can create a cone of depression in the water table. Major changes in water level elevations occurred after the development of more effective well technology in the 1940s. The new well pumps allowed a much greater volume of groundwater to be pumped than had been possible earlier.

Figure 1-1 Phoenix Active Management Area and Sub-Basins



SUB-BASIN NAME

- CAREFREE
- EAST SALT RIVER VALLEY
- FOUNTAIN HILLS
- HASSAYAMPA
- LAKE PLEASANT
- RAINBOW VALLEY
- WEST SALT RIVER VALLEY



1.1.2 GROUNDWATER CONDITIONS AND LAND SUBSIDENCE

Groundwater conditions in an aquifer can be monitored by collection of water level measurements from the aquifer. The water level in an aquifer reflects the cumulative inflow and outflow stresses that have been applied to the aquifer. Groundwater level measurements also provide important information on long and short-term water level trends, and on aquifer storage changes.

The Arizona Department of Water Resources (ADWR) Hydrology Division's Field Services Unit collects water level data using both conventional field methods (electric sounders or steel tapes) and pressure transducers at automated sites. All water level data is stored in ADWR's Groundwater Site Inventory (GWSI) database. This data is available on ADWR's Arizona Groundwater Site Inventory website (<https://azwatermaps.azwater.gov/gksi>).

Water level data is used by ADWR to produce water elevation and depth-to-water maps, as well as water level change reports. Water level change reports and maps, showing groundwater conditions, are available on the ADWR Hydrology Publications eLibrary (<https://new.azwater.gov/hydrology/e-library>).

Land subsidence has been occurring across Arizona since the 1940s (Robinson, G.M., and Peterson, D.E., 1962). Land subsidence in the basins of Arizona is generally due to compaction of alluvium caused by a declining water table. Several areas of land subsidence and earth fissures (see Appendix 1A for definition) exist in the PhxAMA. ADWR monitors land subsidence across Arizona and publishes subsidence monitoring reports and land subsidence maps, which are available on the Hydrology Publications eLibrary (https://new.azwater.gov/sites/default/files/LandSubsidenceInArizonaFactSheet_003.pdf).

1.1.3 GROUNDWATER RECHARGE AND DISCHARGE

Groundwater recharge components in the PhxAMA include: 1) mountain-front, 2) stream recharge, 3) underflow (see Appendix 1A for definition), 4) incidental recharge, and 5) artificial recharge. Further information pertaining to mountain-front recharge, stream recharge, and underflow can be found in the appendix to the Overdraft, Safe-Yield, and the Management Goals in Arizona's Active Management Areas Report (Safe-Yield Report), (<https://new.azwater.gov/ama/management-plans>). Table 1-1 includes the net natural recharge components overtime; additional data can be found on the Overdraft Data Dashboard located on the ADWR website (<https://new.azwater.gov/ama/ama-data>). For purposes of this plan, incidental recharge is defined as water that percolates to the PhxAMA's regional aquifer after being utilized for agricultural, industrial, or municipal purposes. This includes water that is recharged as a result of irrigation activities, reclaimed water that is released to the PhxAMA's rivers and their tributaries or used for irrigation,

and water infiltrating from canals. Artificial recharge is defined as water that is recharged at constructed or managed recharge projects permitted by ADWR (see Appendix 1A for definition). Historically, the largest source of recharge to the PhxAMA regional aquifer has been agricultural incidental recharge.

Groundwater is discharged from the PhxAMA's regional aquifer through pumpage, underflow out of the AMA, and evapotranspiration (ET). Groundwater pumping represents the largest source of outflow in the PhxAMA. Underflow out of the AMA occurs to the east of the Sierra Estrella Mountains and along the Gila River, north of the Buckeye Hills. ET losses occur primarily along the Salt and Gila Rivers riparian corridors.

1.1.4 PHXAMA WATER QUANTITY INFORMATION AND UPDATES

ADWR has been developing groundwater models within the PhxAMA (Salt River Valley Model) since the early 1980's. If you would like more information about the geology and hydrology within the PhxAMA visit the Salt River Valley Regional Model page on the ADWR website (<https://new.azwater.gov/hydrology/groundwater-modeling/salt-river-valley-srv-regional-model>).

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

Year	Natural Inflows			Natural Outflows		Net Natural Recharge
	Mountain Front Recharge	Stream Recharge	GW Inflow	Riparian Evapotranspiration	GW Outflow	
1985	16,692	390,466	27,239	56,817	28,708	-348,871
1986	16,692	117,335	28,040	49,131	29,219	-83,717
1987	16,692	121,897	27,845	46,838	29,351	-90,244
1988	16,692	114,161	28,702	45,145	29,216	-85,195
1989	16,692	97,120	29,326	43,235	29,281	-70,623
1990	16,692	97,193	29,165	40,870	29,322	-72,858
1991	16,692	154,407	27,652	38,932	29,430	-130,390
1992	16,692	432,471	26,390	46,852	29,639	-399,061
1993	16,692	1,112,021	25,849	66,921	29,767	-1,057,874
1994	16,692	109,407	25,437	47,914	29,865	-73,757
1995	16,692	341,545	25,375	53,836	29,938	-299,837

1996	16,692	103,118	26,039	45,090	29,995	-70,764
1997	16,692	103,502	25,011	41,798	29,988	-73,419
1998	16,692	170,374	25,893	43,767	29,926	-139,266
1999	16,692	107,442	25,484	40,408	30,088	-79,122
2000	16,692	123,858	25,004	37,685	29,985	-97,883
2001	16,692	110,428	24,918	35,763	30,156	-86,118
2002	16,692	109,263	24,963	33,627	29,736	-87,556
2003	16,692	109,814	25,661	30,745	29,170	-92,252
2004	16,692	152,707	25,666	28,193	29,110	-137,763
2005	16,692	284,441	23,352	29,464	32,665	-262,355
2006	16,692	148,761	25,168	26,165	29,700	-134,756
2007	16,692	151,215	25,211	23,589	29,011	-141,135
2008	16,692	152,696	26,091	22,075	28,407	-144,997
2009	16,692	153,302	25,830	21,019	27,852	-146,952
2010	16,692	153,146	25,239	21,343	27,529	-146,204
2011	16,692	153,770	25,325	21,786	28,230	-145,772
2012	16,692	155,400	25,786	20,600	28,454	-148,825
2013	16,692	156,174	26,040	18,917	28,814	-151,175
2014	16,692	155,342	26,511	17,587	28,986	-151,972
2015	16,692	155,392	26,556	16,703	29,165	-348,871
2016	16,692	156,545	26,654	15,833	29,424	-83,717
2017	16,692	155,320	26,213	15,335	30,299	-90,244
2018	16,692	155,944	26,675	14,694	30,757	-85,195
2019	16,692	155,709	26,522	16,030	29,726	-70,623

*Data from 2019 is based on historical averages and will be updated on the Overdraft Data Dashboard as updates from the groundwater model become available.

1.2 QUALITY

1.2.1 INTRODUCTION

Water quality is an important component of the PhxAMA water supply management. ADWR's role in water quality relates to the impacts of water quality on available water supplies. Protecting and managing water quality maximizes the overall quantity of usable water and matching the best use to the quality of water is a significant part of ADWR's water management objectives. This chapter describes ADWR's role and authority in meeting groundwater quality management objectives during the fifth management period and addresses water-quality impacts on water-supply management in the PhxAMA.

During the fifth management period, ADWR will continue to play a role in water quality challenges. ADWR's groundwater quality responsibilities include support of groundwater quality protection programs, assistance in the clean-up of contaminated areas, and assistance in matching water quality with the highest beneficial use.

In general, groundwater in the PhxAMA is of acceptable quality for most uses. Most of the groundwater supplies in the PhxAMA meet federal and state drinking water standards, though in some areas, contaminant levels exceed the U.S. Environmental Protection Agency (EPA) National Primary Drinking Water Regulation limits. For more information, see the EPA's National Primary Drinking Water Regulations website (<https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>). Within the PhxAMA there are 18 Water Quality Assurance Revolving Fund (WQARF) sites, seven U.S. EPA National Priorities List (NPL) sites, and two Department of Defense (DOD) sites. PhxAMA groundwater withdrawals from wells within these identified areas have been discontinued or are in the process of being remediated. Other areas of known contamination that are not being remediated are monitored to ensure that contaminants do not spread.

1.2.2 GOALS AND OBJECTIVES

As the agency entrusted with managing and conserving Arizona's long-term water supplies, ADWR will ensure that use of groundwater withdrawn to achieve remedial action objectives is minimized and, where practicable, new groundwater uses are not created and groundwater supplies are conserved. While ADWR believes that it is possible to both achieve reductions in withdrawals of groundwater and provide incentives for the use of remediated groundwater, it recognizes that there is a delicate balance between the two responsibilities that will involve coordinated efforts between the Arizona Department of

Environmental Quality (ADEQ) and ADWR to ensure that, on a case-by-case basis, no more groundwater is withdrawn than is necessary.

To implement its groundwater quality management responsibilities, ADWR will "coordinate and confer" with ADEQ regarding "water plans, water resource planning, water management, wells, water rights and permits, and other appropriate provisions of Title 45 pertaining to remedial investigations, feasibility studies, site prioritization, selection of remedies and implementation of the WQARF program pursuant to title 49, chapter 2, article 5" (A.R.S. § 45-105(B)(4)(c)).

ADWR's goals and objectives for groundwater quality management for the fifth management period are the following:

- to ensure that remediation of contaminated groundwater uses the minimal amount of groundwater necessary to facilitate the objectives of each remedial action project;
- to ensure that end uses of remediated groundwater minimize groundwater withdrawals and are consistent with the safe-yield goal for the PhxAMA. To this end, ADWR will favor end uses that minimize changes in groundwater storage such as reinjection and recharge over those that reduce groundwater in storage. Where remediated groundwater cannot be practicably or cost-effectively reinjected or recharged, ADWR will encourage replacing existing groundwater uses with remediated water; and discourage new permanent uses which would not have occurred without the poor-quality groundwater accounting and which would continue to rely on groundwater after the poor-quality groundwater is no longer available; and
- to ensure efficient use of the remediated water to help meet the water conservation goals of the PhxAMA.

ADWR's objectives are designed to ensure that remedial action projects are not an impediment to achieving the safe-yield management goal for the PhxAMA and that remedial actions are performed in a prudent and efficient manner from a water management perspective.

1.2.3 STATUTORY PROVISIONS

While ADEQ is the agency primarily responsible for regulating water quality in Arizona, ADWR also has certain limited responsibilities in this area. Statutory provisions pertaining to ADWR's limited authority to regulate groundwater quality are discussed below.

The 1980 Groundwater Code (Code) grants ADWR authority to regulate groundwater. Under the Code, ADWR has the following authority and responsibilities relating to water quality:

- "The director may . . . formulate plans and develop programs for the practical and economical development, management, conservation and use of surface water, groundwater and the watersheds in this state, including the management of water quantity and quality" (A.R.S. § 45-105(A)(1)).
- "The director may . . . conduct feasibility studies and remedial investigations relating to groundwater quality and enter into contracts and cooperative agreements under § 104 of the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] of 1980 (P.L. 96-510) to conduct such studies and investigations" (A.R.S. § 45-105(A)(15)).
- For the fifth management period, the Director "may include in each plan, if feasible, in cooperation with the department of environmental quality, an assessment of groundwater quality in the active management area and any proposed program for groundwater quality protection. Any such program shall be submitted to the legislature for any necessary enabling legislation or coordination with existing programs of the department of environmental quality" (A.R.S. § 45-567(A)(6)).
- "The director shall consult with the department of environmental quality on water-quality considerations in developing and implementing management plans under this article" (A.R.S. § 45-573).

WQARF legislation, enacted in 1986 and amended in 1997, expanded ADWR's role in water-quality management. ADWR's responsibilities and authority under WQARF include:

- "The director of water resources, in consultation with the director of environmental quality, may inspect wells for vertical cross-contamination of groundwater by hazardous substances and may take appropriate remedial actions to prevent or mitigate the cross-contamination..." (A.R.S. § 45-605(A)).
- "The director shall notify an applicant for a permit or a person who files a notice of intent to drill a new or replacement well if the location of the proposed well is within a sub-basin where there is a site on the registry established pursuant to

section 49-287.01, subsection D..." The Director also shall adopt rules requiring the review of notices and applications regarding new or replacement wells to identify whether a well will be located where existing or anticipated future groundwater contamination presents a risk of vertical cross-contamination by the well. The rules shall require that a new or replacement well in these types of locations be designed and constructed in a manner to prevent cross-contamination with an aquifer (A.R.S. § 45-605(E)).

- "The director of environmental quality and the director of water resources shall coordinate their efforts to expedite remedial actions, including obtaining information pertinent to site investigations, remedial investigations, site management and beneficial use of remediated water" (A.R.S. § 49-290.01(C)).
- "On consultation with the director of environmental quality, the director of water resources may waive its applicable permits, approvals or authorizations if the director of water resources determines that the permits, approval or other authorization unreasonably limits the completion of a remedial action and if the waiver does not conflict with the statutory intent of the permit, approval or other authorization." A.R.S. § 49-290.01(A).
- "The director of water resources also may waive any regulatory requirement adopted pursuant to Title 45 -with respect to a site or portion of a site as part of a record of decision adopted pursuant to section 49-287.04 for that site or portion of a site if the regulatory requirement conflicts with the selected remedy, provided that the waiver does not "result in adverse impacts to other land and water users" (A.R.S. § 49-290.01(D)).
- "The department of water resources shall include in its management plans... provisions to encourage the beneficial use of groundwater that is withdrawn pursuant to approved remedial action projects..." (1999 Ariz. Sess. Law, H.B. 2189, § 51(A)). In order to encourage the beneficial use of remediated groundwater, "the department of water resources shall account for groundwater withdrawn pursuant to approved remedial action projects under CERCLA or Title 49, Arizona Revised Statutes, except for groundwater withdrawn to provide an alternative water supply pursuant to section 49-282.03, Arizona Revised Statutes, consistent with the accounting for surface water" for purposes of determining compliance with management plan conservation requirements (1999 Ariz. Sess. Law, H.B. 2189, § 51(B)).
- "For each calendar year until 2025, the use of up to an aggregate of 65,000 acre-feet (AF) of groundwater withdrawn within all active management areas pursuant

to approved remedial action projects under CERCLA or Title 49, Arizona Revised Statutes," except for groundwater withdrawn to provide an alternative water supply pursuant to section 49-282.03, Arizona Revised Statutes, shall be considered consistent with the management goal of the active management area as prescribed in A.R.S. § 45-576(J)(2), Arizona Revised Statutes (1999 Ariz. Sess. Law, H.B. 2189, § 52(A)).

- For the fifth management period, "twenty-five percent of the total volume of groundwater withdrawn pursuant to approved remedial action projects under CERCLA or title 49, Arizona Revised Statutes, except for groundwater withdrawn to provide an alternative water supply pursuant to section 49-282.03, Arizona Revised Statutes, in excess of the aggregate volume of sixty-five thousand AF of groundwater authorized in subsections A and C of this section shall be considered consistent with the management goal of the active management area as prescribed in section 45-576 (J)(2),Arizona Revised Statutes..." (1999 Ariz. Sess. Law, H.B. 2189, § 52(B)).
- "The department of environmental quality and the department of water resources shall develop a method of sharing data, including cooperative data base development and integration between the departments that will provide the departments with the information necessary to protect the resources of the state" (1997 Ariz. Sess. Law, S.B. 1452, § 44(A)).
- "The directors of environmental quality and water resources shall enter into an agreement to coordinate the well inspection and remediation programs and to rank wells within an area of contamination according to each well's potential to act as a conduit to spread contamination and to determine the appropriate remedial action regarding the wells with a potential to act as a conduit, including well reconstruction, well abandonment or no action." 1997 Ariz. Sess. Law, S.B. 1452, § 45(A). Per S.B. 1465 (1997 Session Laws) §45(B), ADEQ and ADWR were required to establish rules with procedures to provide affected well owners with "the opportunity to comment on departmental investigations and remedial actions involving vertical cross-contamination" and "provide that well owners with wells with the highest potential to act as a conduit to spread contamination be notified of the status of these wells." This was accomplished in A.A.C. R12-15-850(A) and (B). See also, A.C.C. R12-15-812 and 821.

1.2.4 THE REGULATION OF GROUNDWATER QUALITY IN ARIZONA

To understand ADWR's role in regulating groundwater quality, it is important to understand the broad framework of laws and programs impacting both groundwater and surface water quality. Since groundwater quantity and quality challenges are interrelated, ADEQ and ADWR work together to prevent and mitigate groundwater quality and quantity challenges. ADEQ has the primary responsibility for protecting the State's groundwater and surface water quality, while ADWR secondarily manages groundwater quality concerns. This section will discuss the regulatory agencies responsible for administering laws impacting groundwater and surface water quality as well as the federal laws and state programs impacting groundwater quality and secondarily surface water quality.

1.2.4.1 WATER QUALITY REGULATORY AGENCIES

Water quality protection programs in Arizona are based on both federal and state law and are primarily administered by either ADEQ or the U.S. Environmental Protection Agency (EPA) Region IX. ADEQ has the responsibility to administer state water quality programs pursuant to state statutes and to administer federal water quality programs for which the EPA has delegated its authority to the state, referred to as "state primacy." EPA has the responsibility to administer federal water quality programs pursuant to federal statutes. The EPA delegates its authority to states where the state demonstrates that it can adequately administer the program and the federal statute provides for the delegation of the authority.

ADEQ has authority pursuant to the Environmental Quality Act (EQA) of 1986 (A.R.S. § 49-101 et seq.) to set water-quality standards and to regulate discharges that have the potential to impact the quality of groundwater by requiring such discharges to be made subject to an aquifer protection permits (APP). ADEQ has authority under the Clean Water Act (CWA) to set Arizona's surface water quality standards and to certify that discharges subject to federal permits do not violate state water quality standards.

EPA Region IX delegated authority to administer the CWA National Pollutant Discharge Elimination System (NPDES) permits and the pretreatment program to Arizona in 2002. The ADEQ program is a point source discharge permitting program and is called the Arizona Pollutant Discharge Elimination System (AZPDES). The United States Army Corps of Engineers (Corps), Los Angeles District, retains authority to administer CWA permits for the discharge of dredge or fill materials in Arizona's waters. EPA Region IX also has authority to require groundwater monitoring and remediation in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.2.4.2 FEDERAL LAWS IMPACTING GROUNDWATER QUALITY

The Safe Drinking Water Act (SDWA) is the primary federal law regulating drinking water quality which includes groundwater. The CWA, which regulates surface water, also impacts groundwater quality. CERCLA and the Resource Conservation and Recovery Act (RCRA) impact groundwater management through the regulation of hazardous waste and sites contaminated by hazardous waste. The following is a brief overview of these federal laws and their impacts on ADWR's water quality management.

Safe Drinking Water Act

The SDWA was enacted in 1974 to regulate drinking water. ADEQ has been delegated authority by the EPA to implement the SDWA and "to ensure that all potable water distributed or sold to the public through public and semi-public water systems is free from unwholesome, poisonous, deleterious, or other foreign substances and filth or disease-causing substances or organisms" (A.R.S. § 49-351(A)).

Although ADWR does not regulate drinking water quality, the presence of contaminants in groundwater does negatively impact water quality for municipal providers and poses significant water management issues for drinking water systems.

Clean Water Act

The CWA, first passed in 1972, is the comprehensive federal statute regulating surface water quality. It provides for area-wide, long-range planning processes to mitigate water quality control problems in selected areas which result from urban and industrial wastewater. Because such planning processes provide a comprehensive review of wastewater treatment and reuse options, ADWR participates in such planning and provides technical assistance to local councils of government who administer the plans.

Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA and the Superfund Amendments and Reauthorization Act, commonly referred to as the Federal Superfund Program, authorize investigation and remediation of groundwater contaminated by releases of hazardous substances. In Arizona, CERCLA establishes a comprehensive response program which is administered by ADEQ in cooperation with the EPA. ADWR also plays an advisory role in this process, and regularly participates in CERCLA program activities. ADWR's concern regarding CERCLA sites is that any groundwater that is withdrawn and remediated must be put to reasonable and beneficial use. ADWR may participate on CERCLA technical committees and serve in an advisory capacity for monitoring and extraction well installation, source control projects, and permitting.

Resource Conservation and Recovery Act

RCRA established a national hazardous waste management program in 1976. Under RCRA, hazardous waste permits are issued for the treatment, storage and disposal (TSD) of hazardous wastes. Individual permits issued to these facilities specify design, performance and operational standards which include groundwater monitoring. Hazardous waste facilities also undergo a closure process once operations are reduced or terminated. Moreover, corrective action may be required at TSD facilities and may include groundwater monitoring.

ADEQ has been delegated authority for the implementation of RCRA requirements in Arizona. ADWR's participation at RCRA sites is important for water management activities, particularly in regard to well siting, use permits, and end-use issues.

1.2.4.3 ADEQ PROGRAMS THAT IMPACT ADWR GROUNDWATER QUALITY ACTIVITIES

The Environmental Quality Act (EQA) established the ADEQ and created a strong and comprehensive water quality management structure. ADEQ's programs that protect groundwater resources include water quality assessments, groundwater monitoring, pollutant discharge, permitting activities, and remediation activities. The following are selected water quality protection programs which fall under the jurisdiction of ADEQ and have a direct impact on ADWR activities.

Aquifer Protection Program

The most comprehensive ADEQ groundwater protection program is the Aquifer Protection Program (APP), established by the EQA in 1986 and implemented by rule in 1989. An individual or general permit is required for any person who discharges or who owns or operates a facility that discharges a pollutant from a facility either directly into an aquifer or to the land surface or the vadose zone in such a manner that there is a reasonable probability that the pollutant will reach an aquifer (A.R.S. §§ 49-201(11), 49-241).

ADWR may coordinate with ADEQ to review APP applications for potentially harmful water quality impacts on groundwater conditions. ADEQ advises ADWR of each APP application received for a facility that is an underground storage and recovery project. One of the conditions for the issuance of an underground storage facility permit is that ADEQ must determine that the facility is not in a location which will result in pollutants being leached to the groundwater table so as to cause unreasonable harm (A.R.S. § 45-811.01(C)). Facilities exempt from APP provisions may be required by ADWR, in consultation with ADEQ, to meet other requirements to mitigate harmful water quality impacts to the aquifer.

Wellhead Protection Program

An important addition to Arizona's groundwater protection program has been the development of the Wellhead Protection Program which fulfills Federal requirements of section 1428 of the SDWA by designating Wellhead Protection Areas around public drinking water systems. The Wellhead Protection Program is a voluntary program which encourages the protection of all wells, not just public drinking water system wells. Local entities that have the authority to control land use and exercise other management options can implement wellhead protection, therefore encouraging the creation of local programs.

Reuse Permits

Reuse permits are issued by ADEQ to facilities which provide treated wastewater for reuse. A reuse permit specifies the amount of reclaimed water to be reused and its chemical quality. ADEQ wastewater reuse rules (A.A.C. R18-9-701 et seq.) set the criteria for the use of treated effluent, or reclaimed water, for purposes such as agricultural irrigation, turf irrigation, and recharge. The current reuse rules prescribe numeric reclaimed water quality criteria and monitoring requirements for specific reuse applications. In general, these rules prescribe allowable limits for pH, total fecal coliform, turbidity, enteric viruses, and certain parasites. Reuse may be limited depending on the quality of source water and the intended use.

Wastewater reuse rules undergo periodic updating through ADEQ's rule-making process. ADWR reviews any proposed changes to the wastewater-reuse rules to ensure the protection of public health and groundwater supplies while maximizing the use of a significant renewable water supply. ADWR evaluates reclaimed water reuse permits issued by ADEQ and encourages the use of treated effluent where appropriate.

Underground Storage Tanks

ADEQ's Underground Storage Tank (UST) program was developed to ensure the proper operation of underground storage tanks and to prevent and remediate releases. Under state regulation and RCRA amendments, the UST program consists of notification requirements, technical standards for new and existing USTs, leak detection and closure criteria, corrective actions for remediation, and financial responsibility demonstrations. Leaking USTs in a concentrated area can present detrimental impacts on groundwater quality and supplies.

ADWR has the authority to issue poor quality groundwater withdrawal permits for water contaminated by USTs. ADWR can provide guidance for UST site remediation projects to ensure the beneficial use of remediated water.

Water Quality Assurance Revolving Fund

The WQARF Program, sometimes referred to as the state Superfund program, was created as part of the EQA. WQARF monies are used to protect the waters of our state against hazardous substances and may be used in conjunction with Federal funds. Funds can be used for statewide water quality monitoring, health and risk assessment studies, and remediating hazardous substances which threaten the waters of the state. Mitigation of non-hazardous substances also is allowed under specified conditions (A.R.S. § 49-286). ADEQ has developed a list of environmentally threatened sites which qualify for WQARF monies. Funds are used at those sites to mitigate existing contamination or to prevent further spread of pollutants which may threaten Arizona's water supplies. A registry of sites is maintained by ADEQ. Sites are added to the registry based on criteria such as the degree of risk to the environment and other available funding sources.

ADEQ follows a process for management and cleanup of WQARF sites that consists of site identification and characterization, site prioritization, remedy selection, identification of end uses, implementation and monitoring, and closure. ADWR will coordinate with ADEQ in the planning and implementation of any groundwater cleanup actions under WQARF in the PhxAMA.

Water Infrastructure Finance Authority

In 1989, the Arizona Legislature created the Wastewater Management Authority to administer funds granted to the state pursuant to the Federal SDWA. These funds, which required a 20 percent state match, are loaned to wastewater treatment systems in the state for assistance in meeting requirements of the SDWA. ADEQ made loans for this purpose from monies in the ADEQ wastewater treatment revolving fund. In 1997, this administrative body was amended by the Legislature and renamed the Water Infrastructure Finance Authority (WIFA).

The authority for WIFA was expanded to make loans available to drinking water systems in addition to wastewater treatment systems for assistance in meeting requirements of the SDWA. ADWR is required to participate on the advisory board that oversees the WIFA and has an interest in viability of water systems and SDWA compliance (A.R.S. § 49-1202(A)(8)).

1.2.4.4 ADWR PROGRAMS RELATED TO GROUNDWATER QUALITY

ADWR protects groundwater quality by considering groundwater quality issues in its permitting process and water quantity management programs. As a result of WQARF reform legislation in 1997, ADWR has increased its responsibility in the program to coordinate and provide assistance to WQARF activities. Among other things, the legislation provides for:

- annual funding for ADWR WQARF activities;
- database development and coordination with ADEQ;
- groundwater withdrawn pursuant to certain cleanups to be accounted for in the same manner as surface water for the purpose of determining compliance with conservation requirements;
- amendment of the Assured Water Supply (AWS) Rules;
- advisory participation by ADWR in site assessment, remediation, management, operation, and planning strategies;
- a WQARF Advisory Board on which ADWR has a seat; and
- a well inspection program through which wells that are contributing to vertical cross-contamination may be identified and modified.

ADWR's existing permits and programs which consider groundwater quality protection are discussed in the following section.

Poor Quality Groundwater Withdrawal Permits

Appropriate use of contaminated groundwater conserves the existing supply of potable groundwater. ADWR issues poor quality groundwater withdrawal permits to allow the withdrawal of groundwater which, "because of its quality has no other beneficial use at the present time" (A.R.S. § 45-516). Withdrawal permits are issued by ADWR, and the withdrawal must be consistent with the AMA management plans. Permits are usually issued in conjunction with CERCLA, WQARF or leaking UST sites for pump-and-treat operations. To increase the appropriate uses of poor-quality groundwater during the fifth management period, ADWR will continue to encourage matching poor-quality groundwater with beneficial uses within the PhxAMA.

As of 2021, eight entities hold eight poor quality groundwater withdrawal permits in PhxAMA, primarily at CERCLA and WQARF sites (See Table 1-2).

Table 1-2 Phoenix AMA Poor Quality Withdrawal Permits

Permit Number	Permittee	Maximum Permitted Volume (AF)	Site
59-588107.0001	Arizona Department of Environmental Quality	290	Central and Camelback
59-533880.0000	City of Phoenix	80	Glenrosa Service Center
59-541491.0002	Freescale Semiconductor, Inc.	1,935	56th Street & Earll
59-586182.0003	Freescale Semiconductor, Inc.	1,200	Broadway and Dobson
59-530577.0002	Freescale Semiconductor, Inc.	1,314	52nd Street
59-533159.0001	Honeywell International, Inc.	4,840	Honeywell Peoria Avenue
59-570144.0002	Honeywell International, Inc.	150	Honeywell Deer Valley Computer Park
59-223478.0001	Nammo Talley, Inc.	1,290	Nammo Talley Plant #3
		TOTAL 11,099	

Assured Water Supply Program

The Assured Water Supply (AWS) Program is a consumer protection program that ensures that new subdivisions have a secure supply of water with adequate quality for at least 100 years. Pursuant to A.R.S. § 45-576, before land may be subdivided, the developer of the property must either obtain a Certificate of Assured Water Supply for the subdivision from ADWR, or a written commitment of water service for the subdivision from a city, town, or private water company with a Designation of Assured Water Supply (DAWS).

Pursuant to rules governing the AWS Program set forth in A.A.C. R12-15-701 et seq., in order to establish an AWS, the applicant must prove that a supply of water is physically, legally, and continuously available for the 100-year period to meet the demands of the development that will be the subject of the AWS determination. In the case of a designation, the water supply must meet current and committed demands of the water provider for the 100-year period in addition to the projected demands of the new development. The applicant also must establish that projected water use will be consistent with achievement of the management goal for the active management area and that the

applicant has the financial capability to construct the physical facilities necessary to serve the development. In addition, the applicant must establish that the water supply pledged for assured water supply purposes is of adequate quality.

In assessing the quality of a water supply pledged for AWS purposes, ADWR works closely with ADEQ to determine whether the water supply meets ADEQ standards for the purposes for which the water is pledged. If the water is not of adequate quality, the applicant may need to find alternative water sources or to expend additional resources treating the groundwater to meet the ADEQ standards.

As of 2021, there were 15 municipal water providers that hold DAWS in the PhxAMA. Other areas of the AMA develop by obtaining Certificates of AWS. For a list of providers who hold a DAWS in the PhxAMA, visit the ADWR website (<https://new.azwater.gov/aaws>).

Underground Water Storage and Recovery Program

Underground water storage, commonly referred to as artificial recharge, plays an important role in achieving the PhxAMA's goal of safe-yield. Recharge projects store renewable supplies such as CAP water and reclaimed water that is currently not used directly. Credits for recharged water are then available to water providers and developers to help meet the various requirements for an AWS. Some stored CAP water, particularly that water stored underground by the Arizona Water Banking Authority (AWBA), will be available to help protect municipal and industrial CAP users from future shortages or outages on the CAP system.

The underground water storage program is administered by ADWR. Permits must be obtained from ADWR prior to undertaking recharge activities. ADWR coordinates closely with ADEQ to ensure that underground water storage does not adversely impact existing aquifer water quality and does not cause movement of existing groundwater contamination. If reclaimed water is stored underground, the applicant must obtain an APP from ADEQ, in addition to the underground storage permits required from ADWR. APPs specify monitoring requirements to assure that recharge waters are not negatively impacting the native groundwater. An APP is not required to store CAP water underground (A.R.S. § 49-250(B)(13)). For more information on recharge facilities in the PhxAMA see Chapter 3.

Well Spacing/Impact Analysis

A.R.S. § 45-598 and ADWR's Well Spacing Rules (R12-15-1301 et. seq.) are in place to prevent unreasonable increasing damage to surrounding land or other water users due to the concentration of wells in an AMA. Specifically, these rules require well impact

studies to evaluate the potential for new non-exempt wells and new withdrawals to cause damage to land and other water users. An applicant may submit a hydrologic report to demonstrate the proposed well's impact on surrounding wells but is not automatically required to do so. The Director may require the applicant to submit a hydrologic report if it is needed for the Director to make a determination under the rules. The well permit application may be denied if ADWR determines that the proposed well will cause unreasonable increasing damage on surrounding wells, additional regional land subsidence, or migration of poor-quality groundwater.

The "Notice of Intention to Drill" statute (A.R.S. § 45-596) governing well-drilling was modified in 2006 to allow the Director to deny the authority to drill a well if the Director determines that withdrawals from the well will cause the migration of contaminated groundwater from a remedial action site to another well, resulting in unreasonably increasing damage to the owner of the well, or persons using water from the well. The statute specifies that the Director shall use the same applicable criteria in the Well Spacing Rules used for wells inside of the AMA in making this determination.

Well Construction and Abandonment Requirements and Licensing of Well Drillers

If wells are not constructed, sealed, or abandoned properly they can act as conduits for contaminant flow from the surface to groundwater or between aquifers. ADWR's rules governing well construction, abandonment, and driller licensing, set forth at A.A.C. R12-15-801, et. seq., are summarized below:

- Minimum well construction and abandonment requirements prevent entry of fluids at and near the surface and minimize the possibilities of migration and inadvertent withdrawal of poor-quality groundwater. These requirements also prohibit the use of hazardous materials in the construction of wells.
- Installation, modification, abandonment, or repair of all wells in Arizona must be performed by a driller licensed by ADWR. The licensing procedure includes the administration of written examinations to test the applicant's knowledge of state regulations, hydrologic concepts, and well construction principles and practices.
- Disposal site restriction prevents the use of wells as disposal facilities for any material that may pollute groundwater.
- Special standards may be required by ADWR if the minimum well construction requirements do not adequately protect the aquifer or other water users.
- Open wells must be capped with a watertight steel plate.

- Except for monitor and piezometer wells, no well shall be drilled within 100 feet of any septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area, or petroleum storage areas and tanks, unless authorized by the director.

Wells drilled prior to the enactment of the well construction rules (effective March 5, 1984) were not required to be constructed in accordance with minimum well construction standards. If a pre-rule well is replaced or modified, however, the new or modified well must meet the current well construction standards (A.R.S. § 45-594).

1.2.4.5 ADWR'S ROLE IN THE WQARF PROGRAM

The sections below describe ADWR's role and activities in implementing the Water Quality Assurance Revolving Fund (WQARF) Program.

ADWR Activities in the WQARF Site Cleanup and Management Process

Site Identification and Characterization

Existing WQARF sites are being managed by ADEQ. Additional sites may be identified in the future based on a preliminary investigation by ADEQ to determine the potential risk to public health, welfare, or the environment. The results of the preliminary investigation will be used by ADEQ for site scoring using a method to be established in rules adopted by the director of ADEQ. The completed preliminary investigation will be used by ADEQ to either make a determination of no further action on a site, or to prepare the site for inclusion on the Site Registry. In this latter case, a Site Registry report is prepared containing a description of the site, with its geographical boundaries indicated, and the site score.

After a site is added to the Registry, characterization is important because the nature and extent of contamination must be understood before remedies can be selected and implemented. An important part of site characterization is an evaluation of how contamination impacts current and future groundwater uses.

ADWR will assist ADEQ by providing resource data such as well location and groundwater withdrawal records, water rights information, and any other appropriate data recorded by ADWR. Other ADWR roles may include activities such as site inspections and evaluations, review of investigations, field work such as well inspection, identification of potential water management issues, and any other characterization as appropriate. ADWR computer models may be useful in characterizing groundwater flow patterns.

Remedy Selection

ADEQ has established a list of response actions to be considered when managing a site. Based on the potential impact on current and future water uses, a potential remedy must be evaluated and designed. Each remedy is site-specific. ADWR may assist in defining potential remedies to ensure that the remedy is consistent with ADWR management plans and sound groundwater management practices that are publicly acceptable. Ultimately, ADWR's level of assistance will vary based on the remedy selected.

ADWR is committed to the beneficial use of groundwater withdrawn and treated at WQARF sites and will assist ADEQ with the identification and facilitation of designated end uses for remedial projects. These end uses should be consistent with those determined for existing sites as well as the development of new end uses to match the intended use.

Implementation and Monitoring

The implementation and monitoring phase of a site activity includes construction, startup, monitoring, operation and maintenance, and any other appropriate activities. ADWR will assist ADEQ in this phase through the following activities where appropriate: field work, review of groundwater analyses, appropriate accounting for AWS determinations and for determining compliance with conservation requirements, and any other appropriate activities.

Site Closure

ADEQ must certify that site goals have been attained in order to discontinue cleanup activities. ADWR staff assists in evaluation of sites and certification of site closure. ADWR assists and may need to identify alternative water sources to replace remediated water when sites are closed.

ADWR Policies for WQARF and Other Applicable Cleanup and Management

In general, site plans should be consistent with the management goal of the AMA in which the site is located (A.R.S. §§ 49-282.06(F)). During the fifth management period ADWR will continue to cooperate with ADEQ on the cleanup of remedial sites. ADWR policies are geared toward ensuring that AMA goals are addressed when remedial actions are planned. ADWR generally supports proposed remedial projects that make sense from a groundwater management perspective. The principles which formulate these policies are described below:

- Water use should be consistent with water allocation concepts in Title 45

- This policy requires that entities using water withdrawn pursuant to cleanups, whether under CERCLA, WQARF, RCRA, voluntary or other sites, possess groundwater withdrawal authority, such as permits or water rights.
- ADWR supports source control cleanups to protect water sources
 - Source control, which controls pollution at its source, can be a cost effective and practical approach to cleanups. Many wells have been rendered unsuitable for direct potable use due to migrating contamination. Source control projects to protect wells that are threatened by contaminant migration are generally supported by ADWR.
- Any groundwater withdrawn must be put to reasonable and beneficial use
 - Reasonable and beneficial use of groundwater withdrawn is a policy that applies to all cleanups. Any withdrawals of 100 AF or less annually may qualify for de minimis status and be exempted from beneficial use requirements, but ADWR will evaluate de minimis exemptions from this policy on a case-by-case basis. In the case of leaking UST sites, ADWR generally exempts sites that annually pump only a small volume of water.
- Contaminated groundwater represents a resource that will be important
 - Even if groundwater is contaminated, it represents a resource that can be potentially be used for both potable and non-potable uses. Potable uses must meet the state and federal drinking water standards that govern public consumption of potable water. ADEQ and the Arizona Department of Health Services intend to develop end-use standards for non-potable uses that, if implemented, will make large volumes of groundwater usable again. ADWR will cooperate in the development of non-potable end use standards and will develop policies for appropriate end uses based on the new standards.

From a water management standpoint, ADWR does not encourage containment remedies that involve massive groundwater withdrawals to achieve regional groundwater flow control.

Statutory Mandates for ADWR's Participation in the WQARF Program

The WQARF reform legislation enacted in 1986 and amended in 1997 mandates that ADWR implement certain water quality programs and provides for expanded ADWR involvement in water-quality management. Pursuant to 1999 Ariz. Sess. Law, H.B. 2189, §§

51 and 52, ADWR programs and responsibilities based on the WQARF reform legislation include the following:

- Coordination with ADEQ in Evaluating Proposed Remedial Actions - Pursuant to A.R.S. § 45-105(B)(4)(c), ADWR is required to coordinate and confer with ADEQ in evaluating proposed remedial actions to provide ADEQ with information regarding water resource considerations. ADWR will coordinate and confer with ADEQ prior to ADEQ's approval or denial of proposed remedial action plans. Once a remedial action plan is approved by ADEQ or the EPA pursuant to CERCLA or Title 49, Arizona Revised Statutes, ADWR will account for remediated groundwater in accordance with Laws 1997, Ch. 287, §§ 51 and 52. Among other things, ADWR will consider the following factors relating to proposed remedial actions in its recommendations to ADEQ:
 - Volume of remediated groundwater to be withdrawn - ADWR will encourage remedial actions that use the least amount of groundwater necessary to facilitate a project's remedial goal and will discourage remedial actions that are not prudent and efficient from a groundwater management perspective.
 - End uses to which remediated groundwater will be put - ADWR will encourage end uses that minimize groundwater withdrawals and that are consistent with the safe-yield goal because they will result in no change in groundwater storage. Where remediated groundwater cannot be practicably or cost-effectively re-injected or recharged, ADWR will encourage replacing existing groundwater uses with remediated groundwater and discourage new permanent uses which would not have occurred without the incentive to use remediated groundwater and which would continue to rely on groundwater after the remediated groundwater is no longer available.
 - While circumstances will be evaluated on a case-by-case basis, ADWR has adopted a substantive policy listing end-use preferences (<https://new.azwater.gov/sites/default/files/GroundwaterAdministration-GW38.pdf>), policy GW38, "Remediated Groundwater Incentives for Conservation Requirement Accounting for the Second Management Plan". Those preferences, listed in order from most to least preferred based on the impact on the active management area's management goal and the amount of groundwater in storage:
 - Neutral to local aquifer

- a. Re-inject or recharge in the same local area.
 - b. Replace existing groundwater uses in the same local area.
- Neutral to groundwater basin
 - a. Re-inject or recharge in the same active management area.
 - b. Replace existing groundwater uses in the same active management area.
- Reduce groundwater in storage
 - a. Replace existing non-groundwater use in the same active management area.
 - b. Beneficial uses of water for new purposes.
 - c. Artificial wetlands or artificial lakes.
 - d. Dispose to the sewer (unless the resulting reclaimed water is re-injected, recharged or replaces an existing groundwater use).
- Achievement of maximum beneficial use of waters and viability of proposed remedial action.
- Remedial actions must: assure the protection of public health and welfare and the environment; to the extent practicable, provide for the control, management or cleanup of hazardous substances so as to allow the maximum beneficial use of the waters of the state; and be reasonable, necessary, cost-effective and technically feasible (A.R.S. § 49-282.06(A)).
- Consistency with Title 45 - Groundwater withdrawn pursuant to an approved remedial action must be withdrawn and used consistent with Title 45, Arizona Revised Statutes.

Construction of New Wells in and Near Remedial Action Sites

ADWR will ensure that new or replacement wells in areas of known groundwater contamination are constructed in such a manner that cross-contamination does not occur. ADWR staff screen Notices of Intent to Drill that are submitted to ensure that wells are properly constructed. ADWR has established policies and procedures to implement this

directive, including procedures to effectively communicate with well owners and drillers. ADWR will coordinate review of these notices of intent with ADEQ.

Abandonment of Wells in and Near WQARF Sites

ADWR staff will review and evaluate Notices of Intent to Abandon to ensure that abandonment of wells is done in accordance with ADWR rules and that potential for cross-contamination is minimized. ADWR will coordinate review of these notices of intent with ADEQ.

1.2.5 WATER QUALITY ASSESSMENT

A comprehensive water quality assessment was included in the Third Management Plan. The assessment provided detailed characterization of water quality and an overview of water quality concerns in the PhxAMA. A water quality assessment for the Fifth Management Plan will be qualitative. The following sections discuss goals and objectives of the assessment for the fifth management plan period and water quality of renewable and groundwater supplies in the PhxAMA.

1.2.5.1 ASSESSMENT GOALS AND OBJECTIVES

The primary goal of the Water Quality Assessment is to provide a qualitative evaluation of groundwater and surface water quality conditions in the PhxAMA based on the comprehensive assessment performed during the third management period and to identify potential threats to groundwater quality and its link to the regional water supply. The impact of water quality on water resource management has become more important in recent years as water quality standards become more stringent and due to such factors as conjunctive use of water supplies, groundwater management at remediation sites and increasing levels of public concern.

The municipal, agricultural and industrial sectors have distinctive demand patterns and water quality requirements. For example, treated reclaimed water is used for turf irrigation, agricultural irrigation, industrial uses, and groundwater recharge. Water high in total dissolved solids (TDS) may be inappropriate for agricultural irrigation but may be usable for some industrial applications. Conversely, water that is high in nitrate could provide a suitable end use for agriculture but does not meet potable standards. During the fifth management period, ADWR will continue to encourage matching water quality characteristics with appropriate end uses while ensuring compliance with applicable laws and rules for each end use.

1.2.5.2 RENEWABLE WATER SUPPLIES

The renewable water supplies available for use in the PhxAMA are primarily Colorado River water delivered through Central Arizona Project Infrastructure (CAP), non-CAP surface water, and reclaimed water. The quality of renewable water supplies is discussed in this section.

Central Arizona Project Water

An important surface water supply that augments the water supply of the PhxAMA is CAP water, which is diverted and conveyed from the Colorado River in a primarily open canal. With appropriate treatment, the quality of CAP water is acceptable for most uses.

Total dissolved solids concentrations in CAP water vary depending on the location within the CAP canal system. Seasonal data for TDS levels at various mileposts along the CAP aqueduct from the year 2014 were obtained from the CAP. The seasonal data for this year ranged from approximately 550 mg/l (milligrams per liter) to 670 mg/l for the McKellips Road milepost. At the Brady Pump Plant milepost, TDS concentrations ranged from about 560 mg/l to 640 mg/l.

Reclaimed Water

A.R.S. § 45-101(4) provides the following definition for “reclaimed water” (also called effluent for the purposes of this plan): Water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to Title 49, Chapter 2. Such water remains reclaimed water until it acquires the characteristics of groundwater or surface water.

Sanitary sewers are defined as of any pipe or other enclosed conduit that carries any waterborne human wastes from residential, commercial, or industrial facilities (A.R.S. § 45-101(8)).

Reclaimed water treated at municipal wastewater treatment plants is a significant source of renewable water supply in the PhxAMA. With advanced treatment this water may be used for human consumption (direct potable reuse), and with more typical levels of treatment, reclaimed water is suitable for turf irrigation, some agricultural irrigation, sand and gravel washing, and several other industrial applications. For example, reclaimed water from the 91st Avenue Wastewater Treatment Facility (WTF) is used for industrial purposes at the Palo Verde Nuclear Power Generating Station. Wastewater reuse rules are developed by ADEQ that establish standards for various classes of wastewater. Wastewater discharges require an AZPDES permit to ensure that water quality parameters are being met.

Wastewater treatment facilities currently discharge reclaimed water into stream channels. The two largest facilities in the PhxAMA are the 23rd Avenue and 91st Avenue WTs. The 23rd Avenue facility discharges reclaimed water into the Roosevelt Irrigation District canal system, while the 91st Avenue facility discharges into the Gila River downstream from its confluence with the Salt River. Segments of the Gila River downstream from wastewater discharges have perennial flows. Wastewater discharges to waters of the United States require an NPDES permit and an APP to ensure that water quality standards are being met.

Secondary reclaimed water, which is treated to AZPDES permit standards, usually contains Total Dissolved Solids (TDS), nitrate, sulfate, metals and bacteria at concentrations higher than those present in public water supply systems. Many facilities in the PhxAMA can meet higher classes of reclaimed water supply by filtering and disinfecting their effluent, which is directly delivered for non-potable uses. Wastewater reuse rules are developed by ADEQ and establish parameters for wastewater reuse options.

Constructed wetlands can be developed to further enhance the treatment of reclaimed water and to pretreat water prior to recharge or reuse. Vegetation and microbial activity in wetlands along with filtration of reclaimed water through the vadose zone (soil aquifer treatment) improves the quality of water containing high concentrations of nitrate and organic carbon. Constructed wetlands are occasionally used as a treatment for lower quality surface waters and agricultural return flows. Wetland projects, like at the Tres Rios Wetlands Project, also are being evaluated to determine their effectiveness as enhanced treatment for reclaimed water discharges to meet more stringent AZPDES permit requirements. In addition to improving water quality, wetlands enhance wildlife habitat and serve as an educational and recreational resource for the community.

Surface Water Other Than Central Arizona Project Water

Surface water quality in the PhxAMA is generally good. Most surface water that is not delivered by the CAP is delivered by the Salt River Project (SRP) or other irrigation districts, which comes from the Salt and Verde Rivers. SRP surface water typically contains total dissolved solids (TDS) levels below 500 mg/l (milligrams per liter). TDS concentrations are generally a good indicator of overall water quality. Other constituent parameters of SRP surface water generally meet applicable water quality standards with appropriate treatment.

Other smaller streams and washes in the PhxAMA are ephemeral or intermittent. Because in-stream channel flows are typically short-term and occur in response to runoff from precipitation events, the direct use of this surface water is limited. The surface water supplies other than CAP and SRP are an important source of natural aquifer recharge in

the PhxAMA. Water from these sources often contains bacteria, parasites, and/or viruses. Municipal and industrial storm water runoff also contributes to surface water contamination. In order to address contaminants in storm water runoff, the NPDES storm water program was developed to specifically control the amount of storm water pollutant discharges to waters of the United States.

1.2.5.3 GROUNDWATER SUPPLIES

Groundwater is one of the most important sources of water in Arizona. Most of the groundwater in the PhxAMA is of acceptable quality for most uses. However, some groundwater has been degraded as a result of contamination.

The introduction of contaminants into aquifer systems degrades groundwater quality and may pose a threat to public health and the environment. Contaminants can migrate into areas of potable groundwater due to groundwater pumping or regional groundwater flow patterns. Many areas of the PhxAMA are projected to remain dependent on groundwater pumping, thereby potentially causing contaminant migration.

Groundwater that has been degraded has limited direct beneficial uses due to chemical, biological, or radiological contamination and may have high treatment and delivery costs associated with its use. Despite these limitations, ADWR considers poor-quality groundwater to be a valuable resource for future water management and encourages appropriate uses of this water supply. Matching the highest beneficial use with poor quality groundwater is an important aspect of water management. Frequently, poor quality groundwater is remediated and re-injected into the aquifer because it is not economically feasible to convey the treated water to another location for a higher beneficial use.

Recognizing that there may be groundwater quality impacts resulting from surface water recharge, the EPA requires states to develop a rule for groundwater under the influence of surface water (GUDI). ADEQ, in turn requires additional sampling and treatment of any water supply deemed as GUDI, so that it meets surface water treatment standards (A.A.C. R18-4-212). This additional analysis and treatment may increase the costs associated with the development and operation of underground water storage facilities. See Chapter 8, section 8.3.4, for further discussion of recharge water quality challenges.

1.2.5.4 SPECIFIC CONTAMINATION AREAS

A list and eMap of the locations of specific groundwater contamination areas that have been identified in the PhxAMA are available on the ADEQ website (<http://azdeq.gov/WQARF>). Unless otherwise indicated, each of these sites is listed on the WQARF Registry List or the NPL.

WQARF sites throughout the state have been scored based on criteria developed by ADEQ. The scores assigned to WQARF sites may change as more site-specific information becomes available and is evaluated by ADEQ.

1.2.6 INCENTIVES FOR THE USE OF RENEWABLE SUPPLIES AND REMEDIATED GROUNDWATER

Since the adoption of the Code, several incentives have been developed in both the management plans and statutes to increase the use of non-groundwater supplies. For instance, the management plans have exempted effluent (directly used or stored underground and recovered from within the area of impact) from the per capita use rate for municipal providers under the Total GPCD Program.

Legislation enacted in 1997 and amended in 1999 significantly revised the Water Quality Assurance Revolving Fund (WQARF) Program to provide incentives for the use of remediated groundwater to facilitate the treatment of contaminated groundwater.

Among other provisions, the WQARF legislation provides that when determining compliance with management plan conservation requirements, ADWR shall account for uses of groundwater withdrawn pursuant to approved remedial action projects under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or Title 49, Arizona Revised Statutes, except for groundwater withdrawn to provide an alternative water supply consistent with A.R.S. § 49-282.03, consistent with its accounting for surface water (See Chapter 7, Section 7.4.4.6.), (1997 Ariz. Sess. Laws, Chapter 287, § 51(B), as amended by 1999 Ariz. Sess. Laws, Chapter 295, § 49). Groundwater withdrawn pursuant to an approved remedial action project retains its legal character as groundwater for all other purposes under Title 45, Arizona Revised Statutes, including all other laws regulating groundwater withdrawal and use, such as:

1. the assessment of withdrawal fees pursuant to A.R.S. § 45-611 et seq.;
2. regulation of water exchanges as set forth in A.R.S. § 45-1001 et seq.;
3. transportation of groundwater as set forth in A.R.S. § 45-541 et seq.;

4. withdrawals of groundwater for transportation to active management areas as set forth in A.R.S. § 45-551 et seq.; and
5. underground water storage, savings, and replenishment as set forth in Title 45, Chapter 3.1, Arizona Revised Statutes.

The annual amount of groundwater eligible for the remediated groundwater accounting incentive is generally equal to the maximum annual volume of groundwater that may be withdrawn pursuant to each project, as specified in the consent decree or other documents approved by the U.S. Environmental Protection Agency (EPA) or ADEQ. However, if a project was approved prior to June 15, 1999, and the maximum annual volume of groundwater that may be withdrawn pursuant to the project is not specified in a consent decree or other document approved by the EPA or ADEQ, the annual amount of groundwater that is eligible for the remediated groundwater accounting incentive is the highest annual use of groundwater withdrawn pursuant to the project prior to January 1, 1999. The Director may modify the annual amount of groundwater eligible for the accounting incentive if an increase in withdrawals is necessary to further the purpose of the project or if a change is made to the consent decree or other document approved by the EPA or ADEQ.

In order to qualify for the remediated groundwater accounting incentive, a person must notify the Director in writing of the anticipated withdrawal of the groundwater prior to its withdrawal. The notification must include 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. Unless specified in the document, the notification must include the volume of 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. The notification also must include the purpose for which the remediated groundwater will be used and the name and telephone number of a contact person. Additionally, at the time the notice is given, the person must be using remediated groundwater pursuant to the approved remedial action or must have agreed to do so through a consent decree or other document approved by ADEQ or the EPA. Remediated groundwater which qualifies for the accounting must be metered and reported separately from groundwater that does not qualify for the accounting (See section 5-613 of the Municipal Conservation, Monitoring and Reporting Requirements).

1.2.7 FUTURE DIRECTIONS

ADWR's long-range plans for groundwater quality management will focus on two areas: (1) evaluation of groundwater quality challenges on a site and non-site-specific level to understand the impact of groundwater quality challenges on water resource management on a broader level, and (2) working with local stakeholders in management of remediated groundwater through reinjection and/or use.

1.2.7.1 NON-SITE-SPECIFIC WATER QUALITY MANAGEMENT

Non-site-specific groundwater quality management refers to groundwater quality management activities that may occur in general areas located outside of identified remedial action site boundaries. To address and mitigate dispersed contamination over large areas, a broader management strategy is needed. Areas that may need more intensive management may include those where public or private supply wells have been or may be affected by contamination. For instance, areas that are in the vicinity of major population centers or agricultural areas can be affected by contamination, especially if large volumes of groundwater are pumped, creating cones of depression.

Changes in groundwater levels can result in degradation of aquifer conditions. Rising water levels in areas of known landfills or other areas that have suspended pollutants in the vadose zone (e.g. leaking USTs) have the potential to mobilize and promote pollutant migration. Declining groundwater levels can impact aquifer water quality. Groundwater recharge projects can also affect aquifer conditions by mobilizing pollutants in the vadose zone that migrate into groundwater. Coordination between ADEQ and ADWR and applicants during design, site selection, planning, and permitting can reduce the potential for groundwater recharge projects to affect aquifer water quality.

Groundwater quality management on a non-site-specific scale can enhance water management activities in sub-regional areas. Taking action to identify source groundwater quality and develop area-specific plans to match water quality with intended uses combined with strategies to evaluate and mitigate the effects of contamination in sub-regional areas can help preserve good quality groundwater for current and future uses. Coordination with ADEQ and with affected stakeholders ensures an informed approach. Contaminant management on a non-site-specific scale can be achieved in such a way that it would not affect rights to groundwater, well ownership, delivery responsibilities or existing permits.

1.2.7.2 PRESERVATION OF PHXAMA MANAGEMENT GOALS

The WQARF legislation enacted in 1986 and amended in 1997 was designed to encourage the remediation of groundwater that has limited or no use due to contamination. Pump-and-treat groundwater remediation activities are anticipated to continue to be the predominant means of remediation during the fifth management period. Previously unavailable sources of groundwater from contaminated areas may be put to beneficial use during the fifth management period and thereafter.

Remediated groundwater withdrawals associated with WQARF, CERCLA, DOD, RCRA and voluntary site cleanups may continue to increase. Remediated groundwater withdrawals reported to ADWR by municipal water providers for existing remedial sites within the PhxAMA averaged about 6,000 AF per year from 2007 through 2015. The total reported remediated groundwater withdrawn by municipal providers in the PhxAMA over the period was about 56,740 AF. Such withdrawals may occur as part of aquifer restoration or plume containment. These estimates may be conservative due to the potential detection of unknown sites and because remedial activities on known contaminated areas are in different stages of development.

In the fifth management period, ADWR will monitor water levels, land subsidence and effects on local water providers at remedial project sites in areas of intensive pumping. While ADWR supports the remediation of contaminated groundwater, it also seeks to preserve the management goal of safe-yield in the PhxAMA. Water quality management is a long-term process that is expected to continue far beyond the duration of the fifth management period. Remedial activities will likely continue over the long-term and could result in considerable volumes of groundwater being pumped, treated, and subsequently used or reinjected.

The net effect of continued remediated groundwater withdrawals could result in a substantial increase in the overall volume of groundwater put to use within the PhxAMA. Proper water quantity and water quality management will be required to ensure that groundwater use created as a result of activities at remedial action sites does not negatively impact the goal of safe-yield in the PhxAMA. ADWR will seek to preserve the intent of the Code and the AMA management goals while cooperating with EPA, ADEQ and other water resource agencies to promote rational groundwater quality management.

1.2.8 SUMMARY

Most groundwater supplies in the PhxAMA are of acceptable quality for most uses. However, human activity and natural processes have resulted in the degradation of groundwater quality in some areas to the extent that the groundwater is unusable for direct consumption for many purposes. The extent and type of contamination vary by

location and land-use activities. Contaminated groundwater has afflicted the upper aquifers throughout a large part of the PhxAMA with dissolved solids, nitrates, and other contaminants. Waterlogging down gradient of Phoenix has necessitated drainage pumpage of groundwater with high concentrations of TDS in some cases. Pumpage centers that provide potable water can and do influence the migration of poor-quality water in many areas of the AMA. The WQARF sites identified in the PhxAMA are in varying stages of development, from remedial investigations to actual site cleanup.

As WQARF activities progress, addressing water management challenges such as available supply and reuse options helps to ensure a long-term water supply of adequate quality. The ability to recognize specific groundwater management requirements for contaminated and degraded aquifer conditions also is important as the demand for water increases.

The WQARF reform legislation created an incentive for the use of groundwater withdrawn in accordance with approved remedial action projects pursuant to Title 49, Arizona Revised Statutes, or CERCLA. It provided that generally such groundwater must be accounted for consistent with accounting procedures used for surface water for purposes of determining compliance with management plan conservation requirements and that the use of certain volumes of such groundwater is consistent with achievement of the management goal of the AMA until the year 2025. ADWR has amended its AWS Rules to conform to these provisions, and also considers water-quality challenges more fully in its underground water storage program.

ADWR's Groundwater Permitting and Wells Section provides support to the PhxAMA on issues related to WQARF cleanup activities as part of its commitment to work closely with ADEQ to resolve groundwater quantity and quality issues throughout Arizona.

ADWR will continue to be directly involved in other remedial activities and management action plans such as those associated with WQARF and other cleanup sites. This will ensure that remedial activities meet ADWR's water management objectives and are consistent with the AMA's safe-yield goal.

APPENDIX 1A: DEFINITIONS

1. "Constructed underground storage facility" means a facility that . . . is designed and constructed to store water underground pursuant to permits issued under this chapter (A.R.S. § 5-802.01(4)).
2. "Earth fissures" refer to cracks at or near the earth's surface that are the result of differential (when adjacent areas subside at different rates) subsidence (https://new.azwater.gov/sites/default/files/LandSubsidenceInArizonaFactSheet_003.pdf).
3. "Heterogeneous" means, the state of being nonuniform in structure or composition throughout (Sterrett, R.J., 2017).
4. "Hydrologic properties" mean those properties of a rock that govern the entrance of water and the capacity to hold, transmit, and deliver water, such as porosity, effective porosity, specific retention, permeability, and the directions of maximum and minimum permeabilities (10 C.F.R. § 960.2).
5. "Inflows" mean the water that enters, or is recharged into, the aquifers (can include mountain front recharge, stream infiltration, and water entering the sub-basin from a different sub-basin).
6. "Land subsidence" in the basins of Arizona is generally due to compaction of the alluvium caused by lowering of the water table (https://new.azwater.gov/sites/default/files/LandSubsidenceInArizonaFactSheet_003.pdf).
7. "Managed underground storage facility" means a facility ... that is designed and managed to utilize the natural channel of a stream to store water underground pursuant to permits issued under this chapter through artificial and controlled release of water other than surface water naturally present in the stream (A.R.S. § 45-802.01(12)).
8. "Outflows" mean the water that is withdrawn from, or exits, the aquifers (can include pumping from wells, evapotranspiration, and water leaving the sub-basin to go into another sub-basin).
9. "Water table" means the surface in a body of ground water at which the water pressure is atmospheric (10 C.F.R. § 960.2).
10. "Underflow" means an aquifer may be recharged by underflow from a nearby, hydraulically connected aquifer (U.S. Department of the Interior, 1995).

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CHAPTER 2: SUPPLY & DEMAND

2.1 INTRODUCTION

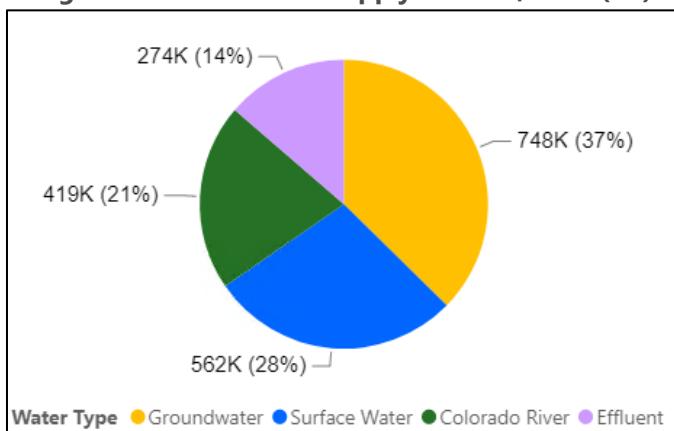
As established in statute, the management plans are required to contain mandatory conservation programs and specific data in support of those conservation programs and water management in the AMA. Over time, there were significant expansions to the data included in the plans. For the 5th Management Plans (5MPs), ADWR has worked to both streamline the plans and modernize the approach to publishing data. To this end, much of the data previously included in the plans will now be published online, allowing for updates and corrections over time and enabling the use of interactive tools and visualizations. Data remains an integral component of the management plans. Some high-level or contextual data will continue to be included in the plans, along with the specific data required by statute, and the more granular, focused data will be located online, with references to that data in the plan. The online data will be updated annually, or as additional data becomes available, providing better transparency and access to updated data over time.

For the 5th Management Plans, ADWR has created extensive online dashboards – interactive tools that visualize data – to enable users to access, explore, and drill down data. They allow for more information to be shared in a more useable, customizable format, and the underlying data are easily updated. The dashboards complement and expand on the information provided in the management plans. The dashboards are organized by sector and can be found on the AMA Data webpage (<https://new.azwater.gov/ama/ama-data>).

2.2 PHOENIX AMA SUPPLY AND DEMAND

The PhxAMA has several sources of water: groundwater, surface water, effluent, and Colorado River water delivered through Central Arizona Project (CAP) infrastructure. Colorado River water and surface water (referring to in-state rivers and streams) are listed separately for the purposes of this plan due to separate legal and regulatory structures. Groundwater and surface water have historically been significant

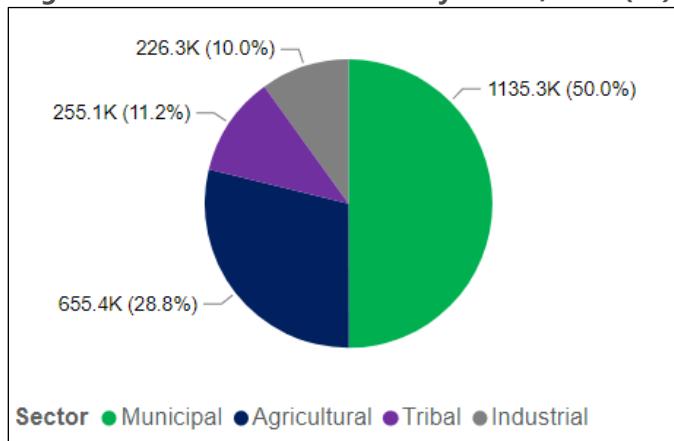
Figure 2-1 AMA Water Supply Sources, 2019 (AF)



sources of supply in the PhxAMA. However, the direct delivery and storage of effluent and Colorado River water has also increased over time, which has somewhat decreased the reliance on groundwater supplies. Effluent has significantly increased in quality over time, and the use of effluent has increased almost six-fold over time, in part due to its incentivized use in the management plans and changes to its allowed uses by legislation. Figure 2-1 shows the 2019 breakdown of sources of water to meet demand in the PhxAMA. More information including historical supply data by water source can be found in the Data Dashboards (<https://new.azwater.gov/ama/ama-data>).

As drought persists throughout the southwest, there is increased likelihood for longer-term and deeper levels of shortage on the Colorado River. Under the 2007 Interim Guidelines and updated through the Drought Contingency Plan (DCP) in 2019, the Basin States, including Arizona, defined the method for distributing cuts at various reservoir elevations, with a goal of reducing the risk of severe reductions. For the first time, a Tier 1 Shortage was declared for 2022, with the potential for ongoing shortage declarations in subsequent years, including the possibility of lower shortage tiers, meaning greater shortage volumes. Under each tier of shortage on the Colorado River, some Colorado River water users in the PhxAMA will be impacted. Although partial mitigation may be provided for loss of Colorado River water during the initial shortage period through the Arizona Implementation Plan, the mitigation measures were designed to phase out by 2026, or in the case of a Tier 3 shortage, whichever occurs first. Furthermore, the 2007 Interim Guidelines and the DCP are scheduled to expire in 2026, and as of publication, negotiations are ongoing regarding how a replacement regime for operating the Colorado River system may be structured. Reductions in the amount of available Colorado River water is expected to increase the use of other sources of water in the PhxAMA.

Figure 2-2 AMA Water Demand by Sector, 2019 (AF)



A.R.S. § 45-552 to A.R.S. § 45-554 allows for groundwater transportation from the McMullen, Butler Valley, or Harquahala groundwater basins to the Phoenix, Pinal, Tucson, and Santa Cruz AMAs. Although the transportation statutes have not been historically utilized, imported water from these basins to the PhxAMA are possible and may occur during the 5MP period.

There are four water use sectors represented in the Phoenix AMA: agricultural, municipal, industrial, and tribal. Each of the four sectors uses all four water types described above. Water demand between the sectors has shifted over time. Historically, agricultural was the dominant water demand in the

Phoenix AMA, which shifted around 1999 to the municipal sector. As shown in Figure 2-2, the agricultural sector still comprises around a third of the PhxAMA's total demand. Municipal use in 2019 comprises over 50 percent of the demand in the PhxAMA. Industrial and Tribal demand have increased slightly over time; however, both remain a small portion of the PhxAMA's overall water demand. Further descriptions of the supply and demand of each sector are included in the next sections of this chapter.

2.3 AGRICULTURAL SECTOR

The agricultural sector is comprised of farms of two or more acres in size that were actively irrigated with groundwater from 1975 to 1980. Agricultural lands that used groundwater to irrigate crops during this time period were issued an Irrigation Grandfathered Groundwater Right (IGFR) by ADWR. Water use pursuant to these rights must be reported to ADWR if the right is larger than 10 irrigation acres.

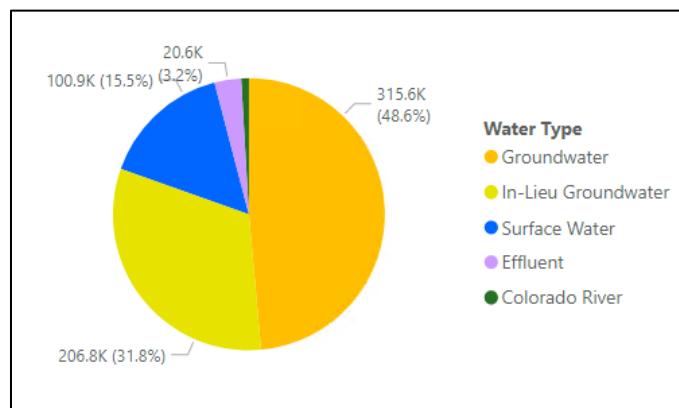
Agricultural water use is composed of the use of water by IGFRs to irrigate two or more acres of land to produce crops or feed, including the lost and unaccounted for water associated with the delivery of agricultural water. This does not include water use on tribal land. Information related to the agricultural conservation programs and requirements can be found in Chapter 4.

2.3.1 AGRICULTURAL SUPPLY

Agricultural water use in the PhxAMA includes water deliveries by active irrigation districts as well as groundwater withdrawals pursuant to individual IGFR holders. Water deliveries can consist of surface water, Colorado River water, effluent, and in-lieu groundwater. In-lieu groundwater consists of renewable supplies of water, such as Colorado River water, surface water, or effluent, delivered to Groundwater Savings Facilities (GSFs). This water is referred to as in-lieu groundwater because the farmers use the renewable supplies of water in-lieu of pumping groundwater, which results in a groundwater savings. This savings is accounted for as a stored water credit (long-term or annual) for the entity that supplied the Colorado River water to the farmer. In-lieu groundwater counts as groundwater in the farmer's flexibility account, which determines compliance with the IGFR annual groundwater allotment. In-lieu groundwater also is counted as groundwater in the calculation of overdraft. GSFs are discussed further in Chapter 3, titled Underground Water Storage, Savings & Replenishment.

Although its use has declined over time in the PhxAMA, groundwater is the dominant source of water to meet agricultural demand. Together with in-lieu groundwater, they account for about 60 percent of the total supply to meet demand in 2019, as shown in Figure 2-3. The quantity of surface water delivered to the agricultural sector in the PhxAMA has declined over time but remains at a third of the agricultural supply in 2019. Both Colorado River water and effluent are both small portions of agricultural supply in the PhxAMA, accounting for the remaining 10 percent of supply.

Figure 2-3 Agricultural Water Demand by Source of Supply, 2019 (AF)



The CAP Agricultural Settlement Pool is the source of direct use Colorado River water for many agricultural users. Established under the Arizona Water Settlement Agreement, the pool was originally sized at 400,000 AF, subject to availability, and scheduled to be reduced over time, ultimately terminating in 2030. The pool was reduced by 25 percent in 2017 and will be reduced another 25 percent in 2024. Agricultural Pool water use in the PhxAMA has fluctuated annually, as most of the use is in the Pinal AMA. Under Arizona's priority system, the Agricultural Pool is among the first to be impacted in Colorado River shortage, as well as NIA users. Additional details regarding Colorado River shortage can be found in Chapter 8.

2.3.2 AGRICULTURAL DEMAND

Although agricultural demand was historically the primary sector of demand, it has decreased over time. Since 1999, the municipal sector has been the dominant water use sector in the PhxAMA. In 2019, agricultural demand comprised 29 percent of the total PhxAMA demand. Much of the decrease in water use can be attributed to urbanization of agricultural lands. Since 1985, there have been almost 200,000 irrigation acres associated with IGFRs that have been retired. Many IGFRs have also been either partially or fully extinguished in the PhxAMA pursuant to the Assured Water Supply Rules. Economic conditions, such as crop price and demand, as well as weather conditions also impact the use of agricultural water in the PhxAMA.

The PhxAMA contains 32 active irrigation districts serving approximately 1,900 IGFRs with more than 130,000 irrigation acres in 2019. Nine of the 32 districts accounted for over 90 percent of the agricultural demand in 2019. A map of the irrigation districts is available on the ADWR website (<https://new.azwater.gov/gis>). More information about historical

water use, irrigation acres, locations, and the proportion of conservation program participants can be found on the ADWR Agricultural Data Dashboard.

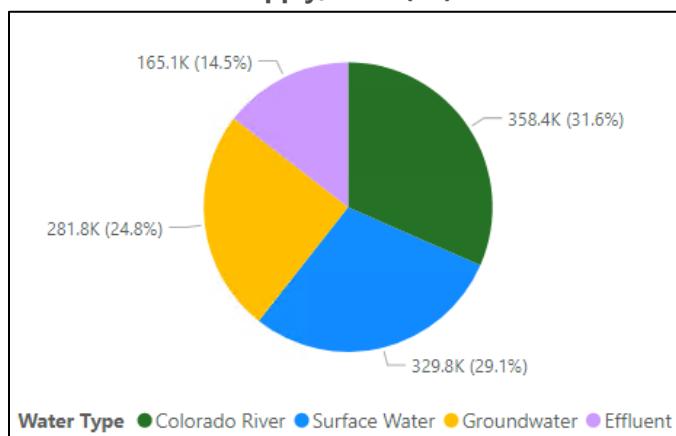
2.4 MUNICIPAL SECTOR

The municipal sector is composed of large municipal providers and small municipal providers, along with large untreated providers who deliver untreated water for landscape irrigation. Although, municipal providers may report on behalf of turf facilities for which they supply water, turf-related facilities have their own conservation requirements under the management plan and are included in the industrial demand category if they receive water from a municipal provider. The municipal sector also includes estimated groundwater demand associated with domestic exempt wells. An exempt well is a well with a pump capacity of 35 gallons per minute or less. As ADWR has no regulatory authority over water withdrawn from exempt wells, exempt well users are not required to report water use to the Department.

Detailed descriptions of the provider types and information related to the 5MP conservation programs for the municipal sector can be found in Chapter 5.

2.4.1 MUNICIPAL SUPPLY

Figure 2-4 Municipal Water Demand by Source of Supply, 2019 (AF)



Water supply for the PhxAMA municipal sector consists of surface water, Colorado River water, groundwater, and effluent. Surface water, primarily provided by the Salt River Project or other districts, has been and continues to be a large source of supply in the municipal sector of the PhxAMA. The supply of Colorado River water delivered through CAP infrastructure to meet municipal demand has been steadily increasing since its introduction in

1986. Colorado River water stored underground is also used to meet municipal demand. Effluent used for landscaping irrigation and other non-potable uses has also steadily increased in the municipal sector to meet demand. The majority of wastewater is captured by wastewater infrastructure and put to beneficial uses including underground storage for future use, power production, agricultural and landscape irrigation, and to help support riparian systems. With growing demand, increased water scarcity, and entities

being approved for direct potable reuse permits, it is expected that value and use of effluent will continue to increase in the future. In 2019, surface water and Colorado River water accounted for approximately one-third of the PhxAMA's municipal supply; groundwater and effluent made up the remaining third, as seen in Figure 2-4.

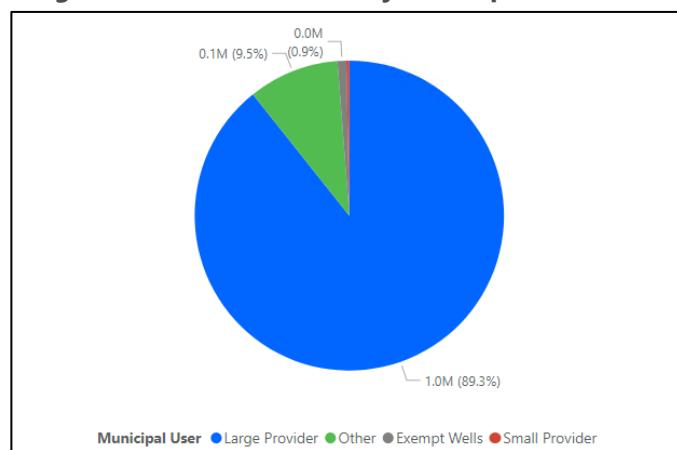
Providers may treat renewable supplies, such as Colorado River water and surface water, at a water treatment facility and directly deliver the renewable water via their potable distribution systems to their customers. Providers that do not have water treatment facilities may still utilize renewable supplies through underground storage and later recovery via permitted recovery wells. Some municipal providers may be dependent on groundwater as their sole source of supply. In addition, some municipal providers may deliver effluent for landscape irrigation or for other purposes such as dust control, while others store and recover effluent for use in either their dedicated water delivery system or their potable delivery system.

2.4.2 MUNICIPAL DEMAND

The PhxAMA includes portions of the Maricopa, Pinal, and Yavapai counties, with 24 incorporated cities and towns. The PhxAMA also includes the population in unincorporated areas as well as the Fort McDowell Yavapai Nation, the Salt River Pima-Maricopa Indian Community, and part of the Gila River Indian Community (GRIC).

Municipal demand has been increasing in the PhxAMA over time. There was a short reduction in total municipal demand due, at least in part, to the economic downturn around 2008, however, demand has since been increasing slowly. Wherein the past agriculture was the primary water demand, municipal demand has been the primary demand since 1999. As municipal growth has continued, agricultural lands have converted, resulting in lower total agricultural demand and increased municipal demand in the PhxAMA.

Figure 2-5 Water Demand by Municipal User, 2019



As population has increased in the PhxAMA, so has the municipal demand. However, per capita use in the PhxAMA has decreased over time, meaning less water is now required to serve the same number of people served in the past. Water conservation measures, the

use of high efficiency fixtures, homes with smaller lots and more xeric landscapes, and a general increase in efficiency contribute to reductions in per capita use over time.

Currently in the PhxAMA, there are 42 large providers and 51 small providers. A majority of demand is from the large providers who serve most of the population, including the largest cities in the PhxAMA. Historically, large providers have supplied around 80 percent or more of the municipal demand. Urban irrigation and small provider demand have decreased, while demand from exempt wells has increased over time. In 2019, as shown in Figure 2-5, large provider demand was 89 percent of municipal demand. The remaining demand was largely from urban irrigation from large untreated providers. Although exempt well use has been increasing over time in the PhxAMA, it remains less than one percent of the total municipal demand in 2019. More information about historical water use, providers, conservation program participants, and spatial data can be found on the ADWR Municipal Data Dashboard.

2.5 INDUSTRIAL SECTOR

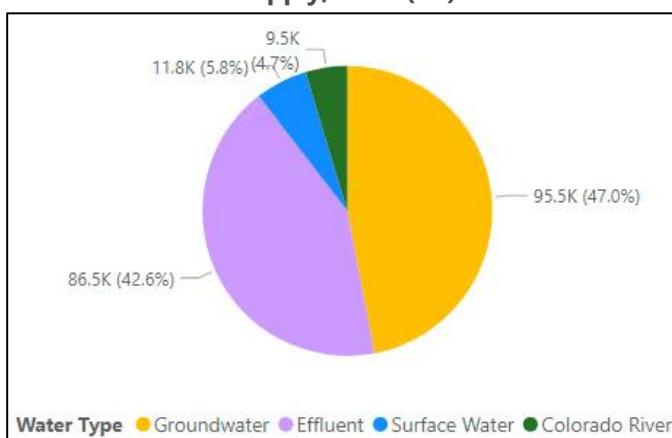
The industrial sector consists of non-irrigation uses of water, not supplied by a city, town or private water company. Included in the industrial sector are several subsectors, including turf-related facilities, electric power generation, sand and gravel operations, mining, and the animal industry use, such as dairies, feedlots, and expansions of those uses.

Detailed descriptions of the subsectors of the industrial sector and information related the 5MP industrial conservation programs can be found in Chapter 6.

2.5.1 INDUSTRIAL SUPPLY

In general, industrial users withdraw water from their own wells that are associated with grandfathered groundwater rights (Type 1 and Type 2 Rights), General Industrial Use (GIU) Groundwater Withdrawal Permits or other withdrawal permits. Groundwater right allotments are based on the highest annual groundwater withdrawal between 1975 and 1980. Although industrial users are primarily dependent on groundwater, there is some use of

Figure 2-6 Industrial Water Demand by Source of Supply, 2019 (AF)



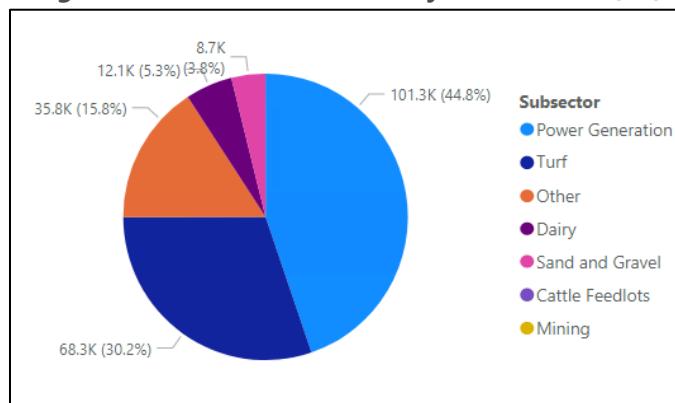
renewable supplies such as Colorado River water, surface water, or effluent, as is shown in Figure 2-6. In particular, effluent use has increased over time and in recent years has grown to nearly 43 percent of demand in the industrial sector.

Much of the effluent supply used to meet demand in the industrial sector in the Phoenix AMA is used by Palo Verde Nuclear Generating Station, which is the largest nuclear generating station in U.S. and the only one in the world using effluent for cooling purposes. The remainder of the industrial sector effluent is used by the turf subsector which is the second largest industrial subsector and includes golf courses, parks, and other facilities. Many turf-related facilities are served effluent or other supplies by municipal water providers, but some use a grandfathered right to withdraw groundwater. Some turf facilities in the PhxAMA use Colorado River water. The remaining subsectors rely almost exclusively on groundwater.

2.5.2 INDUSTRIAL DEMAND

The groundwater code allows for the growth of the sector over time. This is reflected in the fact that industrial allotments can increase as GFRs are retired to Type 1 GFRs. However, total allowable groundwater use is reduced at the time of conversion of the IGFR to a Type 1 GFR. The sum of the industrial allotments may also decrease due to non-irrigation rights becoming inactive and developed, or through extinguishment of GFRs.

Figure 2-7 Industrial Demand by Sector, 2019 (AF)



Industrial use is largely driven by population growth and the economy. Water use in the industrial sector in the PhxAMA has increased more than 110 percent since the Groundwater Act was implemented. The electric power and turf subsectors have remained the dominant subsectors over time, comprising around 80 percent of the demand in the last three decades. Electric power generation has steadily increased over time to become around half of the industrial demand, while turf use has fluctuated slightly over time. The remaining demand, divided among sand and gravel operations, dairies, and other users, such as cooling and manufacturing, have all decreased slightly over time. Feedlot use has historically been low and has comprised less than one percent of the total demand in the last two decades. The demand by the subsectors in 2019, as seen in Figure 2-7, followed similar trends, with the electric power subsector comprising just under half the demand; the turf sector, about a third; and the remaining subsectors using less than 20 percent of

the total industrial demand. More information about historical water use, industrial subsectors, and spatial data can be found on the ADWR Industrial Data Dashboard.

2.6 TRIBAL WATER USE

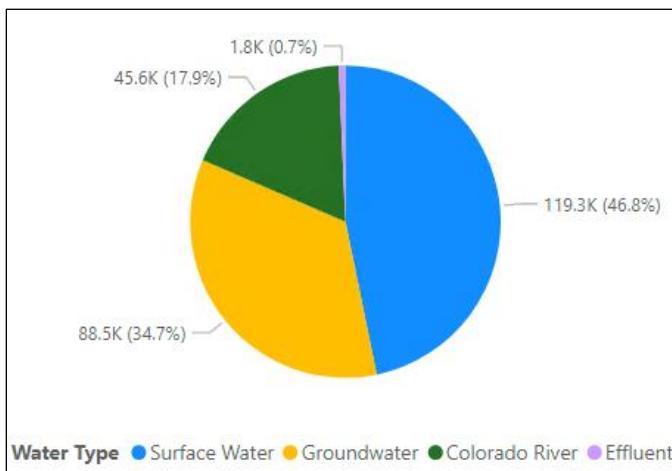
The tribal communities located within the boundaries of the PhxAMA include the Salt-River Pima-Maricopa Indian Community (SRPMIC), the Fort McDowell Yavapai Nation (FMYN), and the northern portion of the Gila River Indian Community (GRIC), which also extends into the PAMA. Tribal water use is exempt from regulation by the state but may be subject to certain limitations and/or a total water budget under the terms of specific tribal water settlements. Certain surface water supplies may be leased by the tribal communities to other entities – these demands are accounted for under the demand sector of the lessee. The supply and demand characteristics of these communities are included in the management plan estimates because of the hydrologic impact on the safe-yield goal.

2.6.1 TRIBAL SUPPLY AND DEMAND

Tribal demand includes primarily agricultural demand with a small portion of municipal demand. The Salt River Pima-Maricopa Indian Community uses groundwater and surface water for agricultural irrigation, with an average estimated use of 85,000 AF per year. The Fort McDowell Yavapai Nation also uses primarily surface water for agricultural irrigation. The Gila River Indian Community is situated along the Gila River and straddles the PhxAMA and the PAMA, however, most of the GRIC farming operations are within the PhxAMA. In 2017, ADWR estimates that about 180,000 AF of groundwater, surface water, Colorado River water and effluent were used for agricultural irrigation in GRIC land within the PhxAMA. Figure 2-8 shows water use by water type for tribal uses.

The population on tribal land in the PhxAMA has increased slightly. In 2000, the U.S. Census accounted for 15,000 people living on tribal land within the PhxAMA. The 2010

Figure 2-8 Tribal Water Demand by Source of Supply, 2019 (AF)



census counted 19,293 persons residing on tribal land in the PhxAMA. The supply for tribal land municipal demand is assumed to be groundwater.

2.7 SAFE-YIELD AND OVERDRAFT

2.7.1 SAFE-YIELD

A.R.S. § 45-561(12)

"Safe-yield' means a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area."

Safe-yield is the management goal of the PhxAMA and is defined in Arizona Revised Statute (A.R.S.) § 45-561(12). It is a groundwater focused objective which attempts to achieve an equilibrium between groundwater withdrawals and recharge in order to prevent unsustainable groundwater declines, preserve groundwater for future use, and to protect the state's economy and welfare.

Assessing safe-yield is complex, but simplistically, it means that the water that is withdrawn from, or exits,

aquifers in the AMA (outflows) is balanced in the long term by what enters or is recharged into the aquifers (inflows), and that balance is maintained going forward. Achieving the goal does not require a balance to be maintained every single year, but there should be a balance in the long term. Achievement of safe-yield also does not mean that no groundwater can be withdrawn from the aquifer. Safe-yield is also not a set volume defined by statute, as it is a balance between inflows and outflows that can vary over time, regardless of the volume.

Safe-yield and overdraft are often, and incorrectly, used interchangeably. Overdraft is a condition in which the volume of groundwater coming out of the aquifer is greater than the volume of recharge going into the aquifer over an annual or long-term time frame. Overdraft is a quantitative metric, which is one aspect used to assess safe-yield. To understand safe-yield, we must first look at overdraft annually and in the long term, then evaluate that information in the context of other factors to assess the ability of an AMA to achieve and thereafter maintain safe-yield. Although the factors that might impact the ability for an AMA to achieve and maintain safe-yield can be quantified, that quantification has a high level of uncertainty. Quantitative projections have been made in the past and could be used to estimate the impacts to future groundwater inflows and outflows, but the assumptions used in those projections are variable and conditions may change rapidly. Rather than quantifying the potential future impacts, it is more relevant to have a qualitative discussion about the factors that may impact the ability of an AMA to reach and maintain safe-yield. Safe-yield, as defined by statute, is halting overdraft in the long-

term to achieve a balance between inflows and outflows, and then maintaining that balance over time. This means that an AMA may have no overdraft in a single year, but this would not necessarily mean safe-yield has been achieved in that AMA if there is not a balance in the longer-term. Conversely, a number of years in overdraft could be balanced out with above average inflows to the aquifer, allowing for the achievement and maintenance of a balance, in the long term. Furthermore, even if an AMA is in a state of long-term balance, if the AMA is unable to maintain that balance going forward due to other factors, such as future supply or demand changes, safe-yield may also not be met. Both quantitative and qualitative factors are evaluated for a comprehensive assessment safe-yield.

2.7.2 SUBGROUP PROCESS AND REPORT

Safe-yield has been described in each management plan; however, the approaches used to calculate and describe the status of safe-yield in the AMAs have not been consistent between plans.

During the development phase of the 5MPs, ADWR created the Management Plans Workgroup process for stakeholder input. Along with a subgroup for each of the sectors, a Safe-Yield Technical Subgroup was created to address the inconsistencies of the previous plans and develop a clear method for assessing and communicating the status of safe-yield. The goals of the Safe-Yield Technical Subgroup, which follow the statutory definition were to:

1. Assess each component of overdraft to establish a consistent quantitative annual overdraft calculation
2. Develop a consistent quantitative method to assess and calculate long-term overdraft
3. Develop a consistent strategy for ADWR to communicate a comprehensive picture of both quantitative and qualitative aspects of the status of safe-yield and/or the management goal AMA to stakeholders and the public

The remainder of this chapter will summarize the method that will be used, as discussed in the subgroup, to calculate annual and long-term overdraft, describe the strategy to communicate the status of safe-yield, and provide an assessment of the status of safe-yield in the PhxAMA. Further information about the safe-yield technical subgroup can be found in the Overdraft, Safe-Yield, and the Management Goals in Arizona's Active Management Areas Report (Safe-Yield Report)

(<https://new.azwater.gov/ama/management-plans>) and the Management Plans work group meetings webpage (<https://new.azwater.gov/5MP/meetings>).

2.7.3 ANNUAL AND LONG-TERM OVERDRAFT

The annual overdraft calculation is comprised of multiple inflows and outflow components, which are added together to create an annual water budget. Inflows represent sources of groundwater that are recharging the AMA aquifers, while outflows represent groundwater removed from an AMA's aquifer for use or water exiting the AMA. The annual overdraft components are derived from two main sources: the Annual Water Withdrawal and Use Reports and the ADWR Regional Groundwater Flow Models.

This quantitative annual overdraft calculation is then analyzed over time to understand the long-term quantitative balance of inflows and outflows, which then combined with the qualitative assessment of the potential for the maintenance of that balance for a comprehensive analysis of safe-yield.

Assessing the long-term overdraft is difficult due to the variability in annual inflows and outflows which produce variability in annual overdraft. The long-term overdraft calculation was developed using the annual overdraft in every year and attempts to smooth the variability, while capturing the cycles that the annual components might experience. The long-term calculation produces a single overdraft number in every year, but also allows longer term trends and directionality to be clearly observed. As natural components follow longer term cycles and artificial components tend to follow shorter term cycles, the long-term overdraft calculation uses a 20-year rolling average of annual natural components and a 3-year rolling average of annual artificial components.

Additional information about the annual inflow and outflow components, the source of those components, and the long-term overdraft calculation can be found in Safe-Yield Report. The Safe-Yield Report also includes an appendix with detailed information on the natural components that are derived in the regional groundwater flow models. Data on the annual components and long-term overdraft calculation can be found on the Overdraft Data Dashboard (<https://new.azwater.gov/ama/ama-data>).

2.7.4 COMMUNICATION AND ASSESSMENT OF SAFE-YIELD IN THE PHOENIX AMA

ADWR considered two distinct audiences when developing the communication strategy: the general public and water resource professionals with a higher level of technical knowledge. Both audiences are equally important but would require different levels of background information and detail. To communicate with the general public, ADWR developed educational infographics on overdraft and safe-yield and provide a basic

metric on the status of the goal for each AMA. To communicate with technical audiences, that metric is expanded to the series of metrics shown in Table 2-1 below, which includes a comprehensive strategy utilizing both qualitative and quantitative metrics in order to provide a full picture of the status of safe-yield. More information about development process for these metrics can be found in the Safe-Yield Report. The communication infographics and metrics for each AMA are also included in the Overdraft Data Dashboard.

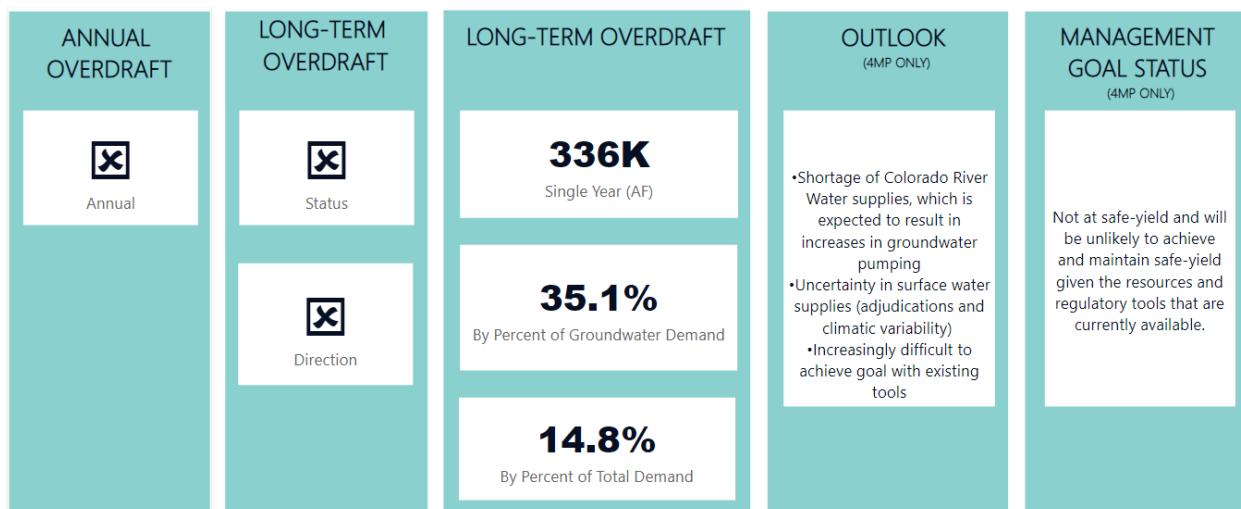
Table 2-1 Metrics Included in the Overdraft Data Dashboard

Metric	Method	Definition
Annual	Qualitative (Yes/No)	A comparison of the number of years with and without annual overdraft. Yes (<input checked="" type="checkbox"/>) indicates there are more years without overdraft than with. No (<input checked="" type="checkbox"/>) indicates there are more years with overdraft than without.
Long-Term Overdraft Status (status of most recent year)	Qualitative (Yes/No)	Using the long-term overdraft calculation, the status of long-term overdraft in the most recent year analyzed. No (<input checked="" type="checkbox"/>) indicates overdraft, Yes (<input checked="" type="checkbox"/>) indicates a balance or net recharge in the most recent year of the long-term overdraft calculation.
Long-Term Overdraft Directionality	Qualitative (Yes/No/Neither)	Using the long-term overdraft calculation, the direction of long-term overdraft in the past 3 years. Yes (<input checked="" type="checkbox"/>) indicates decreasing overdraft, No (<input checked="" type="checkbox"/>) indicates increasing overdraft, and (<input type="checkbox"/>) indicates neither an increase or decrease.
Long-Term Overdraft (single year long-term)	Quantitative value	Using the long-term overdraft calculation, the volume of water necessary to eliminate overdraft in the most recent year analyzed.
Long-Term Overdraft (as a percent of total demand)	Quantitative value	Using the long-term overdraft calculation, the volume of water necessary to eliminate overdraft in the most recent year analyzed as a percent of total water demand in the AMA.
Long-Term Overdraft (as a percent of groundwater demand)	Quantitative value	Using the long-term overdraft calculation, the percent of groundwater demand in the AMA necessary to eliminate overdraft in the most recent year analyzed.

Outlook	Qualitative (Description)	A description of expected impediments to reaching and thereafter maintaining safe-yield or the management goal.
Management Goal Status	Qualitative (Description)	A description of the overall status and combined evaluation of the above metrics.

An assessment of the status of the safe-yield goal in the PhxAMA is provided in Figure 2-9 and the accompanying narrative. The assessment utilizes the metrics in the communication metrics shown in Table 2-1, with data from 1985-2019. As this management plan is a static document, the interpretation of these results is only appropriate for the time frame they are referencing. The Overdraft Data Dashboard will be periodically updated to include the most up-to-date data.

FIGURE 2-9 STATUS OF THE SAFE-YIELD MANAGEMENT GOAL IN THE PHOENIX AMA, 2019



Source: Overdraft Data Dashboard

Annually from 1985 to 2019, the Phoenix AMA has been in overdraft in all but six years. As of 2019, the PhxAMA was in a state of long-term overdraft, with increasing overdraft in the three proceeding years. The Phoenix AMA is the largest AMA in terms of population, square mileage, and of total water use - and that is reflected in the volume of long-term overdraft. In 2019, the volume of single year, long-term overdraft is 15 percent of the AMA's total demand and a third of the AMA's groundwater demand.

As the Phoenix AMA receives around 20 percent of its water supply in Colorado River water, the achievement of safe-yield is greatly impacted by drought and shortage conditions of the Colorado River Basin. Any level of shortage conditions to the Colorado River may result in reduced deliveries to storage facilities, increased recovery of storage credits, reduced supply of storage credits, and ultimately a greater pressure on groundwater supplies. A third of the Phoenix AMA's annual water supply is in-state surface water from the Gila, Salt, and Verde watersheds. While some surface water rights in the AMA are decreed, others will be subject to uncertainty until they have been adjudicated. The in-state surface water supplies may also be variable year to year, impacted by extensive drought and climate variability. In response to limitations of both Colorado River and in-state surface water supplies, groundwater pumping may increase to meet demand.

There are several factors affecting safe-yield that are outside the regulatory authority of ADWR. ADWR's authority to regulate water use in the AMAs is based on groundwater and does not apply to those entities not using groundwater. This means that there is additional competition for non-groundwater supplies that could otherwise be used to offset groundwater demands. Other factors that could drive additional groundwater use include population increase, industrial growth, and certain types of legally allowable new demands. Current conservation and increased efficiency are not sufficient to achieve safe-yield, and replenishment is not required for most water demands. In order to meet the management goal, ADWR may need to develop or utilize additional regulatory tools and potentially acquire additional statutory authority to meet the goal.

The Phoenix AMA is not at safe-yield and will be unlikely to achieve and maintain safe-yield given the resources and regulatory tools that are currently available.

CHAPTER 3: UNDERGROUND WATER STORAGE, SAVINGS, AND REPLENISHMENT

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 *Fifth Management Plan for the Phoenix Active Management Area* (5MP), is intended to support achievement of the safe-yield management goal for the Phoenix Active Management Area (PhxAMA). Increasing the use of renewable water supplies, particularly reclaimed water (see Appendix 3B for definition) and Colorado River water delivered through the Central Arizona Project infrastructure (CAP water) instead of groundwater, is a key component of achieving safe-yield.

For the purposes of this chapter, "recharge" means storage of renewable water supplies for future use pursuant to the Underground Water Storage, Savings and Replenishment Act (A.R.S. § 45-801.01, *et seq*). "Augmentation" means increasing the availability and use of renewable water supplies such as CAP water and reclaimed water instead of groundwater. Although the Arizona Department of Water Resources (ADWR) does not have the ability to implement an augmentation program, ADWR recognizes the need to continue to pursue and obtain additional water supplies into the future.

Although the PhxAMA groundwater management goal of safe-yield applies to the PhxAMA as a whole, the objectives of the Recharge Program in the fifth management period serve to enhance water resource management on a more localized scale. A PhxAMA-wide safe-yield balance between supply and demand of groundwater does not address local concerns regarding groundwater level declines and physical availability challenges. The 5MP recognizes these local challenges, taking these site-specific areas into consideration, and proposes solutions that can assist local stakeholders in addressing these challenges.

3.2 THE RECHARGE PROGRAM

The augmentation and recharge of renewable water resources is a principal mechanism by which the PhxAMA can reach both safe-yield and site-specific goals. During the fifth management period, ADWR will continue to encourage the development, efficient use, and recharge of renewable water supplies for the PhxAMA. Additionally, the Recharge

Program is an effective tool to mitigate local water supply problems, depending where storage and recovery activities occur.

Recharge is an important water management tool in the PhxAMA 5MP. The development and direct use of renewable water supplies is an important component of PhxAMA water management, and new rules allowing Direct Potable Reuse of reclaimed water present a valuable new tool in the development of those direct uses. However, underground water storage remains and will continue to be a cost-effective means of utilizing available renewable water supplies that cannot currently be used directly.

3.2.1 OVERVIEW OF RECHARGE AND RECOVERY

Recharge statutes and 5MP provisions provide the regulatory framework in which water may be stored and recovered. The statutes and the PhxAMA 5MP, when read together, establish several 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 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 seasonal peak demand use and for use during periods of shortage; and
- To augment the local water supply to allow future growth and development.

Since the creation 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. With the increased flexibility have come increased complexity and local water challenges. High or low water tables, water quality, physical availability, and third-party impacts are all challenges that can be impacted positively or negatively by recharge and recovery facilities. Thus, the regulation of the program to maximize benefits and minimize harm is crucial to an effective program.

3.2.2 PRIMARY PROGRAM COMPONENTS

Persons who elect to undertake recharge-related activities must obtain the necessary permits from ADWR. 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, see the Recharge program page on ADWR's website (<https://new.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). Facilities can be permitted to recharge CAP water, reclaimed water, and/or surface water. Water storage permits allow the permit holder to store water 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, except for surface water which, by statute, must be recovered on or before the last day of the following month in which it is stored (or within the same calendar year, whichever is earlier). 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. 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 storers, 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.

The Underground Water Storage (UWS) Program also is the mechanism by which the Central Arizona Groundwater Replenishment District (CAGRD) replenishes water on behalf of its members. The CAGRD may store water and accrue long-term storage credits or obtain credits already accrued. The CAGRD can request that ADWR transfer credits from the CAGRD's long-term storage account to its replenishment account, termed a "conservation district account" by statute, to offset the CAGRD replenishment obligations (A.R.S. § 45-859.01). Once the credits are transferred to the replenishment account, they may not be recovered, assigned, or moved back to the long-term storage account.

Finally, 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 called "cuts to the aquifer" and are taken from storage of CAP water at constructed and managed facilities (see Appendix 3B for definitions), reclaimed water at managed facilities, and CAP water at Groundwater Savings Facilities (GSFs) (see Appendix 3B for definition). "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. In 2019, the cut to the aquifer was reduced from 50 percent to five percent for managed USFs that meet the definition of an existing reclaimed water managed USFs (A.R.S. § 45-802.01(8)).

3.2.3 RECHARGE FACILITY, STORAGE, AND RECOVERY DATA

In order to make prudent water management decisions for the future, it is important to assess the effectiveness of how the Recharge Program has functioned up to this point. An evaluation of permitting, storage, and recovery data and the identification trends in the Recharge Program are presented below in order to help ensure historical successes of the Program into the future and identify challenges that the Program may need to tackle in the fifth management period. Details on this data can be found on the Recharge dashboard (<https://new.azwater.gov/ama/ama-data>).

Recharge and Recovery Permitted Capacity Data

The PhxAMA currently has 59 recharge facilities with a total permitted storage capacity of 1,150,844 AF/year (2019). Approximately 36 percent of that permitted capacity is at GSFs (seven permitted facilities) and the remaining 64 percent is at USFs (52 permitted facilities). The Recharge dashboard (<https://new.azwater.gov/ama/ama-data>) lists all permitted USFs and GSFs with the associated permitted storage volumes.

The locations of these USFs and GSFs are also displayed on the Recharge dashboard with the type(s) of water that is permitted to be stored at each facility. In the PhxAMA, there are 26 facilities permitted to recharge up to a total of 961,221AF/year of CAP water (20 USFs and six GFSs). Reclaimed water can be stored at 41 facilities (39 USFs and two GFSs) up to 552,213AF each year. There are eight facilities (five USFs and three GSFs) in the PhxAMA that are permitted to store up to a total of 450,324AF of surface water each year. In practice, the sum of the permitted storage capacities for each type of water is greater than the total permitted storage capacity for the AMA, because 10 facilities (seven USFs and two GSFs) are permitted to store multiple types of water. Those facilities represent 479,590AF of recharge capacity, but the amount of capacity for each water type in those facilities is not delineated. For more detailed information about the permitted volumes and water types for each of the recharge facilities in the PhxAMA, see the Recharge dashboard.

The Recharge dashboard also shows that the permitted recharge facilities are not evenly distributed amongst the subbasins of the PhxAMA. Currently, six of the seven PhxAMA subbasins have at least one permitted recharge facility. The Rainbow Valley subbasin is currently the only subbasin without any permitted recharge facilities. The dashboard displays the total amount of permitted recharge capacity within each of those six

subbasins. These values include capacity at three recharge facilities that overlap multiple subbasins. The East Salt River Valley (ESRV) and West Salt River Valley (WSRV) subbasins both have the largest amounts of permitted capacity, approximately 500,000 AF each.

Water stored at permitted facilities may only be recovered by a permitted recovery well. There are approximately 1100 recovery wells currently permitted in the PhxAMA. The Recharge dashboard shows the locations of all the permitted recovery wells within the PhxAMA relative to the locations of the permitted USFs and GSFs respectively.

Recharge and Recovery Permitted Capacity Trends

The number of permitted recharge facilities and the associated total permitted storage capacity has increased significantly through time in the PhxAMA. The Recharge dashboard includes a time-elapsed animation of permitted USFs in the PhxAMA. For the purposes of comparison, in 1996 there were 21 recharge facilities (14 USFs and seven GSFs) with an annual total permitted storage capacity of 698,000AF/year permitted storage. In the 23 years since then, the annual permitted storage capacity has increased 65 percent in the PhxAMA.

Since the inception of the recharge program, entities were primarily focused on permitting recharge facilities for the storage of CAP water in order to maximize the state's Colorado River allocation. In 1996 in the PhxAMA, there was slightly more than 600,000 AF/year of storage capacity at facilities permitted to store CAP water, about 223,000 AF/year of storage capacity at facilities permitted to store reclaimed water, and approximately 200,000 AF/year of storage capacity at facilities permitted to store surface water. Since then, the permitted capacity to store CAP water increased by almost 60 percent while the permitted capacity to store reclaimed water has increased by 150 percent during the same time.

Not only has the total permitted storage capacity increased since the inception of the Program but the distribution has also expanded across the AMA. In 1996, the PhxAMA had recharge facilities located only in the ESRV, the WSRV and Hassayampa subbasins. Since that time, the permitted recharge capacity in the WSRV has increased over 300 percent and the Hassayampa subbasin permitted recharge capacity has increased over 1200 percent. The Carefree, Fountain Hills and Lake Pleasant subbasins now also have small amounts of permitted storage capacity. While the permitted storage capacity has grown in most subbasins, the discrepancy among the subbasins in terms of current permitted storage capacity is still evident.

Historically, due to the availability of excess renewable supplies, the regulated community has primarily focused on obtaining recharge facility permits and storing renewable water

supplies. The permitting of recovery wells and recovery of stored water was not as necessary. This is evidenced by the fact that in 1996 there were less than 200 wells in the PhxAMA permitted as recovery wells. As of 2019, there are over five times as many permitted recovery wells as there were in 1996. Due to shortages on the Colorado River and the on-going drought, recovery permitting and activities have become and will continue to be more prominent in the 5th Management Period.

Storage and Recovery Data

While the recharge program was legislatively created in 1986, water storage did not begin until 1989. Since then, almost 9.6 million acre-feet (MAF) of renewable water supplies have been delivered for storage to recharge facilities in the PhxAMA; 52 percent of that total was stored at GSFs and the remaining 48 percent was stored at USFs.

CAP water has been the primary water type delivered for storage through 2019 in the PhxAMA. By comparison, reclaimed water represents only 20 percent of the total amount of water that has been delivered for storage. 400,000AF of surface water has been delivered to recharge facilities. However, because surface water is not eligible for LTSC accrual, the full amount of surface water delivered has already been annually recovered.

Despite the fact that the permitted storage capacities in the ESRV and WSRV are approximately equal, much more water has been delivered for storage to the ESRV, outpacing deliveries to the WSRV by a two to one margin. The other four subbasins of the PhxAMA (Carefree, Fountain Hills, Hassayampa, and Lake Pleasant) have received only 15 percent of the total water delivered, with deliveries to the Hassayampa subbasin contributing a majority of the 15 percent.

A cumulative total of almost 1.7MAF of water has been recovered in the PhxAMA through 2019 (1,405.673AF of annual recovery and 283,000AF of LTSC recovery) displays the annual total amount of water recovered (both LTSC and annual recovery) since the beginning of the recharge program. After deducting these recovered volumes from the total cumulative delivered volume and deducting for physical losses (such as evaporation, transpiration, etc.), cut to the aquifer and other losses, slightly more than 7.4MAF of water is currently in storage underground as of 2019 and available for recovery in the future. A majority of that water is CAP water. See the Recharge dashboard (<https://new.azwater.gov/ama/ama-data>) for more detailed information.

Storage and Recovery Data Trends

The annual total amount of renewable water supplies that have been stored underground since the beginning of the Recharge Program has generally been increasing, at least through the first 20 years. In the last 10 years, the annual amount of storage, while variable, has leveled off. The storage of CAP water is driving these trends. This is evidenced by the fact that the trend in the annual total storage of CAP water closely mirrors the trend in total annual volumes. While CAP water has historically been the overwhelming majority of the water stored in the PhxAMA, there is also a clear, increasing trend in the storage of reclaimed water. See the Recharge dashboard (<https://new.azwater.gov/ama/ama-data>).

Historically there have been large disparities in the distribution of stored water across the subbasins of the PhxAMA. For example, since the commencement of recharge activities in the AMA through 1996, recharge facilities in the ESRV subbasin received and stored greater than 80 percent of the total amount of renewable water supplies stored in the PhxAMA. During that same time period, recharge facilities in the WSRV and Hassayampa subbasins stored less than 10 percent each of the total water in the PhxAMA. Since then, storage in the West Salt River and Hassayampa subbasins has each increased by two orders of magnitude. The volume stored underground in each of the other subbasins is still significantly lower compared to the storage in the ESRV subbasin.

For the first ten years of the Recharge Program there was minimal recovery of stored water. Before 2000, the annual average amount of recovery was approximately 7,000 AF/year. Since then, the annual amount of recovery has increased to an average of approximately 80,000 AF/year. However, despite the fact the annual recovery increased by an order of magnitude over the last 20 years, the annual amount of water recovered is still far less than the annual amount of water stored. The Recharge dashboard displays the trends in annual recovery compared to LTSC recovery. The trends for both annual recovery and LTSC recovery have remained relatively constant since 2000 but the proportion of annual recovery to LTSC recovery has always been greater. However, as deeper shortages of CAP water become a reality, these recent trends in annual and LTSC recovery are likely to change.

5MP Water Management Challenges

The data and trends discussed above highlight some of the successes of the Recharge Program and of PhxAMA water providers over the previous management periods. It also reveals some of the Program's shortcomings which should be addressed in the fifth management period as well as some of the water management challenges facing the PhxAMA water providers. This information can be used to help focus the efforts of the

Program and the regulated community in order to increase the effectiveness of recharge and recovery as a water management tool going forward.

The regulatory framework of statutes, substantive policies, and management plan requirements has provided flexibility to the Recharge Program, which has allowed for the expansion of water storage in the PhxAMA. This flexible framework provides opportunities for improvement and streamlining of the permitting process for recharge facilities going forward, some of which are currently underway. In addition, efforts to improve the quality and availability of ADWR recharge and recovery data should be prioritized in the 5th management period.

Water management in the fifth management period will likely involve significantly less water storage, coupled with significantly more recovery activities. The availability of sufficient and strategically located permitted storage capacity will continue to be important for effective water management. However, evaluating where recovery of water occurs relative to where water has and will be stored is an important consideration that necessitates thoughtful planning.

As discussed above, the number of permitted recharge facilities and the total permitted storage capacity in the PhxAMA has increased significantly since the inception of the Recharge Program. But the availability of a large amount of permitted capacity does not mean that that capacity is being maximized. For example, in 1996, there was a total of about 698,000AF/year of permitted storage capacity in the PhxAMA. However, only 200,000AF of water was delivered to be stored that year, utilizing only 30 percent of the total permitted storage capacity. By 2019, the permitted capacity increased to a total of 1,150,844 AF/year across the AMA. However, only approximately 400,000AF of storage was reported that year, representing 36 percent of the permitted capacity. As we approach a drier, hotter future, a more in-depth analysis on this trend, as well as an evaluation of what external factors could be preventing or deterring entities from maximizing the existing storage capacity in the PhxAMA merits consideration especially considering the anticipated shift in availability of the different types of renewable water supplies going forward.

Historically the large amount of available CAP water has driven the increase in permitted storage capacity, as well as the amount of water stored. In the fifth management period, there will be no more excess CAP water and cuts to Arizona's CAP allocation are expected to continue and increase. On the other hand, storage of reclaimed water has been increasing and the amount of reclaimed water available for storage is likely to increase in the fifth management period, at least until direct potable reuse becomes more widely accepted and implemented. Storage of surface water will also likely continue to be important in the PhxAMA but, as always, will be dependent on the availability in any given

year as well as the amount of direct use that is necessary to supply demands. However, even if the recharge of both reclaimed and surface water was maximized, storage of these water types alone will likely not be able to reach the amounts of CAP water historically stored.

The near certainty of the reduction of available CAP water and other renewable supplies, along with the permitted storage capacity data and trends described above, suggests the need for an evaluation of the existing permitted volumes and water types at individual storage facilities to help maximize storage at these existing facilities. Additionally, any additional permitted recharge capacity in areas of the PhxAMA should be carefully and thoughtfully considered for the fifth management period.

The availability and maximization of existing permitted storage capacity should be a priority in the fifth management period. However, the hotter drier future and the concomitant reduction in available renewable water supplies will necessitate significantly increased amounts of recovery of stored water going forward. This will likely require the permitting of additional recovery wells, the increasing of the permitted recovery capacities of existing recovery wells, and a great deal of planning.

The permitting of recovery wells is governed by an intricate set of statute, rule, policy, and management plan requirements (A.R.S. § 45-834.01, the ADWR well rules, ADWR Substantive Policy RW1, and the Recharge and Recovery Siting Criteria listed at the end of this chapter). One of the primary factors evaluated when permitting a recovery well is whether the well is located inside or out the area of impact of the stored water which the well will be recovering. If a well is located within the area of impact of the stored water, there are significantly fewer permitting requirements. However, in the planning and permitting of recharge facilities, consideration of where the water stored at that facility will ultimately be recovered may not be the most important factor, and statutes and management plan requirements do allow for the permitting of recovery wells, and the subsequent recovery of stored water, in locations other than where the water was stored. This has been referred to as the hydrologic disconnect and can lead to or exacerbate existing problems such as declines in water levels, aquifer compaction and the loss of aquifer storage, subsidence, or fissuring. Potential issues related to hydrologic disconnect and possible solutions to address those issues are a part of ongoing discussions in the Post-2025 AMAs Committee of the Governor's Water Augmentation, Innovation, and Conservation Council (GWAICC).

Recovery of water as close as possible to the area in which it was stored is advantageous from both a recovery well permitting point of view, as well as a water management point of view. But ultimately, it is the responsibility of PhxAMA water users to determine where water will be stored for future uses, as well as where and when that water will be

recovered. And it is the Recharge Program's role to provide and administer a regulatory framework that avoids aggravating existing local water supply and water level problems. In some areas of the PhxAMA groundwater declines have been observed, while in other areas shallow water level conditions persist. In areas of excessive water level declines, management plan requirements restrict the permitting of recovery wells and recovery from existing permitted recovery wells (Section 8-801(B)(2)&(3)) with some exceptions. For areas experiencing persistent shallow water levels, recharge and recovery are tied together via a management plan requirement (Section 8-801(B)(1)(a)) that the Recharge Program will enforce for this management period in order to help prevent the exacerbation of those conditions.

There is one additional storage and recovery issue that will be unique to the fifth management period: the distribution and recovery of water/credits stored by the Arizona Water Banking Authority (AWBA). Heightened awareness and recognition of the potential to exacerbate the hydrologic disconnect merits serious consideration as that process moves forward.

3.3 ARIZONA WATER BANKING AUTHORITY

Since its inception in 1996, 4.4 million acre-feet (MAF) of excess CAP water has been delivered for AWBA storage at recharge facilities in the Phoenix, Pinal, and Tucson AMAs. This amount represents 30 percent of the total volume of CAP water delivered for long-term storage within Arizona through 2019. Long-term storage credits (LTSCs) accrued from this storage total 4.2 MAF and includes 0.6 MAF for interstate banking. In addition to storing water, the AWBA has also purchased 124,003 acre-feet of LTSCs from other entities (AWBA governing statutes were amended in 2014 to allow the AWBA to purchase LTSCs after all excess CAP supplies available annually have been scheduled for storages). AWBA governing statutes were amended in 2014 to allow the AWBA to purchase LTSCs after all excess CAP supplies available annually have been scheduled for storages. AWBA LTSCs will be distributed and recovered in the future to mitigate the impacts of shortage reductions in Colorado River supplies to Fourth Priority (P4) on-River M&I contractors and CAP M&I priority subcontractors including supply reductions resulting from disruptions to the CAP system. Additionally, the LTSCs will be used to meet the state's obligations under Tribal water rights settlements and contractual obligations for interstate water banking with Nevada, specifically the Southern Nevada Water Authority (SNWA).

As shown in Table 3-1, the AWBA has accrued 1,981,849 acre-feet of LTSCs in the PhxAMA, of which 85,282 acre-feet were acquired through credit purchase and 60,021 acre-feet are for SNWA. The highest percentage of credits have been accrued at the Tonopah Desert Recharge Project (TDRP) (24 percent), followed by the Granite Reef Underground Storage Project (GRUSP) (21 percent) and the New Magma Irrigation and Drainage District

(NMIDD) GSF (18 percent). By bringing additional CAP water into the AMA, the AWBA has played an important water management role, augmenting supplies in locations considered areas of concern and effectively reducing the amount of groundwater pumped by agricultural interests. AWBA storage accounts for 101,365 AF of water provided as a benefit to the aquifer (5 percent cut). An interactive map showing the location of recharge facilities and AWBA LTSCs accrual can be found on the AWBA webpage (<https://waterbank.az.gov/lpsc-map>).

AWBA LTSCs are also accounted for by the funding sources used to accrue or acquire the LTSCs. The AWBA is authorized to use several different funding sources. Three main sources include general fund appropriations, an *ad valorem* property tax (Water Storage Tax) levied and collected by CAWCD, and groundwater withdrawal fees collected by ADWR. The revenues available from each source vary both on an annual basis and by the amounts collected within each AMA or County. There are also limitations on how each fund may be utilized by the AWBA to achieve its various goals (A.R.S. § 45-2425 describes how revenues are made available to the Arizona Water Banking Fund and A.R.S. § 45-2457 describes how these revenues may be used). Table 3-2 identifies the allowable uses for LTSCs based on the funding source used. The availability and use of funds for any given year are described in the AWBA's Annual Plan of Operation. Funding for interstate storage is provided by SNWA at the time storage occurs.

Table 3-3 identifies the volume of credits the AWBA has accrued in the PhxAMA for each funding source. The majority of the credits (77 percent) are from use of the Water Storage Tax funds. While this amount represents 97 percent of the AWBA's original PhxAMA M&I firming goal of 1.57 MAF, recent hydrologic modeling suggests that significantly more water may be needed to firm supplies for PhxAMA M&I subcontractors for the next 100 years (1.89 MAF to 2.99 MAF) (AWBA 2020 Annual Report).

Table 3-1 Phoenix AMA AWBA Credits Accrued & Location Through 2019

Storage Facility		AWBA Long-term Storage Credits (AF)		
		Intrastate	Interstate	Total
USF	Agua Fria Recharge Project - Managed	68,533	1371	69,903
	Agua Fria Recharge Project - Constructed	52,182	872	45,682
	Granite Reef Underground Storage Project	412,592	0	412,592
	Hassayampa Recharge Project	1,276	0	1,276
	Hieroglyphic Mountain Recharge Project	105,885	0	105,885
	Superstition Mountains Recharge Project	36,558	0	36,558
	Tonopah Desert Recharge Project	429,430	51,009	480,438
Subtotal		1,106,456	53,251	1,159,707
GSF	Chandler Heights Citrus ID	4,517	0	4,517
	Maricopa Water District	47,916	0	47,916
	New Magma IDD	353,519	2,850	356,369
	Queen Creek ID	118,425	3,449	121,874
	Salt River Project	84,788	0	84,788
	Roosevelt Water Conservation District	114,456	0	114,456
	Tonopah ID	3,438	471	3,909
	Gila River Indian IDD	88,313	0	88,313
Subtotal		815,372	6,770	822,142

Table 3-2 Summary of AWBA Intrastate Funding Sources and Allowable Uses

FUNDING SOURCE	Firming CAP M&I	Firming On-River M&I (P4)	Firming Indian Settlements (Tribal NIA)	Fulfilling Water Management Objectives
Water Storage Tax	X			
Groundwater Withdrawal Fees	X		X	X
General Fund	X	X	X	X
Shortage Reparations¹	X	X	X	X

¹ Funds made available pursuant to the 2007 Arizona-Nevada Shortage-Sharing Agreement.

Table 3-3 Phoenix AMA AWBA Credits Accrued Per Funding Source Through 2019

Funding Source	Long-term Storage Credits (AF)
Groundwater Withdrawal Fees¹	339,724
Four-cent <i>Ad valorem</i> Tax	1,519,147
General Fund	42,316
Shortage Reparation	20,642
Interstate Banking - Nevada	60,021
Total	1,981,849

¹Up to 40,500 AF of LTSCs have been reserved for exchange under DCP. (Lower Basin Drought Contingency Plan ("LBDPC") Implementation Plan: Agreement to Exchange Long-Term Storage Credits between AWBA and the City of Avondale; City of Chandler; City of Goodyear; City of Peoria; City of Phoenix; City of Scottsdale; City of Tucson; Freeport Minerals Corporation; and EPCOR Water Arizona Inc.)

Although additional firming supplies are needed, the volume of excess CAP water available to the AWBA has steadily decreased due to an increase in use by higher priority CAP water users. Additionally, excess CAP water supplies have also been used to conserve water in Lake Mead, either for system conservation or to meet Arizona's Tier Zero water savings contribution of 192,000 AF under the LBDPC. As a result, the AWBA has stored very little water over the last several years and may be limited in the future to storing supplies that are turned back during the year by other CAP water users or purchasing

LTSCs. The persistence of warmer and drier conditions has also increased the probability of declared shortages on the Colorado River. As a result, the AWBA anticipates transitioning to its next phase, the distribution of LTSCs for firming purposes and/or to develop intentionally created unused apportionment (ICUA) to make water available to SNWA.

3.3.1 ASSISTANCE IN SETTLEMENT OF INDIAN WATER RIGHTS CLAIMS

The AWBA plays an important role in assisting with the settlement of tribal water rights claims. As the state's agent for fulfilling the state's obligations under the Arizona Water Settlements Act of 2004 (AWSA) (See A.R.S. § 45-2491), the AWBA must: 1) firm 15,000 AF of CAP non-Indian agricultural (NIA) priority water re-allocated to the Gila River Indian Community (Community); 2) firm 8,724 AF of CAP NIA priority water re-allocated in the future to Arizona Tribes; and 3) assist the US Secretary of the Interior (Secretary) in its firming requirement for the Tohono O'odham Nation by providing \$3 million in cash or in-kind goods or services, including water, to the Secretary. The AWBA must firm supplies for a 100-year period (through 2107) to the same level of priority that CAP M&I priority supplies are delivered whenever supplies are insufficient to meet demand.

Presently, the AWBA's settlement obligation in the PHXMA is limited to firming CAP NIA priority supplies re-allocated to the Community. This obligation is shared with the Pinal AMA since Community lands straddle the boundaries of both AMAs. The AWBA has entered into several intergovernmental agreements (IGA) with the Community to facilitate firming, including an IGA in 2015 that describes the procedures for developing a firming plan and the firming methods that can be used for this purpose (IGA between the AWBA and the Gila River Indian Community (GRIC) executed June 16, 2015). These methods include the use of LTSCs accrued at the GRIIDD GSF, Firming Credits accrued on-reservation, Intentionally Created Surplus (ICS) firming credits created as part of the Drought Contingency Plan (DCP) and the recovery of AWBA LTSCs off-reservation by CAWCD, the AWBA's recovery partner (IGAs between the AWBA and the GRIC for the Development of Firming Credits executed June 30, 2016 and for the Development of Intentionally Created Surplus Firming Credits executed May 20, 2019). The volume of firming supplies developed under these IGAs totals 194,390 AF. The Indian Firming Study Commission estimated that 350,000 AF of water would be needed to firm supplies for the Community. However, similar to firming for CAP M&I subcontractors, the supplies needed to firm the Community have also increased. The AWBA may need an estimated 456,000 to 577,000 AF of water to meet the state's firming obligations to the Community. This represents a 30 to 65 percent increase in the original estimates.

The AWBA will also be required to firm up to 3,750 AF per year of NIA Priority CAP water under the White Mountain Apache Tribe (WMAT) Water Rights Quantification Agreement

(Quantification Agreement), executed on December 8, 2010 as part of the Claims Resolution Act of 2010. This obligation is part of the 8,724 AF per year identified for reallocation to future Arizona Indian Tribes under the AWSA. The current firming volume is estimated to be between 112,000 and 142,000 acre-feet. Because this water will be leased by entities in the PhxAMA, the AWBA's responsibility will be to firm the leased water supplies during shortages (Lessees under the Quantification Agreement for which the AWBA will have a firming obligation include Avondale, Chandler, Gilbert, Glendale, Mesa, Peoria, Phoenix and Tempe). The enforceability date of the Quantification Agreement has been extended to April 30, 2023.

As noted in Table 3-2, PhxAMA LTSCs accrued using withdrawal fees can be used to meet Tribal settlement obligations if necessary. Given the potential increase in firming supplies needed to meet these obligations, as well as future settlement obligations, the AWBA will likely need to utilize its withdrawal fee LTSCs for this purpose.

3.3.2 DISTRIBUTION AND RECOVERY OF AWBA LONG-TERM STORAGE CREDITS

In August 2021, the Secretary declared the first-ever Tier 1 shortage for Colorado River operations in 2022. As a result, Arizona's Colorado River water entitlement was reduced by 512,000 AF: 320,000 AF under the 2007 operating guidelines and 192,000 AF in additional LBDGP contributions. This reduction in supplies resulted in the need to firm CAP NIA priority supplies for the Gila River Indian Community. To satisfy this firming obligation, the AWBA and the Community elected to extinguish an equal volume of Firming Credits located on-Reservation.

Although the reduction to Arizona's Colorado River supplies did not impact P4 on-River contractors or CAP M&I Priority supplies in 2022, there is an increasing likelihood that the AWBA could have a CAP M&I firming requirement in the near-term (U.S. Bureau of Reclamation). In the spring of 2021, AWBA, ADWR and CAWCD released an update to the recovery plan that was developed in 2014, *2021 Update - Recovery of Water Stored by the Arizona Water Banking Authority – A Joint Plan by AWBA, ADWR and CAP*, available on ADWR's website (<https://new.azwater.gov/rpag>). The Joint Update was developed in consultation with a 14-member Recovery Planning Advisory Group (RPAG) and builds on previous planning efforts including the methods for recovering AWBA LTSCs and the volume of recovery capacity that may be needed over time. During this process, many CAP M&I subcontractors advocated for the recovery of AWBA LTSCs using their own infrastructure, or a partner's, in order to reduce costs. The AWBA was subsequently given the statutory authority to distribute Water Storage Tax LTSCs directly to CAP M&I subcontractors for firming purposes (Senate Bill 1147 was signed by Governor Ducey on April 14, 2021). In the PhxAMA, subcontractors utilize their CAP entitlements either through delivery to water treatment plants, annual storage and recovery or long-term

storage. In the near-term, the majority of CAP M&I subcontractors will likely request that the AWBA provide firming water by distributing its LTSCs directly to them. However, subcontractors that have limited recovery capacity and are fully utilizing their entitlements to meet direct use demands, may request the direct delivery of recovered AWBA LTSCs from CAWCD.

The AWBA has a total of 613,846 acre-feet of interstate LTSCs stored for Nevada with 60,021 acre-feet located in the PhxAMA. Recovery of these interstate credits is anticipated to begin in 2025 but will likely occur first in the Pinal and Tucson AMAs based on CAWCD's existing interstate recovery agreements. Pursuant to the AWBA's interstate banking agreement with SNWA, nearly all of the LTSCs must be recovered by December 31, 2063.

3.3.3 RECOMMENDATIONS TO THE ARIZONA WATER BANKING AUTHORITY

One of the stated purposes of the legislation creating the AWBA is to "store water brought into this state through the CAP to fulfill the water management objectives of this state set forth in Chapter 2 of this title." A.R.S. § 45-2401(H)(3). The AWBA is required to coordinate with the Director of ADWR, who serves as chair of the AWBA Commission, in the "storage of water and distribution and extinguishment of long-term storage credits . . . in accordance with the water management objectives set forth in Chapter 2 of this title [the Code]." A.R.S. § 45-2423(A)(3). To meet these statutory requirements, ADWR must provide specific advice to the AWBA as to how to incorporate such objectives into the AWBA's activities. Specifically, the Groundwater Code requires that ADWR include recommendations to the AWBA in the 4MP regarding the following three questions: 1) whether additional water storage in the AMA would help to achieve the management goals of the AMA, 2) where the additional water storage would be most useful in achieving the management goal, and 3) whether the extinguishment of credits would assist in achieving the management goal. ADWR provides the following recommendations to the AWBA for water storage in the AMA.

Advice to the AWBA on Additional Water Storage in the AMA

Water storage by the AWBA helps to meet the water management objectives of the PhxAMA. Although excess CAP water supplies may be limited in availability, ADWR recommends that the AWBA continue to store water in the PhxAMA when possible, in order to continue to provide water management benefits and to create additional firming supplies that can be used for Tribal settlements and CAP M&I priority subcontractors.

Advice to the AWBA on the Location of Water Storage in the AMA

The AWBA has stored a considerable amount of water in both the east and west Salt River Valleys of the AMA, augmenting water supplies while also improving aquifer health in those areas. If excess CAP water or other renewable supplies are available, ADWR recommends that the AWBA continue to work with ADWR, CAWCD and PhxAMA interests to select sites for recharge that serve as many water management objectives as possible while also considering the future recovery of that water.

Advice to the AWBA on Water Storage Credit Extinguishment

While the extinguishment of withdrawal fee credits could provide water management benefits, because the AWBA has an obligation to meet the state's obligations under the AWSA and withdrawal fee credits may be used for this purpose, ADWR recommends that the AWBA hold these credits in reserve at this time. If withdrawal fee credits were to become available for extinguishment, ADWR recommends that the AWBA develop a program in cooperation with PhxAMA water users and interested parties to extinguish storage credits specifically in areas of ongoing overdraft.

3.4 ALTERNATIVE WATER SUPPLIES ASSESSMENT

Renewable supplies in the PhxAMA are Colorado River water, reclaimed water, in-state surface water (referred to as surface water for the purpose of the 5MP). The following section describes the major water supplies and how they are currently used in the PhxAMA. For a broader discussion of water supplies in the PhxAMA, see Chapter 2.

3.4.1 COLORADO RIVER WATER AND THE CENTRAL ARIZONA PROJECT

The CAP infrastructure delivers Colorado River water (CAP water) to Maricopa, Pinal, and Pima counties. The following sections describe the PhxAMA's CAP water supply, and supply reliability challenges related to allocation priorities. Additional discussion of CAP water use challenges can be found in Chapters 2 and 8.

Central Arizona Project Water Supply

CAP water is the second largest source of renewable supply available in the PhxAMA. Annual CAP water allocations for the PhxAMA total 834,298 AF per year. Of this total, approximately 480,000 AF per year are currently used by tribes. This amount includes 311,800 AF per year allocated to the Gila River Indian Community (GRIC), which has lands both in the PhxAMA and the Pinal AMA (PAMA). The GRIC have entered into long-term leases with several cities in the PhxAMA and with Freeport McMoran for more than 66,000

AF per year of the GRIC's total allocation. The Fort McDowell Indian Community settlement includes 18,233 AF of CAP water that may be leased for up to 100 years off-reservation within Pima, Pinal, and Maricopa counties. Of that amount, 4,300 AF is leased to the City of Phoenix. The Salt River Pima Maricopa Indian Community (SRPMIC) settlement agreement provided for a 98-year lease to PhxAMA cities (which commenced in the year 2000) of its 13,300 AF CAP allocation. The Ak-Chin Indian Settlement allows for the lease of its 85,000-acre-foot entitlement to users within the PhxAMA, Tucson AMA, or Pinal AMA, of which more than 6,000 AF has been leased to the Del Webb Corporation in the PhxAMA. Additionally, the San Carlos Apache Tribe may lease its 61,645-acre-foot entitlement of CAP water to users in Pima, Maricopa, and Pinal counties. The San Carlos Tribe has entered into a long-term lease agreement with the City of Scottsdale for 12,500 AF per year of the total San Carlos entitlement. Finally, the Yavapai-Prescott Indian Tribe was authorized to market its 500-acre-foot CAP allocation to the City of Scottsdale. The remaining 354,635 AF per year of CAP subcontracts consist mostly of municipal and industrial users. Additional CAP water has been recommended to be allocated as a result of the Non-Indian Agriculture (NIA) reallocation. Excess CAP water from unused entitlements and surplus Colorado River supplies has historically provided an opportunity to bring additional CAP water supplies into the PhxAMA beyond existing allocations but is not expected to be a reliable supply as ongoing shortage becomes likely. Additional discussion Colorado River shortages can be found in Chapters 2 and 8.

Tribal Supply of Central Arizona Project Water

The three Indian communities in the PhxAMA all have allocations of CAP water. The three communities are: (1) the Fort McDowell Indian Community, (2) the Gila River Indian Community, and (3) the Salt River Pima-Maricopa Indian Community.

Fort McDowell Indian Community

In 1990, the Fort McDowell Indian Community Water Rights Settlement Act (the 1990 Act) was ratified by Congress. The 1990 Act is an agreement between the Fort McDowell Yavapai Nation (FMYN) and neighboring non-Indian communities, including SRP, Roosevelt Water Conservation District, Chandler, Mesa, Phoenix, Scottsdale, Tempe, Gilbert, CAWCD, the United States and the State of Arizona. FMYN is provided an annual entitlement to 35,223 AF of water from the Verde River and CAP under this agreement. The 18,233 AF of CAP water in the water budget may be leased for 100 years or less off-reservation within Pima, Pinal, and Maricopa counties. This settlement also provides for a minimum stream flow on the Lower Verde River of 100 cfs. In accordance with the 1990 Act, a fund for the development of agricultural and other beneficial uses of water on the reservation was created with \$23 million from the United States and with a \$2 million appropriation by the Arizona State Legislature (ADWR, 2010).

Gila River Indian Community

In December 2004, the President signed into law The Arizona Water Settlements Act (AWSA) P.L. 108-451. Title II of the Act provided approval of the Gila River Indian Water Settlement Agreement. The settlement awarded the GRIC an annual entitlement to 653,500 AF of water from various sources including CAP allocations, reclaimed (through CAP exchange), groundwater, and surface water from the Gila, Verde, and Salt rivers. It also established a funding mechanism for on-reservation development of this Community's farming operations and gave leasing authority to the GRIC for its CAP water as long as the water is leased within Arizona (ADWR, 2010).

Salt River Pima-Maricopa Indian Community

In the Salt River-Pima Maricopa Indian Community (SRPMIC) Water Rights Settlement Act of 1988, Congress approved an agreement which gave the SRPMIC an annual entitlement to 122,400 AF of water plus storage rights behind Bartlett and modified Roosevelt Dams. Sources of water for the SRPMIC under the settlement include the Salt and Verde rivers, groundwater, and CAP water. This Community is permitted to pump groundwater but must achieve safe yield when the East Salt River sub-basin in the Phoenix AMA does so. The SRPMIC has leased its 13,000 AF CAP allocation to the Phoenix valley cities from 2000 to 2099. The Arizona State Legislature appropriated \$3 million, which was added to \$47 million from the United States for the SRPMIC's trust fund (ADWR, 2010).

3.4.2 RECLAIMED WATER

Reclaimed water provides an important component of the total water supply available to the PhxAMA. There are several benefits to increasing use of reclaimed water. The primary benefit is reserving high quality groundwater for potable use. Other benefits include the following:

- Use of reclaimed water for turf irrigation offsets the use of groundwater or other renewable supplies.
- Land subsidence caused by over-pumping of groundwater can be partially reduced by reclaimed water use/recharge.
- Reclaimed water may also be recharged or directly used in areas with severe groundwater level declines.

PhxAMA cities, towns, and water companies have spent millions of dollars in investments to construct wastewater treatment plants and recharge facilities to use and store reclaimed water in the PhxAMA over the past decade. Although reclaimed water use

increased during the fourth management period, the production of reclaimed water also has increased with the population growth. As excess CAP water supplies decline, reclaimed water will be the only increasing renewable future supply. There is remaining potential for greater use of reclaimed water, both for direct uses and indirect uses and for potable and non-potable uses. Storage of reclaimed water underground can improve its quality while preserving it in the AMA for future use. Direct use of reclaimed water and its storage and recovery recycles water supplies. When reclaimed water is captured and reused, the original source water gets used more than once, and may cycle through the system multiple times prior to its full consumption. This increases the value of reclaimed water as a resource in the Phoenix AMA.

Water exchanges have contributed to the increased direct use of reclaimed water in the PhxAMA. The 1992 Water Exchange Act laid the legal framework for water exchanges, which has provided opportunities to manage renewable water supplies, including reclaimed water more efficiently. For example, a three-way exchange between the City of Phoenix, Roosevelt Irrigation District, and the Salt River Project (SRP) has resulted in putting 30,000 AF per year of reclaimed water from the 23rd Avenue Wastewater Treatment Plant (WWTP) to beneficial use. In 2019 municipal water providers in the PhxAMA reported producing approximately 339,193 AF of reclaimed water. Approximately 79,113 AF of the volume of reclaimed water produced was sent to constructed or managed recharge facilities in the PhxAMA compared to only 4,602 AF that was delivered to GSFs.

3.4.3 SURFACE WATER

Surface water resources in the PhxAMA have historically met and continue to meet a large proportion of the demand in the AMA. Surface water supplies are not typically underutilized in the PhxAMA because they are an economical source, they are available in most years, and an extensive infrastructure exists to deliver the water to the water users.

Salt River Project (SRP) facilities have a maximum reservoir storage capacity of more than two million AF of Salt and Verde River water. The amount of SRP surface water delivered each year depends on the amount of surface water in storage each year. When reservoirs are low, SRP supplements its surface water deliveries with groundwater to meet customer demand. SRP surface water use is based on decreed and appropriative water rights and is available only to water users on SRP member lands. Many providers with rights to surface water utilize USFs and recovery wells to manage their surface water supplies. Appropriable surface water generally must be recovered within the same month it is stored. If stored and recovered in this manner, it is considered a direct use of the supply. Through 2019, approximately 407,537 AF of Salt and Verde River water was put to use through annual storage and recovery activity.

Plan 6 Water

Plan 6 refers to the development of reservoir facilities for storing CAP water. Plan 6 included construction of New Waddell Dam on the Agua Fria River, modifications to Roosevelt Dam, and the proposed construction of Cliff Dam on the Verde River. The plans to construct Cliff Dam were halted in 1987 due to environmental concerns; however, Phoenix area cities were assured by the Arizona Congressional Delegation and the Secretary of Interior that they would receive water supplies necessary to replace the additional resources that would have been provided by Cliff Dam. This was provided through the assignment of the Hohokam Irrigation and Drainage District agricultural subcontract to certain cities in exchange for the payment of private and federal debts related to the district's distribution system. Plan 6 water provides opportunities for additional surface water resources from the Agua Fria River and the Salt River to augment supplies in the AMA. Waddell Dam on the Agua Fria River was replaced by New Waddell Dam which has an increased storage capacity. The original dam and reservoir could store up to 150,000 AF while the new dam and reservoir can store up to 800,000 AF (Maricopa Association of Governments, 1993). Not only has this increased capacity allowed Colorado River water to be delivered into central Arizona for storage throughout the year (which was not possible previously), it resulted in additional appropriative rights to CAWCD of up to 698,800 AF of Agua Fria River water captured by the increased storage capacity. The Maricopa Water District (MWD) retained the historical appropriative and storage rights associated with the original Waddell Dam.

Plan 6 also included modifications to Roosevelt Dam on the Salt River, to address needed design upgrades. These modifications increased storage capacity in the reservoir by approximately 255,100 AF, not including flood control space. The appropriative rights to the additional surface water captured by the modified dam were obtained for municipal use by the cities of Chandler, Glendale, Mesa, Phoenix, Scottsdale, and Tempe, which contributed funding toward the construction of the dam modifications. Unlike Salt and Verde River water, this Plan 6 water supply may be used off SRP member lands or recharged underground for long-term storage. Through the year 2019, approximately 31,058 AF of Plan 6 water had been stored at USFs, with an additional nearly 53,019 AF stored at GSFs.

3.5 RECHARGE PROGRAM GOALS AND OBJECTIVES

This Recharge Program chapter has thus far highlighted the successes and shortcomings of the Recharge Program during the previous management periods in the PhxAMA, the availability of renewable water supplies, and the water management challenges facing the PhxAMA during the fifth management period. ADWR has developed the goals and objectives of the Recharge Program for the fifth management period based upon these

PhxAMA considerations. The Recharge Program for the fifth management period is intended to move the PhxAMA toward its goal of safe-yield and to begin to address sensitive areas by emphasizing the following primary objectives:

- Encourage the replacement of groundwater use by facilitating the efficient use of renewable supplies throughout the PhxAMA.
- Improve or maintain groundwater conditions in areas of the PhxAMA experiencing or projected to experience impacts due to water level declines.
- Explore options for managing local aquifer areas.
- Maximize storage of alternative supplies to offset Colorado River shortages and groundwater depletion.
- Manage recovery activities to address issues related to water level declines.
- Encourage/facilitate recovery of stored water in a location that does not counter the management goal of safe-yield.

During the fifth management period ADWR will work to:

- Facilitate and maximize recovery of stored water near the location of storage.
- Manage storage and recovery activities in a way that assists in stabilizing water levels.
- Facilitate the access to and use of renewable water supplies through recharge and recovery in order to reduce reliance on groundwater and reduce overdraft.
- Support efforts to utilize the canal conveyance infrastructure to the fullest extent possible in order to provide greater flexibility to deliver alternative water supplies, including delivery of recovered water.
- Continue to support creative solutions to assist in local water management goals, including direct potable reuse, on-site non-potable reuse, collaborative storage or exchange agreements, etc.
- Develop groundwater monitoring programs, improve databases, and expand public information programs and education to support planning and management activities.
- Coordinate groundwater replenishment, implementation of AWS requirements, and related activities to ensure that recharge activities protect the quality and storage capacity of the aquifer, and that facilities are sited in a manner that maximizes benefits and provides for future recovery as required.
- Support comprehensive regional water management efforts, including the development and beneficial use of alternative supplies and infrastructure partnerships.
- Develop incentives for augmentation of water supplies, including incentives that promote efficient use of alternative supplies and efforts that aim to reduce overdraft.

- Support efforts to identify and assess feasibility of potential future water supply augmentation measures.

ADWR will continue to assist water users in maximizing the use of existing renewable water supplies in meeting the PhxAMA water management goal.

3.6 AUGMENTATION AND RECHARGE PROGRAM

ADWR is required to include in the 5MP "if feasible, a program for additional augmentation of the water supply of the active management area, including incentives for artificial groundwater recharge" (A.R.S. § 45-568(A)). Pursuant to A.R.S. § 45-561(2), "Augmentation means to supplement the water supply of an active management area and may include the importation of water into the active management area, storage of water or storage of water pursuant to chapter 3.1 of this title." The Recharge Program must be consistent with this statute, but, as described in the introduction, for purposes of this chapter *augmentation* means increasing the availability and use of renewable supplies such as reclaimed water in lieu of groundwater and *recharge* means storage of water pursuant to Title 45, Chapter 3.1, the Underground Water Storage, Savings and Replenishment Act. The Recharge Program, therefore, includes provisions for maximizing the use of renewable supplies and for storage of renewable water.

PhxAMA's water users are principally responsible for developing water supplies and for storing that water for future uses. ADWR's responsibility under A.R.S. § 45-568(A) is to design a program that encourages and facilitates the efforts of those water users. The program should particularly encourage augmentation and storage of water where groundwater supplies are limited. While there are aspects of augmentation in the Recharge Program, there is not currently a separate augmentation program in the 5MP. However, in 2021, the Arizona Legislature passed a bill (SB1822) which created the Drought Mitigation Revolving Fund to provide financial support for water supply augmentation projects and to create the Drought Mitigation Board which would establish criteria to evaluate applications for this funding. ADWR will provide clerical, administrative, and technical support to this board.

The Recharge Program for the 5MP includes the statutory requirements for storing and recovering water within an AMA. The key statutory provisions for storage facilities relate to hydrologic feasibility (A.R.S. § 45-811.01(C)(2)); protection of land and other water users from unreasonable harm (A.R.S. § 45-811.01(C)(3)); and avoidance of water quality impacts (A.R.S. § 45-811.01(C)(5)). The Underground Water Storage, Savings and Replenishment Act requires certain types of storage and recovery to be found consistent with the management plan and management goal for the AMA. The provision that governs non-recoverable storage includes a requirement that non-recoverable water storage must be

consistent with the AMA's Recharge Program (A.R.S. § 45-833.01(A)). Provisions governing recovery allow stored water to be recovered outside the area of impact of the stored water only if certain conditions are met (A.R.S. § 45-834.01). One of the conditions is that the Director must determine that recovery at the proposed location is consistent with the management plan and management goal of the AMA (A.R.S. § 45-834.01(A)(2)(b)(ii)).

3.6.1 STORAGE AND RECOVERY SITING CRITERIA

Recharge Program water management benefits are dependent upon the location of storage and recovery. Because recovery outside the area of impact must be consistent with the PhxAMA's management plan and management goal, the locations of storage and recovery of water are inherently linked. Both must be considered when determining whether the future recovery of stored water meets the requirement for consistency with the management plan and management goal of the PhxAMA. Water management benefits to the PhxAMA would depend greatly on whether water recovered from an existing recovery well was stored in a remote area of the PhxAMA or in a large pumping center of the PhxAMA. Therefore, the criteria to determine whether the recovery location is consistent with the management plan and goal for the PhxAMA must also consider where water was stored.

The locations of storage and recovery also are important factors in addressing local and regional supply problems, particularly in areas experiencing severe water-level declines, land subsidence, or other aquifer management issues, and in attempting to balance the PhxAMA's supplies during the fifth management period. For example, these locations also are crucial because future PhxAMA water supplies may be diminished if water storage occurs in a remote location with no future demand for the stored water and recovery occurs in an area experiencing water-level declines. On the other hand, if storage occurs in an area experiencing high water levels and recovery occurs away from the area of impact, the water storage will contribute to those high-water levels. Water stored pursuant to permits issued after January 1, 2025 and determined to be impacting areas of high water levels may only be recovered within the area of impact of the facility at which the water was stored in order to minimize impacts on these areas.

Pursuant to A.A.C. R12-15-716(B)(3)(c)(ii), the AWS Program protects the estimated water demand of AWS determinations, including groundwater and stored water to be recovered outside the area of impact, from being considered physically available to subsequent AWS applicants.

The Recharge Program criteria also link future use benefits to determinations under the AWS Program. If the recovery will occur outside the area of impact of storage, but the storage contributed to groundwater supplies that have been committed to establish an

AWS determination (such as a Designation, Certificate, or Analysis of AWS), the recovery is deemed to be consistent with the management plan and achievement of the management goal. If recovery is to take place outside the area of impact, but is not contributing to groundwater supplies of an AWS determination, the recovery may still be consistent with the management plan and achievement of the management goal if the storage contributes to groundwater supplies accessible to current groundwater users, is a component of a remedial action project, or is otherwise determined by the Director to have contributed to the objectives of this chapter or achievement of the management goal.

The requirement that recovery outside the area of impact of storage must be consistent with the PhxAMA's management plan and management goal continues to be a requirement even after the recovery well permit has been issued. Thus, previously permitted recovery wells are subject to the criteria of the 5MP and any future management plans.

3.7 CONCLUSION

Strategic storage and recovery will be a focus for ADWR in the fifth management period. Additional strategies will also be considered in order to attempt to achieve the AMA-wide goal of safe-yield and address water management challenges in specific geographic areas of the PhxAMA as the need arises. Many of these efforts will need to be undertaken in a cooperative approach with local stakeholders. The efforts to address these issues will require partnerships with PhxAMA entities that are willing to make necessary changes, and support efforts to improve groundwater conditions.

3.8 RECHARGE AND RECOVERY REQUIREMENTS

3-801 Storage and Recovery Siting Criteria

During the fifth 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 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:
- Located in an area experiencing an average annual rate of decline that is less than 4.0 feet per year; or
 - 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
 - Likely to contribute to the water management objectives of the geographic area in which the well is located, as determined by the Director.

3-802 Storage of Non-Recoverable Water

During the fifth 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:

- 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
- 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.*

APPENDIX 3A: DECLINE RATE METHODOLOGY

In evaluating an application for a proposed recovery well permit, ADWR considers many factors in determining consistency with the average water level decline rate siting criteria. The time frame for which the average is calculated may vary based on data availability and the hydrologic characteristics of the area. Major trends in precipitation, water supply utilization over time, hydrogeologic data, and the modeling of projected impacts may be factors in evaluating this rate. Other considerations may also be appropriate depending on the location of the proposed recovery well.

Typically, ADWR examines the historic static water level data for the period of record for wells located in the section in which the proposed recovery well is located and in the eight sections that surround the section where the proposed well is located. The specific area examined depends on the availability and quality of water level data and the hydrogeology of the area. Bedrock outcrops, large pumping centers, and other features may affect the determination of pertinent data. Generally, wells that are screened in the aquifer of concern and regularly monitored using consistent methods for static water level data are good reference points (such as ADWR's statewide monitoring or index wells). ADWR examines the well hydrographs (graphs of static water levels over time) and evaluates the slope of the curve for the period of interest. The slope indicates whether the static water level in the monitoring well has risen or fallen over time. A horizontal line on the hydrograph indicates that water levels remained stable over time. ADWR identifies what activities may have caused the groundwater changes over time to see whether the activity still exists or has been reduced, eliminated, or increased over time.

This approach provides more flexibility and protection of the groundwater resource than would be provided by a simplistic evaluation of decline rates calculated for all water level data within a set radius and during the entire period of record. For example, if a recovery well is proposed for an area which historically had a rapid decline in groundwater levels due to activities that no longer exist (e.g., retirement of agriculture after heavy agricultural use in the 1940s and 1950s), and if the proposed area is not at high risk for land subsidence, the proposed recovery well might be deemed consistent with the average decline rate criteria by looking at the period of time after the historic change in use. Similarly, if water levels in the vicinity of the proposed recovery well were stable for decades, but recently a new use caused rapid rates of decline, the proposed recovery well may be deemed inconsistent with the criteria.

ADWR's groundwater models may be used to project future water levels and decline rates on a regional basis. Modeling may assist the permittee in evaluating recovery options. Where there are sufficient data, a model may give an indication of how long recovery within a region may remain permitted based on the current average decline rate criteria.

The most current procedures for establishing the average groundwater level decline rate in the vicinity of a proposed recovery well is described below.

Decline Rate Procedure Description

To evaluate the four-foot decline criteria, ADWR will review water level data from all available, reliable sources of water level data in the vicinity of the proposed recovery well. Some sources include the ADWR Groundwater Site Inventory (GWSI) database, water levels submitted with the recovery well application from the applicant, or other water level data available.

The entire period of record for each well in the vicinity of the proposed recovery well is plotted on a hydrograph. The entire period of record of measurements is often used in the evaluation; however, sometimes the hydrograph reveals a pronounced inflection in average slope of the hydrograph, indicating that the entire period of record may not be representative of current conditions. The inflection may be attributed to conditions such as urbanization of previously irrigated acreage or the introduction of a new water source. The latest portion of the hydrograph that is most representative of current conditions, and will likely continue in the future, is then used in the analysis.

The average annual rate of decline for a given well is calculated by dividing the total change in water level for the selected period of record by the period of record, in years. The water level change for each well is averaged to arrive at an average water level change in the vicinity of the proposed recovery well. Care is taken to select wells for averaging near the proposed recovery well that are representative of nearby aquifer conditions.

APPENDIX 3B: DEFINITIONS

1. "Constructed underground storage facility" means a facility that . . . is designed and constructed to store water underground pursuant to permits issued under this chapter (A.R.S. § 5-802.01(4)).
2. "Groundwater savings facility" means a facility . . . in an active management area or an irrigation non-expansion area at which groundwater withdrawals are eliminated or reduced by recipients who use in-lieu water on a gallon-for-gallon substitute basis for groundwater that otherwise would have been pumped from within that active management area or irrigation non-expansion area (A.R.S. § 45-802.01(8)).
3. "Managed underground storage facility" means a facility . . . that is designed and managed to utilize the natural channel of a stream to store water underground pursuant to permits issued under this chapter through artificial and controlled release of water other than surface water naturally present in the stream (A.R.S. § 45-802.01(12)).
4. "Reclaimed water" has the same definition as effluent in A.R.S. § 45-101.

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CHAPTER 4: AGRICULTURAL

4.1 INTRODUCTION

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). IGFRs were issued by the Arizona Department of Water Resources (ADWR) based on acreage irrigated during the period 1975 to 1980, and water duties and allotments were calculated for each IGFR based on crop type grown during the same period. 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)). A key component of the Code prohibits the establishment of new IGFRs – prohibiting new acres from being put into agricultural production.

4.1.1 AGRICULTURAL SECTOR DESCRIPTION

In 2019, the Phoenix Active Management Area (PhxAMA) agricultural sector consists of over 2300 IGFRs and around 170,000 irrigation acres. The primary crops grown in the PhxAMA alfalfa, cotton, wheat, barely, corn, and vegetables. Alfalfa production has increased as the dairy industry has expanded. In the PhxAMA, there are 32 irrigation districts. Most irrigation acres and approximately 95 percent of the water use are located within the nine largest irrigation districts. A summary of agricultural water supply and demand and irrigation acres in the PhxAMA can be found in Chapter 2, and more detailed data can be found on the AMA Data webpage (<https://new.azwater.gov/ama/ama-data>).

The Buckeye Water Logged Area (BWLA) was established in 1988 by A.R.S. § 45-411.01. This statute exempts the Buckeye Water Conservation and Drainage District (BWCDD), the St. Johns Irrigation District (SJD), and the Arlington Canal Company (ACC) from the conservation requirements for the distribution of groundwater. In addition, the statute exempts persons using groundwater pursuant to an IGFR on certain waterlogged farm areas located in or near BWCDD, SJD and the ACC from irrigation water duties and the payment of withdrawal fees. These exemptions became effective on January 1, 1989 and continue until December 31, 2034. ADWR is required to review hydrologic conditions influencing the designated waterlogged areas, consult with area stakeholders, and issue a report recommending whether to extend the designation by 2031.

4.2 AGRICULTURAL CONSERVATION PROGRAM DESCRIPTION

ADWR is required by statute to develop and administer an Agricultural Conservation Program in all five AMAs and for all five management periods. The following section describes the Agricultural Conservation Program for the 5MP. The Agricultural Conservation Program for the Fifth Management Plan (5MP) for the PhxAMA is designed to assist agricultural users in the with increasing water conservation and efficiency in order to move toward its goal of safe-yield by reducing withdrawals of groundwater. Efficient use of groundwater, reduction in total water use, and offsetting groundwater use by switching to renewable supplies can each contribute to the achievement and maintenance of the PhxAMA safe-yield goal.

In all the AMAs, there are four conservation program options for IGFR holders: (1) the Base Program, (2) the Historic Cropping Program, (3) Integrated Farm Program, and (4) the Best Management Practices (BMP) Program. The Base Program is the default program; however, if certain requirements are met, the owner of an IGFR may opt to enroll in one of the three alternative conservation programs. The BMP and Historic Cropping Programs are required by statute (A.R.S. § 45-568.02(G) and A.R.S. § 45-568.02(A)-(E), respectively) to be included in the 5MPs, and ADWR has developed a new program, the Integrated Farm Program, to be included in the 5MP, pursuant to A.R.S. § 45-568.02(F). 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 contains conservation and reporting requirements and are described below.

In the PhxAMA, 2129 rights are regulated under the Base Program while 178 rights are regulated under the BMP Program. The Historic Cropping program has no participants as of 2019. Data related to the IGFRs regulated under each conservation program can be found on the AMA Data webpage (<https://new.azwater.gov/ama/ama-data>).

The Agricultural Conservation Programs for the PhxAMA have been updated for the 5MP:

- the Base Program and the methods for establishing allotments are defined in statute and are not changed from the 4MP, but the top 25 percent of water duties in each area of similar farming conditions (ASFC) may be reduced by up to five percent;
- the Best Management Practices (BMP) Program has been updated to better reflect current technologies and practices;
- the Historic Cropping Program is unchanged from the 4MP;

- a new alternative conservation program, called the Integrated Farm Program, has been added for the 5MP.

The conservation requirements contained in this chapter are designed to reduce withdrawals of groundwater and will become effective on January 1, 2025. 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 4.5.

4.2.1 BASE PROGRAM

The Base Program is the default allotment based agricultural conservation program. Pursuant to A.R.S. § 45-568(A) and A.R.S. § 45-568.02, each IGFR owner and any person entitled to use groundwater pursuant to the right will be regulated under the Base Program unless an application for regulation under an alternative conservation program is approved by ADWR during the fifth management period or if the IGFR owner was regulated under the BMP Program in the 4MP and documentation of continued compliance is submitted. Section 45-568(A), A.R.S., requires ADWR to calculate the water duty according to the calculations in Section 4.5 of this chapter. Certain water duties may be reduced by up to five percent in the 5MP pursuant to A.R.S. § 45-568(A)(2), as further detailed in Section 4.5 of this chapter.

The Base Program provides flexibility for farmers to use more than their allotment in some years, and less in other years, provided they do not exceed a maximum debit in their flexibility account. The Base Program has been modified several times since the Groundwater Management Act was adopted to assist farmers who had compliance issues. Changes to the conservation programs included: allowing a farmer to market some of his flexibility account credits to other farms, the treatment of effluent in the compliance calculation, the exemption of IGFRs of 10 or fewer acres from compliance and reporting requirements, and limitations on the maximum on-farm efficiency ADWR may use when calculating irrigation water duties. The Base Program in the 5MP is identical to the program included in the 4MP.

The irrigation acres, water duty acres, assigned irrigation efficiency, irrigation water duty, and maximum annual groundwater allotment for each IGFR in the PhxAMA are set forth in the document entitled "Supplement I to the 5MP for the PhxAMA," which is available online (<https://new.azwater.gov/ama/management-plans>).

4.2.1.1 FLEXIBILITY ACCOUNTS

Participants in the Base Program may borrow or bank groundwater from year to year to allow for varying climatic and market conditions, pursuant to A.R.S. § 45-467. ADWR maintains an operating flexibility account for each IGFR. In the Base Program, the potential to accrue flexibility account credits is not limited. However, a negative balance that exceeds 50 percent of the annual allotment constitutes a violation of the conservation requirement. Flexibility account credits can be used at any time in future years on the same farm unit and may be used to offset debits. Under certain conditions, IGFR owners regulated under the Base Program may transfer, convey, or acquire flexibility credits (A.R.S. § 45-467(O)).

The State of Arizona and ADWR have 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 any debit to be registered to a farm's flexibility account. Therefore, a person using groundwater on a farm pursuant to an IGFR may use an unlimited amount of effluent on the farm without any of the effluent being debited 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 Historic Cropping Program and is used to determine the maximum annual groundwater allotment for each IGFR regulated under these programs. This section describes the calculations and description of the formula components used to determine water duties and maximum annual groundwater allotments. This section and the described water duties do not apply to the BMP Program.

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 quantity of water reasonably required per acre to annually irrigate the crops historically grown on a farm unit from 1975 to 1980. The crops historically grown in each farm unit were verified and established during the first management period. ADWR calculates the irrigation water duty for each IGFR using the following formula:

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

In this formula, the irrigation water duty is calculated by dividing the total water requirements to produce the crops historically grown by the assigned irrigation efficiency. Each component of the formula is discussed below.

Assigned Irrigation Efficiencies

In the Base Program, the assigned irrigation efficiency for most farm units is 80 percent as prescribed by A.R.S. § 45-566(A)(1) (See also, A.R.S. § 45-567(A)(1)). For those farm units with limiting soils or excessive slopes, the assigned irrigation efficiency has been determined by the Director to be 75 percent. Farm units may have land with limiting factors such as excessive slopes, limiting soils, or lands with both limiting and non-limiting soils. In such cases, an irrigation efficiency between 75 and 80 percent will be assigned based upon the total number of acres in each category of soil. For farm units where orchard crops were historically grown and continue to be grown, the assigned irrigation efficiency is 75 percent for pecans and 65 percent for citrus.

Total Irrigation Requirement (IR)

The total irrigation requirement for each farm unit equals the amount of water needed annually to satisfy the sum of the irrigation requirements for any crops grown between 1975 and 1980. For each crop, the irrigation requirement (IR) consists of the amount of water needed to meet the consumptive use (CU) requirement of the crop, plus any other needs (ON) that the crop may have, plus any needed leaching allowance (LA), less any effective precipitation (EP). The irrigation requirement is calculated by the following equation:

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

The components of the irrigation requirement equation are discussed in the table below.

Component	Definition
Consumptive Use (CU)	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.

Other Needs (ON)	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 PhxAMA.
Leaching Allowance (LA)	<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, <i>LA</i> = leaching allowance for the crop; <i>AE</i> = assigned irrigation efficiency for the farm unit; <i>CU</i> = consumptive use requirement of the crop; <i>ECw</i> = electrical conductivity of the irrigation water (expressed in millimhos per centimeter); and <i>ECe</i> = 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 PhxAMA is of adequate quality for irrigation purposes, ADWR does not include leaching allowances in the calculation of irrigation requirements for crops grown in the PhxAMA. If an IGFR had an irrigation water supply with an <i>ECw</i> 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>
Effective Precipitation (EP)	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 PhxAMA, 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.

4.2.1.3 ADJUSTMENT OF HIGHEST WATER DUTIES

Pursuant to A.R.S. § 45-568(A)(2), the highest 25 percent of water duties within an “area of similar farming conditions” (ASFC) may be reduced by up to five percent in the 5MP, so long as the adjusted amount is no less than:

- a) the highest water duty within the lowest 75 percent of water duties for that ASFC, and
- b) the water duty calculated for that farm unit using an irrigation efficiency of 80 percent.

In implementing this provision for the 5MP, ADWR will not apply the reductions in cases where an administrative review caused an IGFR to be in the highest 25 percent of water duties that would not otherwise have been in that category. Removing these rights from eligibility for reductions will not have an effect of causing other rights to become eligible for reductions.

4.2.2. HISTORIC CROPPING PROGRAM

The Historic Cropping Program was developed and introduced in the 3MP by ADWR pursuant to A.R.S. § 45-566.02 and is required to be included in the 5MP pursuant to A.R.S. § 45-568.02. The Historic Cropping Program is an allotment-based program that requires a high level of farm management. Participants in the Historic Cropping Program will be required to comply with certain reporting requirements, including information regarding irrigation water management practices, irrigation system type, and the acreage and type of crops grown.

The maximum annual groundwater allotment will be calculated according to A.R.S. § 45-465 and is described in section 4.2.1 and 4.5. However, as prescribed by A.R.S. § 45-568.02 (B)(2), the assigned irrigation efficiency for farm units with non-limiting soils is 75 percent. In areas having limiting soils, the Director may use an assigned irrigation efficiency of 70 percent for calculating a farm unit’s water duty.

As further required by A.R.S. § 45-568.02(C)(1), the use of flex account provisions under the historic cropping program is limited. Accrued flexibility account credits are limited to 75 percent of the farm’s annual allotment. A negative flexibility account balance that exceeds 25 percent of the annual allotment constitutes a violation of the conservation

requirement. Flexibility account credits can be used at any time in future years and may be used to offset debits. Participants in the Historic Cropping Program are not allowed to convey, sell or acquire flexibility account credits (A.R.S. § 45-568.02(E)).

IGFR owners interested in enrolling in the Historic Cropping Program must satisfy the following requirements:

- File an application with ADWR.
- Reduce any debit balance in the existing flexibility account to an amount which does not exceed 25 percent of the existing maximum annual groundwater allotment.
- Reduce any flexibility account credits in the existing flexibility account balance to an amount which does not exceed 75 percent of the existing maximum annual groundwater allotment.
- Provide documentation showing that an actual irrigation efficiency of at least 70 percent has been, or will be, achieved on the farm unit on a seasonal basis, or agree to enroll in an irrigation management services program.

Once an IGFR owner has enrolled in the Historic Cropping Program, the owner must remain in the program until the effective date of subsequent conservation requirements or there is a change in ownership of the IGFR.

4.2.3. INTEGRATED FARM PROGRAM

The Integrated Farm Program was developed for the 5th Management Plan under A.R.S § 45-568.02(F), which allows for the creation of an alternative conservation program. It was created with input and feedback from the agricultural community through the 5MP subgroup process. The Integrated Farm Program allows the owner/operator of IGFRs to combine allotments of those IGFRs and apply that water anywhere within the combined footprint of the IGFRs. The owner/operator is then able to file a single annual report for the combined footprint. To participate in the program, IGFRs must be within the same irrigation district or within the same sub-basin, if they are not located within an irrigation district.

The maximum annual groundwater allotment will be calculated according to A.R.S. § 45-465 and is described in section 4.5 and 4.2.1. The total combined allotments are subject to a cut to the aquifer. The total combined annual allotment for the integrated farm unit would therefore be the sum of the individual IGFRs annual allotments minus a cut to the aquifer of five percent.

Under the Integrated Farm Program, existing flexibility accounts would be frozen. A new and separate flexibility account would be created for the integrated farm unit and would debit or accrue credits according to the total allotment for the integrated farm. The flex account would be limited to debits/accruals totaling +/-50 percent of the total allotment. A flexibility account that has a negative balance exceeding 50 percent would be out of compliance with this program. Upon, exiting the Integrated Farm Program, the flexibility account of the integrated unit would be divided proportionally among the individual IGFRs.

IGFR owners interested in enrolling in the Integrated Farm Program must satisfy the following requirements:

- File an application with ADWR
- Submit a current map showing all active IGFRs to be included
- IGFRs that would be combined for participation in this program must be in the same irrigation district, or IGFRs that are not in a district must be in the same sub-basin in order to be combined. IGFRs that are not in a district may not be combined with those in a district.
- Ensure that each IGFR is not in violation with the flexibility account provisions. An IGFR's flexibility account debits cannot be in excess of 50 percent of its annual groundwater allotment. A flex debit account in excess of this amount must be eliminated by either accumulating or transferring flexibility account credits in an amount equal to or greater than the existing debit violation.
- 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 until future conservation requirements, as established by the legislature become effective. ADWR will develop a policy that allows the owner and ADWR to agree to specific terms of compliance at the time the application is filed so that the owner will know at that time the extent of the owner's liability for any violations of the Integrated Farm Program while the land is leased.

The owner or lessee of the enrolled IGFR(s) will be regulated under the Integrated Farm Program until future requirements, as established by the legislature become effective, 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, unless an application is approved for regulation under another alternative program.

- The owner(s) of the Integrated Farm Program enrolled IGFR(s) 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 next reporting year.

4.2.4. BEST MANAGEMENT PRACTICES (BMP) PROGRAM

The Best Management Practices Program (BMP Program) and the approved best management practices (BMPs) were developed for the 3MP with the assistance of the agricultural community and the Best Management Plans Advisory Committee, first established by Executive Order 2002-09. For the development of the 5MP the continuation of the BMP Advisory Committee was established through Executive Order 2020-55. Through this committee, the BMPs were amended to reflect current technology and practices, and the points associated with certain BMPs and categories were adjusted, increasing the conservation potential from the 3rd and 4th Management Plans.

As required by A.R.S. § 45-568.02(G), a BMP Program is included as an agricultural conservation program in the 5MP. Under the BMP Program, water use is not restricted to maximum annual groundwater allotments based on the crops historically grown. Instead, IGFRs are required to implement specific agricultural BMPs that involve on-farm irrigation system improvements and improved farm water management. These practices are designed to assist farmers in achieving a high level of on-farm seasonal irrigation efficiency and increased water conservation. As the BMP program is not allotment-based, upon acceptance into the program, the IGFR flexibility account(s) are frozen and farmers may not accrue credit or debit the account.

The BMP Program, developed with the assistance of the agricultural community, utilizes a point-based system based on water conservation potentials and is separated into four categories: 1) Water Conveyance System Improvements; 2) Farm Irrigation Systems; 3) Irrigation Water Management Practices; and 4) Agronomic Management. Each of these categories contains specific approved practices and can be found in Appendix 4B. Compliance with the program requires all of the following:

- A total of at least 12 points
- A maximum of four points within each category

- A minimum of three points in the Water Conveyance System Improvements category and a minimum of two points in each of the other three categories
- A BMP may be selected from Category 1 or 2 only if the BMP has already been installed and is in use on the farm
- A BMP may be selected from Category 3 or 4 only if the BMP will be implemented annually during the time the farm is regulated under the BMP Program
- Water savings that are at least equivalent to that of the approved BMPs in Appendix 4B must be demonstrated to ADWR to receive points for substitute agricultural conservation practices in all Categories

While enrolled in the program, the participant must implement all BMPs selected in the application approved by ADWR. BMPs in Category 3 and 4 may be replaced with an approved BMP in the same category if the owner or lessee of the farm unit gives ADWR written notice of the replacement within 30 days following replacement. A BMP selected in Category 3 or 4 may also be replaced with a substitute practice (i.e., a practice that is not an approved BMP) in the same category if the owner or lessee of the farm unit has an ADWR approved application. ADWR approval is based on determination that implementation of the substitute practice will likely result in water savings on the farm at least equivalent to the water savings of the approved BMP that is being replaced.

Under the BMP Program, multiple IGFRs may be combined under a single BMP enrollment as long as the IGFRs are either contiguous or in close proximity to each other and part of a single farm unit. If a person regulated under the BMP Program acquires or leases land with an IGFR that is not enrolled in the BMP Program, the person may apply to have the IGFR enrolled in the BMP Program, subject to the owner's consent, if applicable.

In order to enroll in the BMP Program, an individual must meet all eligibility requirements and complete all the following:

- File an application, including a completed BMP Worksheet, with ADWR.
- Ensure that each IGFR is not in violation with the flexibility account provisions. An IGFR's flexibility account debits cannot be in excess of 50 percent of the IGFR's annual groundwater allotment. A flex debit account in excess of this amount must be brought into compliance by either accumulating or transferring flexibility account credits in an amount equal to or greater than the existing debit violation.
- Submit current farm map showing all existing improvements to the farm unit respective to water conveyance and farm irrigation systems.

- If the applicant is leasing the land, the applicant must provide a signed affidavit from the owner of each IGFR for which the application is filed stating that the owner agrees to regulation under the BMP Program until future conservation requirements, as established by the legislature become effective, with certain exceptions as set forth below. ADWR will develop a policy that allows the owner and ADWR to agree to specific terms of compliance at the time the application is filed so that the owner will know at that time the extent of the owner's liability for any violations of the BMP Program while the land is leased.

A person regulated under the BMP Program in the 4MP shall remain in the BMP Program in the 5MP without re-applying but will be required to submit a new BMP Worksheet, demonstrating continued compliance with the program by July 1, 2024. If a BMP Worksheet is not submitted in a timely manner, that person will be converted to regulation under the Base Program and may re-apply for the BMP Program in subsequent reporting years. More information about the BMP program, including a link to the BMP Worksheet is on ADWR's website (<https://new.azwater.gov/ama/ama-conservation>).

The owner or lessee of the BMP enrolled IGFR(s) will be regulated under the BMP Program until future requirements, as established by the legislature become effective, except under the following conditions:

- New owners of IGFRs may file a written request to the Director to withdraw from the BMP Program within 30 days after the conveyance of the IGFR has been completed. Transfer of ownership solely for the purpose of withdrawing from the BMP Program is not permitted. Once withdrawn, the new owner will be regulated under the Base Program, unless an application is approved for regulation under another alternative program.
- The owner of the BMP enrolled IGFR(s) demonstrates to the Director that they have been unable to find a person willing to lease the IGFR(s) and be regulated under the BMP Program.

4.2.4.1 BMP TECHNICAL STANDARDS ASSISTANCE

In 2013, ADWR established a new partnership with the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) to assist with the technical standards of the BMPs included in the Agricultural BMP Program. The NRCS is available to provide technical and financial assistance to farmers in implementing the BMPs. The NRCS has established specific technical standards for each BMP including yield increase and water savings. In addition, the NRCS is providing matching funds which will result in additional technical personnel available to assist farms in implementing the program requirements at local agricultural conservation assistance offices.

4.3 IRRIGATION DISTRIBUTION SYSTEM REQUIREMENTS

For the fifth management period, the Director may establish "additional economically reasonable conservation requirements for the distribution of groundwater by cities, towns, private water companies and irrigation districts within their service areas" (A.R.S. § 45-568(A); 45-567(A)(4)).

The irrigation distribution system requirements, as well as the monitoring and reporting requirements for irrigation districts and private water companies apply to irrigation districts and private water companies distributing any amount of water for irrigation use. These irrigation districts and private water companies are required to reduce their irrigation distribution system lost and unaccounted-for water by lining all their canals or by operating their delivery systems so that the total quantity of lost and unaccounted-for water is 10 percent or less of the total quantity of water withdrawn, diverted, or received during a year. These requirements are effective upon the commencement of operation, or by the first compliance date of the 5MP, whichever is later.

If a private water company or irrigation district has economic circumstances which prevent timely compliance with the irrigation distribution system conservation requirements, a variance of up to five years may be requested as provided by A.R.S. § 45-574. Information submitted in support of the variance request must include a complete water loss reduction plan prepared by a registered civil engineer that contains all of the following:

- A complete construction design document showing specifications for repairing or modifying the irrigation distribution system. The document must include material specifications, proposed design specifications, installation and construction specifications and any other engineering information or specifications necessary to complete the proposed rehabilitation of the distribution system.
- A detailed list of engineering costs and the proposed financing options to complete the system improvements.
- The final completion date for the rehabilitation.
- If applicable, a system operating guide to minimize lost and unaccounted-for water. This guide may be modified as the rehabilitation progresses.

The procedures for obtaining a variance are described in Chapter 7.

4.4 OTHER REGULATORY & NON-REGULATORY EFFORTS

Use of remediated groundwater and renewable supplies is encouraged in the PhxAMA. The Water Quality Assurance Revolving Fund (WQARF) Program provides incentives for the use of remediated groundwater to facilitate the treatment of contaminated groundwater. The criteria that must be met to qualify for this accounting are set forth in the legally enforceable provisions in section 4-507 of this chapter, entitled: *Remedial Groundwater Accounting for Conservation Requirements*. More information on ADWR's involvement in the WQARF Program is provided in Chapter 1. Effluent use is encouraged through calculation of the farms flex account as described in section 4.2.1.1.

In addition to the Agricultural Conservation Programs described in section 4.2, other water resource management strategies have been developed to help achieve the water management goal for the PhxAMA. The Water Management Assistance Program is designed to provide funds to encourage and support additional strategies and enhance groundwater conservation activities within all use sectors, including the agricultural sector, and is described more fully in Chapter 7 of this plan.

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, the following words and phrases used in sections 4-501 through 4-509 of this chapter shall have the meanings set forth below, unless the context otherwise requires:

1. *"4MP" means the Fourth Management Plan for the Phoenix Active Management Area.*
2. *"5MP" means the Fifth Management Plan for the Phoenix Active Management Area.*
3. *"ADWR" means the Arizona Department of Water Resources.*
4. *"Assigned Irrigation Efficiency" means the irrigation efficiency used to compute an irrigation water duty for the fifth management period pursuant to A.R.S. § 45-568 and 45-568.02.*
5. *"BMP Program" means the Best Management Practices Program as described in A.R.S. § 45-568.02(G) and section 4-505 of this chapter.*
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. *"Integrated Farm Unit" is the Irrigation Grandfathered Rights that have been accepted to be regulated together pursuant to an application for the Integrated Farm Program.*
12. *"IGFR" means an Irrigation Grandfathered Right as prescribed in A.R.S. § 45-402.*
13. *"Irrigation Acre" has the same definition as prescribed in A.R.S. § 45-402.*

14. "*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.
15. "*Irrigation Water Duty*" has the same definition as prescribed in A.R.S. § 45-568 which, for the 5MP, is the total irrigation requirement to produce the crops historically grown divided by the assigned irrigation efficiency, with reductions made in certain cases as prescribed in A.R.S. § 45-568.
16. "*Lost Water*" means water from any source, including effluent, which enters an irrigation distribution system and is lost from the system during transportation or distribution due to seepage, evaporation, leaks, breaks, phreatophyte use, or other causes.
17. "*Maximum Annual Groundwater Allotment*" means the maximum amount of groundwater that may be used per year for the irrigation of each irrigation acre in the farm that is calculated pursuant to A.R.S. § 45-465.
18. "*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.
19. "*Remedial Groundwater*" means groundwater withdrawn pursuant to an approved remedial action project under 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.
20. "*Total Quantity of Lost and Unaccounted-for 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.
21. "*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 Historic Cropping Program described in section 4-503, the Integrated Farm Program described in section 4-504, or the Best Management Practices Program described in section 4-505, 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, 2025, and during each calendar year thereafter until the first compliance date of a future conservation program or until the legislature determines otherwise. The irrigation acres, water duty acres, assigned irrigation efficiency, irrigation water duty, and maximum annual groundwater allotment for each IGFR in the PhxAMA are set forth in the document entitled "Supplement I to the 5MP for the PhxAMA," which is incorporated herein by reference and which is available for inspection and copying at ADWR and on the ADWR Management Plans webpage (<https://new.azwater.gov/ama/management-plans>).*
- 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 A.A.C. R12-15-1013, the IGFR owner and any person using groundwater pursuant to 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 Historic Cropping Program

A. Application for Regulation under the Historic Cropping Program

Only an owner of an IGFR may apply to be regulated under the Historic Cropping Program. An application may be filed by an IGFR owner at any time after the 5MP has been adopted until the first compliance date of a future conservation program or until the legislature determines otherwise. An application for regulation under the Historic Cropping 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 IGFR owner.*

2. *The number of the Certificate of IGFR.*
3. *The name, address, phone number, and email address of any person entitled to use groundwater under the IGFR.*
4. *For each of the three previous years, the number of acres and types of crops planted and the amount of water used to irrigate the planted acres.*
5. *For each of the three previous years, the type of irrigation system which has been used, including percent of slope, length of runs, and method of field application.*
6. *For each of the three previous years, a description of all water conservation practices used on the farm, including the name of any conservation program or irrigation water management service used on the farm.*

B. Criteria for Approval of Application

The Director shall approve an application for regulation under the historic cropping 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. *Any negative flexibility account balance in the farm's flexibility account does not exceed 25 percent of the maximum annual groundwater allotment in effect at the time that the application is made.*
3. *Any positive flexibility account balance in the farm's flexibility account does not exceed 75 percent of the maximum annual groundwater allotment in effect at the time that the application is made. In order to satisfy this requirement, the IGFR owner may sell or convey any excess credits as provided by A.R.S. § 45-467 or the IGFR owner may relinquish any excess credits.*
4. *The IGFR owner demonstrates that the average on-farm seasonal irrigation efficiency achieved on the farm's irrigation acres during the previous three years was 75 percent or greater, otherwise the IGFR owner shall agree in writing to develop and implement at least one of the following:*
 - a. *Enroll in an ADWR-sponsored or private irrigation management services program at all times while regulated under the Historic Cropping Program or until the IGFR owner can demonstrate to the Director's satisfaction that an average on-farm seasonal irrigation*

efficiency of at least 75 percent has been achieved during the previous three years.

- b. Implement water conveyance system or farm irrigation system improvements, approved by the Director, designed to enable the IGFR owner to achieve an on-farm seasonal irrigation efficiency of at least 75 percent.*

C. Historic Cropping Program Requirements

An IGFR owner whose application has been approved for regulation under the Historic Cropping Program and any person using groundwater pursuant to that IGFR 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 Historic Cropping Program, and continuing thereafter until first compliance date of a future conservation program or until the legislature determines otherwise. The Director shall establish the irrigation water duty and maximum annual groundwater allotment in the same manner it was assigned for the IGFR in the Base Agricultural Conservation Program described in section 4-502, except that the Director shall use an assigned irrigation efficiency of 75 percent.*
- 2. The IGFR owner may use the maximum annual groundwater allotment assigned for the IGFR to irrigate only the irrigation acres to which the IGFR is appurtenant.*
- 3. The IGFR owner may not use water for irrigation purposes during a calendar year in an amount which exceeds the maximum annual groundwater allotment assigned to the right, except as provided in the flexibility account provisions of A.R.S. § 45-467, as modified in subsection D of this section, and any rules adopted by the director.*

D. Flexibility Account Provisions

Under the Historic Cropping Program, the flexibility account provisions of A.R.S. § 45-467 shall apply to the IGFR owner and any person entitled to use groundwater under that IGFR with the following modifications:

- 1. If the amount of water used to irrigate the farm in any year is less than the maximum annual groundwater allotment established for the farm 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 75 percent of the maximum annual groundwater allotment. The Director shall not register a credit to the farm's flexibility account in any year in which the account has an existing positive account balance equal to 75 percent of the maximum annual groundwater allotment.

2. *The IGFR owner, and any person entitled to use groundwater under that IGFR, regulated under the Historic Cropping Program shall not:*
 - a. *Purchase flexibility account credits from, or convey or sell flexibility account credits to, another IGFR owner, or any other person entitled to use groundwater under another IGFR, regardless of whether they are regulated under the Historic Cropping Program.*
 - b. *Transfer credits from the flexibility account of one farm to another farm, even if the farms are owned by the same IGFR owner.*
3. *The maximum excess amount of groundwater that may be used pursuant to A.R.S. § 45-467 shall not exceed 25 percent of the maximum annual groundwater allotment established for the farm pursuant to subsection C, paragraph 1 of this section. The IGFR owner, and any person entitled to use groundwater under that IGFR, violates this section if the flexibility account maintained for the IGFR is in arrears at any time in excess of this amount.*

E. Reporting Requirements

1. *In addition to the information required to be submitted in the annual report required by A.R.S. § 45-632, the IGFR owner, or any person entitled to use groundwater pursuant to that IGFR, 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 IGFR owner:*
 - a. *The name, address, phone number, and email address of any person entitled to use groundwater under the IGFR.*
 - b. *The number of acres and types of crops planted and the amount of water used to irrigate the planted acres.*
 - c. *The type of irrigation system which has been used, including percent of slope, length of runs and method of field application.*

- d. A description of all water conservation practices used on the farm, including the name of any conservation program or irrigation water management service used on the farm.*
2. Pursuant to A.A.C. R12-15-1013, the IGFR owner, and any person using groundwater pursuant the IGFR, shall keep and maintain, for a minimum of three calendar years following the filing of the form, all records which may be necessary to verify the information and data contained therein.

F. Duration of Regulation under Historic Cropping Program

1. Except as provided in paragraph 2 of this subsection, after the Director approves an application for regulation under the Historic Cropping Program, the IGFR owner and any person entitled to use groundwater pursuant to that right shall be regulated under the Historic Cropping Program until the first compliance date of a future conservation program or until the legislature determines otherwise.
2. After the Director approves an application for regulation under the Historic Cropping Program, a subsequent owner of the IGFR may file with the Director a written request to withdraw from the Historic Cropping Program within 90 days after acquiring an ownership interest in the IGFR. The Director shall grant the request unless the Director determines that the transfer of ownership was made solely for the purpose of circumventing the provisions of paragraph 1 of this subsection, in which case the request will be denied.

4-504 Integrated Farm Program

A. Application for Regulation under the Integrated Farm Program

Owner of IGFRs, or any person entitled to use groundwater pursuant to those IGFRs may apply to be regulated under the Integrated Farm Program after the 5MP has been adopted until the first compliance date of a future conservation program or until the legislature determines otherwise. One application may be filed for multiple IGFRs, if the IGFRs are within the same irrigation district and are farmed by the same owner or any person entitled to use groundwater pursuant to those IGFRs. One application may be filed for multiple IGFRs within the same sub basin, if the IGFRs are not within an irrigation district 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. *The current balance in the flexibility account for each IGFR.*
5. *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 or until the legislature determines otherwise, except as provided in subsection G, of this section.*
6. *A current farm plan map*
7. *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(7) of this section.*
2. *The applicant is not currently out of compliance with any applicable agricultural conservation requirement in this chapter. This paragraph does not apply to a violation of a conservation requirement if the violation has been resolved by ADWR through a stipulation and consent order or other mechanism and the applicant is not in violation of that stipulation and consent order or other mechanism*

C. Integrated Farm Program Requirements

An owner of the IGFRs whose application has been approved for regulation under the Integrated Farm Program and any 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 future conservation program or until the legislature determines otherwise, 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 from the integrated farm unit 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 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 future conservation program or until the legislature determines otherwise, 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 Integrated Farm Program enrolled IGFR(s) submits a written request to the Department detailing the IGFR(s) that would be removed from the program. Those IGFRs exiting the program would remain regulated under the

Integrated Farm Program until the next reporting year.

4-505 Best Management Practices Program

A. Application for Regulation under the Best Management Practices Program

Except as provided in subsection C of this section, an owner of an IGFR, or any person using groundwater pursuant to that IGFR, may apply to be regulated under the BMP Program at any time after the 5MP has been adopted until the first compliance date of a future conservation program or until the legislature determines otherwise. One application may be filed for multiple IGFRs if the IGFRs are contiguous or in close proximity to each other and are within the same farm unit. An application for regulation under the BMP 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 number(s) of IGFR(s) for which the application is filed.*
3. *The name of the farm or farm unit (if applicable).*
4. *The current balance in the flexibility account for the farm.*
5. *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 BMP Program until the effective date of any future conservation program or until the legislature determines otherwise, except as provided in subsection K, paragraph 2 of this section.*
6. *A current farm plan map showing all existing improvements to the farm unit's water conveyance system and farm irrigation systems.*
7. *An identification of those BMPs described in Appendix 4B that the applicant selects to implement on the farm while regulated under the BMP Program. In selecting BMPs:*
 - a. *The applicant shall select at least two BMPs in each of the four BMP Categories described in Appendix 4B: Category 1 (water conveyance system improvements), Category 2, (farm irrigation systems), Category 3 (irrigation water management practices), and Category 4 (agronomic management practices). The total number of points for all BMPs selected by the applicant shall be at least twelve points, using the point values assigned to each BMP in Appendix 4B, subject to the*

following:

- i. *The maximum number of points allowed in any category is four points.*
- ii. *The applicant shall select a BMP or BMPs in BMP Category 1 that have a total of at least three points.*
- b. *A BMP may be selected in BMP Category 1 or BMP Category 2 only if the BMP has already been installed and is being used on the farm at the time the application is filed. A BMP may be selected in BMP Category 3 or BMP Category 4 only if the BMP will be implemented on the farm annually while water use on the farm is regulated under the BMP Program.*
- c. *If the applicant selects a substitute practice as described in Appendix 4B, the applicant shall describe the substitute practice in detail and demonstrate that the practice will likely achieve efficiency on the farm at least equivalent to the water efficiency that would result from implementation of an approved BMP in that category.*

B. Criteria for Approval of Application

The Director shall approve an application for regulation under the BMP 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(7) of this section and the BMPs selected by the applicant under subsection A, paragraph 7 of this section meet the requirements of that paragraph.*
2. *The applicant is not currently out of compliance with any agricultural conservation requirement in this chapter. This paragraph does not apply to a violation of a conservation requirement if the violation has been resolved by ADWR through a stipulation and consent order or other mechanism and the applicant is not in violation of that stipulation and consent order or other mechanism.*
3. *If the BMPs selected by the applicant under subsection A, paragraph 7 of this section include a substitute practice as described in Appendix 4B, the applicant has demonstrated to the satisfaction of the Director that the substitute practice will likely achieve efficiency on the farm at least equivalent to the*

efficiency that would result from implementation of an approved BMP in that category.

C. Continuing Regulation in the BMP Program from the 4MP

1. *An IGFR owner who was regulated under the BMP Program in the 4MP or any person using groundwater pursuant to the IGFR, may be regulated under the BMP Program for the 5MP without the need to re-apply under subsection A of this section, unless the IGFR owner provides written notification of intent to withdraw from the BMP Program pursuant to paragraph 3 of this subsection.*
2. *An IGFR owner or any person using groundwater pursuant to the IGFR who was regulated under the BMP Program in the 4MP shall submit an updated BMP Worksheet by July 1, 2024 demonstrating compliance with the BMP Program under the 5MP.*
3. *An IGFR owner who was regulated under the BMP Program in the 4MP may elect to be regulated under the Base Program in the 5MP by providing written notice of the election to the Director within 60 days after receiving notice of the 5MP agricultural conservation requirements.*
4. *If an IGFR owner does not submit a updated BMP Worksheet pursuant to section C(2) or provides written notification pursuant to C(3), the IGFR owner, and any person using groundwater pursuant to the IGFR, shall be regulated under the Base Program beginning January 1, 2025. The beginning balance of the farm's flexibility account shall be the balance in the account at the time the farm was enrolled in the BMP Program.*

D. Commencement of Regulation Under BMP Program

1. *If the Director approves an application for regulation under the BMP Program pursuant to subsection B of this section, the IGFR owner and any person using groundwater pursuant to the IGFR shall be regulated under the BMP Program beginning January 1 of the first calendar year following the year in which the application is approved, unless the Director approves an earlier date.*
2. *An IGFR owner who was regulated under the BMP Program in the 4MP and any person using groundwater pursuant to the IGFR, may be regulated under the BMP Program beginning January 1, 2025, unless the IGFR owner provides written notification of intent to withdraw from the BMP Program pursuant to subsection I(3) of this section or fails to submit the required BMP Worksheet demonstrating compliance pursuant to subsection I(2) of this section*

3. A person who acquires an IGFR that is appurtenant to land enrolled in the BMP Program, and any person using groundwater pursuant to the IGFR, shall be regulated under the BMP Program beginning on the date the IGFR is acquired if a BMP Worksheet demonstrating compliance with BMP Program in the 5MP is submitted, pursuant to subsection I(2) of this section.
- E. Exemption from Maximum Annual Groundwater Allotment Conservation Requirement

A person regulated under the BMP Program is exempt from the maximum annual groundwater allotment conservation requirements set forth in section 4-502.
- F. BMP Program Requirements

A person regulated under the BMP Program shall comply with all of the following:

 1. The person shall implement all selected BMPs in the application approved by the Director pursuant to subsection A(7) of this section, or all selected BMPs in the BMP Worksheet submitted pursuant to subsection I(2) of this section, whichever applies, beginning on the first date of regulation under the BMP Program, and, except as provided in subsection K, paragraph 2 of this section, continuing thereafter until the first compliance date of a future conservation program or until the legislature determines otherwise. If a BMP has been replaced with a new BMP pursuant to subsection G of this section, the IGFR owner and any person entitled to use groundwater pursuant to that IGFR shall implement the new BMP in lieu of the replaced BMP.
 2. The person may use groundwater to irrigate only the irrigation acres to which the IGFR is appurtenant.

G. Replacement of an Existing BMP with a New BMP after Acceptance into BMP Program

A person regulated under the BMP Program may:

1. Replace a BMP required to be implemented with an approved BMP in the same category, as described in Appendix 4B, if the person notifies the Director in writing of the replacement within 30 days after the replacement occurs.
2. Apply to the Director to replace a BMP required to be implemented with a substitute practice in the same category as described in Appendix 4B. The Director shall approve the application if the Director determines that implementation of the substitute practice will likely result in efficiency on the

farm at least equivalent to the efficiency that would result from implementation of the BMP sought to be replaced.

H. Requirement of New Lessee to Apply for Participation in BMP Program

1. *Any person who acquires a leasehold interest in the land enrolled in the BMP Program shall file with the Director an application to participate in the BMP 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 BMP Program while leasing the land, and an identification of all BMPs the applicant agrees to implement while leasing the land. The BMPs shall meet the requirements set forth in subsection A, paragraph 7 of this section.*
 - d. *Any other information required by the Director.*
2. *The Director shall approve an application to participate in the BMP 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 BMP 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*

I. Flexibility Account Provisions

Under the BMP Program, the flexibility account provisions of A.R.S. § 45-467 shall not apply to a person regulated under the BMP Program. Upon acceptance into the BMP Program, the balance in the farm's flexibility account at the time of acceptance into the BMP Program shall remain unchanged until the farm is no longer regulated under the BMP program.

J. Reporting Requirements

In addition to the information required to be submitted in the annual report required by A.R.S. § 45-632, a person regulated under the BMP Program shall submit the following information on a form provided by the Director by the date the annual report is due, regardless of whether an irrigation district files the annual report on behalf of the IGFR owner:

1. *The name, address, phone number, and email address of any person entitled to use groundwater on the farm unit.*
2. *Certification that all required BMPs have been implemented during the previous calendar year. 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 verifying that the BMPs were implemented.*

K. Duration of Regulation under BMP Program

1. *Except as provided in paragraph 2 of this subsection, a person regulated under the BMP Program shall be regulated under the program until the first compliance date of a future conservation program or until the legislature determines otherwise.*
2. *An IGFR owner may file with the Director a written request to withdraw from the BMP Program. The Director shall grant the request if the IGFR owner demonstrates to the satisfaction of the Director that either of the following apply:*
 - a. *The IGFR owner desires to lease the land to which the IGFR is appurtenant to a lessee for a term of at least one year but has been unable to find a lessee willing to be regulated under the BMP Program, after making a good faith effort to find such a lessee.*
 - b. *The IGFR owner has found a person that will lease the land for a term of at least one year if the owner is allowed to withdraw from the BMP Program, and that person did not previously lease the land while the owner was regulated under the BMP Program.*
3. *A person who acquires an IGFR appurtenant to land enrolled in the BMP Program may file with the Director a written request to withdraw from the BMP Program within 90 days after acquiring an ownership interest in the IGFR. The Director shall grant the request unless the Director determines that the transfer of ownership was made solely for the purpose of circumventing*

the provisions of paragraph 1 of this subsection, in which case the request shall be denied.

4-506 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, 2025 or upon commencement of operation, whichever is later and continuing thereafter until the legislature determines otherwise, 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.*

4-507 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 2025 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 or until

the legislature determines otherwise, 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 ADWR.*
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. This quantity shall be determined by a generally accepted engineering method.*
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.*

4-508 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 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 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 Jan. 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 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 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.

4-509 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 4-501 through 4-508 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, e.g., A.R.S. §§45- 633(D), 880.01(D), 1061(D), and/or A.A.C. R12-15-1102I).*

APPENDIX 4A

PHXAMA CONSUMPTIVE USE AND OTHER NEEDS REQUIREMENTS BY CROP

<i>Crop</i>	<i>Consumptive Use (AF/acre)</i>	<i>Other Needs (AF/acre)</i>	<i>Irrigation Requirement (AF/acre)</i>
<i>Grain Crops</i>			
Barley	2.08	0.00	2.08
Maize (Sorghum)	2.12	0.00	2.12
Millet	2.58	0.00	2.58
Oats	1.83	0.00	1.83
Rye	1.83	0.00	1.83
Sorghum Grain (Single Crop)	2.12	0.00	2.12
Sorghum Grain (Double Crop)	4.28	0.00	4.28
Wheat	2.15	0.00	2.15
Corn, Grains	2.12	0.00	2.12
<i>Forage Crops</i>			
Alfalfa	4.69	0.00	4.69
Alfalfa High Yield ²	6.19	0.00	6.19
Bermuda Grass	3.63	0.00	3.63
Blue Panic Grass	4.36	0.00	4.36
Clover ³	4.33	0.00	4.33
Ensilage (All Single Crop)	2.08	0.00	2.08
Ensilage, Sorghum (Double Crop)	4.52	0.00	4.52
Permanent Pasture Mix	5.67	0.00	5.67
Sudan Sudex Grass	2.58	0.00	2.58
<i>Field Crops</i>			
Castor Beans	3.70	0.00	3.70
Cotton	3.43	0.00	3.43
Cotton (Dry Plant) ⁴	3.43	0.33	3.76
Flax	2.60	0.00	2.60
Pinto Beans	1.25	0.00	1.25
Safflower	3.78	0.00	3.78

Soybeans	1.85	0.00	1.85
Sugar Beets	3.56	0.00	3.56
Plantago	1.25	0.00	1.25
Guar (for seed production)	1.93	0.00	1.93
Vegetable Crops			
Beets, Table	2.00	0.50	2.50
Broccoli	1.64	1.00	2.64
Cabbage, Early	1.43	1.00	2.43
Cabbage, Late	2.04	1.25	3.29
Carrots	1.38	0.75	2.13
Cauliflower	1.55	1.00	2.55
Chili Peppers	2.50	0.50	3.00
Corn, Sweet	1.63	0.87	2.50
Cucumbers, All	1.50	0.50	2.00
Lettuce	0.71	2.44	3.15
Okra	2.50	0.50	3.00
Onions, Dry	1.94	0.75	2.69
Onions, Green	1.46	0.75	2.21
Parsnips	2.00	0.50	2.50
Potatoes	2.03	0.75	2.78
Radishes	0.75	0.50	1.25
Rappini	2.75	0.50	3.25
Turnips and Rutabagas	1.50	0.50	2.00
Tomatoes, All	2.00	0.50	2.50
Miscellaneous Vegetables	2.00	0.50	2.50
Mixed Vegetables	2.00	0.50	2.50
Summer Squash and Zucchini	1.75	0.50	2.25
Green Manure Crops			
Guar	1.93	0.00	1.93
Papago Peas	1.63	0.00	1.63
Sesbania	1.09	0.00	1.09

<i>Small Grain for Green Manure</i>	1.00	0.00	1.00
Vine Crops			
<i>Cantaloupe, Early</i>	1.71	0.50	2.21
<i>Cantaloupe, Late</i>	1.40	0.50	1.90
<i>Honeydew Melons</i>	2.00	0.50	2.50
<i>Watermelons</i>	1.75	0.50	2.25
Citrus			
<i>Grapefruit</i>	3.99	0.00	3.99
<i>Lemons/Limes</i>	3.99	0.00	3.99
<i>Oranges, All</i>	3.26	0.00	3.26
<i>Tangerines</i>	3.26	0.00	3.26
Fruits			
<i>Dates</i>	4.92	0.00	4.92
<i>Grapes</i>	3.00	0.50	3.50
<i>Apricots</i>	4.17	0.00	4.17
<i>Nectarines</i>	4.17	0.00	4.17
<i>Peaches</i>	4.17	0.00	4.17
<i>Plums</i>	4.17	0.00	4.17
<i>Olives</i>	2.58	0.00	2.58
Nuts			
<i>Pecans with Ground Cover</i>	5.83	0.00	5.83
<i>Pecans Without Ground Cover</i>	4.50	0.00	4.50
<i>Pistachios</i>	4.33	0.00	4.33
Miscellaneous Crops			
<i>Aloe Vera</i>	1.50	0.00	1.50
<i>Guayule</i>	3.00	0.00	3.00
<i>Jojoba</i>	3.00	0.00	3.00
<i>Christmas Trees</i>	2.50	0.00	2.50
<i>Flowers, Cut</i>	3.33	0.00	3.33
<i>Double Cropped Vegetables</i>	3.33	0.00	3.33
<i>Roses</i>	2.50	0.00	2.50

<i>Nursery Stock</i>	3.00	0.00	3.00
<i>Salt Bush</i>	1.50	0.00	1.50
<i>Cactus (In Nursery)</i>	1.25	0.00	1.25

1 Based on crops that were reported from 1975 to 1980 history. 2 ADWR assigned an irrigation requirement of 6.19 AF per acre to farms with demonstrated historic yields above the average.

3 Data are not available for the consumptive use of clover. Until FAO calculations can be made, ADWR has estimated that value at 4.33 AF per acre. 4 ADWR assigned an irrigation requirement of 3.76 AF per acre for Areas of Similar Farming Conditions #3 (Roosevelt Irrigation District) and #4 (Buckeye) due to historic dry plant practices.

Sources: *Consumptive Use of Water by Major Crops in the Southwestern United States, Conservation Research Report #29, United States Department of Agriculture, Agricultural Research Service.* (Provides consumptive use values for major crops in southwestern United States.)

FAO Irrigation and Drainage Paper #24, Food and Agriculture Organization of the United Nations (revised 1977). (Describes Blaney-Criddle method for computing consumptive use values.)

APPENDIX 4B
BEST MANAGEMENT PRACTICES PROGRAM
SECTION I: APPROVED BEST MANAGEMENT PRACTICES & POINTS

BMP CATEGORY 1. WATER CONVEYANCE SYSTEM IMPROVEMENTS

Description: A farm's water conveyance system allows water to be conveyed from an irrigation district delivery point or a well head for irrigation of each field. This category includes water conveyance system improvements that qualify as approved BMPs.

Approved Water Conveyance Improvements

BMP 1.1 Lined ditch

Definition: A means of transporting water to farm fields via a well-maintained concrete-lined ditch (open channel) or a lining that performs at least equivalently to a well-maintained concrete lining in order to minimize transmission losses through seepage.

BMP 1.2 Pipelines

Definition: Any type of low or high-pressure pipeline (closed conduit) used to convey water to a farm field in order to reduce or eliminate water loss prior to the act of irrigation. Pipelines may be constructed of PVC, ABS, concrete, aluminum, and or steel.

BMP 1.3 Drainback system

Definition: Level irrigation system technology utilizing headland channel conveyance which is designed and maintained to "drain" excess water applications from one irrigated field to the next down gradient field.

Substitute Practice: Water Conveyance Improvements

A new or existing water conveyance improvement method not listed above that the Director determines will likely result in a reduction in transmission losses at least equivalent to the reduction in transmission losses that would result from the implementation of one of the approved improvements described in this category.

The Director may add an approved substitute practice to the list of Approved Best Management Practices, pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.

CATEGORY 1: POINT VALUE DETERMINATION

An applicant for the BMP Program must select one or more of the water conveyance system improvement BMPs described above in the application for the BMP Program. A BMP may be selected only if it is being implemented on the farm at the time the application is filed. The total points for the BMP or BMPs selected in this category shall be calculated by estimating the percentage of the farm's

irrigated acreage served by the selected BMP or BMPs, and then determining the point value for that percentage in the Category 1: Water Conveyance System – Point Table below. For purposes of this determination, “irrigated acreage” means those acres within the farm that will be irrigated while the applicant is regulated under the BMP Program. If the applicant selects more than one BMP in this category, an acre shall not be counted twice in determining the total percentage of the farm’s irrigated acreage served by the BMPs. In this category, the maximum number of points allowed is four and the minimum number is three.

CATEGORY 1: POINTS TABLE

<i>Percentage of Farm’s total irrigated acreage served by the approved BMPs</i>	<i>Point Value</i>
60-64	1.0
65-69	1.3
70-74	1.8
75-79	2.3
80-84	2.8
85-89	3.3
90-94	3.8
95-100	4.0

BMP CATEGORY 2. FARM IRRIGATION SYSTEMS

Description: Farm irrigation systems are the methods by which a farm field is irrigated. Farm irrigation systems include slope, modified slope, level or near level, sprinkler, trickle or drip, or any combination thereof. This category includes farm irrigation systems that qualify as approved BMPs.

Approved Farm Irrigation Systems

BMP 2.1 Slope systems without uniform grades with tailwater reuse – (0.5 Point)

Definition: Sloped fields without uniform grades with a constructed recovery system that allows for the reuse of water that runs off the end of the field after an irrigation event.

BMP 2.2 Uniform slope systems without tailwater reuse – (0.5 Point)

Definition: Sloped fields that have been engineered to uniform grades with no means of reusing the water that runs off the end of the field after an irrigation event.

BMP 2.3 Uniform slope systems with tailwater reuse – (1.5 Points)

Definition: Sloped fields that have been engineered to uniform grades with a constructed recovery system that allows for the reuse of water that runs off the end of the field after an irrigation event.

BMP 2.4 Uniform slope within an irrigation district that captures and redistributes return flows – (1.5 Points)

Definition: Sloped fields that have been engineered to uniform grades enabling an irrigation district to collect the water that leaves a farm field after an irrigation event for distribution to another farm field.

BMP 2.5 Modified slope systems – (2 Points)

Definition: Sloped fields that have been engineered to uniform grades in the upper portion of the field, with the bottom portion generally having a field slope of 0.0 to 0.2 feet of total fall in the direction of irrigation. All irrigation water is retained on the field.

BMP 2.6 Uniform slope systems with polyacrylamide in applied irrigation, with either tailwater reuse or within an irrigation district that captures and redistributes return flows – (2 Points)

Definition: Sloped fields that have been engineered to uniform grades with either a constructed recovery system that allows for the reuse of water that runs off the end of the field after an irrigation event or within an irrigation district that collects the water that leaves a farm field after an irrigation event for distribution to another farm field. In addition, irrigation efficiency is improved by applying polyacrylamide to the irrigation water. This compound is a flocculating agent which removes suspended soil from the water and allows the soil to stay in place, reducing soil erosion in the furrow or border and improving the soil uptake of water.

BMP 2.7 High pressure sprinkler systems – (2 Points)

Definition: Side-roll, linear, center-pivot, and solid set designs that operate at nozzle water pressures of 10 pounds per square inch (psi) or more.

BMP 2.8 Minimum qualifying low pressure sprinkler systems – (2.0 Points)

Definition: Linear and center pivot sprinkler designs that operate at water pressures measured at the nozzle of no greater than 10 psi and possess any of the following conditions:

1. *Field slopes beneath a sprinkler system that exceed 0.25 foot/100 feet fall along any bisecting line within a circle or in the direction of irrigation in a linear.*
2. *Lack of a mainline factory water filtration system that minimizes sediment and particle blockage and wear in the sprinkler regulators.*
3. *Lack of an automatic main water supply pump shut down system in the event of sprinkler forward travel failure.*

BMP 2.9 Minimum-qualifying trickle irrigation systems- (2.0 Points)

Definition: Pressurized drip or subsurface irrigation system that possess any of the following conditions:

1. *A pressurized drip or subsurface irrigation system that delivers less than 90 percent of the original designed gallons per minute (GPM) and cannot be corrected in a way that is economically feasible.*
2. *Lack of a system to visually or through pressure measurement check all lateral and other diversion values for leakage.*
3. *Lack of organizational policies for management and labor that assure that all visible leaks in drip lines and related systems are repaired within 12 hours and to retain leaked water on the field.*

BMP 2.10 Near level systems – (3.0 Points)

Definition: Sloped fields that have been engineered to uniform grades between 0.031 to 0.06 foot per 100 feet of fall in the direction of irrigation over the entire length of the field. All irrigation water is retained on the field.

BMP 2.11 Level systems – (4 Points)

Definition: Level border or level furrow system where the field slope may vary from 0.0 to 0.03 foot per 100 feet of fall in the direction of irrigation over the entire length of the field. Either all irrigation water is retained on the field or a level drainback system is used.

BMP 2.12 Qualifying low pressure sprinkler systems – (4 Points)

Definition: Linear and center-pivot sprinkler designs that operate at water pressures measured at the nozzle of no greater than 10 psi with none of the conditions enumerated in BMP 2.7.

BMP 2.13 Qualifying Trickle irrigation systems – (4 Points)

Definition: Pressurized drip or subsurface irrigation capable of applying precise amounts of water to the crop root zone (also referred to as drip irrigation) with none of the conditions enumerated in BMP 2.8.

Substitute Practice: Farm Irrigation Systems – (1-4 Points)

Definition: A new or existing farm irrigation system definition, or, a different remedy for an existing BMP minimum qualifying condition not listed above that the Director determines will likely result in efficiency on the farm at least equivalent to the efficiency that would result from implementation of one of the approved BMPs described in this category.

The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.

CATEGORY 2: POINT VALUE DETERMINATION

An applicant for the BMP Program must select one or more of the farm irrigation systems BMPs described above in the application for the BMP Program. A BMP may be selected only if it is being implemented on the farm at the time the application is filed. The points for a BMP selected in this category shall be calculated by multiplying the points assigned to the BMP as shown above by the percentage of the farm's irrigated acreage served by the irrigation system described in the BMP. For purposes of this determination, "irrigated acreage" means those acres within the farm that will be irrigated while the applicant is regulated under the BMP Program. If the applicant selects more than one BMP in this category, an acre shall not be counted twice in determining the total percentage of the farm's irrigated acreage served by the BMPs. In this category, the maximum number of points allowed is four and the minimum number is two.

BMP CATEGORY 3. IRRIGATION WATER MANAGEMENT PRACTICES

Description: Irrigation water management practices include management practices that, when implemented properly, will increase a farm's overall efficiency of water application in a growing season. This category includes irrigation water management practices that qualify as approved BMPs.

Approved Irrigation Water Management Practices

BMP 3.1 Laser or GPS touch-up – (1 Point)

Definition: Annual re-establishment of precision laser or GPS grades to ensure good advancement of applied irrigation water. Must be applied to a minimum of 20 percent of the near level and level basin acreage irrigated the prior year.

BMP 3.2 Low pressure sprinkler system annual maintenance – (1 Point)

Definition: Annual maintenance program on all individual sprinkler systems serving irrigated acreage within a BMP regulated irrigation right. This annual maintenance regime must be a dealer or factory specified broadly based inspection and replacement program performed by a dealer, qualified service agent, or by a BMP operator under the guidelines so specified.

BMP 3.3 Trickle irrigation advanced maintenance drip tape or line replacement program – (1 Point)

Definition: Drip Tape or Drip lines begin being replaced 10 years after installation on 20 percent of all irrigated acreage served by trickle irrigation within a BMP regulated irrigation right. Every year thereafter for another four years 20 percent more of all drip tape or drip lines is replaced. At the end of 15 years all original drip tape & lines have been replaced.

A BMP Program Participant implementing this BMP may apply to the Director to extend the replacement timelines in this BMP by providing flow test results demonstrating that the system delivers at least 90 percent of the original designed gallons per minute (GPM). The initial application for a timeline extension may be made no earlier than nine years after the initial installation of the

drip tape or drip line. The Director may add up to two years to the replacement timeline, and the timeline may be extended multiple times.

BMP 3.4 Alternate row irrigation – (1 Point)

Definition: The practice of irrigating every other cultivated row during either single or multiple irrigation events to minimize the surface area of applied water. Annually, must be used on at least 20 percent of the acreage irrigated in row crops for at least one irrigation.

BMP 3.5 Furrow checks – (1 Point)

Definition: Manually applied or installed devices placed in rows to raise the water level in the row reducing the velocity to prevent erosion and enhance infiltration rates. Annually, must be used on at least 20 percent of irrigated acreage for at least one irrigation.

BMP 3.6 Angled rows/Angled borders/contour farming – (1 Point)

Definition: Annual practice of reducing row fall through row angling, border angling, and/or contouring to enhance water advancement and infiltration rates. This practice may also minimize or eliminate tailwater runoff. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 3.7 Surge irrigation – (1 Point)

Definition: The practice of applying irrigation water to a field by intermittent surges or pulses of water rather than by a continuous flow rate. The irrigation water advances down the field (or furrow), in stages, allowing uniform water penetration and avoiding tailwater runoff. A gradual sealing and soil conditioning occurs with each progressive surge allowing a more efficient water application. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 3.8 Temporary sprinklers – (1 Point)

Definition: Utilization of portable, roller and/or solid set sprinkler system for meeting pre-irrigation needs, seedling germination to establish a crop, and/or pre-harvest irrigation for maintaining crop quality. This practice reduces water use when compared to conventional flood irrigation techniques that require excessive water applications for seedling germination and/or crop quality. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 3.9 Participation in an educational irrigation water management program – (1 Point)

Definition: Enrollment in a private, governmental, or ADWR-sponsored educational irrigation water management program that includes irrigation water management topics such as soil water replacement needs, application rates, and irrigation scheduling. Must participate in such a program throughout the entire crop season annually.

BMP 3.10 Participation in an irrigation scheduling service – (1 Point)

Definition: Participation with a private or governmental consultant or ADWR-sponsored irrigation scheduling service that provides recommendations on soil moisture monitoring, soil water replacement needs, irrigation application rates, and irrigation scheduling dates based on soil moisture monitoring or real-time evapotranspiration data. Must participate in such a program throughout the entire crop season annually.

BMP 3.11 Participation in an irrigation district program to increase the flexibility of water deliveries – (1 Point)

Definition: Enrollment in a cooperative program set up by the irrigation district to assist a farmer with timely irrigation deliveries and shut off, constant flow rates, and other water order guidelines developed by the irrigation district. Must participate in such a program throughout the entire crop season annually.

BMP 3.12 Measure flow rates to determine the amount of water applied – (1 Point)

Definition: Measure flow rates to determine the amount of water applied for each irrigation event on each field for the purpose of achieving good application efficiencies.

BMP 3.13 Soil moisture monitoring – (1 Point)

Definition: Use of a number of accepted methods to monitor/measure soil moisture for the purpose of determining soil water replacement needs, application rates, and irrigation scheduling on each field (accepted methods may include core sampling, resistance blocks, neutron probe, tensiometers) throughout the entire crop season.

BMP 3.14 Computer based modeling using meteorological data – (1 Point)

Definition: Use of a computer-based irrigation scheduling program that incorporates real-time meteorological data (e.g. AZMET or other qualified services) for the purpose of determining irrigation event schedules on each field throughout the entire crop season.

Substitute Practice: Irrigation Water Management – (1 Point)

Definition: A new or existing irrigation water management practice not listed above that the Director determines will likely result in water savings or efficiency on the farm at least equivalent to the water savings or efficiency that would result from implementation of one of the approved BMPs described in this category.

The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.

CATEGORY 3: POINT VALUE DETERMINATION

An applicant for the BMP Program must select one or more of the irrigation water management BMPs described above in the application for the BMP Program. A BMP may be selected only if it will be implemented on an annual basis while the applicant is regulated under the BMP Program. In this category, the maximum number of points allowed is four and the minimum number is two.

BMP CATEGORY 4. AGRONOMIC MANAGEMENT PRACTICES

Description: Agronomic management practices include combinations of plant and soil management practices that, if implemented properly, will conserve water over the length of the growing season. This category includes agronomic management practices that qualify as approved BMPs.

Approved Agronomic Management Practices

BMP 4.1 Crop rotation – (1 Point)

Definition: Periodic rotation of crop types on a given farm field to ensure the non-degradation of soil tilth. Annually, at least 20 percent of the acreage irrigated the prior year needs to be rotated to a different crop.

BMP 4.2 Crop residue management – (1 Point)

Definition: Crop residue should be left on the soil surface or incorporated to a shallow depth into the soil profile to increase soil nutrients, soil water holding capacities, and increase the available soil moisture to a crop. Annually, must be employed on at least 20 percent of the total irrigated acreage.

BMP 4.3 Soil and water quality testing – (1 Point)

Definition: Annual soil testing to determine: 1) residual amounts of fertilizer, 2) soil salinity for leaching needs, and 3) water intake rates and water holding capacity. Soil testing is required on at least 50 percent of the irrigated acreage. Water quality testing for needs such as estimating leaching requirements or avoiding potential injury to crops. Testing must include a "blend" analysis of irrigation water used from all sources.

BMP 4.4 Pre-irrigation surface conditioning – (1 Point)

Definition: Mechanical means (i.e. driving rows, soil torpedoes, etc.) by which rows or borders are prepared prior to an initial irrigation to smooth flow of water to avoid unwanted deep percolation during dry conditions or to enhance water advancement rates. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.5 Transplants – (1 Point)

Definition: Use of established seedlings transplanted into a field. This practice eliminates excessive applications of water to germinate crops in the field from seeds. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.6 Mulching – (1 Point)

Definition: Use of organic matter (apart from or in addition to crop residues) or plastic sheets to cover plant beds (plastic mulch) and/or use of plastic material laid over hoops suspended above the plant beds (floatable row covers) to reduce evaporation losses. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.7 Shaping furrow or bed – (1 Point)

Definition: Use of mechanical means such as a row former to make the bed profile shallower to minimize time of infiltration and minimize the wetted surface area along the rows. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.8 Planting in bottom of furrow, bed, or border – (1 Point)

Definition: Practice of planting in the bottom of the furrow, bed, or border as opposed to planting along the top of formed irrigation rows and beds to minimize impacts of salt build up and wetting (subbing) requirements for germination. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.9 Chemical maintenance of trickle irrigation system – (1 Point)

Definition: Chemical usage in a trickle irrigation system to control or eliminate calcification and/or organic growth in the system. Annually, must be used on at least 20 percent of irrigated acreage.

BMP 4.10 Use of polyacrylamide in applied irrigation – (1 Point)

Definition: Improving irrigation efficiency by applying polyacrylamide to the irrigation water. This compound is a flocculating agent which removes suspended soil from the water and allows the soil to stay in place, reducing soil erosion in the furrow or border and improving the soil uptake of water.

Substitute Practice: Agronomic Management (1 Point)

Definition: A new or existing agronomic management practice not listed above that the Director determines will likely result in water savings or efficiency on the farm at least equivalent to the water savings or efficiency that would result from implementation of one of the approved BMPs described in this category.

The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.

CATEGORY 4: POINT VALUE DETERMINATION

An applicant for the BMP Program must select one or more of the agronomic management BMPs described above in the application for the BMP Program. A BMP may be selected only if it will be

implemented on an annual basis while the applicant is regulated under the BMP Program. In this category, the maximum number of points allowed is four and the minimum number is two.

APPENDIX 4B

BEST MANAGEMENT PRACTICES PROGRAM

SECTION II: PROCEDURE FOR ADDING A BEST MANAGEMENT PRACTICE TO THE LIST OF APPROVED BEST MANAGEMENT PRACTICES

An applicant for or participant in the Best Management Practices Program may apply to the Director to implement a Substitute Practice, as described in each BMP Category in Section I of this appendix. Upon receipt of an application, the Director shall review the application and may request additional information from the applicant. The Director may seek information from other sources, such as the Agricultural Water Conservation Best Management Practices Advisory Committee, as deemed necessary to determine if the Substitute Practice should be approved.

If the Director approves the application for a Substitute Practice, the Director may add the substitute practice to the list of Approved Best Management Practices set forth in Section I of this appendix by posting the modified list of Approved Best Management Practices on ADWR's web site and filing the modified list within ADWR's active management area office.

CHAPTER 5: MUNICIPAL

5.1 INTRODUCTION

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 uses). Municipal water providers also can include well co-operatives, mobile-home parks, or improvement districts. ADWR regulates those water providers serving more than 250 acre-feet (AF) of water for non-irrigation use annually as large municipal providers. Those providers serving 250 AF or less annually are regulated as small municipal providers. Some municipal water providers deliver water that is untreated for landscape/flood irrigation purposes only. ADWR regulates a municipal provider who delivers 100 AF or more of untreated water annually for landscape/flood irrigation as a large untreated provider. Municipal providers who deliver less than 100 AF of untreated water per year and only deliver water for landscape/flood irrigation are considered small untreated providers and are included in the small municipal water provider category. There are 43 large municipal providers and 52 small municipal providers in the Phoenix Active Management Area (PhxAMA). Two of the 43 large municipal providers are regulated as large untreated providers. A summary of municipal water supply and demand in the PhxAMA can be found in Chapter 2 and more detailed data can be found on the [AMA Data webpage](https://new.azwater.gov/ama/ama-data) (<https://new.azwater.gov/ama/ama-data>). The online data will be updated annually.

The Municipal Conservation Programs for the PhxAMA have been updated for the Fifth Management Plan (5MP). The Total Gallons Per Capita per Day (GPCD) Program and the Non-Per Capita Conservation Program (NPCCP) have been substantially modified as compared to the Fourth Management Plan (4MP) and are designed to reduce withdrawals of groundwater. The Alternative Conservation Program (ACP) and the Institutional Provider Program (IPP) are not included in this plan. The programs for small providers and large untreated providers are unchanged from the 4MP. The conservation requirements contained in this chapter will become effective on January 1, 2025. Each program is described in this chapter, and the legal language pertaining to each program can be found in section 5.11.

5.2 MUNICIPAL CONSERVATION PROGRAM: HISTORY AND BACKGROUND

The Municipal Conservation Program for the PhxAMA 5MP is designed to assist municipal providers with increasing water conservation and efficiency in order to move toward the goal of safe-yield by reducing withdrawals of groundwater. Efficient use of groundwater, reduction in total water use, and offsetting groundwater use by switching to renewable supplies can each contribute to the achievement and maintenance of the PhxAMA safe-yield goal. The fifth management period Municipal Conservation Program continues to encourage long-range planning, cooperative regional efforts, technical assistance, public education to support the AMA goal.

The initial Third Management Plan (3MP) included the NPCCP however after the 3MPs were promulgated, there were statutory modifications that required changes be made to the 3MP which resulted in the Modified NPCCP (MNPCCP). Throughout the remainder of this chapter, references to the NPCCP mean the 5MP NPCCP, which corresponds to the NPCCP in the 4MP and the MNPCCP in the 3MP.

5.2.1 ROLE OF 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; that the projected use is consistent with the management plan and achievement of the management goal for the PhxAMA and that the financial capability has been demonstrated to construct the water facilities necessary to make the supply of water available for the proposed use (A.R.S. § 45-576(J)). Criteria for establishing consistency with the management plans and management goals can be found in A.A.C. R12-15-722. Additional information on the AWS program can be found on the [Assured and Adequate Water Supply webpage](https://new.azwater.gov/aaws) (<https://new.azwater.gov/aaws>), and additional information on recharge and recovery for AWS purposes can be found in Chapter 3.

5.3 MUNICIPAL CONSERVATION PROGRAMS

The following section describes the Municipal Conservation Program components for the PhxAMA 5MP. This program consists of two regulatory programs for large municipal providers: the NPCCP and the Total GPCD Program. The 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 NON-PER CAPITA CONSERVATION PROGRAM (NPCCP)

The NPCCP is a performance-based program designed to achieve water use efficiency in the municipal provider's service area, equivalent to the water use efficiency assumed by the Director in establishing the per capita conservation requirements under the Total GPCD Program. While regulated under the NPCCP, a provider must implement a Public Engagement Program, as well as additional BMPs that are relevant to the provider's existing service area characteristics or water use patterns.

The municipal provider must select the additional BMPs from the list of BMPs approved by the Director in Appendix 5B. The number of additional BMPs that must be implemented depends on the total number of residential and non-residential service connections to the provider's water distribution system.

5.3.1.1 REGULATED PARTIES – ELIGIBILITY AND PROVIDER PROFILE REQUIREMENTS

Providers regulated under the NPCCP must submit a Provider Profile containing the information required under A.R.S. § 45-568.01(E) before entering the program and must also submit a Conservation Efforts Report (CER) along with their Annual Water Withdrawal and Use Reports. Large municipal providers that do not have a Designation of Assured Water Supply (DAWS) are required to be regulated under the NPCCP and shall submit a Provider Profile to the Director as described in 5-1105(B) no later than July 1, 2024. Large municipal providers with a DAWS that elect to be regulated under the NPCCP shall submit a Provider Profile to the Director at the time the provider submits written notice to the Director that the provider elects to be regulated under the NPCCP. The provider must begin complying with the NPCCP upon approval of the Provider Profile by the Director.

A new large municipal provider, including a small municipal provider whose deliveries expand to qualify as a large municipal provider during the fifth management period, that does not have a DAWS must submit a Provider Profile within six months after receiving notice of its conservation requirements as a large municipal provider from the Director. The provider must begin complying with the NPCCP upon approval of the Provider Profile by the Director.

Small providers that consolidate to the degree that the consolidated entity now qualifies as a large municipal provider or small providers that begin to deliver 250 AF or more for at least three out of the five most recent consecutive years and that does not have a DAWS must submit a Provider Profile to the Director within 60 days after the consolidation becomes effective. The consolidated provider will be regulated under the NPCCP upon approval of the Provider Profile by the Director. A template for the provider profile can be found on the [Municipal Program webpage](https://new.azwater.gov/ama/municipal-program) (<https://new.azwater.gov/ama/municipal-program>), and additional details on requirements can be found in section 5-1105.

5.3.1.2 GENERAL REQUIREMENTS

Large municipal providers regulated under the NPCCP must also comply with individual user requirements, municipal distribution system requirements, and monitoring and reporting requirements. Conservation requirements for individual users in the 5MP are largely unchanged from those in the 4MP, but the language has been modified to improve clarity. For more information on individual user requirements see section 5-1110, and for more information on specific subsectors of individual users, see Chapter 6.

Providers in the NPCCP will be placed in tiers based on the provider's combined total of residential and non-residential service connections. For municipal providers with multiple systems, each system having a separate Service Area Right will be treated separately. Only the service connections within that system will be counted to determine the system's tier. In addition to the Public Engagement Program, which is required for all tiers, the additional number of BMP points that providers must implement is based on which tier they are in:

- Tier 1: 0 – 1,000 service area connections
 - Provider must earn at least three BMP points from at least two or more BMP categories
- Tier 2: 1,001 – 5,000 service area connections
 - Provider must earn at least five BMP points from at least three or more BMP categories
- Tier 3: 5,001 – 30,000 service area connections
 - Provider must earn at least 10 BMP points from at least four or more categories
- Tier 4: 30,000+ service area connections
 - Provider must earn at least 20 BMP points from at least five or more categories

5.3.1.3 PUBLIC ENGAGEMENT PROGRAM AND ADDITIONAL BEST MANAGEMENT PRACTICES

All providers regulated under the NPCCP shall implement a Public Engagement Program, as detailed in Appendix 5B. The provider must select water conservation measures from the list in Appendix 5B or any future modifications of the list approved by the Director. All the BMPs selected for implementation must be reasonably relevant to the provider's existing service area characteristics or water use patterns. The provider must begin implementing all the BMPs described in its Provider Profile upon approval by the Director.

5.3.1.4 SUBSTITUTE BEST MANAGEMENT PRACTICES

A provider may discontinue implementing a BMP identified in its Provider Profile, other than the Public Engagement Program, and begin implementing a substitute BMP if the substitute BMP is on the list of approved BMPs and the provider determines that the substitute BMP is reasonably relevant to its existing service area characteristics or water use patterns. See sections 5-1105(D)(4) and 5-1105(D)(5) for more information.

A provider that substitutes a BMP must notify the Director of the substitution in its next CER (See section 5.3.1.4). If the Director determines that the substitute BMP is not reasonably relevant to the provider's existing service area characteristics or water use patterns, the provider will be notified and must resume implementing the discontinued BMP or a substitute BMP that the Director approves. The Director's determination may be appealed.

5.3.1.5 CONSERVATION EFFORTS REPORT (CER)

A large municipal provider regulated under the NPCCP must include a CER for the previous calendar year with its Annual Water Withdrawal and Use Report (Annual Report), filed by March 31 of each year. Details regarding what shall be included in the CER are in section 5-1105(E). Providers regulated under the NPCCP also have requirements regarding water rate structure (see section 5-1105(F)), records retention (see section 5-1105(G)), and individual users (see section 5-1110).

5.3.1.6 REVIEW OF NPCCP

The Director is required to periodically review the program, including the list of approved BMPs, to evaluate its effectiveness. The Director is authorized to establish an advisory committee, and to contract with an independent researcher, to assist the Director in the evaluation. If the Director determines that changes are appropriate to improve the effectiveness of the program, and that those changes are consistent with the existing statutory provisions, the Director must modify the program pursuant to A.R.S. § 45-572. If

the changes that the Director determines should be made are not consistent with the existing statutory provisions, the Director must give written notice of the appropriate changes to the Speaker of the House of Representatives, the President of the Senate, and the Governor.

5.3.2 TOTAL GALLONS PER CAPITA PER DAY (GPCD) CONSERVATION PROGRAM

In the PhxAMA 5MP, ADWR will calculate a GPCD requirement for each large municipal provider not regulated under the NPCCP using a methodology different from the methodology used to calculate GPCD requirements in the 4MP (described in more detail in section 5-1103(C)). Each large municipal provider will be given notice of its GPCD requirement for its service area. Municipal providers may apply for a variance from or administrative review of the conservation requirements within 90 days following the date of notice. Alternatively, a large municipal provider who has a DAWS may elect to be regulated under the NPCCP. A large municipal provider that has a DAWS, and which does not enroll in the NPCCP, will be regulated under the Total GPCD Program.

5.3.2.1 TOTAL GPCD PROGRAM DESCRIPTION

A large municipal provider regulated under the Total GPCD Program must limit the annual gallons per capita per-day water usage within its service area to the amount allowed under its GPCD requirement. For each year in which the provider is regulated under the Total GPCD Program, the actual amount of water withdrawn, diverted or received by the provider for non-irrigation use will be compared to the amount allowed by its GPCD requirement to determine compliance during that year. Compliance is determined pursuant to a flexibility account, which allows providers to use more water than their GPCD requirement in some years, subject to a maximum negative account balance. In the 5MP, non-potable effluent used directly from a treatment plant or stored underground and recovered within the area of impact of storage is not counted when determining a provider's compliance with its GPCD requirement.

All large municipal providers that have a DAWS, including municipal providers previously regulated under the original NPCCP, will be regulated under the Total GPCD Program for the 5MP, pursuant to A.R.S. § 45-568(A), unless they notify the Director that they elect to be regulated under the NPCCP and the Director approves their entry into the NPCCP. All large municipal providers that have not obtained a DAWS will be regulated under the NPCCP.

5.3.2.2 TOTAL GPCD PROGRAM DEVELOPMENT

For the 5MP, ADWR's goal in developing the GPCD Program was to design a program that reduced withdrawals of groundwater while setting updated and realistic GPCD requirements. To determine conservation potential and GPCD requirement reasonability, ADWR analyzed historical data and surveyed large municipal providers. Conservation potential, based on historical water use, is an estimate of the amount of reduction in per capita water use that a municipal provider can achieve. To determine the conservation potential of each large municipal provider in the 5MP, ADWR compared large municipal providers' historical compliance GPCD with their 3MP and 4MP GPCD requirements. ADWR found that some of the GPCD requirements were unreasonable, either much higher or lower than the provider's actual (compliance) GPCD. ADWR set the GPCD requirement using a three-year rolling average of the provider's compliance GPCD minus one percent. However, the GPCD requirement will not be set lower than a computed minimum requirement of the provider's last GPCD requirement minus one percent and will not be set higher than the computed maximum requirement of a five-year rolling average of the provider's compliance GPCD. In the 4MP, direct use effluent and effluent recovered within the area of impact were not included when calculating a provider's compliance with its GPCD requirement. In the 5MP, non-potable direct use effluent and non-potable effluent recovered within the area of impact are not included when calculating a provider's compliance with its GPCD requirement to better capture a GPCD based on all potable uses.

5.3.2.3 FLEXIBILITY ACCOUNT

To account for variations in weather, the flexibility account ADWR established in the 3MP will continue into the 5MP. The flexibility account allows large municipal providers regulated in the Total GPCD Program to accumulate 45 GPCD of credits or incur debits up to 15 GPCD.

5.3.2.4 GPCD COMPLIANCE

A large municipal provider's annual compliance with its GPCD requirement will be determined by first calculating the total amount of water that the municipal provider is allocated for municipal use during the year. This allocation is calculated by multiplying the municipal provider's GPCD requirement for the year by the municipal provider's service area population for the year and then multiplying the product by the number of days in the year.

The amount of water allocated to the municipal provider is then compared to the total amount of water, from any source except non-potable direct use effluent and non-potable effluent recovered within the area of impact, for non-irrigation use, that is withdrawn,

diverted, and received by the municipal provider for use during the year. If the allocated amount is greater than the amount withdrawn, diverted, and received, the difference is credited to the municipal provider's flexibility account, subject to the maximum positive account balance. If the allocated amount is less than the amount withdrawn, diverted, and received, the difference is debited to the municipal provider's flexibility account. The large municipal provider is out of compliance for the year if the debit causes the flexibility account to exceed the negative account balance limitation.

5.3.2.5 ANNUAL POPULATION ESTIMATES

Each time there is a decennial U.S. Census, ADWR compiles the Census data to determine an updated decennial U.S. Census base population for each provider. ADWR uses the provider's water distribution lines to select Census blocks likely served by the provider. Once ADWR determines the U.S. Census base population for each provider, persons per housing unit and occupancy characteristics are obtained from the U.S. Census American Community Survey at the tract or block group level of geography and are assigned to each provider's service area. Each year after the Census year, the provider's annual service area population is estimated based on the number of housing units the provider reports each year as having been added to its distribution system and multiplying those added housing units by the occupancy and persons per housing unit rates from the American Community Survey data assigned to the provider. The figures are corrected following each decennial Census. ADWR informs each provider of updates to its estimated service area population associated with each decennial Census and may provide opportunity for the provider to discuss potential corrections with ADWR staff.

5.4 LOST AND UNACCOUNTED-FOR WATER

Large municipal providers must limit the amount of lost and unaccounted-for water in their distribution systems to no more than 10 percent of the total quantity of water that enters their distribution system, calculated on an annual or three-year average basis (See section 5-1111).

5.5 CONSERVATION REQUIREMENTS FOR NEW LARGE MUNICIPAL PROVIDERS

A new large municipal provider is defined as a city, town, private water company, or irrigation district that begins serving more than 250 AF of water for non-irrigation use per year after January 1, 2000. All new large providers that have a DAWS will initially be assigned to the Total GPCD Program. Their GPCD requirement will be calculated consistent with the statistical methodology used for existing large municipal providers. ADWR will determine the base year for the municipal provider as the year preceding the

year in which the provider began serving greater than 250 AF per year, unless the Director determines that water usage during that year is not representative of historic water use. Additionally, ADWR will collect residential and non-residential water use data during the base year and the total gallons of water withdrawn, diverted, or received by the provider in the service area.

A new large municipal provider that does not have a DAWS will be regulated under the NPCCP described in section 5-1105. The provider must submit a Provider Profile containing the information described in section 5-1105(B)(1) within six months after receiving written notice of its conservation requirements from the Director. The provider must begin complying with the NPCCP upon approval of the Provider Profile pursuant to section 5-1105(B)(2) or (B)(3).

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 as follows:

1. If the consolidated provider has a DAWS, it will be assigned to the Total GPCD Program and its GPCD will be calculated by prorating the respective per capita requirements, populations, and water use as appropriate. The consolidated provider may elect to be regulated under the NPCCP.
2. If the consolidated provider does not have a DAWS, the provider must submit an updated Provider Profile to the Director within 60 days after the consolidation becomes effective. The consolidated provider will be regulated under the NPCCP upon approval of the Provider Profile by the Director.

Providers that acquire or convey a portion of a service area continue to be regulated under the conservation program under which they were regulated prior to the acquisition or conveyance. If the conveying or acquiring provider does not have a DAWS, it will be regulated under the NPCCP regardless of whether it was regulated under that program prior to the conveyance or acquisition. If the conveying or acquiring provider is regulated under the NPCCP after the conveyance or acquisition, and it was regulated under that program immediately prior to the conveyance or acquisition, the provider must submit a new Provider Profile to the Director if either: (1) the conveyance or acquisition resulted in the total number of service area connections to the provider's water distribution system increasing or decreasing to a new tier level; or (2) the Director determines that the provider's service area characteristics or water use patterns have changed.

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-related facility. A large untreated water 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

During the fifth management period, small providers will continue to be required to minimize waste of all water supplies, maximize efficiency in outdoor watering, encourage reuse of water supplies, and improve water use efficiency as feasible. Small providers must also comply with lost and unaccounted for standards not to exceed 15 percent, as well as certain other reporting requirements described below.

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. For the 5MP, the director is required to establish “additional conservation requirements for non-irrigation uses...” (A.R.S. § 45-568(A)). Additionally, there is a prohibition on certain turf-related facilities larger than 90 acres. 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. See section 5-1110 for determining responsibility for compliance with the individual user requirements.

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 areas. Lost and unaccounted for water will be determined for each municipal provider based on the total quantity of metered and unmetered water deliveries and the total water pumped, received, or diverted by the municipal provider for each calendar year, excluding direct use effluent. Small municipal providers must maintain 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 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.

For the 5MP, ADWR 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 other regulatory requirements such as well purging and line flushing. Providers also may 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 the volume.

5.9.3 MONITORING AND REPORTING REQUIREMENTS

All municipal providers, including providers regulated under the NPCCP, are required to annually report to ADWR:

1. Information on the total quantity of water withdrawn, diverted, or received 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 added to 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 or 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 municipal providers are required to separately measure and report the amount of water delivered via the provider's 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-related facility use, commercial use, industrial use, government use, construction use, surface water treatment, and other uses). A large municipal provider regulated under the NPCCP must submit a CER, as described in section 5-1105(E) of this chapter and must also report the total number of service connections within the provider's water distribution system as of the end of the reporting year.

5.10 NON-REGULATORY EFFORTS

ADWR has a program for water management assistance in the AMAs. Funding for the program comes from an annual withdrawal fee levied and collected from all large groundwater users in the AMAs. Since the Water Management Assistance program began, the PhxAMA has funded many projects that promote prudent water management within the PhxAMA. Additional information is discussed in Chapter 7.

5.11 MUNICIPAL CONSERVATION, MONITORING, AND REPORTING REQUIREMENTS

5-1101 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. *"4MP" means the Fourth Management Plan for the Phoenix Active Management Area.*
2. *"5MP" means the Fifth Management Plan for the Phoenix Active Management Area.*
3. *"ADWR" means the Arizona Department of Water Resources.*
4. *"Canal" means a waterway constructed for the purpose of transporting water to a point of delivery, including main canals and lateral canals.*
5. *"CAP water" means Colorado River water delivered through Central Arizona Project infrastructure.*
6. *"CER" means the Conservation Efforts Report required to be filed by a large municipal provider regulated under the Non-Per Capita Conservation Program (NPCCP) as provided in section 5-1105(E) of this chapter.*
7. *"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.*
8. *"Compliance GPCD" means the GPCD achieved by a provider in a given year as calculated by the following:*
 - a. *Determine the total gallons of water from any source (except non-potable direct use effluent and non-potable effluent recovered within the area of impact) withdrawn, diverted or received by the provider during the calendar year for non-irrigation use in a given year.*
 - b. *Divide the amount calculated in (a) by the service area population in that year, as determined by 5-1103(B).*
 - c. *Divide the amount calculated in (b) by 365.*

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. "Existing Individual User" means an individual user that was receiving water from a municipal provider as of the date the 5MP was adopted.
15. "Existing large municipal provider" means a large municipal provider that was in operation and was serving water on or before the date of adoption of the 5MP.
16. "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.
17. "GPCD" means gallons of water per capita per day.
18. "GPCD Requirement" means the total amount of water from any source except non-potable effluent and non-potable effluent recovered within the area of impact (for non-irrigation use) a provider may withdraw, divert or receive during a year as calculated in section 5-1103(C) and subject to the flexibility provisions in section 5-1104. GPCD Requirement may be listed in GPCD or acre-feet (AF).
19. "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.

20. "*Housing unit*" means a group of rooms or a single room occupied as separate living quarters. *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. 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.*
21. "*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.
22. "*Large municipal provider*" means a municipal provider serving more than 250 AF of water for non-irrigation use during a calendar year.
23. "*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.
24. "*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.
25. "*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.

26. "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.
27. "Low Water Use & Drought Tolerant Plants Lists" means the list of low water use & drought tolerant plants for the Phoenix Active Management Area found on [ADWR's Management Plans webpage](https://new.azwater.gov/ama/management-plans) (<https://new.azwater.gov/ama/management-plans>) including any modifications to the list.
28. "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.
29. "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.
30. "Municipal provider" means a city, town, private water company, or irrigation district that supplies water for non-irrigation use.
31. "NPCCP" means the Non-Per Capita Conservation Program (formerly the Modified Non-Per Capita Conservation Program).
32. "New Individual User" means an individual user that begins receiving water from a municipal provider after adoption of the 5MP.
33. "New large municipal provider" means a municipal provider that begins serving more than 250 AF of water for non-irrigation use after January 1, 2025.
34. "Remedial Groundwater" means groundwater withdrawn pursuant to an approved remedial action project under CERCLA or Title 29, A.R.S., but does not include groundwater withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03.
35. "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.
36. "Service area" has the definition prescribed by A.R.S. § 45-402.
37. "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, as determined pursuant to section 5-1103(C).

38. "Service connection" means a coupling of a municipal provider's distribution system and its customer's water system.
39. "Single-family housing unit" means a detached dwelling, including mobile homes not in mobile home parks.
40. "Small municipal provider" means a municipal provider that supplies 250 AF or less of water for non-irrigation use during a calendar year.
41. "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.
42. "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.
43. "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.
44. "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 or modifications to the list, 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.

5-1102 Large Municipal Providers - Conservation Programs

- A. Except as provided in subsection D of this section, beginning with calendar year 2025 or the calendar year specified in section 5-1107(A)(1) and continuing thereafter until the legislature determines otherwise, a large municipal provider designated as having an assured water supply shall be regulated under the Total Gallons Per Capita Per Day (GPCD) Program described in section 5-1103, unless the provider elects to be regulated under the NPCCP described in section 5-1105 as provided in subsection B of this section.

- B. A large municipal provider designated as having an assured water supply may elect to be regulated under the NPCCP at any time after adoption of the 5MP by giving the Director written notice of the election together with a Provider Profile pursuant to section 5-1105(A)(2)(a). If the provider elects to be regulated under the NPCCP, the provider shall continue complying with the conservation requirements in effect for the provider at the time it notifies the Director of the election until the Director approves the provider's Provider Profile pursuant to section 5-1105(B)(2) or (B)(3), at which time the provider shall comply with the NPCCP.
- C. A large municipal provider that is not designated as having an assured water supply shall submit a Provider Profile to the Director as prescribed in section 5-1105(A). Upon approval, the provider shall be regulated under the NPCCP beginning on January 1, 2025 or the date the Director approves the provider's Provider Profile pursuant to section 5-1105(B)(2) or (B)(3), whichever is later, and continuing thereafter until the legislature determines otherwise. Until the provider is regulated under the NPCCP, the provider shall continue to be regulated under the conservation program under which it was regulated at the time the 5MP was adopted.
- D. If the Director designates a large municipal provider as having an assured water supply while the provider is regulated under the NPCCP, the provider shall continue to be regulated under the NPCCP unless the provider gives written notice to the Director that it elects to be regulated under the Total GPCD Program. If the provider elects to be regulated under the Total GPCD Program, the Director shall give written notice to the provider of its GPCD requirement and the provider shall comply with the GPCD requirement beginning on the date specified in the notice and continuing thereafter until the legislature determines otherwise.
- E. All municipal providers shall comply with Individual User requirements, distribution system requirements, and applicable monitoring and reporting requirements as prescribed in sections 5-1110, 5-1111, and 5-1112.

5-1103 Total Gallons Per Capita per Day (GPCD) Program

A. GPCD Requirement

Beginning with the calendar year specified in section 5-1102(A) or (D), or section 5-1107(A)(1), whichever applies, and continuing thereafter until the legislature determines otherwise:

A large municipal provider regulated under the Total GPCD Program shall not withdraw, divert or receive water from any source, except non-potable direct use effluent and non-potable effluent recovered within the area of impact, for non-irrigation use during a year in

a total amount that exceeds its GPCD requirement as calculated using the methodology set forth in section 5-1103(C) and subject to the flexibility provisions in section 5-1104.

B. Calculation of Large Municipal Provider's Service Area Population

The Director shall use the provider's service area population for the year in determining compliance with its GPCD requirement. The Director shall calculate a large municipal provider's service area population for a calendar year as follows, unless the Director has approved an alternative methodology for calculating the provider's service area population prior to the calendar year in question:

- 1. Determine the number of single-family and multifamily housing units added to the provider's distribution system between December 31 of the previous calendar year and December 31 of the calendar year in question, less any units removed from the system during that period.*
- 2. Adjust these totals by the respective average annual vacancy rate for single-family housing units and multifamily housing units as calculated from the most recent United States Census Bureau American Community Survey data for the geographic area most closely corresponding to the provider's service area or other source of information approved by the Director.*
- 3. Multiply the adjusted number of single-family housing units calculated in 2 above by the average number of persons per occupied single-family housing unit as calculated in accordance with the most recent United States Census Bureau American Community Survey data for the geographic area most closely corresponding to the provider's service area or other source of information approved by the Director. The result is the provider's new single-family population for the year in question.*
- 4. Multiply the adjusted number of multifamily housing units calculated in 2 above by the average number of persons per occupied multifamily housing unit as calculated in accordance with the most recent United States Census Bureau American Community Survey data for the geographic area most closely corresponding to the provider's service area or other source of information approved by the Director. The result is the provider's new multifamily population for the calendar year in question.*
- 5. Add the results of 3 and 4 to the provider's new single-family population and new multifamily population for each year since the most recent decennial U.S. Census year and add that sum to the provider's decennial U.S. Census service*

area population. The sum is the provider's service area population for the calendar year in question.

C. Calculation of Large Municipal Provider's GPCD Requirement

The GPCD requirement for a large municipal provider for the fifth management period shall be calculated using a default calculation with minimum and maximum boundaries.

1. *The default shall be calculated using a three-year rolling average of the provider's compliance GPCD minus one percent.*
2. *The minimum GPCD requirement shall be calculated using the provider's previous year GPCD requirement minus one percent.*
3. *The maximum GPCD requirement shall be calculated using a five-year rolling average of the provider's compliance GPCD.*
4. *If the default GPCD requirement is less than the minimum, then the provider's total GPCD requirement shall be the minimum value. If the default total GPCD requirement is higher than the maximum, then the provider's total GPCD requirement shall be the maximum value.*

Default GPCD Requirement Calculation	Minimum GPCD Requirement Calculation	Maximum GPCD Requirement Calculation
<i>3 year rolling average of provider's compliance GPCD minus 1%</i>	<i>The provider's previous year GPCD requirement minus 1%</i>	<i>5 year rolling average of provider's compliance GPCD</i>

5-1104 Compliance with GPCD Requirement - Flexibility Account

A. Total GPCD Program Flexibility Account

The Director shall determine if a large municipal provider regulated under the Total GPCD Program is in compliance with its GPCD requirement through the maintenance of a flexibility account for the provider which shall operate as follows:

1. *Each provider regulated under the Total GPCD Program shall be assigned a flexibility account. The beginning balance in the flexibility account of a provider that was regulated under the Total GPCD Program in the 4MP shall be the ending balance in the flexibility account maintained for the provider*

under section 5-604 of the 4MP. The beginning balance in the flexibility account of all other large municipal providers shall be zero.

2. *Following each calendar year in which the provider withdraws, diverts or receives water for non-irrigation use, beginning with the first calendar year in which the provider is regulated under the Total GPCD Program as provided in section 5-1102(A) or (D) or section 5-1107(A)(1) the Director shall adjust the provider's flexibility account as follows:*
 - a. *Determine the total gallons of water from any source (except non-potable direct use effluent and non-potable effluent recovered within the area of impact) withdrawn, diverted or received by the provider during the calendar year for non-irrigation use and then subtract that amount from the provider's GPCD requirement in units of acre-feet (AF) for the year, as calculated in subparagraph b of this paragraph.*
 - b. *The provider's GPCD requirement in units of AF for a calendar year is calculated by:*
 - *Multiplying the provider's GPCD requirement for the calendar year, as assigned to the provider using the methodology in section 5-1103(C), by the provider's service area population as of December 31 of the year, as calculated pursuant to section 5-1103(B),*
 - *Multiplying the product by the number of days in the calendar year,*
 - *Dividing the product by 325,851 to convert to AF.*
 - c. *If the result in subparagraph a above is negative, debit the flexibility account by this volume.*
 - d. *If the result in subparagraph a above is positive, credit the flexibility account by this volume.*
3. *After the adjustment provided for in paragraph 2 of this subsection is made, the account balance existing in a provider's flexibility account shall carry forward subject to the following limitations:*
 - a. *The maximum positive account balance allowed in the flexibility account of a provider regulated under the Total GPCD Program shall be calculated by:*

- Multiplying the provider's service area population as of December 31 of the previous calendar year by a GPCD rate of 45,
- Multiplying the product by the number of days in the calendar year,
- Dividing the product by 325,851 to convert to AF.

This formula converts the maximum positive GPCD rate into units of AF for the purposes of account administration.

- b. If the account balance exceeds the maximum positive GPCD rate of 45 GPCD after any credits are registered, the balance carried forward shall equal the maximum positive GPCD rate for that year.
- c. The maximum negative account balance allowed in the flexibility account of a provider regulated under the Total GPCD Program shall be calculated by
 - Multiplying the provider's service area population as of December 31 of the previous calendar by a GPCD rate of -15,
 - Multiplying the product by the number of days in the calendar year,
 - Dividing the product by 325,851 to convert to AF.

This formula converts the maximum negative GPCD rate into units of AF for the purposes of account administration.

- d. If the account balance exceeds the maximum negative GPCD rate of -15 GPCD after any debits are registered, the balance carried forward shall equal the maximum negative GPCD rate for that year.

B. Compliance Status

If the adjustment to a large municipal provider's flexibility account following a calendar year as provided for in subsection A of this section causes the account to have a negative account balance which exceeds the maximum negative account balance allowed in the provider's flexibility account for the year as calculated in 5-1104(A)(3)(c) the provider is out of compliance for that calendar year.

5-1105 Non-Per Capita Conservation Program (NPCCP)

A. Provider Profile – Submittal Date

- 1. Large municipal providers not designated as having an assured water supply:*
 - a. An existing large municipal provider that is not designated as having an assured water supply shall submit a Provider Profile to the Director as described in 5-1105(B)(1) of this section no later than July 1, 2024.*
 - b. A new large municipal provider that is not designated as having an assured water supply and that receives written notice of the NPCCP from the Director shall submit a Provider Profile to the Director no later than six months after the date of the notice.*
- 2. Large municipal providers designated as having an assured water supply:*
 - a. A large municipal provider that is designated as having an assured water supply and that elects to be regulated under the NPCCP shall submit a Provider Profile to the Director at the time the provider submits written notice to the Director that the provider elects to be regulated under the NPCCP.*
 - b. A large municipal provider that is designated as having an assured water supply and whose designation of assured water supply is terminated while the provider is regulated under the Total GPCD Program shall submit to the Director a Provider Profile no later than six months after the designation is terminated.*

B. Provider Profile – Contents; Review; Approval or Disapproval

- 1. A Provider Profile required by subsection (A) of this section shall contain the following information:*
 - a. A description of the provider's existing service area characteristics and water use patterns.*
 - b. The total number of residential and non-residential service connections to the provider's water distribution system.*
 - c. A description of the BMPs currently being implemented by the provider.*

- d. A description of the public engagement program and the additional BMPs that the provider intends to implement to comply with subsection (D)(1) of this section.
 - e. An explanation of how the additional BMPs that the provider will implement to comply with subsection (D)(1)(b) of this section are relevant to the provider's existing service area characteristics or water use patterns.
- 2. Within 90 days after receiving a large municipal provider's Provider Profile, the Director shall approve or disapprove the Provider Profile and send written notice of the decision to the provider. The Director shall approve the Provider Profile if the Director determines that the profile contains information demonstrating that the provider will implement at least the minimum number of best management practices (BMPs) required pursuant to subsection (D)(1) of this section and that the conservation measures to be implemented pursuant to subsection (D)(1)(b) of this section are reasonably relevant to the provider's existing service area characteristics or water use patterns. If the Director disapproves the Provider Profile, the Director shall include with the written notice of the decision the reasons for the disapproval. A decision of the Director disapproving a Provider Profile is an appealable agency action pursuant to Title 41, Chapter 6, Article 10. If the Director fails to send the provider written notice approving or disapproving the Provider Profile within 90 days after receiving the Provider Profile, the Provider Profile shall be deemed approved.
- 3. If the Director disapproves the Provider Profile submitted by a large municipal provider that is not designated as having an assured water supply, within 90 days after the date of the Director's written notice disapproving the Provider Profile, or if the provider files a timely notice of appeal of the decision pursuant to Title 41, Chapter 6, Article 10, within 90 days after the Director's decision is final, the provider shall revise the Provider Profile to correct the deficiencies identified by the Director in the written notice and submit the revised Provider Profile to the Director. If the Director disapproves the Provider Profile submitted by a large municipal provider that is designated as having an assured water supply, the provider may revise the Provider Profile to correct the deficiencies identified by the Director in the written notice disapproving the Provider Profile and may submit the revised Provider Profile to the Director. The Director shall approve or disapprove a revised Provider Profile submitted under this paragraph pursuant to paragraph 3 of this subsection. If the Director disapproves the revised Provider Profile:

a. *The decision is an appealable agency action pursuant to Title 41, Chapter 6, Article 10.*

b. *If the provider is not designated as having an assured water supply, the provider is in violation of A.R.S. § 45-568.01 beginning on the date the Director's decision is final until the provider submits a Provider Profile that is approved by the Director.*

C. *Commencement of Regulation under Non-Per Capita Conservation Program (NPCCP)*

1. *An existing large municipal provider that is not designated as having an assured water supply shall be regulated under the NPCCP beginning January 1, 2025 or the date the provider's Provider Profile is approved by the Director pursuant to subsection B of this section, whichever is later.*
2. *A new large municipal provider that is not designated as having an assured water supply shall be regulated under the NPCCP beginning on the date the provider's Provider Profile is approved by the Director pursuant to subsection B of this section.*
3. *A large municipal provider that is designated as having an assured water supply and that elects to be regulated under the NPCCP shall be regulated under the program beginning on the date the Director approves the provider's Provider Profile pursuant to subsection B of this section.*

D. *Required Best Management Practices (BMPs)*

1. *A large municipal provider regulated under the NPCCP shall implement the following BMPs while regulated under the program:*
 - a. *The Public Engagement Program described in Appendix 5B.*
 - b. *The required number of BMP points shall be selected from the list of BMPs in Appendix 5B or any modification of the list made pursuant to the modification procedure described in Appendix 5B. The selected BMPs shall be reasonably relevant to the provider's service area characteristics or water use patterns.*
 - c. *The required number of BMP points shall be earned from a minimum number of BMP Categories listed in Appendix 5B.*

d. The number of BMP points required to be implemented and the minimum number of categories that BMP points must be earned from shall be determined based on the total number of service connections to the provider's water distribution system and the following four tier levels:

Tier	Number of Service Connections	Required Number of BMP Points Per Year	Minimum Number of Categories that BMP Points Must Be Earned From
1	0 – 1,000	3	2
2	1,001 – 5,000	5	3
3	5,001 – 30,000	10	4
4	30,001 +	20	5

2. Except as provided in paragraphs 4 and 5 of this subsection, a large municipal provider regulated under the NPCCP shall implement the BMP points required by paragraph 1 of this subsection as described by the provider in the provider's approved Provider Profile.
3. If the total number of service connections to the provider's water distribution system increases to a higher tier level as described in paragraph 1 of this subsection after the Director approves the provider's Provider Profile pursuant to subsection (B)(2) or (B)(3) of this section, the provider shall submit a new Provider Profile to the Director within 60 days after the provider becomes aware of the increase and shall include in the profile the information required by subsection (B)(1). The provisions in subsection (B)(2) and (B)(3) shall apply to the new Provider Profile when it is submitted to the Director. Until the new Provider Profile is approved by the Director, the provider shall continue implementing the BMPs described by the provider in its previously approved Provider Profile. Upon approval of the new Provider Profile, the provider shall implement all the BMPs described in the newly approved Provider Profile.
4. A large municipal provider regulated under the NPCCP may discontinue implementing a BMP identified in the provider's approved Provider Profile, other than the Public Engagement Program required by paragraph (1)(a) of this subsection, and begin implementing (a) substitute BMP(s) if all of the following apply:

- a. *The substitute BMP(s) is described on the list of BMPs set forth in Appendix 5B, or any modification of the list made pursuant to the modification procedure described in Appendix 5B.*
 - b. *The provider determines that the substitute BMP(s) is reasonably relevant to the provider's existing service area characteristics or water use patterns.*
 - c. *The provider continues to meet their total BMP points requirements pursuant to section 5-1105(D).*
5. *If a large municipal provider regulated under the NPCCP implements (a) substitute BMP(s) pursuant to paragraph 4 of this subsection, the provider may discontinue implementing the substitute BMP(s) and begin implementing (a) new substitute BMP(s) if the following apply:*
 - a. *The new substitute BMP(s) is on the list of BMPs set forth in Appendix 5B, or any modification of the list made pursuant to the modification procedure described in Appendix 5B.*
 - b. *The provider determines that the new substitute BMP(s) is reasonably relevant to the provider's existing service area characteristics or water use patterns.*
 - c. *The provider continues to meet their total BMP points requirements pursuant to section 5-1105(D).*
6. *If a provider substitutes (a) BMP(s) pursuant to paragraph 4 or 5 of this subsection, the following shall apply:*
 - a. *The provider shall notify the Director of the substitution in the CER filed by the provider for the year in which the substitution occurred, as provided in subsection (E)(5) of this section.*
 - b. *If the Director determines that the substitute BMP(s) is not reasonably relevant to the provider's existing service area characteristics or water use patterns, the Director shall give written notice of that determination to the provider and the provider shall begin implementing the discontinued BMP(s) or (a) substitute BMP(s) from the list of BMPs set forth in Appendix 5B, or any modification of the list made pursuant to the modification procedure described in Appendix 5B, that the Director determines is reasonably relevant to the provider's*

existing service area characteristics or water use patterns. The Director's determination is an appealable agency action pursuant to Title 41, Chapter 6, Article 10.

E. Conservation Efforts Report (CER)

In addition to any information required by section 5-1112, a large municipal provider regulated under the NPCCP shall include with its annual reports required by A.R.S. § 45-632 a CER containing the following information:

1. *A description of the Public Engagement Program and each BMP implemented during the previous year.*
2. *The implementation and reporting requirements for each BMP implemented during the previous year.*
3. *An assessment of each BMP implemented as to what worked and what needs modification.*
4. *The provider's plan for implementation of BMPs during the current year.*
5. *If the provider substituted a BMP pursuant to subsection (D)(4) or (D)(5) of this section during the reporting year: a description of the BMP that was discontinued and a reason for its discontinuation, a description of the substitute BMP, and an explanation of how the substitute BMP is relevant to the provider's existing service area characteristics or water use patterns.*
6. *A copy of the provider's current rate structure, unless the rate structure is unchanged since it was last submitted to ADWR.*

F. Water Rate Structure

A large municipal provider regulated under the NPCCP shall include in its annual reports filed pursuant to A.R.S. § 45-632 a copy of the provider's current water rate structure unless no changes have been made to the rate structure since it was last submitted to the Director.

G. Records Retention

For at least five years after a year in which a large municipal provider is regulated under the NPCCP, the provider shall keep and maintain the following records:

1. *Accurate records verifying that the provider implemented the BMPs that it was required to implement during that year.*

2. Accurate records of the provider's water use during the year.

5-1106 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. Upon consolidation, a consolidated provider that qualifies as a large municipal provider and that is designated as having an assured water supply shall be regulated under the Total GPCD Program, unless the consolidated provider elects to be regulated under the NPCCP as provided in section 5-1105(A)(2)(a).
2. If the consolidated provider is designated as having an assured water supply and is regulated under the Total GPCD Program, the Director shall establish a GPCD requirement for the consolidated provider consistent with the methodology set forth in section 5-1103(C). The Director also shall establish and maintain a flexibility account for the consolidated provider in accordance with section 5-1104(A) with a beginning balance to be established by the Director based on the ending balances in the flexibility accounts of the consolidating providers.
3. If the consolidated provider qualifies as a large municipal provider and is not designated as having an assured water supply, the consolidated provider shall submit to the Director a Provider Profile pursuant to section 5-1105(B) within 60 days after the consolidation becomes effective. The consolidated provider shall be regulated under the NPCCP beginning on the date the Director approves the Provider Profile.

C. Regulation of Acquiring Provider

1. Except as provided in paragraph 2 of this subsection, 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.
2. If the acquiring provider is not designated as having an assured water supply after the acquisition, or if the acquiring provider was regulated under the NPCCP immediately prior to the acquisition, the following shall apply:

 - a. The acquiring provider shall be regulated under the NPCCP after the acquisition. If the acquiring provider becomes designated as having an assured water supply after the acquisition, the provider may elect to be regulated under the Total GPCD Program by providing the Director with written notice of the election as provided in section 5-1102(D).
 3. If the acquiring provider was regulated under the NPCCP immediately prior to the acquisition, the following shall apply:

 - a. If the total number of service connections to the provider's water distribution system increases to a higher tier level, as described in section 5-1105(D)(1)(d), as a result of the acquisition, the provider shall submit to the Director a new Provider Profile pursuant to section 5-1105(B)(1) within 60 days after the acquisition.
 - b. If the Director determines that the provider's service area characteristics or water use patterns have changed, the Director may require the provider to submit a new Provider Profile pursuant to section 5-1105(B)(1).
 - c. If the provider submits a new Provider Profile, section 5-1105(B)(2) and (B)(3) shall apply to the new Provider Profile. The provider shall continue implementing the BMPs described by the provider in its previously approved Provider Profile until the Director approves the new Provider Profile. Upon the Director's approval of the new Provider Profile, the provider shall implement the BMPs described in the newly approved Provider Profile.
 - d. If the acquiring provider is regulated under the Total GPCD Program after the acquisition, the Director shall establish a new GPCD requirement for the acquiring provider consistent with the methodology in section 5-1103(C), taking into account the addition to the provider's service area. The Director may also adjust the balance in

the acquiring provider's flexibility account maintained under section 5-1104(A) to consider the balance in the conveying provider's flexibility account at the time of the conveyance.

D. Regulation of Conveying Provider

- 1. Except as provided in paragraph 2 of this subsection, a large municipal provider that conveys a portion of its service area to another provider and that 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.*
- 2. If the conveying provider is not designated as having an assured water supply after the conveyance, or if the conveying provider was regulated under the NPCCP immediately prior to the conveyance, the following shall apply:*
 - a. The conveying provider shall be regulated under the NPCCP after the conveyance. If the conveying provider becomes designated as having an assured water supply after the conveyance, the provider may elect to be regulated under the Total GPCD Program by providing the Director with written notice of the election as provided in section 5-1102(D).*
 - 3. If the conveying provider was regulated under the NPCCP immediately prior to the conveyance, the following shall apply:*
 - a. If the total number of service connections to the provider's water distribution system decreases to a lower tier level as described in section 5-1105(D)(1)(d) as a result of the conveyance, the provider shall submit to the Director a new Provider Profile pursuant to section 5-1105(B)(1) within 60 days after the conveyance.*
 - b. If the Director determines that the provider's service area characteristics or water use patterns have changed, the Director may require the provider to submit a new Provider Profile pursuant to section 5-1105(B)(1).*
 - c. If the provider submits a new Provider Profile, section 5-1105(B)(2) and (B)(3) shall apply to the new Provider Profile. The provider shall continue implementing the BMPs described by the provider in its previously approved Provider Profile until the Director approves the new Provider Profile. Upon the Director's approval of the new Provider*

Profile, the provider shall implement the BMPs described in the newly approved Provider Profile.

d. If the conveying provider is regulated under the Total GPCD Program after the conveyance, the Director shall establish a new GPCD requirement for the provider consistent with the methodology in section 5-1103(C), taking into account the reduction in the provider's service area. The Director may also adjust the balance in the conveying provider's flexibility account maintained under section 5-1104 to consider the reduction in the provider's service area.

5-1107 Conservation Requirements for New Large Municipal Providers

A. Total GPCD Program

- 1. A new large municipal provider that is designated as having an assured water supply shall be assigned to the Total GPCD Program and shall comply with its annual GPCD requirement beginning with the second full calendar year after the provider is given written notice of the requirement by the Director, and for each calendar year continuing thereafter until the legislature determines otherwise.*
- 2. A new large municipal provider's GPCD requirement for a year shall be calculated using the methodology in section 5-1103(C).*
- 3. The Director shall determine if a new large municipal provider is in compliance with its GPCD requirement pursuant to the flexibility account provisions in section 5-1104.*

B. Non-Per Capita Conservation Program (NPCCP)

- 1. A new large municipal provider that is not designated as having an assured water supply shall be regulated under the NPCCP in accordance with section 5-1105. If the Director designates the provider as having an assured water supply while the provider is regulated under the NPCCP, the provider may elect to be regulated under the Total GPCD Program as provided in section 5-1102(D).*
- 2. A new large municipal provider that is designated as having an assured water supply may elect to be regulated under the NPCCP as provided in section 5-1102(B).*

5-1108 Conservation Requirements for Large Untreated Water Providers

A. Rate of Use Requirement

Beginning on January 1, 2025, and continuing thereafter until the legislature determines otherwise, 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 5-1110(A)(1).*
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.*

5-1109 Conservation Requirements for Small Municipal Providers

A. By January 1, 2025, or upon commencement of service of water, whichever is later, and continuing thereafter until the legislature determines otherwise, 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.*

5-1110 Individual User Requirements for Municipal Providers and Individual Users

A. 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 6.5 of Chapter 6 of the 5MP and shall comply with the monitoring and reporting requirements set forth in section 6-507 of the 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 6-402 of Chapter 6, 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 at the facility complies with all applicable conservation requirements and monitoring and reporting requirements contained in section 6.8 of Chapter 6 of the 5MP as though the municipal provider/individual user was an industrial user. The person responsible for compliance shall also comply with the applicable monitoring and reporting requirements contained in sections 6-403 and 6-803 and the conservation requirements contained in section 6-402 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 PhxAMA. 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 PhxAMA, 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.*

B. Responsibility for Compliance with Individual User Requirements

Pursuant to A.R.S. § 45-571.02, beginning January 1, 2025 and continuing thereafter until the legislature determines otherwise:

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 the department and received by the director at least ninety days before the adoption of the 5MP, as being an individual user to which the municipal conservation requirement applies.*
 - c. *The individual user was given written notice of the municipal conservation requirement by the director in the manner prescribed in paragraph 2 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.*
2. *If the individual user was not reported by the municipal provider as an individual user to which the municipal conservation requirement applies on a form provided by the department and received by the director at least ninety days before the adoption of the 5MP, the director may give written notice of a municipal conservation requirement that is substantially identical to an industrial conservation requirement to that individual user more than thirty days after the adoption of the 5MP. An individual user that is given written notice pursuant to this subsection shall comply with the conservation*

requirement not later than January 1 of the calendar year following the first full year after the date of the notice.

C. Notification of New Individual User by Municipal Provider

Beginning January 1, 2025, or upon commencement of service of water, whichever is later, and continuing thereafter until the legislature determines otherwise, a municipal provider shall notify a new individual user in writing of the applicable individual user requirements as set forth in subsection A of this section before commencement of service of water to the individual user.

5-1111 Conservation Requirements for Municipal Distribution Systems

A. Beginning with calendar year 2025, or the calendar year in which the provider commences service of water, whichever is later, and continuing thereafter until the legislature determines otherwise:

- 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.

5-1112 Monitoring and Reporting Requirements for Municipal Providers and Individual Users

A. Beginning with calendar year 2025, or the calendar year in which the municipal provider commences service of water, whichever is later, and continuing thereafter until the legislature determines otherwise:

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. *In addition to the information required by paragraphs 1 and 2 of this section, a large municipal provider regulated under the NPCCP shall include the following in its annual report required by A.R.S. § 45-632:*
 - a. *A CER as prescribed by section 5-1105(E).*
 - b. *The total number of residential and non-residential connections to the provider's water distribution system as of the end of the reporting year.*

5. 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.
6. 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.
7. An individual user shall comply with the monitoring and reporting requirements prescribed in section 5-1110(A).

5-1113 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 EPA or 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 desiring 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 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 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 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 groundwater withdrawn and used during the previous calendar year that qualifies for the accounting.

5-1114 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 5-1101 through 5-1113 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)).*

APPENDIX 5A

LOST AND UNACCOUNTED FOR WATER AND ALLOWABLE ESTIMATED USES

Lost and Unaccounted for Water Includes:	Water System Uses Include:
<u>Leaks:</u>	Residential Metered Deliveries Non-Residential Metered Deliveries Standpipe Uses Fire Flow* Hydrant Meter Reading* Hydrant Flow Tests* Fire Sprinkler System Flow Tests* Construction*
Distribution Lines	
Sewer Lines	
Storage Tanks	
Storage Ponds	
Hydrants	
Other	
<u>Breaks:</u>	Dust Control*
Distribution Lines	Line Flushing (distribution, sewer, or treatment facility)*
Sewer Lines	
Mains	Street Cleaning*
Hydrants	Storm Drain Flushing*
Other	Water Tests & Pressure Tests*
Measurement Errors:	Well Purging*
Meter Under-Registration	
Source Meter Errors	
Flumes/Weirs Errors	
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.

APPENDIX 5B

NON-PER CAPITA CONSERVATION PROGRAM BEST MANAGEMENT PRACTICES

The Non-Per Capita Conservation Program (NPCCP) is a conservation program for large water providers. Large undesignated providers shall be regulated under the NPCCP and shall submit a provider profile to ADWR by July 1, 2024. Large designated providers may elect to be regulated under the NPCCP by submitting a provider profile. See 5-1105 for more information.

All providers regulated under the NPCCP must implement a Public Engagement Program (section I) and select additional required best management practice (BMP) points from section II below. A BMP is a measure that is implemented with the goal of reducing water consumption or increasing water use efficiency. A water provider's required number of BMP points is based on the provider's tier which is determined by the provider's total number of service connections. At any time while regulated under the NPCCP, a water provider may choose to discontinue implementation of a selected BMP (other than the required Public Engagement Program) and implement a substitute BMP instead. The substitute BMP must be on the list of approved BMPs in section II of this appendix and the provider must determine that the substitute BMP is reasonably relevant to its existing service area characteristics or water use patterns. A water provider that substitutes a BMP must notify the Director of the substitution in its next CER.

Private water companies may establish an agreement with a municipality or local government within their service area to collaborate on the implementation of BMPs by one or both entities to reach the required number of BMP points in order to comply with the NPCCP. Parties involved in this collaboration would then be referred to as the "water provider" or "provider" for the purposes of complying with BMP requirements. BMPs implemented and managed by either the water company or the municipality or local government count towards BMP points for the regulated water provider. Private water companies participating in such an agreement must describe in their Conservation Efforts Report (CER) which entity is responsible for the implementation and management of each BMP in addition to the other reporting requirements for each BMP. This does not prohibit private water companies from participating in the NPCCP independently.

The Director may modify the list to include additional BMPs pursuant to the procedure set forth in section III of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.

I. Public Engagement Program (Required of all providers)

All large municipal providers regulated under the NPCCP are required to implement a Public Engagement Program that includes the following components:

1. At least four times a year, water providers shall communicate to customers the importance of water conservation and notify them of the water conservation materials and programs available from the provider and how they may obtain the materials or more information. Each communication event shall include communication through the provider's website **and** two or more of the following: water bills, paper newsletters, e-newsletters, group email blasts, social media platforms, postcards, print newspapers,

or other print pieces or other digital mediums. Water providers must review (and update, if necessary) their conservation material on an annual basis to ensure the information is up to date and meets the most recent water conservation and efficiency standards.

Implementation and Reporting Requirement: Water providers must submit with their CER whether each listed communication channel was utilized and how frequently each communication channel was utilized.

2. Water providers shall make available to customers free written information on water conservation (e.g., pamphlets, brochures, fact sheets, etc.). The information shall be available in the provider's office, sent to customers on request or provided online for customers who prefer this method. Providers are encouraged to distribute water conservation information at other locations and those locations' websites (e.g. libraries, chamber of commerce, town hall, etc.).

Implementation and Reporting Requirement: Water providers must submit with their CER a list of the free written information on water conservation that was made available to customers during the reporting year.

3. Water providers shall develop and implement a distribution plan to effectively deliver water conservation materials and programs.

Implementation and Reporting Requirement: Water providers must submit with their CER:

- a. the goals and objectives for the distribution of materials;
- b. a description of the conservation materials to be distributed;
- c. how the materials will be distributed (e.g., libraries, landscape architects, nurseries, realtors, master gardeners, etc.);
- d. how the materials or programs will be marketed (e.g., post cards, water bill inserts, messages on water bills, on-hold phone messages, e-mail messages, public events, workshops, provider website, newsletters, local publications, etc.);
- e. a timetable for distribution; and
- f. a mechanism for tracking the distribution of materials.

II. Additional Best Management Practices

Tier	Service Connections	Required Number of BMP Points/Year
1	0 – 1,000	3 points (from 2 or more categories)
2	1,001 – 5,000	5 points (from 3 or more categories)
3	5,001 – 30,000	10 points (from 4 or more categories)
4	30,001 +	20 points (from 5 or more categories)

Category 1: Education and Public Awareness

BMPs in this category are designed to raise awareness of the need for water conservation or to educate and/or train a specific audience on water conservation practices.

Point(s) Value	Description	Implementation and Reporting Requirements
1.1 Local or Regional Conservation Campaign		
1 point	Water providers actively participate in an advertising or social marketing campaign to raise awareness of the need for water conservation and to encourage the efficient use of water. The campaign must reach local or regional customers using methods such as traditional media (television, radio or print), websites, social media, and promotional materials (e.g., brochures, vehicle wraps, bookmarks, magnets, etc.).	Water providers must submit documentation with their CER that states the name of the campaign, a brief description of the campaign goal and targeted audience(s), the amount of money contributed or in-kind services offered, the campaign's methods of advertising media utilized, and marketing analytics that measure reach.
1.2 Special Events, Programs, and Community Presentations		
1 point	Water providers provide speakers, conduct tours for the public, or participate in community events to display, provide or present information about water conservation, and inform the public about the programs and resources.	Water providers must record how many events they participated in, how many people attended each event, and a brief description of each event in their CER.
1.3 Residential Adult Education and/or Training Program		
1 point	Water providers implement an education and/or training program for adults within their service area that includes active personal participation. Examples include regularly scheduled workshops and/or education programs for homeowners.	Water providers must state in their CER, the number and type of trainings and/or education programs held and the number of attendees per training and/or education program.
1.4 Non-Residential Adult Education and/or Training Program		
1 point	Water providers implement an education and/or training program for adults within their service area that includes active personal participation. The education and/or training program must be led by a qualified water provider staff or by a consultant or external individual with expertise. Examples include regularly scheduled workshops and/or education	Water providers must state in their CER, the number and type of trainings and/or education programs held and the number of attendees per training and/or education program.

	programs for landscape professionals or non-residential water users.	
1.5 Youth Education		
1 point	Water providers work with schools in their service area to provide or support programming that increases students' understanding of water resources and promotes water conservation. Examples of youth education programs include teacher trainings, classroom presentations, educational materials, assembly programs, water festivals, and guided field trips.	Water providers must state in their CER the number and type of education programs and the number of participants per education program.
1.6 Xeriscape Demonstration Garden		
1 point	Water providers install and maintain a low-water-use or water-efficient demonstration garden. The garden must meet the following criteria: <ol style="list-style-type: none"> 1. Be available to the public 2. Include interpretive signage and/or literature about low-water-use plants and/or water-efficient landscape practices 3. Maintain natural pruning practices, within safety constraints 4. Utilize and maintain efficient irrigation system(s) and practices and/or use passive rainwater harvesting 	Water providers must verify in their CER that the xeriscape demonstration garden meets all the required criteria and state the location of the garden and its approximate size.
1.7 Industry and/or Regional Partnerships		
1 point	Water providers contribute financial support or in-kind services and actively participate in an industry or regional partnership that implements a collaborative program designed to increase water use efficiency or reduce water consumption.	Water providers must submit with their CER a description of the partnership, program objectives, annual accomplishments, ongoing and future efforts, and whether they contributed financial support or in-kind services.
1.8 Non-Mandatory Staff Education or Training		
1 point	Attend an education or training program that expands employee knowledge related to BMPs for landscape maintenance, non-residential water audits, integrated land use and planning, water resources and	Water providers must submit the total number of employees who participated in educational or training programs and total number of CEUs and certifications obtained.

	other water conservation related courses. These trainings and or educational events must be apart from or in addition to any mandatory CEU requirements or certification maintenance trainings.	Water provider must keep a list of training participants and the number of associated continuing education credits or certifications obtained per training and have it available upon request.
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Category 2: Targeted Outreach and Consultation

BMPs in this category are designed to develop a relationship between customers and their water providers. These BMPs should increase a provider's involvement with its customers through outreach and/or consultation related to water conservation.

Point(s) Value	Description	Reporting Requirements
2.1 New Homeowner Outreach		
1 point	Water providers provide low-water-use landscape information and information about available rebates and/or incentives to all owners of newly constructed homes and existing homes (resale), either when the new homeowner calls to set up their service or through a phone call or email initiated by the provider. If a new homeowner requests physical copies of the information the provider shall distribute the material through mail, email, or delivery.	Water providers must submit with their CER the number of homes that were notified of low-water-use landscape materials and/or available rebates and/or incentives.
2.2 Residential Audit and Landscape Consultation		
1 point	Water providers offer an audit and/or landscape consultation program to all residential customers within their service area. The audit and/or landscape consultation may include indoor components, outdoor components, or both. The audit and/or landscape consultation may be performed by the provider or designated representative via phone call, email, video chat, or in-person. A residential audit and/or landscape consultation must include at least three of the following: 1. Indoor water use (e.g., toilets, faucets, showerheads, etc.)	Water providers must submit with their CER: <ol style="list-style-type: none"> 1. The total number of audits and/or landscape consultations 2. The number of each type of audit (indoor, outdoor, or both) 3. How each audit and/or landscape consultation was performed (phone call, email, video chat, or in-person) 4. Which three components were included in the audit and/or landscape consultation (indoor outdoor, leak check, an/or

	<p>2. Outdoor water use (e.g., hose bibs, irrigation system, pool/spa, water features, plant selection, turf conversion options, etc.)</p> <p>3. Leak check and detection assistance at the water meter</p> <p>4. Review with the resident their overall water consumption patterns for the home</p> <p>The individual providing the audit and/or landscape consultation shall provide on-site written or verbal suggestions, and offer a follow-up visit, interview, or online survey.</p>	<p>review of water consumption), if available</p> <p>5. Actual water savings one year pre- and post-audit and/or landscape consultation, if available</p>
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2.3 Non-Residential Audit and Landscape Consultation

1 point	<p>Water providers offer an audit and/or landscape consultation program to all non-residential customers within their service area. The audit and/or landscape consultation may include indoor components, outdoor components, or both. The audit and/or landscape consultation may be performed by the provider or designated representative via phone call, email, video chat, or in-person. A non-residential audit and/or landscape consultation must include at least three of the following:</p> <p>1. Indoor water use (e.g., toilets, faucets, showerheads, etc.)</p> <p>2. Outdoor water use (e.g., hose bibs, irrigation system, pool/spa, water features, plant selection, turf conversion options, etc.)</p> <p>3. Leak check and detection assistance at the water meter</p> <p>4. Review with the non-residential customer or contractor their overall water consumption patterns</p> <p>The individual providing the audit and/or landscape consultation shall provide on-site written or verbal suggestions, and offer</p>	<p>Water providers must submit with their CER:</p> <ol style="list-style-type: none"> 1. The total number of audits and/or landscape consultations 2. The number of each type of audit (indoor, outdoor, or both) 3. How each audit and/or landscape consultation was performed (phone call, email, video chat, or in-person) 4. Which three components were included in the audit and/or landscape consultation (indoor outdoor, leak check, an/or review of water consumption), if available 5. Actual water savings one year pre- and post-audit and/or landscape consultation, if available
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	a follow-up visit, interview, or online survey.	
2.4 Residential Water Budget		
1 point	<p>Water providers offer a water budgeting program to residential customers within their service area. The water budget shall establish target amounts for outdoor water use and may include indoor water use. These targets should meet or exceed water-use efficiencies required for outdoor uses (turf or low-water-use plants) and/or indoor uses (EPA WaterSense) referenced in the Fifth Management Plan. If they are not addressed in the plan, water-use rates should be commensurate with state-of-the-art water efficiency standards found elsewhere in the body of water conservation literature. Water budgets must be broken down by month and be delivered either in print, through an online portal, or by email.</p>	<p>Water providers must submit with their CER the number of individual budgets provided and whether they included indoor, outdoor, or both components. The methodology for creating budgets must be made available upon request.</p>
2.5 Non-Residential Water Budget		
1 point	<p>Water providers offer a water budgeting program to nonresidential water-using groups (e.g., homeowner associations, industries, commercial properties, government facilities, parks, schools, etc.) or to apartment complexes within their service area. The water budget shall establish target amounts for outdoor water use and may include indoor water use. These targets should meet or exceed water-use efficiencies required for outdoor uses (turf or low-water-use plants) and/or indoor uses (EPA WaterSense) referenced in the Fifth Management Plan. If they are not addressed in the plan, water-use targets should be commensurate with state-of-the art water efficiency standards found elsewhere in the body of water conservation literature. Water budgets must be broken down by month and be</p>	<p>Water providers must submit with their CER the number of individual budgets provided and whether they included indoor, outdoor, or both components. The number of non-residential customers that received budgets must also be recorded, if available. The methodology for creating budgets must be made available upon request.</p>

	delivered either in print, through an online portal, or by email.	
2.6 Customer High Water-Use Inquiry Resolution		
1 point	Water providers design and implement a program to assist customers who inquire about water bills increases or high-water usage. The program may include a site inspection to discover the cause of a water bill increase and a meter check to inform the customer on how to read the meter and check for leaks. Water providers must follow up on all customer inquiries, as appropriate. Providers should make an effort to follow up on customer inquiries within two billing periods if possible.	Water providers must submit with their CER the number of customers assisted and the type of assistance provided.
2.7 Customer High Water-Use Notification		
1 point	Water providers develop a program to identify customers with high water usage and contact them by phone, email, door hanger, mail, text, or in-person. The notification must include information on provider services that could benefit the customer, such as audits, educational materials, or rebate programs.	Water providers must submit with their CER the number of notifications sent.
Category 3: Physical System Evaluation and Improvement		
BMPs in this category are designed to reduce water loss by evaluating water distribution systems for leaks and/or malfunctioning equipment and implementing plans to correct the issues.		
Point(s) Value	Description	Implementation and Reporting Requirements
3.1 Distribution System Leak Detection and Mitigation		
2 points	Water providers implement a systematic evaluation of their water distribution system to identify and fix leaks. Providers must implement this program throughout their service area unless they can demonstrate that targeting certain portions of their service area is likely to yield the highest water savings.	Water providers must submit with their CER: <ol style="list-style-type: none"> 1. The number of leaks identified 2. The number of leaks repaired 3. Miles of distribution system surveyed A description of the distribution system leak detection and mitigation program that the provider followed must be made available to ADWR upon request.

3.2 Meter Repair or Replacement Program	
1 point	<p>Water providers implement a program to systematically assess the meters or submeters in their service area to identify malfunctioning meters and to repair or replace them.</p>
3.3 Advanced Metering Infrastructure (AMI) Installation	
2 points	<p>Water providers or designated representatives plan and install advanced metering infrastructure (AMI) throughout the service area. Providers may also retrofit automatic meter reading (AMR) to AMI.</p>
3.4 Advanced Metering Infrastructure (AMI) Maintenance and Utilization	
2 points	<p>Water providers or designated representatives maintain the physical AMI system and related software. Providers shall utilize the AMI data to provide services such as high-water consumption and/or leak alerts.</p>
3.5 Approved Comprehensive Water System Audit Program	
3 points	<p>Water providers conduct a systematic water loss or non-revenue water audit following an established methodology and utilizing best loss control techniques (such as those defined in the American Water Works Association M36 Manual). The audit program may include a review of the provider's water distribution system, systems control equipment, and water records to identify and quantify water losses, and shall develop a plan for corrective measures. The audit can be a precursor to a leak detection or meter repair or replacement</p>

program. M36 is an approved program, and a provider may submit to ADWR a written request for approval of an alternate water loss control program that meets or exceeds the criteria above.

Category 4: Sustainable Water Governance

BMPs in this category are designed to reduce water use within the provider's service area by implementing ordinances or tariffs. Ordinances apply to cities and towns and tariffs apply to private water companies regulated by the Arizona Corporation Commission (ACC). A provider that is not part of a municipality can receive credit if it works with local or county jurisdictions to implement a new ordinance.

Note: BMPs that are part of curtailment tariffs for private water utilities do not qualify for the NPCCP because they are only implemented as a response to water shortage or potential water shortage, and do not apply at all times.

Point(s) Value	Description	Implementation and Reporting Requirements
4.1 Low-Water-Use Landscape Requirements		
1 point	Residential and/or non-residential properties are either required to include low-water-use landscapes (using plants listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA) in at least 70% of the landscapable area or limit water-intensive landscaping and/or turf to no more than 30% of the landscapable area.	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
4.2 Water Waste Prohibition		
1 point	Water waste is prohibited on and/or from leaving the premises of residential and/or non-residential properties.	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a

		documented system for compliance and/or enforcement and include a description of those activities with their CER.
4.3 Plumbing Requirements		
1 point	Plumbing requirements for new residential and/or non-residential properties incorporate water-efficiency standards that exceed those specified by the EPA WaterSense Program.	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
4.4 Water Feature Limitations		
1 point	Residential and/or non-residential properties have limitations on or water conservation requirements for water features (fountains, waterfalls, ponds, and other artificial water structures).	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
4.5 Water-Efficient Model Home Landscape Requirements		
1 point	Landscaping at model homes in new residential developments is required to be water-efficient, is limited as to the size of water-intensive landscaped areas or requires water-	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or

	intensive landscaping to be used for functional areas only.	remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
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4.6 Graywater or Rainwater System Requirements

1 point	Residential and/or non-residential facilities are required to have on-site plumbing or systems for collecting and utilizing graywater or rainwater.	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
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4.7 Water Intensive Commercial User Requirements

1 point	Water intensive commercial users are required to implement at least two of the following measures: <ol style="list-style-type: none">1. recycle water2. use high efficiency nozzles, fixtures, or other process controls to minimize waste3. have an established system for detecting and repairing leaks4. develop and implement a maintenance plan for irrigation systems5. water landscapes with non-potable water6. install low-water-use landscapes	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
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7. use automatic shut-off valves on hoses and faucets and/or high-efficiency landscape irrigation methods, (e.g., drip)

4.8 Landscape Watering Restrictions

1 point

The watering of landscapes is restricted to certain times of day, specific days of the week, limited after a rainfall, or changed depending on seasons, etc.

Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.

4.9 Water-Efficient Hot Water Device or System Requirements

1 point

Water-efficient plumbing design, "on-demand" hot water recirculation devices, or other devices or designs for providing hot water efficiently are required in new residential and/or non-residential buildings.

Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.

4.10 Retrofit on Resale

1 point

Owners of single-family homes, multi-family home complexes or non-residential facilities are required to replace or retrofit all indoor plumbing fixtures (e.g., toilets, showerheads, faucets) that do not

Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or

	conform to meet or exceed current EPA WaterSense efficiency standards. This could be implemented by the seller prior to sale or by the buyer after the sale.	remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
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4.11 Non-Residential Landscape Irrigation Efficiency Standards

1 point	New or rehabilitated non-residential facility landscaping of a particular size is required to meet specified standards for maximum water allowance, plant selection, irrigation design, grade parameters, pressure-compensating emitters, spray bodies and controllers that meet or exceed current EPA WaterSense efficiency standards, or other components that result in improved landscape water use efficiency.	Water providers must submit with their CER the requirement's ordinance number or tariff number and a link to the digital municipal code where the ordinance/tariff can be found. It must be noted if the requirement is new, was updated, or remained unchanged for the reporting year. It must also be noted if the requirement is reviewed for compliance, enforcement, or both. To get credit for this BMP, the provider must have a documented system for compliance and/or enforcement and include a description of those activities with their CER.
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4.12 Conservation Rate Structure

1 point	Water providers implement a rate structure that incentivizes customers to conserve more water and/or use water more efficiently.	Water providers must submit with their CER a description of how the rate structure promotes efficient use of water or increased conservation of water.
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Category 5: Residential Conservation Incentives

BMPs in this category are designed to encourage residential water users to reduce water-use through no interest or low interest loans, financial rebates, and other incentives.

Point(s) Value	Description	Implementation and Reporting Requirements
5.1 Residential Customer Assistance		
1 point	Water providers offer residential customers in their service area free services or no interest or low-interest loans to repair inefficient equipment or leaks. Repairs include replacing parts,	Water providers must submit with their CER the number of customers assisted, type of repair (part replacement, maintenance, or replacement), and actual water use

	performing maintenance, or installing new fixtures.	one year pre- and post-repair per type.
5.2 Residential Toilet Incentive		
1 point	Water providers offer residential customers in their service area a financial rebate or other incentive for the purchase and installation of toilets that are at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER the number of toilets rebated, the total amount rebated, and actual water use one year pre- and post-rebate.
5.3 Residential Smart Irrigation Technology Incentive		
1 point	Water providers offer residential customers in their service area a financial rebate or other incentive for the purchase and installation of smart irrigation technology (e.g., irrigation controllers, nozzles, flow sensors, etc.). The technology must be at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER documentation that the technology meets or exceeds current EPA WaterSense standards, the number and type of technology rebated, the total amount rebated per technology, and actual water use one year pre- and post-rebate per technology.
5.4 Residential Water-Efficient Appliance Incentive		
1 point	Water providers offer residential customers in their service area a financial rebate or other incentive for the purchase and installation of water efficient appliances (e.g., clothes washer). The appliance must be at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER documentation that the appliance meets or exceeds current EPA WaterSense standards, the type and number of appliances rebated, the total amount rebated per type of appliance, and actual water use one year pre- and post-rebate per appliance.
5.5 Residential Graywater Incentive		
1 point	Water providers offer residential customers in their service area a financial rebate or other incentive for the installation of graywater systems, fixtures, or retrofits along with educational material on the benefits of using graywater.	Water providers must submit with their CER the type and number of retrofits rebated, total amount rebated, and actual water use one year pre- and post-rebate.
5.6 Residential Rainwater Harvesting Incentive		
1 point	Water providers offer residential customers in their service area a financial rebate or other incentive for the installation of active or passive rainwater	Water providers must submit with their CER the type and number of rebates provided, total amount

	harvesting systems (e.g., gutters, downspouts, landscape designs, containers, etc.) along with information about water-harvesting techniques.	rebated per type, and actual water use one year pre- and post-rebate.
5.7 Residential Xeriscape Installation and/or Landscape Conversion Incentive		
2 points	Water providers offer residential customers in their service area a financial rebate or other incentive for the conversion of water-intensive landscape to xeriscape and/or for installing a xeriscape landscape in new residential construction. Examples include replacing grass with xeriscape or converting a high-water-use landscape to a landscape which exclusively uses plants on the Low Water Use & Drought Tolerant Plants Lists for the PhxAMA .	Water providers must submit with their CER the type and number of rebates provided, total amount rebated per type, square feet of grass removed (if applicable), and actual water use one year pre- and post-rebate per type of rebate.

Category 6: Non-Residential Conservation Incentives

BMPs in this category are designed to encourage non-residential water users to reduce water-use through no interest or low interest loans, financial rebates, and other incentives.

Point(s) Value	Description	Implementation and Reporting Requirements
6.1 Commercial and Industrial Customer Incentive		
1 point	Water providers identify commercial and industrial customers in their service area with significant conservation potential and implements a water conservation program and/or rebate or incentive program for those customers. The program may include replacements, retrofits, and audits and may focus on outdoor use (e.g., irrigation, water features, pools, etc.) and/or indoor use (e.g., machinery, bathrooms, cooling towers, etc.).	Water providers must submit with their CER a description of the program and actual water use pre- and post-project.
6.2 Non-Residential Toilet and/or Urinal Incentive		
1 point	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the purchase and installation of toilets and/or urinals that are at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER the number of toilets and/or urinals rebated, the total amount rebated, and actual water use one year pre- and post-rebate.

6.3 Non-Residential Smart Irrigation Technology Incentive

1 point	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the purchase and installation of smart irrigation technology (e.g., irrigation controllers, nozzles, flow sensors, etc.). The technology must be at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER documentation that technology meets or exceeds current EPA WaterSense standards , the number and type of technology rebated, the total amount rebated per type of technology, and actual water use one year pre- and post-rebate per type of technology.
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6.4 Non-Residential Water-Efficient Appliance Incentive

1 point	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the purchase and installation of water efficient appliances (e.g., clothes washer). The appliance must be at least as efficient as the current EPA WaterSense standards.	Water providers must submit with their CER documentation that the appliance meets or exceeds current EPA WaterSense standards , the type and number of appliances rebated, the total amount rebated per type of appliance, and actual water use one year pre- and post-rebate per appliance.
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6.5 Non-Residential Graywater Incentive

1 point	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the installation of graywater systems, fixtures, or retrofits along with educational material on the benefits of using graywater.	Water providers must submit with their CER the type and number of retrofits rebated, total amount rebated, and actual water use one year pre- and post-rebate.
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6.6 Non-Residential Rainwater Harvesting Incentive

1 point	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the installation of active or passive rainwater harvesting systems (e.g., gutters, downspouts, landscape designs, containers, etc.) along with information about water-harvesting techniques.	Water providers must submit with their CER the type and number of rebates provided, total amount rebated per type, and actual water use one year pre- and post-rebate per type of rebate.
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6.7 Non-Residential Xeriscape Installation and/or Landscape Conversion Incentive

2 points	Water providers offer non-residential customers in their service area a financial rebate or other incentive for the conversion of	Water providers must submit with their CER the type and number of rebates provided,
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	<p>water-intensive landscape to xeriscape and/or for installing a xeriscape landscape in new non-residential construction. Examples include replacing grass with xeriscape or converting a high-water-use landscape to a landscape which exclusively uses plants on the Low Water Use & Drought Tolerant Plants Lists for the PhxAMA.</p>	<p>total amount rebated per type, square feet of grass removed (if applicable), and actual water use one year pre- and post-rebate per type of rebate.</p>
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Category 7: Planning

BMPs in this category are related to planning and long-term sustainability of water supply.

Point(s) Value	Description	Implementation and Reporting Requirements
7.1 Land Use Planning and Water Utility Committee		
1 point	<p>The committee goal is to provide enhanced collaboration and communication between community land use planners and water efficiency experts. The committee may include but is not limited to elected representatives, senior management, planning and water experts. The committee may share data and develop and implement project or programs designed to increase water use efficiency. The meetings should be used to collaborate on water and land use planning, share data, and develop projects or scenario planning for their shared jurisdiction. This partnership implements a collaborative program designed to increase water use efficiency or reduce water consumption within the water provider's and land use authority's service areas.</p>	<p>A minimum of one program or project must be in development or implemented each year, and the committee must meet at least three times per year to qualify. Water providers must submit with their CER an explanation of the collaboration between the land use planning staff and water provider staff which must include the type of project or program implemented and committee meeting agendas from that year.</p>
7.2 Non-Residential Water-Use Plan		
1 point	<p>All new commercial, industrial, and institutional (CII) customers with projected annual water use of 10 AF or more per year are required to submit a water use plan that identifies all anticipated water uses by the customer and the water efficiency measures associated with the uses. The water use plan must include at least five of the following:</p> <ol style="list-style-type: none"> 1. Statement of water efficiency policy 2. Water conservation education or training for employees 	<p>Record in the CER the number of plans received from CII customers and which five or more elements were included in each plan.</p>

3. Identification of on-site recycling and reuse strategies
4. Total cooling capacity and operating total dissolved solids or conductivity for cooling towers
5. Identification of best available technologies used for process, cooling, and domestic water uses
6. Landscape watering system distribution uniformity and landscape water budget
7. Total annual water budget for the facility
8. Consideration of land use planning BMPs to promote demand management, water efficiency, and water conservation

7.3 Integrated Long-Range Planning

Water providers work with local governments to ensure that long-range planning activities take water resource availability and sustainability into account, in at least three of the following ways:

1. Local governments include at least three of the following in their General Plan:
 - a. Requirements of A.R.S. § 9-461.05(D):
 - (a) The known legally and physically available surface water, groundwater and effluent supplies. (b) The demand for water that will result from future growth projected in the county plan, added to existing uses. (c) An analysis of how the demand for water that will result from future growth projected in the comprehensive plan will be served by the water supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies
 - b. Calculating water use by land use type in zoning maps and proposed zoning changes
 - c. Prioritization of water-efficient land use forms, such as mixed-use

1 point

Water providers must submit with their CER copies of their local plans highlighting how they take long-range planning, water resources, and sustainability into account.

- development, infill development, compact development, smaller lots, or increased building density
- d. Use of zoning tools, such as an overlay zone, to protect areas for groundwater recharge, water quality, or stormwater infiltration
 - e. Development and use of annexation policies sensitive to water availability and service infrastructure
 - f. If a private water company, must review and comment or otherwise participate in the General Plan development and implementation of a water element for local jurisdictions within their service area
2. Providers work with local governments to ensure their Capital Improvement Plans are consistent with provider Conservation, Drought, or Adequacy Plans; and/or with any other water related planning activities conducted by the provider
 3. Providers work with local governments to prioritize water resources sustainability and resiliency in Sustainability Plans, Resilience Plans, or Climate Action Plans
 4. Providers work with local governments to provide strategies for securing their water resources within Hazard Mitigation Plans and comment on how the plan could be implemented within their service area
 5. Providers create a One Water Plan or Integrated Water Resources Management Plan to holistically consider management of potable water, wastewater, and stormwater
 6. Provider may propose to ADWR other long-range planning strategies to be considered

7.4 Conservation-Oriented Development

1 point

Water providers incentivize developers to design advanced water efficiency and water management considerations into new buildings

Water providers must submit with their CER a description of how developers are taking water management

<p>or subdivisions, in at least one of the following ways:</p> <ol style="list-style-type: none"> 1. Green building standards such as Leadership in Energy and Environmental Design (LEED) or International Green Construction Code (IgCC) 2. EPA WaterSense Labeled Homes 3. Low water use model or demonstration homes using non-ordinance incentives 4. Low impact development and green infrastructure design for stormwater management or rainwater harvesting 5. Low water use land uses such as mixed-use development, infill development, compact development, cluster development, smaller lots, or increased building density 6. Developer incentives for water conservation and efficiency such as density bonuses or infill incentives 7. Low water use landscaping requirements or irrigation efficiency requirements using non-ordinance incentives 8. Prioritize water uses for public areas within the provider's service area in case of shortage/drought by methods such as by creating an implementation plan to establish separate irrigation system zones in parks and other public landscaped areas in the service area where, if necessary, water can be cut back (e.g., turf) versus areas where water should be maintained (e.g., trees) 9. Providers may propose to ADWR other conservation-oriented development strategies to be considered 	<p>considerations into new building design and/or associated incentive programs encouraging developers to do so.</p>
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Category 8: Research, Analysis, and Innovation

BMPs in this category are designed to encourage water providers to conduct systematic evaluations of conservation measures already implemented, research and implement state-of-the-art water conservation technologies and techniques, and/or develop or try new technologies and techniques.

Point(s) Value	Description	Implementation and Reporting Requirements
8.1 Market Surveys and/or Focus Groups		
1 point	Water providers conduct a professional market survey and/or focus group to be used to improve their current water conservation activities or to plan future activities. The survey and/or focus group is designed to gather data regarding customers' information needs, program preferences, or effectiveness of conservation messages or programs.	Water providers must submit with their CER the objectives of the survey and/or focus group, data collection methods, analysis of results, and how the results were communicated. This document shall be made available for public distribution. Credit for this BMP is limited to once every five years.
8.2 Research of a New Technology and/or Technique		
1 point	Water providers research, contribute financial support, or provide in-kind services for the research of a new technology or technique that will enhance their conservation program decision making and development, improve water efficiency or result in water savings.	Water providers must submit with their CER documentation that describes the research objectives, methods, and results. Additionally, providers must provide their involvement and methods of support and any other participatory party's involvement and methods of support. This documentation shall be made available for public distribution. Additional documentation regarding project progress or new research being conducted will be required to earn points for multiple years.

8.3 Pilot Plan Development for a New Technology and/or Technique

2 points	<p>Water providers contribute financial support or provide in-kind services for the plan development for a pilot of a new technology or technique that will enhance their conservation program decision making and development, improve water efficiency, reduce reliance on non-renewable resources, improve demand management practices, or result in water savings.</p>	Water providers must submit with their CER documentation that details the pilot plan, including but not limited to the timeline for implementation, the projected cost of the project, the customers selected (residential, non-residential, the water provider, etc.), the desired outcomes, the proposed methods of analysis, and any anticipated challenges. Additionally, providers must provide their involvement and methods of support and any other participatory party's involvement and methods of support. This documentation shall be made available for public distribution.
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8.4 Piloting a New Technology and/or Technique

2 points	<p>Water providers contribute financial support or provides in-kind services for piloting a new technology or technique that will enhance their conservation program decision making and development, improve water efficiency, reduce reliance on non-renewable resources, improve demand management practices, or result in water savings.</p>	Water providers must submit with their CER documentation that includes the pilot program tracking information, including but not limited to the actual timeline of implementation, the actual cost of the pilot, the actual customers selected, the actual method of analysis, and any challenges that occurred and how they were mitigated. Additionally, providers must provide their involvement and methods of support and any other participatory party's involvement and methods of support. This documentation shall be made available for public distribution.
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8.5 Quantitative Evaluation of Actual Water Savings of an Existing Best Management Practice or of a New or Emerging Technology or Practice

2 points	<p>Water providers or subject matter experts engaged by a provider conduct a quantitative analysis of an existing BMP or a new or emerging technology or practice that yields results regarding actual water savings. The evaluation should state the effectiveness of the practice or technology, volume of water savings, and should discuss potential for larger-scale implementation.</p>	<p>Water providers must submit with their CER documentation that shows the methodology of the analysis, the actual water savings, a discussion of the effectiveness of the practice or technology, and a discussion of the potential for larger-scale implementation. This documentation shall be made available for public distribution.</p>
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III. Procedure for Adding a Best Management Practice

1. A large municipal provider may submit a written request to the Director to add a BMP to the list of additional BMPs set forth in section II of this appendix.
2. Upon receipt of a written request submitted pursuant to paragraph 1 above, the Director shall review the request and may request additional information from the applicant. The Director may seek information from other sources as deemed necessary to determine if the BMP should be added.
3. If the Director approves the request, the Director shall add the BMP to the list of additional BMPs set forth in section II of this appendix, post the modified list of additional BMPs on ADWR's web site and file the modified list within ADWR's active management area office.
4. The Director may add a BMP to the list of additional BMPs set forth in section II of this appendix.

CHAPTER 6: INDUSTRIAL

6.1 INTRODUCTION AND BACKGROUND

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. The total volume of Type 2 GFRs in the PhxAMA was set following enactment of the *1980 Groundwater Code* (Code). The total volume of water associated with Type 1 GFRs can increase over time as agricultural land with Irrigation Grandfathered Rights (IGFRs) is retired from agricultural production and the IGFRs are converted to Type 1 GFRs. However, total allowable groundwater use is reduced at the time of conversion of the IGFR to a Type 1 GFR. General Industrial Use (GIU) groundwater withdrawal permits are issued by ADWR 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 a GFR or a GIU permit (A.R.S. § 45-497(B) and 45-515) if they intend to receive groundwater from an irrigation district in excess of the amount it was entitled to receive on June 12, 1980.

There are also groundwater users that, although served by a municipal water provider, are subject to industrial program conservation 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 users who use groundwater 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 and the requirements for each subsector, and the 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, and more detailed data can be found on the AMA Data webpage (<https://new.azwater.gov/ama/ama-data>).

6.2 INDUSTRIAL CONSERVATION PROGRAMS DESCRIPTION

The objective of all Industrial Conservation Programs is to achieve reductions in withdrawals of groundwater in order to contribute to the goal of the AMA. 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 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, new large landscape users, and new large 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 PhxAMA 5MP conservation program for all industrial users is similar to the 4MP program. All industrial users are required 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 new large landscape users are required to use plants listed on the ADWR Low Water Use & Drought Tolerant Plants Lists for the PhxAMA for landscaping where feasible, and water with efficient irrigation systems. Improving irrigation efficiency can be a source of major water savings whether the plants have high or low water needs. ADWR encourages all facilities to irrigate efficiently regardless of the type of vegetation planted. In addition, since January 1, 2002, industrial users have been prohibited from serving groundwater to vegetation planted in a public right-of-way on or after January 1, 2002 unless the plants are on the ADWR Low Water Use & Drought Tolerant Plants Lists for the PhxAMA. Industrial users have also been prohibited from serving groundwater to a water feature in the right-of-way if installed after January 1, 2002. For those Industrial Conservation Programs where a water conservation plan was required by the 4MP, an update to that plan is required to be submitted by July 1, 2024.

The Industrial Conservation Programs for the PhxAMA have been updated for the 5MP:

- The calculation to set golf course conservation allotments was updated.
- The calculation to set non-golf turf facility conservation allotments was updated.

- Allotment additions for all turf facilities was updated.
- The conservation requirements for sand and gravel facilities, large-scale power plants, large-scale cooling facilities, dairy operations, cattle feedlot operations, metal mining facilities, new large landscape users, and new large industrial users is unchanged from the 4MP.

The conservation requirements contained in this chapter are designed to reduce withdrawals of groundwater and will become effective on January 1, 2025. 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, parks, cemeteries, golf courses, or common areas within a housing subdivision, with ten or more acres of water-intensive landscaped area. Because “irrigation” is defined in the Code 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. Facilities may also apply for an allotment addition, if certain criteria are met. The turf conservation program also includes flexibility accounts and an incentive 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 unique set of conservation requirements, different from non-golf turf-related facilities. Both conservation requirements are described in this section.

Turf-related facilities regulated 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 that are 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 for more information).

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 (AF)/acre application rate to determine the allotment. Both turf acres and low water-landscaped areas must have permanent irrigation system. Further definitions of both types of landscaping can be found in section 6-501.

It is important to note that the allotment formula outlined below does not dictate how turf-related facilities are to use water within their facility. The facility manager has discretion on how to use the allotment within the facility. The formula is merely a way for ADWR to calculate an allotment for a diverse number of turf-related facilities and therefore may not reflect the exact conditions in each facility. For example, the turf application rate is based on 77.5 percent efficiency, and the allotment method design is centered on 90 acres for an 18-hole golf course (five acres/hole), but it does not require courses to have the same efficiency or be limited to 90 acres. Instead, the allotment formula is intended to encourage efficient design, construction, water application, and to acknowledge limited overseeding practices.

The allotments for turf related facilities that are not golf courses are structured to incentivize less turf and water surface area, or water-intensive landscaped area, as defined in section 6-501. There are two categories of turf-related facilities, a "Low" facility will have 30 percent or less water-intensive landscaped area and a "High" facility will have more than 30 percent water-intensive landscaped area. Facilities with "Low", or 30 percent or less of water intensive landscaped area will have an allotment method that is more generous. Allotments are calculated by multiplying acreage by the appropriate application rates shown in Table 6-503-1, depending on the category the facility is in. The application rate for turf acres in the high water intensive landscaped area category is based on ornamental uses of turf, at 4.43 AF/acre. While the low water use intensive category uses the same application rate from the 4MP, at 4.75 AF/acre. Low water use acres are calculated at a rate of 0.85 and 1.08 AF/acre for high and low water intensive landscaped area facilities respectively. Water surface acres are calculated at a rate of 6.2 AF/acre. The allotments for the individual landscaping types are then summed together

for a total maximum annual water allotment. To add some flexibility for parks and schools, who may have a large percentage of functional turf, such as athletic fields. A park or school may apply for an additional application rate for non-ornamental turf acres up to a total of 4.75 AF/ac. Non-ornamental acres will be defined as a permanent athletic field or highly trafficked area that is not practical to convert to hard or low water use landscape.

In developing the water allotment formula for golf courses, ADWR recognized the need to simplify a complex formula while including application rates based on updated analysis from scientific experts and current practices used on golf courses such as overseeding. ADWR also recognized the need to continue a standard that has been established within the golf course conservation program in previous management plans that encouraged a smaller water intensive footprint 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 ADWR encourages golf course sizes of five acres per hole or less, it is not a requirement and golf courses may expand or develop any number of water-intensive landscaped acres. However, water use 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.

The allotment for water surface area is based on the highest number of water surface acres in existence up to 1989, which is calculated at a rate of 6.2 AF/acre. Water surface acres that were expanded prior to 1989 or any course built after 1989 are capped at an amount calculated by multiplying the application rate of 6.2 AF/acre by 0.14 acre/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 5MP.

Allotment Addition for the Establishment of 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 AF/acre of newly turfed area. For golf courses, the allotment is limited to five AF per number of holes in 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 to the courses total turfed area.

Allotment Addition for Revegetation

A revegetation allotment addition is available to facilities that want to establish low-water use or other site-adapted landscaping plants which will need only temporary supplemental water application after 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 ADWR'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 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 which has been emptied for maintenance work to eliminate or reduce seepage losses. The allotment addition may be given only 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 need an additional amount of 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 ADWR 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, 2024 or 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 are 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 that was neither in operation as of December 31, 1984 nor substantially commenced as of December 31, 1984 so that no more than 75 percent of the total cemetery operating area is landscaped with plants not listed on the ADWR Low Water Use & Drought Tolerant Plants Lists for the PhxAMA (<https://new.azwater.gov/conservation/landscaping>). 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, 1984.

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 is required to submit updated documentation as outlined in section 6-507. A new maximum annual allotment will then be calculated for the facility to reflect the acres that are in existence.

Beginning with the 4MP, new 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. This does not apply to turf-related facilities existing prior to the 4MP.

6.2.1.3 EFFLUENT USE ADJUSTMENT

In the PhxAMA, effluent is the only water supply that is expected to increase in availability throughout the 5MP. Effluent's relatively high nutrient content 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 fifth management period, ADWR has maintained the effluent incentive that was included in the 4MP. While the maximum annual water allotment does not change under this incentive, each AF 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

In order to compensate for fluctuating weather conditions, each turf-related facility will have a flexibility account with credit and debit limits. In wetter years or through careful management, facilities will be able to accrue a credit balance 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 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. Prudent facility managers will take advantage of wet years and the latest conservation technologies to accumulate as many credits as allowed in order to compensate fluctuations in water demand during hot or dry years.

6.2.1.5 MONITORING AND REPORTING REQUIREMENTS

The conservation requirements for the fifth management period include monitoring and reporting requirements for all turf-related facilities. All turf-related facility water use will be 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 provisions in the 5MP for the Sand and Gravel Facility Program have not changed from those contained in the 4MP. The 5MP 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 fifth management period.

As in the 4MP, sand and gravel operators will be required to evaluate specific water-saving methods and submit a conservation plan to ADWR during the fifth management period. The conservation plan must be submitted to the Director by July 1, 2024. Sand and gravel facility operators will analyze conservation methods to identify those that will result in a positive economic return. Operators will be 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 "down-time," or increasing the size of reserves
- Costs associated with regulatory permitting

6.2.3 LARGE-SCALE POWER PLANT PROGRAM DESCRIPTION

ADWR 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 5MP: steam electrical plants, combustion turbine plants, and combined-cycle plants. 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 5MP, ADWR 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. ADWR 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 5MP 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 applies 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

exempted 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 will result 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. In addition, facilities must report the amount of electricity generated, periods when they are not generating electricity, and the 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 have 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 ADWR of the existence of the individual user as provided in section 5-1110 of the Municipal Conservation Requirements (See Chapter 5 of this plan) or ADWR 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 ADWR and are responsible for complying with industrial conservation requirements.

6.2.5 DAIRY PROGRAM DESCRIPTION

ADWR 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.

6.2.5.1 ALLOTMENT-BASED REQUIREMENTS

The amount of water required by a dairy depends upon 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.

Table 6-3 Phoenix AMA Water Needs at a Typical Dairy

Operation	Water Use Allocation (gallons/day)	
	Lactating Cow	Non-Lactating Animal
Drinking needs ¹	30	15
Udder washing – based on 72 minutes/day at 8 gallons/minute; 16 cows/milking (two per group). Varies with number of milkings/day. ¹	35	0
Barn cleanup and sanitizing. Varies with number of milkings/day. ¹	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
Total	105	20

1 Assumes three milkings/day

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

The assumptions of Table 6-3 are the basis for the annual water allotments for dairies. When calculating the total annual allotment, lactating cows are allotted 105 gallons/animal/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 non-lactating animals/day present at the dairy each year.

Upon application, ADWR 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, ADWR has included a three-year averaging provision in the maximum annual water allotments in the fifth management period. The water use of three consecutive years can be averaged to determine if compliance with the 5MP allotment has been achieved.

6.2.5.2 BEST MANAGEMENT PRACTICES REQUIREMENTS

As an alternative to the annual allotment requirement, a dairy may submit an application to the Director to be regulated under the Best Management Practices Program (BMP Program). This program requires implementation of conservation and management practices to maximize efficiency in the following water use categories:

- Delivery of drinking water for dairy animals;
- Udder washing and milk parlor cleaning;
- Corral design and maintenance;
- Cleaning and sanitization milking equipment;
- Dust control, calf housing cleaning, and feed apron flushing;
- Dairy animal cooling; and
- Dairy animal feed preparation.

Implementation of all the standard BMPs listed in Appendix 6A will have a specific measurable result. While most of the standard BMPs are applicable to all dairies, the water-use activities associated with some of the standard BMPs may not exist at all dairies. If a dairy cannot implement a standard BMP, the dairy may apply to implement a substitute BMP with a specific measurable result that demonstrates a water savings equivalent to the water savings associated with the standard BMP. If a substitute BMP is not possible, the dairy may apply for a waiver of the standard BMP. The Director may grant a waiver only for the following standard BMPs: (1) BMP 2.1.2 (Udder Wash System); (2) BMP 2.2.2 (Milking Parlor Floor and Wall Washing); (3) BMP 4.1.1 (Milk Cooling and Vacuum Pump); (4) all of the standard BMPs in Water Use Category No. 5 (Dust Control, Calf Housing Cleaning, and Feed Apron Flushing); (5) all of the standard BMPs in Water Use Category No. 6 (Dairy Animal Cooling); and (6) all of the standard BMPs in Water Use Category No. 7 (Dairy Animal Feed Preparation).

Five years after a dairy is accepted for regulation under the BMP Program, the Director will review the dairy's BMPs to determine if they are still appropriate. If the BMPs are no

longer appropriate due to an expansion of the dairy or a change in management practices, the Director will require a modification to the BMPs.

6.2.6 CATTLE FEEDLOT PROGRAM DESCRIPTION

ADWR 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.

For the 5MP, ADWR has not changed the Cattle Feedlot Conservation Program from the program included in the 4MP. The conservation requirements for cattle feedlot operations in the 5MP include a maximum annual water allotment for each facility based on the assumed use of specific conservation technologies.

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 five GAD. Total water requirements for a cattle feedlot operation are 30 GAD. These requirements are continued for the fourth management period.

6.2.7 MINING PROGRAM DESCRIPTION

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

The 5MP 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 fifth 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 ADWR in a long-range conservation plan.

In the fifth management period there will also be a new 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 6B. See section 6-1104 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 that were planted after January 1, 1990. 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 6.5 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 using 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 and 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 USER PROGRAM DESCRIPTION

New large industrial users in the 5MP are industrial users that use over 100 AF/year and commence use after January 1, 2025. 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 PhxAMA 5MP contains incentives to increase the use of non-groundwater supplies. For example, ADWR has included an effluent adjustment for turf-related facilities in the management plans. When determining a turf-related facility's compliance with its maximum annual water allotment within the PhxAMA, ADWR 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 ADWR for an allotment addition to allow for leaching of salts below the root zone.

6.4 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING 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, unless the context otherwise requires, the following words and phrases used in this chapter shall have the following meanings:

1. "4MP" means Fourth Management Plan for the PhxAMA.
2. "5MP" means Fifth Management Plan for the PhxAMA.
3. "ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA" means the list of low water use & drought tolerant plants found on ADWR's website, <https://new.azwater.gov/conservation/landscaping> including any modifications to the list.
4. "Industrial process purposes" means water that is used by an industrial user directly in the creation or manufacture of a product.
5. "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.
6. "Industrial user" means a person who uses water for industrial uses.
7. "PhxAMA" means the Phoenix Active Management Area.
8. "Effluent" has the same definition as prescribed in A.R.S. § 45-101.
9. "Remedial groundwater" means groundwater withdrawn pursuant to an approved remedial action project under 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.
10. "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.
11. "Wastewater" means water that is discharged after an industrial or municipal use, excluding effluent.

12. "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

- A. Beginning on January 1, 2025 or upon commencement of water use, whichever occurs later, and continuing until the legislature determines otherwise, 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 PhxAMA for landscaping to the maximum extent feasible and water with 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, 2002, groundwater may only be used to water landscaping plants within any publicly owned right-of-way if those plants are listed on the ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA. If the industrial user demonstrates that plants listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA 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, 2002 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.

Beginning on January 1, 2025, or upon commencement of water use, whichever occurs later, and continuing until the legislature determines otherwise, 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. 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 PhxAMA during the calendar year as a result of removal of plants not on ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA. An industrial user regulated as a turf-related facility under sections 6.5 or as a new large landscape user under section 6.12, is exempt from this requirement.*

B. Applicability

An 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 AF/year.*
2. *holds more than one such right or permit in the aggregate amount of more than 10 AF/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/year is exempt from the requirements set forth in subsection A of this section.

C. 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. R12-15-1102(E)).

6-403 Monitoring and Reporting Requirements

A. Requirements

Beginning on January 1, 2025, or upon commencement of water use, whichever occurs later, and continuing until the legislature determines otherwise, 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. 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 PhxAMA during the calendar year as a result of removal of plants not on ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA. An industrial user regulated as a turf-related facility under section 6.5 or as a new large landscape user*

under section 6.12 is exempt from this requirement.

B. Applicability

An 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 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.

C. 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. R12-15-1102(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 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.*

B. 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.*

C. 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, and section 6-401 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-501 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 PhxAMA. 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 ARS 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 ARS 15-101(22); or (B) any accredited public or private postsecondary institution, where "accredited" has the same definition as ARS 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 PhxAMA. 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 2025 or the first full calendar year after commencement of landscape watering, whichever is later, and continuing thereafter until the legislature determines otherwise, an 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 sections 6-503 and 6-504.

B. Conservation Plan

No later than January 1, 2025 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 a conservation plan for the facility that contains an accurate and detailed description of the conservation technologies, including management practices, that are applied at the facility when water is used for landscape watering purposes. The industrial user shall maintain or update the conservation plan at least annually. The industrial user shall remain in compliance with this requirement pursuant to the 5MP until the legislature determines otherwise.

C. Limiting Water-Intensive Landscaped Area

- 1. Beginning on January 1, 2025 or upon commencement of landscape watering, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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, 2023 are exempt from the limitation on water-intensive landscaped area but are encouraged to reduce*

water-intensive landscaped area.

2. *Beginning on January 1, 2025 or upon commencement of landscape watering, whichever occurs later, and continuing thereafter until the legislature determines otherwise, an industrial user who uses water at a turf-related facility that is a cemetery shall limit the water-intensive landscaped area within any portion of the cemetery that was neither in operation as of December 31, 1984 nor substantially commenced as of December 31, 1984 so that no more than 75 percent of the total cemetery area within that portion of the cemetery is planted with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for the PhxAMA. This requirement shall not apply to any expanded portion of a cemetery in operation as of December 31, 1984 or substantially commenced as of December 31, 1984 if the expanded portion of the cemetery was under the same ownership as the cemetery as of December 31, 1984.*

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 of type of landscaping by the applicable application rate for each facility category, both listed in Table 6-503-1 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

From 2025 until the first compliance date for any substitute requirement after the 5MP as established by the legislature

Facility Category	Type of Landscaping:	Application rate: (AF/acre/calendar year)
High (>30% water-intensive landscaped area)	1.Turf acres	4.43
	2.Total water surface area	6.2
	3. Low water use landscaped area	0.85
Low (≤30% water-intensive landscaped area)	1.Turf acres	4.75
	2. Total water surface area	6.2
	3. Low water use landscaped area	1.08

B. The owner or operator of a 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 4.75 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 non-ornamental turf acres:

- Historical water-use and compliance of the facility
- 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 6-505-1 and footnote 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 facility, whichever is less, will be calculated at the overseeded application rate listed in Table 6-505-1. 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 6-505-1. 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.

Table 6-505-1 Application Rates for Golf Courses

From 2025 until the first compliance date for any substitute requirement after the 5MP established by the legislature

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
5. Total water surface area	6.2	See footnote 1

¹ 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 1989, 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 turf-related facility, the facility may apply to the Director for an allotment addition of 1.0 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 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 PhxAMA, 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 sections 6-503 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, 2023 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:

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

Where:

- E_{cw} = Electrical conductivity of water used
 E_{ce} = 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 for the facility's conservation requirements after the the 5MP, as established by the legislature whichever occurs first.

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 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 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 AF 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, a flexibility account shall be established for a turf-related facility with a beginning balance of zero. The beginning balance in the flexibility*

account of a facility that was previously regulated shall be the ending balance in the flexibility account maintained for the facility in the 4MP, subject to the limitations in paragraph 3 of this section.

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, 2025, 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 2025 or the calendar year in which landscape watering commences, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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 turf 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 6-503, subsection B.*
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 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 pursuant to section 6-505, subsection E. 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 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, 2025 or upon commencement of water use, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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.

1. 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 for any substitute conservation requirement after the 5MP as established by the legislature.

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 5MP as established by the legislature, shall submit to the Director a plan to improve 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 2025 or the calendar year in which the sand and gravel facility first commences using water, whichever occurs later, and for each calendar year thereafter until the legislature determines otherwise, 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. 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 LARGE-SCALE 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 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 make-up 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-1984 power plant" means either:*
 - a. *A large-scale power plant that does not qualify as a pre-1985 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-1985 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 31, 1984.*
13. *"Pre-1985 power plant" means a large-scale power plant that either produced electric power as of December 31, 1984 or was substantially commenced as of December 31, 1984 and includes any expanded or modified portion of such a power plant if the expansion or modification was substantially commenced as of December 31, 1984 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 31, 1984" 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 31, 1984 or that a substantial capital investment in the physical on-site construction of the project was made within the 12 months prior to December 31, 1984.

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-1985 Steam Electric Power Plants

Beginning on January 1, 2025, and continuing thereafter until the legislature determines otherwise, an industrial user who uses water at a pre-1985 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-1984 Steam Electric Power Plants and for Combined-Cycle Power Plants

Beginning on January 1, 2025, or upon commencement of water use, whichever occurs later, and continuing thereafter until the legislature determines otherwise, an industrial user who uses water at a post-1984 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 6-702 or section 6-703, 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 6-702 or section 6-703. 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 legislature determines otherwise.

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, 2025 or upon commencement of water use, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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 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.

1. *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 2025 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the legislature determines otherwise, 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 6-705, subsection A, or for which a cycles of concentration adjustment was granted pursuant to section 6-705, 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 2025, or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the legislature determines otherwise, 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 6-703, 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 6-703, 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-1985 power plant and a post-1984 power plant that are contiguous and owned by the same owner. The report shall describe the combined operations of the pre-1985 and post-1984 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 LARGE-SCALE 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 and section 6-401 of this chapter, unless the context otherwise requires, the following words and phrases used in section 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, 2025 or upon commencement of water use, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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.*
2. *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.

1. *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 2025 or the calendar year in which water use first commences, whichever is later, and continuing thereafter until the legislature determines otherwise, 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 make-up water 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.*
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, unless the context otherwise requires, the following words and phrases used in sections 6-902 through 6-905 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, 2025 or upon commencement of water use, whichever is later, and continuing thereafter until the legislature determines otherwise, 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, unless the industrial user applies for and is accepted into the Best Management Practices Program described in section 6-904.

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 non-lactating 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 present during the calendar year by 105 gallons per animal per day (GAD) and then convert to AF per year as follows:*

$$CL \times \underline{105 \text{ GAD}} \times d/\text{yr} = \text{Maximum annual water allotment}$$

$$325,851 \text{ g/af for lactating cows (AF/year)}$$

Where:

CL = Average daily number of lactating cows

GAD = Gallons per animal per day

g/af = Gallons/AF

d/yr = Days in the year

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

- a. *Multiply the average daily number of non-lactating animals present during the calendar year by 20 gallons per animal per day (GAD) and then convert to AF per year as follows:*

$$AN \times \underline{20 \text{ GAD}} \times d/\text{yr} = \text{Maximum annual water allotment for}$$

$$325,851 \text{ g/af non-lactating animals (AF/ year)}$$

Where:

AN = Average daily number of non-lactating animals

GAD = Gallons/animal/day

g/af = Gallons/AF

d/yr = Days/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 non-lactating 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:*
 1. *Milkings per lactating cow occur more than three times daily;*
 2. *Technologies are used to achieve industry health and sanitation objectives that require additional water use; and*
 3. *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 Best Management Practices Program Conservation Requirements

A. Criteria for Approval of Application

An industrial user who uses water at a dairy operation may apply for regulation under the Best Management Practices Program (BMP Program) by submitting an application on a form provided by the Director. The Director shall approve an application for regulation under the BMP Program if the Director determines that the applicant will implement all of the standard best management practices (BMPs) described in Appendix 6A, unless a substitution of a standard BMP under subsection D of this section or a waiver of a standard BMP under subsection E 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. Exemption from Maximum Annual Water Allotment Conservation Requirements

An industrial user accepted for regulation under the BMP Program is exempt from the maximum annual water allotment conservation requirements set forth in section 6-902 beginning on January 1 of the first calendar year after the industrial user's application for the BMP Program is approved, unless the Director approves an earlier date.

C. Compliance with Best Management Practice Program

Beginning on a date established by the Director and continuing thereafter until the legislature determines otherwise, an industrial user accepted for regulation under the BMP Program shall comply with all standard BMPs listed in Appendix 6A, unless the Director approves a substitution of a standard BMP or a waiver 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 standard BMPs. The standard BMPs listed in Appendix 6A are broken into the following seven categories: (1) delivery of drinking water for dairy animals; (2) udder washing and milking parlor cleaning; (3) corral design and maintenance; (4) cleaning and sanitizing milking equipment; (5) dust control, calf housing cleaning, and feed apron flushing; (6) dairy animal cooling; and (7) dairy animal feed preparation.

D. Substitution of Best Management Practices

- 1. The Director may allow an industrial user applying for the BMP Program 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 BMP Program 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 BMP Program may apply to the Director for a substitution of an existing BMP that is no longer appropriate for the industrial user's dairy operation. 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.*

E. Waiver of Best Management Practices

- 1. The Director may waive a standard BMP if it is determined that the standard BMP cannot be achieved and that no substitute BMP is appropriate. To apply for a waiver of a standard BMP, the industrial user shall include in its application for the BMP Program an explanation of why the standard BMP is not achievable and why no substitute BMP is appropriate.*
- 2. An industrial user regulated under the BMP Program may apply to the*

Director for a waiver of an existing BMP listed in paragraph 3 of this subsection if the BMP is no longer appropriate for the industrial user's dairy operation. The Director may waive the existing BMP if the Director determines that the existing BMP is longer appropriate for the industrial user's dairy operation and that no substitute BMP is appropriate.

3. *Only the following standard BMPs may be waived by the Director under this subsection: (1) BMP 2.1.2 (Udder Wash System); (2) BMP 2.2.2 (Milking Parlor Floor and Wall Washing); (3) BMP 4.1.1 (Milk Cooling and Vacuum Pump); (4) all of the standard BMPs in Water Use Category No. 5 (Dust Control, Calf Housing Cleaning, and Feed Apron Flushing); (5) all of the standard BMPs in Water Use Category No. 6 (Dairy Animal Cooling); and (6) all of the standard BMPs in Water Use Category No. 7 (Dairy Animal Feed Preparation).*

F. Five Year Review of Best Management Practices

Five years after an industrial user is accepted for regulation under the BMP Program, 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 dairy operation or a change in management practices at the operation, 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 operation 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 BMP Program, but shall thereafter be required to comply with the maximum annual water allotment conservation requirements set forth in section 6-902.

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 substitute conservation requirement after the 5MP as established by the legislature.

G. Change in Ownership of Dairy Operation

1. *If an industrial user regulated under the BMP Program sells or conveys the dairy operation to which the BMPs apply, the new owner of the dairy*

operation shall continue to be regulated under the BMP Program until January 1 of the first calendar year after acquiring ownership of the dairy operation. Except as provided in paragraph 2 of this section, beginning on January 1 of the first calendar year after acquiring ownership of the dairy operation, the new owner shall comply with the maximum annual water allotment conservation requirements set forth in section 6-902. The new owner may at any time apply for regulation under the BMP Program.

- 2. If the new owner submits a complete and correct application for regulation under the BMP Program prior to January 1 of the first calendar year after acquiring ownership of the dairy operation, the new owner shall continue to be regulated under the BMP Program 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 maximum annual water allotment conservation requirements immediately upon notification of the denial or January 1 of the first calendar year after acquiring ownership of the dairy, whichever is later. If the Director approves the application, the new owner shall continue to be regulated under the BMP Program until the first compliance date for any substitute conservation requirement after the 5MP as established by the legislature.*

6-905 Monitoring and Reporting Requirements

For the calendar year 2025 or the calendar year in which water use is commenced at the dairy operation, whichever occurs later, and continuing thereafter until the legislature determines otherwise, an industrial user who uses water at a dairy 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 by 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.*
- 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.*
5. *If the dairy operation is regulated under the BMP Program, any documentation as required by the Director that demonstrates compliance with the program.*

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, unless the context otherwise requires, the following words and phrases used in sections 6-1002 through 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, 2025, or upon commencement of water use, whichever is later, and continuing thereafter until the legislature determines otherwise, 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 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 AF per year as follows:

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

$325,851 \text{ g/AF feedlot operation (AF/year)}$

Where:

CB = Average daily number of beef cattle

GAD = Gallons/animal/day

g/AF = Gallons/AF

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 2025 or the calendar year in which water use is first commenced at the cattle feedlot operation, whichever occurs later, and continuing thereafter until the legislature determines otherwise, 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, 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-1984 metal mining facility*" means either:
 - a. A *large-scale metal mining and processing facility* that does not qualify as a *pre-1985 metal mining facility*, including any expanded or modified portion of the facility, or
 - b. Any expanded or modified portion of a *pre-1985 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 31, 1984.
11. "*Pre-1985 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 31, 1984, or that was substantially commenced as of December 31, 1984, 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 31, 1984.
12. "*Seepage water*" means water that has infiltrated from tailings impoundments into the material underlying the tailings impoundments.

13. "Substantially commenced as of December 31, 1984" 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 31, 1984, or had made a substantial capital investment in the physical on-site construction of the project in the 12 months prior to December 31, 1984.
14. "Tailings" mean 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-1985 Metal Mining Facilities

Beginning on January 1, 2025, or upon commencement of water use, whichever is later and continuing thereafter until the legislature determines otherwise, an industrial user who uses water at a pre-1985 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 2025, 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 three 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.

6-1103 Conservation Requirements for Post-1984 Metal Mining Facilities

Beginning on January 1, 2025 or upon commencement of operations at the facility, whichever is later, and continuing until the legislature determines otherwise, an industrial user who uses water at a post-1984 metal mining facility shall comply with conservation requirements applicable to pre-1985 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-1984 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-1984 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

An 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 (BMPs) described in Appendix 6B, 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 legislature determines otherwise, 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 6B (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 6.4 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 6B 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 section 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 substitute conservation requirement after the 5MP as established by the legislature.

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 section 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 section 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 substitute conservation requirement after the 5MP as established by the legislature.

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 6-1102 and 6-1103, 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, 2025 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 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 2025 or the calendar year in which the facility commences operation, whichever is later, and continuing thereafter until the legislature determines otherwise, 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-12-15-901, 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 6-1802, subsection F.

B. Contiguous Facilities

A single annual report may be filed for a pre-1985 metal mining facility and a post-1984 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 and section 6-401 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 January 1, 1990 or bodies of water, other than bodies of water used primarily for swimming purposes, filled and maintained after January 1, 1990, 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:

1. Any area of land that is planted primarily with plants not listed in ADWR's Low Water Use & Drought Tolerant Plants Lists for PhxAMA 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.
2. 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, 2025 or upon commencement of water use, whichever is later, and continuing thereafter until the legislature determines otherwise, 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, 2025 or upon commencement of water use, whichever is later and continuing thereafter until the legislature determines otherwise, 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 2025 or the calendar year in which the facility first begins to use water, whichever is later, and continuing thereafter until the legislature determines otherwise, 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 PhxAMA (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 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 6-401 of this chapter, "new large industrial user" as used in section 6-1302 means an industrial user that begins using more than 100 AF of water per year for industrial purposes after January 1, 2025.

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 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 DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM STANDARD BEST MANAGEMENT PRACTICES

WATER USE CATEGORY 1. DELIVERY OF DRINKING WATER FOR DAIRY ANIMALS

Description: The level of milk production, season of year and type of dairy animal housing has a significant effect on the water intake of a dairy animal. The drinking water needs of a lactating cow will vary from 25 to 45 gallons per day. As milk production per cow per day increases, drinking water intake will also increase. Conservation of dairy animal drinking water could best be accomplished by preventing and promptly repairing leaks in the drinking water system.

BMP 1.1 Install and maintain valves and floats throughout the drinking water system to allow for the isolation of leaks in lines and tanks.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all valves and floats. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the location of the valves or floats.

BMP 1.2 Inspect the drinking water system for leaks daily to ensure that leaks are promptly identified and repaired to prevent water loss. If a leak occurs, stop water flow by isolating the area of the leak and/or repair the leak within 72 hours.

WATER USE CATEGORY 2. UDDER WASHING AND MILKING PARLOR CLEANING

Description: Udder washing and milking parlor cleaning is the single largest water use at a dairy operation. Floor and wall wash and sanitation of the milking area is necessary for producing a safe product. These systems can be either manual or semi-automatic. The amount of water used also depends on weather conditions. Udder washing and milking parlor cleaning offer the greatest conservation potential at a dairy through management of the system.

2.1 UDDER WASH SYSTEM

BMP 2.1.1 Install and operate the udder washing system with automatic timers. When udder washing, use a maximum of one minute of water for the soak cycle followed by a minimum of two minutes off and a maximum of three minutes of water for the wash cycle followed by one minute off. Repeat with a second wash cycle if needed.

BMP 2.1.2 Install a grid no larger than six feet by five feet between sprinkler heads on wash pens installed or renovated after January 1, 2002.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all sprinkler heads and the dimensions of the wash pens. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the location of the sprinkler heads or to the dimensions of the wash pens.

BMP 2.1.3 Install lock-out devices so that the wash system can be used only once per group of cows unless exceptional conditions require an override of the lock-out device.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all lock-out devices. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the location of the lock-out devices.

BMP 2.1.4 Establish and implement an inspection schedule to properly maintain and replace spray heads and timing devices. Inspect all spray heads and timing devices daily to ensure that they are operating correctly. If a device is found to be malfunctioning, repair or replace the device within 72 hours.

2.2 MILKING PARLOR FLOOR AND WALL WASHING

BMP 2.2.1 Equip all parlor hoses with shut-off valves. Inspect all hoses and valves daily. If a leak occurs, stop water flow by isolating the area of the leak and/or repair the leak within 72 hours.

BMP 2.2.2 If a semi-automatic floor flush system is used, it must be equipped with a timing device to limit the duration of cleaning and be designed to use no more water than necessary unless the water used is water recycled within the dairy operation.

The Annual Report required by A.R.S. § 45-632 shall include a description of the flush system that includes the flush schedule and the amount of water used for each flush. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the timing device.

WATER USE CATEGORY 3. CORRAL DESIGN AND MAINTENANCE

Description: Proper corral design and maintenance will reduce water use in the cow wash pen prior to milking by reducing the amount of wash time necessary to clean the cow. Sloping and maintaining the corral in a dry condition keeps the cow in a cleaner condition.

BMP 3.1 Slope corrals to prevent standing water and to promote drainage to the wastewater system.

The Annual Report required by A.R.S. § 45-632 shall include a dairy facility map that shows the corral design and the direction of slope. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to corral design.

BMP 3.2 Scrape, harrow or drag corrals to eliminate holes and maintain corrals in a dry condition.

The Annual Report required by A.R.S. § 45-632 shall include a description of corral maintenance for wet and dry conditions and a maintenance schedule. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in corral maintenance.

WATER USE CATEGORY 4. CLEANING AND SANITIZING MILKING EQUIPMENT

Description: Cleaning and sanitizing milking equipment is necessary to provide a safe dairy product. Water is also used in pre-coolers and vacuum pumps during the milking operation. Water used for this purpose is usually between 5-10 percent of the total water use at the dairy operation. This water can be recycled for other uses at the dairy.

4.1 MILK COOLING AND VACUUM PUMP

BMP 4.1.1 If the milk cooling and vacuum pump system is water-cooled and is not a closed system, reuse water from the system to wash cow udders or pens, or for any other uses, consistent with state and federal sanitary codes.

The Annual Report required by A.R.S. § 45-632 shall include a description and diagram of how water is reused from the milk cooling and vacuum pump system. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in how water is reused from the milk cooling and vacuum pump system.

4.2 MILK LINE WASHING

BMP 4.2.1 Install and operate the milk line washing system with an automatic or semi-automatic timing device.

The Annual Report required by A.R.S. § 45-632 shall include a description of how the milk line washing system operates. The description shall include the number of cycles per washing and the amount of water used per washing. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the number of cycles per washing and the amount of water used per washing.

4.3 BACK-FLUSH SYSTEMS

BMP 4.3.1 Maintain and service all back-flush systems in accordance with the manufacturer's design specifications and maintenance schedule.

The Annual Report required by A.R.S. § 45-632 shall include the manufacturer's design specifications and a maintenance schedule. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the back-flush system.

WATER USE CATEGORY 5. DUST CONTROL, CALF HOUSING CLEANING AND FEED APRON FLUSHING

Description: Control of dust, wastes and feed residues is necessary for fly control, sanitation and animal health. This requires water for cleaning and flushing feed aprons and calf housing and for wetting roadways. Conservation potential in this category includes recycling and reusing water, avoiding waste, and employing simple technologies that can reduce the amount of water needed for dust control.

BMP 5.1 If the dairy flushes the cow feed apron, design the systems to recycle water from the cow udder wash system or to pump wastewater and recycle it from the lagoon or wetland area.

The Annual Report required by A.R.S. § 45-632 shall include a description of how water is recycled at the operation, an estimate of the amount of water recycled, and the method of estimation. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to how water is recycled.

BMP 5.2 If the calf housing utilizes a flush system to remove animal wastes, design and manage the system so that it uses only the minimum amount necessary and equip with a timer to minimize the duration of each flush.

The Annual Report required by A.R.S. § 45-632 shall include a description of how the system is designed and managed to minimize water use, the length of time of each flush and the number of times per day on average that the system is in operation, and a water system map of the facility showing the location of the timer. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the design or operation of the flush system.

BMP 5.3 If dust control practices are used at the facility, the following dust control methods should be used: paving, aggregate, chemical binding agents or dairy wastewater if consistent with state and federal standards. If potable water is used for dust control it must be used as efficiently as possible.

The Annual Report required by A.R.S. § 45-632 shall include a description of the dust control technology(ies) used and the area on which dust control is practiced, and the amount of water used for dust control. If water use is estimated, provide a description of how water use is estimated. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to dust control practices.

WATER USE CATEGORY 6. DAIRY ANIMAL COOLING

Description: Dairy animal cooling is an effective method to improve milk production per cow and reproductive efficiency, which are important factors in dairy profitability. Animal cooling is also an important factor in improving animal health. The amount of water required depends on the type of method or methods used to cool cows, on the maintenance practices for the system and on the hours of usage. Methods to conserve water for each cooling system are available to dairy-farm management.

6.1 HOLDING PEN COOLING

BMP 6.1.1 Design and operate independent fan and spray systems to ensure that water is used efficiently under all weather conditions.

The Annual Report required by A.R.S. § 45-632 shall include a diagram demonstrating that fans and spray systems are used independently and provide information on how the system is managed depending on weather conditions. This information shall be submitted one time only

(the first annual report following acceptance into the BMP Program) unless there is a change to the fan and spray systems.

6.2 COW EXIT AND RETURN LANES COOLING

BMP 6.2.1 Use leaf gate, wand switch, electric eye or motion (proximity) indicators to automatically activate the water valve.

The Annual Report required by A.R.S. § 45-632 shall include a description of the activation device used at the dairy operation and how it operates, including the length of time the water valve is in operation and the amount of water used, and include the average number of times per day that the device is activated in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in activation device.

6.3 FEED LINE COOLING

BMP 6.3.1 Locate the feed line cooling system to take advantage of prevailing winds in order to place water directly on the dairy animal. Equip the system with timers to control the duration of use.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all timers and the direction of prevailing winds. Report the length of time the timer is in operation and the average number of times per day that the system is in operation in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the feed line cooling system or timers.

6.4. CORRAL SHADE COOLERS

BMP 6.4.1 Equip corral shade coolers with thermostats or timers to control operation time.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all thermostats or timers and report the average daily length of time the coolers are in operation in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the thermostats or timers.

BMP 6.4.2 Establish an inspection schedule to ensure regular maintenance of nozzles and water filter systems.

The Annual Report required by A.R.S. § 45-632 shall include an inspection and maintenance schedule. This schedule shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the maintenance schedule.

WATER USE CATEGORY 7. DAIRY ANIMAL FEED PREPARATION

Description: Water is used in the preparation of dairy animal feed at dairy operations to pre-soak cereal grain for processing, (rolling and flaking). A large use of water in feed preparation is its addition to the total mixed ration (TMR) to improve feed intake. The amount of water needed depends on the dryness of the feed in the ration. The total amount of water added to the feed could equal 20 percent of the ration. The greatest conservation potential for feed preparation rests with leak detection and prevention.

BMP 7.1 Install shut-off valves at each water source used for feed preparation to allow for the isolation of leaks. If a leak occurs, isolate the area of the leak and/or repair the leak within 72 hours.

The Annual Report required by A.R.S. § 45-632 shall include a water-system map of the facility showing the location of all valves. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the location of the valves.

APPENDIX 6B 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-1984 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-1985 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, COMPLIANCE, AND SUPPORT

7.1 INTRODUCTION

This chapter describes the process the Arizona Department of Water Resources (ADWR) will follow when implementing, determining compliance with, and enforcing the Fifth Management Plan (5MP) requirements for the Phoenix Active Management Area (PhxAMA). The plan elements will be carried out in accordance with ADWR'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

ADWR will 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 adoption of the 5MP (A.R.S. § 45--568(B)). A person who receives notice of an irrigation water duty or conservation requirement established in the 5MP 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--567(D)). 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. If a person receives notice of a 5MP irrigation water duty or conservation requirement that replaces an irrigation water duty or conservation requirement established for the person in the Fourth Management Plan (4MP), the

person must continue complying with the 4MP irrigation water duty or conservation requirement until the effective date of the 5MP requirement.

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 not 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 Code (Code) recognizes that certain individual conservation requirements may pose hardship in certain circumstances. To allow relief in these situations, the Code 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 review and variance process are fact-intensive inquiries which may result in some regulatory relief and are considered on a case-by-case basis.

Upon receipt of a notice of a 5MP 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. § 45-574(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 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 5MP 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 ADWR'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 5MP 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, ADWR must give written notice of the modification to the person required to comply with the modified requirement (A.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 Code contains several provisions that enable ADWR to acquire needed information on water use. This information is used to evaluate compliance with the Code and ADWR 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 ADWR has shifted to a more interactive, web-based reporting format. Beginning in 2009, ADWR discontinued mailing hard copy Annual Water Withdrawal and Use Report forms to right holders. Instead, each year, right holders are sent a one-page letter in January, reminding them of the requirement to report by March 31. While the hard copy of the annual report is still available, water users are encouraged to report online. Holders of several types of water rights and authorities may now file their reports using ADWR’s Online Annual Reporting Tool (eAR). During the fifth management period, ADWR intends to increase the number of water rights and authorities for which an annual report may be filed using the eAR tool.

ADWR also has devoted significant efforts towards increasing the availability of public records from ADWR 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 ADWR to help them better manage their own water portfolio and comply with ADWR requirements.

7.5.1 WATER MEASUREMENT

The Code requires persons withdrawing groundwater from non-exempt wells in Active Management Areas (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 in A.R.S. § 45-604. ADWR 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 Code 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 or a groundwater withdrawal permit and persons assigned and noticed of individual user requirements must meet the record keeping and reporting requirements, although certain small right holders are exempted from those provisions.

ADWR 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

ADWR has the authority to determine compliance with Code, management plan, and rule requirements. This authority is described below.

7.6.1 MEASURING DEVICES

ADWR 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, ADWR 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 ADWR 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

ADWR 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. ADWR investigates any potential discrepancies or violations identified using these methods.

7.6.3 ANNUAL REPORT REVIEWS AND AUDITS

ADWR reviews all annual water withdrawal and use reports. This is ADWR's primary means for determining compliance with conservation requirements, measuring requirements, and groundwater use limitations.

ADWR 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 ADWR 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 Code 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 Code allows ADWR to enter property where wells or other facilities that are used for the withdrawal, transportation, or use of groundwater are located. This authority allows ADWR to inspect facilities and lands subject to Code provisions and obtain data or access to records relating to the withdrawal, use, or transportation of groundwater (A.R.S. § 45-633).

ADWR 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 Code, 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 871.01.

7.7 COMPLIANCE APPROACH

ADWR has developed a compliance program approach that includes education, assistance, and flexibility. To attain compliance with water resource management requirements, ADWR employs a variety of strategies, including education, compliance monitoring, investigation, and enforcement. Additionally, public knowledge of ADWR compliance efforts may be the most significant factor in achieving a high rate of voluntary compliance and serves as a disincentive for future violations. ADWR often works with those in violation of their management plan requirements to identify a method to achieve future compliance, and ADWR may also levy civil penalties as a result of enforcement actions.

7.7.1 DETERMINATION OF COMPLIANCE

The mandatory conservation programs in the 5MP 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 ADWR 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, ADWR must adopt a set of policies for commingled

systems. ADWR 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. This volumetric accounting policy works well for most providers because of its simplicity and certainty. Individual circumstances may warrant individual consideration, however, ADWR is continually reviewing its policies on volumetric accounting to recognize necessary exceptions.

7.7.2 MAXIMUM ANNUAL WATER ALLOTMENTS AND GALLONS PER CAPITA PER DAY REQUIREMENTS

The 5MP establishes maximum annual water allotments for irrigation grandfathered rights, turf-related facilities, dairies, and cattle feedlots. Municipal providers regulated under the Total Gallons Per Capita per Day (GPCD) Program are required to comply with GPCD requirements. 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 or GPCD requirement 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 or GPCD requirement. However, the use of water in excess of the allotment or GPCD requirement 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, ADWR determines compliance either through the operation of a flexibility account or through a three-year averaging method, depending on the type of use.

Flexibility accounts are used to determine compliance for municipal providers who are subject to GPCD requirements, turf-related facilities, and irrigation grandfathered rights. The total water use reported by the user for the year is compared with the amount of water the user was entitled to use during the year. Generally, if the total amount of water used during the year is less than the allotment for the year, the flexibility account is credited with the difference. If the water use exceeds the allotment, the flexibility account is debited with the difference. A user is out of compliance with its allotment or GPCD requirement in any year in which its flexibility account is debited with an amount of water

that causes the account balance to exceed the maximum negative balance allowed. The maximum positive account balances and the maximum negative account balances for each type of use can be found in Chapters 4, 5, and 6.

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, turf-related facility, or municipal provider 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. ADWR 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 Code authorizes ADWR to count recovered effluent in determining municipal compliance with groundwater GPCD and 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)). ADWR may, under its "stacking" method, consider use of the Central Arizona Project (CAP) water in determining GPCD compliance.

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 or GPCD requirement. 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. Because groundwater use is counted last, the amount of any water used by a person in excess of its allotment or GPCD requirement will be comprised, at least partially, of groundwater. Groundwater withdrawn pursuant to an approved remedial action project under the Comprehensive Environmental Response, Compensation, and Liability Act or U.S. Code: Title 49 is counted as surface water when certain conditions are met.

7.7.3 SPECIFIC CONSERVATION MEASURES

Municipal providers regulated under the Non-Per Capita Conservation Program and irrigation grandfathered right holders regulated under the Agricultural Best Management Practices (BMP) Program are required to comply with specific conservation measures instead of GPCD requirements or maximum annual groundwater allotments. The following industrial users are required to comply with conservation measures specific to their type of use instead of maximum annual water allotments: dairies regulated under the Dairy BMP Program, sand and gravel facilities, mines, large-scale power plants, large-scale cooling facilities, and new large landscape users. For these municipal providers and industrial users, 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 section 6-602 of Chapter 6. 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 and water features in publicly-owned rights of way, and single pass heating and cooling. In addition to these requirements, section 6-1402 of Chapter 6 requires that all new large industrial users submit a water conservation plan to the Director.

ADWR encourages agricultural and industrial water users to invite ADWR staff to conduct an informal inspection and BMP review to proactively identify compliance concerns and the necessary steps for improvement.

7.7.4 THE ENFORCEMENT PROCESS

When ADWR'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 ADWR staff or an audit at ADWR's office after notice to the potential violator. ADWR may request that the individual produce

relevant records for the inspection or audit. Based on the investigation, ADWR 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, ADWR 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 ADWR.

During the first and second management periods, ADWR took a nontraditional approach to enforcement. Given the recent enactment of the Code and adoption of the management plans, a high level of tolerance was employed. Fines were set at low levels and probationary provisions and advisory notices were widely used. In many instances, for unintentional violations of management plan requirements such as GPCD limits and maximum turf or irrigation grandfathered right allotments, ADWR deferred any monetary penalties. Instead, it allowed the violator to develop or expand conservation measures designed to help the violator reduce water use. ADWR felt that the long-term benefits of a properly designed and implemented conservation program, tightly structured and closely monitored, would exceed the benefits of a traditional monetary penalty program.

In each instance of a management plan violation, the violator was given the following options:

- Contest the enforcement action by requesting a hearing,
- Pay a predetermined monetary penalty, generally based on the amount of groundwater used in excess of the requirement, or
- Negotiate a mitigation program with ADWR designed to develop or expand conservation programs intended to assist the violator in achieving future compliance.

The results of this enforcement strategy have been mixed. Some mitigation programs developed under this approach have been successful in increasing water-use efficiency, while others have been less effective. In most cases, significant and sometimes disproportionate amounts of time and resources have been invested by both the violators and ADWR. Due to these factors ADWR will be implementing a proactive compliance

approach for the 5MP. Water users working in cooperation with ADWR through inspections and BMP verification practices can minimize violations and penalties.

The 4MP approach to enforcement exercised flexibility at a very limited scale. The arguments of "newness and complexity" will no longer be compelling in this management period. The 5MP approach will be more proactive and comprehensive. Previous violations will be considered in determining the appropriate compliance approach. In addition, ADWR may consider new compliance approaches during the management period for the Code and management plan violations. A related approach may allow the purchase and extinguishment of long-term storage credits to offset a violation. The result of these approaches is a penalty that results in a positive water resource activity. If a water user anticipates a violation and informs ADWR of this expectation before receiving a notice of non-compliance, the Director may consider this voluntary disclosure to be a mitigating factor in determining the appropriate enforcement action.

ADWR 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 ADWR 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 Code 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 Code; or with a permit, rules, or order issued or adopted under the Code (A.R.S. § 45-636).

7.7.5 EDUCATION AND ASSISTANCE

ADWR informs water users of their conservation and reporting requirements as described in section 7.2 of this chapter. ADWR 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.

7.7.6 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, ADWR conducted an extensive public process for the development of the 5MPs through the Management Plans Work Group, with participation from each of the three sectors. In that process and in the others detailed below, ADWR prioritizes transparency and posts many meeting materials online. Public meeting information, including meeting recordings and materials and upcoming meeting details, can be found on ADWR's Public Meetings page (<https://new.azwater.gov/meetings>).

7.7.6.1 GOVERNORS WATER AUGMENTATION, INNOVATION, AND CONSERVATION COUNCIL (COUNCIL)

The Council was established by Executive Order 2019-02 on January 31, 2019, concurrent with the historic signing of the legislation ratifying the Drought Contingency Plan (DCP) and legislation implementing the DCP in Arizona. The new executive order superseded and rescinded Executive Order 2015-13, which established the Governor's Water Augmentation Council under the Arizona Water Initiative. In recognition of the fact that there is more work to be done to address Arizona's water issues beyond the immediate issues on the Colorado River, the Council expands on the foundation laid by the former Council.

The Council is a forum for discussion of water issues. It brings together a diverse group of stakeholders from across the State to raise, analyze, discuss, and vet what are often difficult and complex issues, as directed by the Governor, in order to ensure a sustainable water future. In doing so, it builds greater understanding of the water resource challenges and the potential solutions to those challenges, as well as a greater understanding and appreciation among the stakeholders, elected leaders, and government agencies of one another's perspectives on these issues.

The Council continues the legacy of cooperative long-term strategic water planning in Arizona. Through the Council and its committees, stakeholders across the water-use sectors – including members of the public, industry, non-profits, academia, and policymakers – are encouraged to confront difficult issues and to work collaboratively to identify and develop solutions to challenges faced by water users throughout the State.

The Council is tasked with:

- Identifying and recommending opportunities for water augmentation, innovation, and conservation.
- Assessing long-term impacts of conservation projects funded with monies from the Groundwater Conservation Grant Fund and reporting on those impacts.
- Considering a communication plan for the State to convey the status of its water supply resiliency and its efforts to maintain that status moving forward.
- Preparing and submitting an annual report that describes the Council's activities and recommendations.

The Council is also charged with providing guidance to the Director of ADWR on issues upon the Director's request. Additional information on the Council can be found on ADWR's GWAICC webpage (<https://new.azwater.gov/gwaicc>).

7.7.6.2 ARIZONA RECONSULTATION COMMITTEE (ARC)

Before the end of 2026, the U.S. Secretary of the Interior will develop new guidelines for the long-term management of the Colorado River system. The Colorado River Basin States will play a leading role in the process to develop those new guidelines. The process will take many years and require multiple levels of discussion, negotiation, and coordination within Arizona and among the Basin states.

To ensure Arizona remains stronger together, the ADWR and CAP are beginning now by reconvening the Lower Basin Drought Contingency Plan Steering Committee delegates to form ARC. This committee will develop an Arizona perspective on the reconsultation of the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead, known as the 2007 Guidelines.

Additional information can be found on ADWR's ARC webpage (<https://new.azwater.gov/arc>).

7.7.6.3 AGRICULTURAL BMP ADVISORY COMMITTEE

The Agricultural Water Conservation BMP Advisory Committee was initially established by executive order in 2002 and was continued in November of 2020 by Governor Doug Ducey's Executive Order 2020-55. The Committee is charged with advising ADWR's Director regarding the statutorily authorized Agricultural BMP Program and will provide vital input to the Director on the BMP Program as future Management Plans and conservation programs are contemplated. Additional information can be found on the Committee's webpage (<https://new.azwater.gov/ama/bmp/meetings>).

7.7.6.4 FUTURE STAKEHOLDER PROCESSES

Moving forward, ADWR 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 ADWR 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 ADWR's website as they are available.

7.7.6.5 GROUNDWATER USER ADVISORY COUNCIL

The Code 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 ADWR website. Members of the public will have an opportunity at each meeting to address the Council during the call to the audience. Meeting dates and agendas are posted in advance of each meeting on the ADWR Calendar.

Additional information is available on ADWR's GUAC webpage (<https://new.azwater.gov/ama/guac/meetings>).

7.7.6.6 WATER MANAGEMENT ASSISTANCE PROGRAM

The Water Management Assistance Program (WMAP) is intended to provide financial and technical resources to assist water users in the development and implementation of conservation programs, facilitate augmentation and renewable water supply utilization, and obtain information on hydrologic conditions and water availability in the PhxAMA (A.R.S. § 45-567(A)(5) and (7)).

The WMAP is funded primarily from groundwater withdrawal fees collected from each person or entity withdrawing groundwater in an AMA from a non-exempt well (A.R.S. § 45-611(C)). Withdrawal fees are authorized by the Code and are levied based on the acre-foot (AF) volume of groundwater withdrawn on an annual basis. The groundwater withdrawal fee rate for augmentation of the water supply, conservation assistance to water users within the AMA, and monitoring and assessing water availability within the AMA, is set annually by the Director, with input from the PhxAMA GUAC, and is limited to a maximum of two dollars per AF per year (A.R.S. § 45611(A)(2)).

Programs funded by the WMAP help water users achieve efficient use of water supplies and help the PhxAMA meet its water management goal. Additional information can be found on ADWR's WMAP webpage (<https://new.azwater.gov/ama/wmap>).

7.7.7 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 Historic Cropping Program may not purchase flex credits. Some information can be found as live queries on ADWR's website (<http://infoshare.azwater.gov/docushare/dsweb/View/Collection-90>), and right holders or operators can request additional information at earp@azwater.gov or by calling 602-771-8585.

CHAPTER 8: WATER STRATEGY

8.1 INTRODUCTION

The 1980 Groundwater Management Act (GMA) 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 area in reaching its goal. The Act was and is visionary - unique and creative in its approach of addressing groundwater depletion at the groundwater basin scale, using hydrologic boundaries for a cohesive regulatory structure, and with state and local coordination on issues and management approaches. The coordination and the conservation strategies and programs that have been developed since the passage of the GMA have undoubtedly resulted in Arizona being in a stronger, more prosperous, and more sustainable position than would have been the case without the Act. 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.

Recent efforts have built on this collaborative history. Discussions have continued to produce the analysis and innovative strategies necessary to meet the challenges ahead. Stakeholder participation in public meetings and the time dedicated to considering important issues have significantly increased. Examples of recent or ongoing efforts include:

- the Steering Committee process used to discuss and develop strategies to mitigate the impacts of a potential Colorado River shortage for Arizona water users in the Lower Basin Drought Contingency Plan (<https://new.azwater.gov/lbdcp>);
- the Governor's Water Augmentation, Innovation, and Conservation Council (Council) created by Governor Ducey to consider and recommend sustainable water supply policies for Arizona (<https://new.azwater.gov/gwaicc>);
- the Management Plans Work Group used as the public stakeholder forum for the analysis of previous and existing conservation requirements and the development of updated conservation requirements for the Fifth Management Plans (5MPs) (<https://new.azwater.gov/5MP>).

8.2 PAST: FIRST, SECOND, THIRD, AND FOURTH MANAGEMENT PLANS

The GMA has evolved over the course of the management periods. Many parts of the original Act have been modified in some way – notably in the creation of programs for water storage and recovery, storage and firming through the Arizona Water Banking Authority – and the statutes related to the management plans are no exception. The intent of the management plans was to be incremental – with progressively more stringent conservation requirements designed to reduce withdrawals of groundwater with each management plan, moving each AMA toward its management goal in an attempt to achieve the goal. This is reflected in the modifications to the management plans statutes that were made through the years: additional data requirements, regulatory authority, and requirements or options for additional conservation programs. Because of this, each management plan is unique – representative of not just the AMA it applies to, but also of the hydrologic, political, and statutory structures of that time.

These increasingly stringent requirements over time, along with the other requirements and tools laid out in the GMA, have placed the AMAs in a stronger water supply position than they would have been absent those criteria (see Chapter 2 for analysis of the PhxAMA's progress toward its goal).

A.R.S. § 45-563(A)

"The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater."

A.R.S. § 45-564 et seq.	1MP	2MP	3MP	4MP	5MP
Calculate Water Duty	●	●	●	●	●
Municipal GPCD Reduction	●	●	●	●	●
Municipal Lost & Unaccounted for Water	●	●	●	●	●
General Industrial Conservation	●	●	●	●	●
Conservation for Untreated Providers		●	●	●	●
Conservation for Small Providers		●	●	●	●
Municipal Non-Per Capita Conservation		●	●	●	●
Incentives for Augmentation/Recharge		●	●	●	●
Assessment of Water Quality		●	●	●	●
Program for Conservation Assistance		●	●	●	●
Historical Natural Recharge		●	●	●	●
May Reduce Highest 25% of Water Duties		●	●	●	●
Agricultural Historic Cropping Program			●	●	●
Agricultural BMP Program			●	●	●
Option for Alternative Agricultural Programs			●	●	●
May Establish Cropped Acreage Program			●	●	●
May Include Program for GFR Purchase & Retirement			●	●	●
Recommendations to AWBA/for well locations			●	●	●

Additionally, and significantly, these requirements have contributed to a long-standing culture of conservation in the state, in which end users recognize the scarcity of water in an arid environment and work diligently to conserve and protect those limited supplies.

Despite the contributions of the GMA and widespread, established conservation efforts, there have also been significant challenges. Arizona has been in a drought since 1996. Many researchers are cautioning that this is not a drought, but rather the “new normal”. Arizona is experiencing hotter temperatures, lower precipitation, and more extreme weather events, and these changes are expected to worsen as climate change continues. The contributions of the GMA, bold and thoughtful work to plan for reliable water supplies to meet the needs of current and future Arizonans, and the role of innovation in conservation are valuable and are worth recognizing and celebrating; however, as this “new normal” becomes less “new”, significant additional work and new strategies are needed to take Arizona into the future.

8.3 PRESENT: FIFTH MANAGEMENT PLANS

The 5MPs are the final plans in the series established by the GMA. While the conservation requirements in these plans remain effective “until the legislature determines otherwise” (A.R.S. § 45-568(C)), these plans serve as an important transition into an era of recognizing and planning for the increasing challenges of a hotter, drier future. In the development of the 5MPs, ADWR saw the need for detailed discussions with a broad range of stakeholders and established the Management Plans Work Group to analyze existing programs and develop additional conservation strategies for the 5MPs. Through those public meetings and discussions, distinct guiding principles and goals for the 5MPs became apparent.

8.3.1 “REDUCTIONS IN WITHDRAWALS OF GROUNDWATER”

The management plans contain mandatory conservation programs intended to move each AMA toward its goal, and these programs must be designed “to achieve reductions in withdrawals of groundwater” (A.R.S. § 45-563(A)). This statutory requirement was the main guiding principle for the development of the 5MPs. Increasing efficiency and conservation to reduce demands on groundwater and other supplies will be critical to resiliency and reliability as supplies are increasingly constrained and as the water future is less certain. A drier future is also a more uncertain future, and a broader range of hydrologic futures is becoming possible, further underscoring the necessity of forward-looking planning and conservation policy.

8.3.2 IMPLEMENTATION CONSIDERATIONS

Much of the initial portion of the development of the 5MPs was occupied with consideration of the challenges of existing programs and how the conservation requirements might be modified to be better streamlined and implemented. This included discussions of the existing programs and consideration of the criteria required for updated programs. These criteria included improved simplicity of programs allowing for better communication of the requirements in an understandable and direct manner, improved feasibility in terms of ADWR having the technical and staff capacity to administer the programs, improved transparency in terms of the usefulness and accessibility of data being provided, and improved reasonableness in terms of ensuring that the requirements are achievable for the regulated community. Individual program updates were developed with these criteria in mind, in addition to the requirement to achieve reductions in withdrawals of groundwater.

8.3.3 DATA ACCESSIBILITY AND MANAGEMENT

Improved data management and usability is a key concern for both ADWR and stakeholders. Better data enable better informed decisions, ongoing improvements to programs, and, ultimately, better water management at both the individual and AMA scale. ADWR has worked hard to make its data more accessible and useable in recent years, and this progress was reflected throughout the development of the 5MPs, with a wide range of data and materials made available online. A noteworthy example of this is the 5MPs Concepts page (<https://new.azwater.gov/5MP/plans-concepts>), which was used as a communication tool and kept updated throughout the development of the 5MPs. This page includes data dashboards, calculators, links to presentations and meetings, stakeholder comments, and other details in support of draft concepts that were being developed for the 5MPs. As those concepts began to be finalized, some were marked as not moving forward, and some were updated with draft regulatory language. This represents significant progress toward accessibility and transparency in the development phase as compared to previous plans. The availability of online tools allowed for much of that progress, and ADWR will continue to build on that progress with additional online data and tools that will supplement the 5MPs. These online tools have also allowed the content of the 5MPs to be significantly streamlined and will allow the data referenced in the plans to be updated through the fifth management period (see <https://new.azwater.gov/ama/ama-data>).

Increased data transparency has also functioned to better show where the data quality needs improvement. With the 5MPs, ADWR will be working to better verify data through audits and through GIS and statistical analyses. These types of practical data considerations, analyses, and tools led to the development of streamlined programs and

will allow implementation of those programs and future programs to be simpler, more transparent, and more cost-effective to implement for all involved.

Improved data management and transparency will also allow for streamlined compliance processes in the AMAs. Data and technology improvements have allowed for better automation of annual reporting, data compilation, and quality control processes, which leads to improvements in using that data to ensure compliance with the requirements in the management plans. ADWR's interest is in using this data within compliance processes to improve water management and conservation. Staff will continue to work with the regulated community on conservation and compliance issues to ensure that Arizona's finite water resources are being used effectively.

Data will be a significant source of insight for future water management. ADWR will continue to work to ensure that its data is useful, accessible, accurate, and usable. With better data, data analysis, and data communication, there is opportunity to better implement the water management tools and conservation requirements contained in the 5MP, which are designed to move toward the goal of each AMA by reducing withdrawals of groundwater.

8.3.4 INDEFINITE TIMELINE

The 5MPs are the final set of plans that were originally defined in the GMA. The fifth management period is defined as 2020 through 2025, and the fifth management plans were intended to be effective for that same time period. ADWR fell behind schedule in the development and adoption of management plans after the third management plans (3MPs), and the conservation requirements in the 5MPs will become effective on January 1, 2025. Those requirements will remain in effect "until the legislature determines otherwise" (A.R.S. § 45-568(C)). While the conservation programs do not end with the fifth management period, the uncertainty regarding how or when programs would be updated in the future required consideration. Some programs, like the Municipal GPCD program (see Chapter 5), were able to be designed with automatically resetting targets. Other programs are static.

This indefinite timeline adds to the uncertainty of future water management in the AMAs and doesn't allow the plans to evolve to adapt as circumstances and climatic conditions continue to change. In order to meet the goals of the AMAs and to address future challenges, additional authorities and regulatory tools are needed, and statute will need to be amended to ensure a regular, timely sequence of updates for management plans and conservation programs beyond the 5MPs.

8.4 FUTURE: WATER MANAGEMENT ISSUES FOR THE 5MPS AND BEYOND

While there are significant uncertainties about the scale, timelines, and ripple effects of changing hydrologic and climatic conditions, it is clear water is finite and we are entering into an era of limits. There is some consensus around the types of issues that may be anticipated, and there will inevitably be additional concerns identified over time. Some of these issues are already being discussed in the Council and other forums. Addressing the full range of interconnected issues will require ongoing and collaborative focus in coming years.

8.4.1 WATER SCARCITY AND SUPPLY CONSTRAINTS

The intent of the GMA was to protect and stabilize the economy and welfare of the state by 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 there has been significant progress in slowing and limiting groundwater mining, 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 deeply 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 ability to conjunctively manage all water types as "one water". Increasingly, all water types are seen as a valuable component of water resource portfolios, and differences in incentives and requirements around different types of water can often lead to confusion, conflict, and to difficulty in wisely managing water resources.

A.R.S. § 45-401

- A. "...*In many basins and sub-basins withdrawal of groundwater is greatly in excess of the safe annual yield and that this is threatening to destroy the economy of certain areas of this state and is threatening to do substantial injury to the general economy and welfare of this state and its citizens...*"
- B. "*It is therefore declared to be the public policy of this state that in the interest of protecting and stabilizing the general economy and welfare of this state and its citizens it is necessary to conserve, protect and allocate the use of groundwater resources of the state...*"

In-State Surface Water

Surface water in Arizona is defined as "the waters of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels, whether perennial or intermittent, flood, waste or surplus water, and of lakes, ponds and springs on the surface... and are subject to appropriation and beneficial use...", (A.R.S. § 45-141). Early in its history, Arizona adopted the doctrine of prior appropriation to govern the use of surface water. This doctrine is based on the tenet of "first in time, first in right" which means the person who first puts the water to a beneficial use acquires a right that is senior to later appropriators of the water. In Arizona, there are two ongoing general stream adjudications, judicial proceedings to determine the nature, extent, and relative priority of water rights: the Gila River System and Source (Gila Adjudication) and the Little Colorado River System and Source (LCR Adjudication). The exterior boundaries of these two adjudications include more than half the state, where most of the Indian reservations and federal land are located.

While the regulatory authority in the Groundwater Code is based on the use of groundwater, the availability of renewable supplies like surface water are inextricably linked to the use – and overuse – of groundwater. As sedimentation impacts reservoir capacity and as climate change increases hydrologic variability, there may be increasing concerns about the reliability of surface water supplies in the PhxAMA. Any reduction in annual flows in the Salt and Verde River systems would likely lead to increases in the amount of groundwater withdrawals made by SRP to serve its customers, which could impact the ability of the AMA to achieve safe-yield. Beyond climate impacts and considerations around annual surface flows, there is further uncertainty for surface water users due to the general stream adjudications. Progress toward resolving the amount and priority of surface water rights in the state will have disparate impacts – providing some certainty and resiliency for some users and causing others to lose access to water they may have assumed was reliable. Nonetheless, this resolution will be critical to effective and coordinated water planning for the state.

Colorado River Water

Since the 1922 Colorado River Compact and the 1944 Water Treaty with Mexico, it has become increasingly clear the Colorado River's allocation exceeds what the river yields on an average annual basis. Because these allocations were based on limited historical data from an unusually wet period, an overallocation of the river was written into the Compact. Recently, changes in climatic conditions in the Colorado River Basin have further reduced average flows and exacerbated the deficit between water demand and supply. Water managers in the Colorado River's Lower Basin have long acknowledged what is referred

to as the “structural deficit” on the system: more water is drawn out of Lake Mead annually than flows in from Lake Powell on average.

In the face of the water supply concerns due to the regional drought persistent since the turn of the millennium, the Colorado River Basin States and the federal government built a framework to better respond to drought conditions and coordinate the operations of Lake Powell and Lake Mead. Executed in 2007, the resulting *Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (2007 Guidelines)* identified the conditions for shortage determinations, among other provisions. In 2019, the Basin States and Mexico established Drought Contingency Plans for the Upper and Lower Basins as an addendum to the 2007 Guidelines, which also triggered the Binational Water Scarcity Contingency Plan with Mexico pursuant to Minute 323 of the Mexican Water Treaty.

Pursuant to the 2007 Guidelines and DCP, the Bureau of Reclamation declared the first ever shortage on the Lower Colorado River for calendar year 2022, based on the release of its August 24-Month Study. Reclamation’s five-year projections from the August 2021 run of its Colorado River Mid-term Modeling System (CRMSS) project the probability of any level of Colorado River shortage in any month to be over 90 percent through 2026, based on the Stress Test Hydrology, with increasing likelihoods of deeper shortage in the model’s out years.

The 2007 Guidelines and DCP are set to expire in 2026, well before the anticipated end of the 5MP period. Activities surrounding the renegotiation of the 2007 Guidelines are beginning, yet the composition of what a post-2026 operational regime on the Colorado River will look like remains uncertain. Similar to the 2007 Guidelines and DCP development processes, the Secretary of the Interior will develop new guidelines for the long-term management of the system, in conjunction with the Basin States and Mexico; the intra-Arizona process will take place through the Arizona Reconsultation Committee (ARC), including a diverse coalition of cities, Tribes, agricultural and industrial entities, CAP users and others, which kicked off in mid-2020.

Lower Basin – Lake Mead
Percent of Traces with Event or System Condition
Results from August 2022 CRMMS-ESP (values in percent)

Event or System Condition	2023	2024	2025	2026	2027 ^s
Surplus Condition – any amount (Mead \geq 1,145 ft)	0	0	0	0	0
Surplus – Flood Control	0	0	0	0	0
Normal or ICS Surplus Condition (Mead $< 1,145$ and $> 1,075$ ft)	0	7	0	7	13
Recovery of DCP ICS / Mexico's Water Savings (Mead $>/\geq 1,110$ ft)	0	0	0	0	0
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,090$ and $> 1,075$ ft)	0	7	0	3	3
Shortage Condition – any amount (Mead $\leq 1,075$ ft)	100	93	100	93	87
Shortage / Reduction – 1 st level (Mead $\leq 1,075$ and $\geq 1,050$)	0	17	30	13	10
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,075$ and $> 1,050$ ft)	0	17	30	13	10
Shortage / Reduction – 2 nd level (Mead $< 1,050$ and $\geq 1,025$)	100	57	30	33	33
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,050$ and $> 1,045$ ft)	100	0	0	13	3
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,045$ and $> 1,040$ ft)	0	10	0	7	3
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,040$ and $> 1,035$ ft)	0	7	7	3	10
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,035$ and $> 1,030$ ft)	0	13	7	7	7
DCP Contribution / Mexico's Water Savings (Mead $\leq 1,030$ and $\geq > 1,025$ ft)	0	27	17	3	10
Shortage / Reduction – 3 rd level (Mead $< 1,025$)	0	20	40	47	43
DCP Contribution / Mexico's Water Savings (Mead $\leq < 1,025$ ft)	0	20	40	47	43

Notes:

¹ Modeled operations include the 2007 Interim Guidelines, Upper Basin Drought Response Operations, Lower Basin Drought Contingency Plan, Minute 323, including the Binational Water Scarcity Contingency Plan, 2022 Drought Response Operations Plan, and 2022 Glen Canyon Dam operational adjustment.

² The projected operating tiers are computed "as if" the 480 kaf reduced release from Glen Canyon Dam in water year 2022 was delivered to Lake Mead.

³ When Lake Powell is operating in the Lower Elevation Balancing Tier in water year 2023 or 2024, balancing releases were limited (with a minimum of 7.0 maf) to protect Lake Powell from declining below 3,525 feet at the end of December 2023 or 2024.

⁴ Reservoir conditions for 2022–2027 were simulated using the August 2022 CRMMS in ensemble mode using the CBRFC unregulated inflow forecast ensemble (CRMMS-ESP) dated August 2, 2022.

⁵ For modeling purposes, simulated years beyond 2026 assume a continuation of the 2007 Interim Guidelines, the 2019 Colorado River Basin Drought Contingency Plans, and Minute 323, including the Binational Water Scarcity Contingency Plan. Except for certain provisions related to ICSC recovery and Upper Basin demand management, operations under these agreements are in effect through 2026. Reclamation anticipates beginning a process in early 2023 to develop operations for post-2026, and the modeling assumptions described here are subject to change for the analysis to be used in that process.

^s Percentages shown in this table may not be representative of the full range of future possibilities that could occur with different modeling assumptions.

⁷ Percentages shown in this table may not sum to 100% due to round to the nearest percent.



The five-year probability table from the August 2022 CRMMS-ESP Projections, based on the Stress Test Hydrology. See <https://www.usbr.gov/lc/region/g4000/riverops/crss-5year-projections.html> for current probability tables.

In years in which shortages reduce water supplies for fourth priority municipal and industrial (M&I) water users as well as certain Tribal entities, the Arizona Water Banking Authority (AWBA) will "firm" a portion of the reductions via the recovery of long-term storage credits (LTSCs) it accrued since its inception in 1996. While the AWBA is obligated to firm specific volumes of water for Tribal entities under the Arizona Water Settlements Act of 2004, firming for on-River M&I contractors and CAP M&I Priority subcontractors is limited to the volume of LTSCs available for this purpose. Presently, the AWBA has over 400,000 acre-feet of LTSCs to firm on-River entities and 2.32 million acre-feet of LTSCs that can be distributed and recovered specifically for CAP M&I Priority subcontractors. The AWBA has a statutory responsibility to distribute LTSCs to CAP M&I Priority subcontractors "to the extent necessary" to meet demands during shortages, A.R.S. § 45-2457(B)(7). To facilitate the mitigation component of Arizona's Implementation Plan for the LBDCP, the AWBA committed to firming all reductions to CAP M&I subcontractor's scheduled deliveries through 2026. However, in the likely event of ongoing shortages, the volume of LTSCs available for firming can be quickly exhausted and excess water supplies needed to store and replace those LTSCs utilized are not expected to be available in the years ahead. Given the finite nature of these LTSCs, it is of high importance that careful consideration be given to any future firming policies to ensure the prolonged use of these LTSCs for firming and the security it provides to water users.

In a further example of the ways water supplies are intertwined, some municipal providers may request a drought exemption in shortage years to exempt groundwater pumping from incurring a replenishment obligation in those years. Exempting groundwater replenishment when surface water supplies are lacking is logical; however, when shortage of those renewable supplies is persistent, groundwater mining increases, overdraft compounds, and progress made toward long-term management of finite supplies is eroded.

Effluent

Arizona has long been and remains a leader in the reuse of effluent. The management plans have encouraged and incentivized massive investment in advanced treatment and the infrastructure to beneficially utilize this resource. When it would have been easier and cheaper to simply 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 of technology allowing for direct potable reuse of effluent (DPR) facilitated and accelerated this change in perception. Water management strategies have increasingly moved to a “one water” approach, in which all supplies of water – including effluent – are seen as equally valuable components of a water portfolio. Existing incentives for the use of effluent are increasingly being re-evaluated and scrutinized: when water supplies are considered “one water,” and new supplies are scarcer and more expensive, incentivizing any water use becomes questionable.

As competition has increased for effluent over time, there have been growing conversations around how the uses of effluent might be prioritized. While the long-standing paradigm of “the right water for the right use” may still be useful, there are increasing calls for consideration of what the “highest” use for that resource might be. 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 as a potential source of water for restoration or riparian uses and as 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 – getting the most uses out of each drop.

Groundwater

The risks associated with the overuse of groundwater have been long recognized in Arizona. 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 Code: "(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 to shift water users to alternate supplies and preserve groundwater.

The regulations and goals laid out in the GMA have proven to be insufficient though: despite significant conservation efforts and imported water supplies added to the PhxAMA since 1980, the AMA has not reached, and is not expected to reach, its goal of safe-yield by 2025. Continued overdraft has resulted in growing pressure on groundwater supplies: physical availability challenges in the AWS program which have already been observed in the Pinal AMA are expected eventually to also occur in the PhxAMA, and there are additional concerns about the physical impacts (subsidence, fissures, water quality degradation, etc.) associated with continued groundwater mining.

Management plans and water management strategies – including the GMA itself – continue to rely in large part on correcting imbalances in water supply and demand by importing additional supplies. The importation of Colorado River water to central Arizona, the development of uses for reclaimed water, and provisions allowing for importation of groundwater from specified basins into the AMAs are all examples of these supply-side strategies. These types of strategies allowed for significant economic progress and progress toward the goals in the AMAs. However, the imported water was often used to support increases in total demands rather than offsetting existing groundwater demands and led to continued groundwater overdraft despite significant additional supplies.

Water Transfers and Importation

There are numerous regulatory and statutory provisions around water transfers and importation. While the GMA created a prohibition on moving groundwater between basins, it allowed for some exceptions: the McMullen Valley (A.R.S. § 45-552), Butler Valley (A.R.S. § 45-553), and Harquahala (A.R.S. § 45-554) groundwater basins, and the Big Chino sub-basin of the Verde River groundwater basin (A.R.S. § 45-555) were specifically designated in the Code as transportation basins, allowing groundwater to be withdrawn in these basins and moved into the AMAs. As this water was intended to be an additional supply for the AMAs, it would be treated similarly to surface water for the purposes of the management plans: transported water would be subject to stacking provisions under which total water use is regulated for groundwater users in the AMAs (see Chapter 7), but

it would not be subject to those regulations in instances where no groundwater withdrawn from within the AMA was used.

Beyond these provisions for transportation from other groundwater basins, there have been growing efforts and discussions around other types of transfers, leases, and sharing agreements. ADWR's 2014 Strategic Vision (<https://new.azwater.gov/drought/resource/arizona-strategic-vision-water-supply-sustainability>) discussed the history, role, regulatory evolution, and practical complexity of water transfers in Arizona, including transfers of groundwater and Colorado River water (See CR11 at <https://new.azwater.gov/laws-rules-policies/substantive-policy-statements>). Moving water is often complex and controversial, and additional stakeholder discussion regarding water transfers and transportation will be necessary as water supplies become increasingly constrained in the future.

8.4.2 RECHARGE, RECOVERY, AND REPLENISHMENT

The focus of the Recharge and Recovery Program has historically been to encourage and enable the beneficial use of renewable supplies through annual storage and recovery, long-term storage for future demands, and replenishment. As climate change impacts water availability, as evidenced by the first year of Colorado River shortage in 2022, the focus of the program is beginning to shift from storage for future demands to recovery for current demands.

While effluent is not anticipated to experience supply constraints in the same ways as surface water and Colorado River water, increasing efficiency will continue to reduce wastewater flows. Additional competition for this supply is expected and will lead to increased direct use and a corresponding reduction in storage. These supply constraints show that recovery will be the future focus of the program: it is unlikely additional supplies for storage will be consistently available in coming years.

With this expected overall reduction in storage and increase in recovery, procedures and strategies around recovery must be managed carefully to consider aquifer health, water levels, hydrologic disconnect between storage and recovery, and other practical and legal requirements. ADWR is already considering some methods to streamline processes to ensure that recovery is done in a reasonable manner both hydrologically and practically. In 2021, a substantive policy was issued clarifying the methodology for determining whether recovery occurs within the area of hydrologic impact of the stored water (AOHI). This change is intended to ease some of the regulatory hurdles related to recharge, allowing consistency with statutory requirements, but easing some of the modeling requirements to streamline legal access to recharge.

As the state looks toward a drier future, recharge and recovery will continue to be significant water management tools for the PhxAMA and will be an important area of consideration as the tools to address the next era of challenges are developed. Some of the potential strategies and considerations already starting to take shape include:

- further streamlining processes and incentives,
- continued and expanded focus on recovery planning and permitting processes
- leveraging existing storage capacity,
- considering the impacts of hydrologic disconnect in siting storage and recovery activities,
- shifting toward other types of recharge as shortage limits the availability of Colorado River supplies, and
- creative arrangements using inter-governmental agreements (IGAs) and exchanges to better facilitate recovery activities.

8.4.3 MANAGEMENT GOALS

The GMA established management goals for the five AMAs. While the goals for the Santa Cruz and Pinal AMAs are indefinite, the Prescott, Phoenix, and Tucson AMAs each have a goal to achieve safe-yield by 2025 (See Chapter 2 for additional discussion of the PhxAMA's progress toward safe-yield and the Overdraft, Safe-Yield, and the Management Goals in Arizona's Active Management Areas Report (Safe-Yield Report)

A.R.S. § 45-562(A)

"The management goal of the Tucson, Phoenix, and Prescott active management areas is safe-yield by January 1, 2025..."

A.R.S. § 45-561(12)

"Safe-yield' means a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area."

(<https://new.azwater.gov/ama/management-plans>) for additional details on the 5MP discussions and methodology for analyzing and communicating safe-yield). While the PhxAMA is not expected to achieve safe-yield by 2025, some have argued the goal remains relevant due to the indefinite nature of the "thereafter maintain" language in the safe-yield goal.

In the development of the 5MPs, through the MPWG Safe-Yield Technical Subgroup, there was significant focus on the methodology for analyzing

and communicating safe-yield. Those discussions illuminated both strengths and weaknesses in the goal as defined by the statute. Safe-yield has proven to be a critical metric for the progress of each AMA, but in such a complex physical system, there will be weaknesses and blind spots for any single metric. To allow for the continued communication and analysis of safe-yield, ADWR has published an interactive Overdraft Data Dashboard (<https://new.azwater.gov/ama/ama-data>) showing the annual calculation, long-term analysis, and a metrics list which can be filtered and will be updated over time.

Looking at both the past and into the future, there are many factors that influence the achievement of safe-yield. With the first Colorado River shortage in 2022 and anticipated increases in groundwater pumping, the achievement of this goal will become both more difficult and more critical. Existing allowable groundwater pumping, particularly in cases where total groundwater use would increase, poses distinct challenges to reductions in groundwater withdrawals and achievement of the goal, and considerations regarding local aquifer conditions will become increasingly relevant, whether or not safe-yield is achieved. Conservation is not expected to be sufficient to achieve the goal in the PhxAMA. Additional demand management measures and further identification, development, and utilization – including direct deliveries – of alternative water supplies will be necessary in order to continue to move the AMA toward its goal and to allow for the long-term sustainability of the AMA.

As the PhxAMA moves beyond the fifth management period and plan, it will be critical to consider whether the management goal is comprehensive enough for the challenges of the future and whether existing tools are sufficient for the AMA to achieve its goal.

8.4.4 MANAGEMENT PLANS

In 2018, through a series of discussions with stakeholders and the Governor's Office, ADWR developed a proposal to add three additional management plans and management periods. A version of this proposal, adding one additional management plan and management period was introduced as SB1512 by then-State Senator Gail Griffin, but that bill eventually failed.

The 5MPs will become effective on January 1, 2025 and will remain in effect until the legislature takes some action. In light of rapidly changing hydrologic circumstances, climatic changes, and development pressures, it is imperative that Arizona continue its culture of conservation and expand on the foundation established by the GMA. The management plans are an essential tool for regular, incremental progress toward the management goals of each AMA and will be an essential part of planning for the

continued success of the AMAs in the drier future. Without additional management plans or authorities, new technologies and tools may not be able to be implemented.

With the impacts of climate change becoming increasingly evident and with improvements to modeling and projection techniques, there are more tools than ever before to analyze trends and to plan for the future, but the rate of climatic and hydrologic change is such that there is an increasing range of realistic future outcomes. This increasing range of uncertainty makes careful planning even more critical to the continued wellbeing and sustainability of the AMAs and will necessitate the inclusion of new innovations for conservation strategies beyond the 5MPs. In order to continue building on the lessons from the development of the 5MPs, and to begin preparing for future management structures, ADWR is continuing to build its analytical and planning capabilities for the AMAs. Arizona is experiencing increased interest in water management as various supply pressures have moved more into public view and as the increased availability of online meetings has allowed for broader participation in stakeholder processes. ADWR is refocusing AMA staff on the research, analysis, collaboration, and outreach needed for these planning activities, and intends to engage stakeholders as planning processes are developed and expanded, with an end goal of developing a process for more continuous updates to projection scenarios and to avoid placing undue reliance on any single set of assumptions.

8.4.5 ISSUES IDENTIFIED BY THE COUNCIL POST-2025 AMAS COMMITTEE

In the first meeting of the newly re-formed Council in March 2019, it created a committee to focus on planning and regulatory challenges for the AMAs beyond the 5MPs and after 2025. The Post-2025 AMAs Committee first met in October 2019 and continued meeting approximately every two to three months through 2021. The Committee laid out a timeline to spend the remainder of 2019 and 2020 identifying the challenges and publishing issue briefs for the priority issues and to spend 2021 developing potential solutions to those issues. Information regarding these meetings can be found on the Council meetings page (<https://new.azwater.gov/gwaicc/meeting>) and the issue papers developed through this process can be found on the Council Documents page (<https://new.azwater.gov/gwaicc/documents>).

Six issue briefs and one dissenting response, along with an executive summary, were combined into one paper and published by the Committee. Each issue brief opens with a concise issue statement describing the scope of the paper. Those issue briefs and statements are as follows:

- Hydrologic Disconnect: The storage and recovery of water supplies in hydrologically disconnected areas within AMAs has the potential to create or

worsen localized groundwater depletion. Similar issues may arise in the context of hydrologically disconnected pumping and replenishment to meet requirements of the Assured Water Supply Program.

- Exempt Wells: Exempt wells contribute to groundwater overdraft in the Prescott AMA, more so than in other AMAs, placing the long-term viability of its aquifers at greater risk and impeding the ability to reach the management goal in the Prescott AMA.
- Unreplenished Groundwater Withdrawals: In Arizona's active management areas, unreplenished groundwater withdrawals by all water-using sectors, as permitted by law, combined with a lack of sufficient incentives to either reduce withdrawals or mitigate the impacts, may limit the State's ability to meet the AMA long-term groundwater management goals.
- Groundwater in the Assured Water Supply Program: Large areas of the AMAs remain groundwater-dependent due to a lack of renewable water supplies and infrastructure, which creates uncertainties as groundwater supplies become more limited.
 - What are the role and consequences of the use of groundwater to support new growth after 2025?
 - What are the risks to homeowners whose physical groundwater supplies may be depleted after the regulatory Assured Water Supply 100-year timeframe?
 - What roadblocks prevent access to renewable supplies and infrastructure in these groundwater-dependent areas?
- CAGRD Replenishment and Water Supplies: The Central Arizona Groundwater Replenishment District (CAGRD) provides a mechanism to replenish some of the Assured Water Supply related groundwater use within three Active Management Areas it serves (Phoenix, Pinal, and Tucson AMAs). However, the CAGRD and its members face long-term uncertainties related to the availability and costs of supplies for replenishment.
 - What are the long-term uncertainties for the CAGRD related to the availability of renewable supplies for replenishment?
 - What issues may arise as replenishment supply costs are borne by the CAGRD and passed on to its members?

- What concerns exist about ADWR's oversight and review criteria of CAGRD Plans of Operation in relationship to the CAGRD's long-term viability?
- AMA Management Structure: There is no statutory provision establishing Active Management Area (AMA) goals or additional management periods and plans after 2025. The fifth management plans will remain in effect until statutory changes designate otherwise.

For the solutions phase, the committee chose three of the six issue briefs on which to focus – Groundwater in the Assured Water Supply Program, Unreplenished Groundwater Demand, and the Hydrologic Disconnect – and met monthly from June to November 2021 to further refine the issues and propose potential solutions and strategies. The committee co-chairs determined ideas that addressed more than one challenge or opportunity, had overall Committee support, and were politically viable in 2022 (considering ADWR and/or legislative leadership) would be brought forward to the Council. In November 2021, the committee presented to the Council a package of proposals, including ideas for potential legislation, rules, and policy, as well as a list of ideas for potential further exploration in 2022. The complete package of proposals can be found on the Council Documents webpage.

8.5 NEXT STEPS

This chapter and this management plan list several analyses and potential issues but is not a complete listing of every analysis and potential issue. This plan and the conservation requirements set forth within it are just one part of a set of tools which allow Arizona to carefully manage its water supplies. 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.

Previous water management strategies often focused on finding the "next bucket" of water to meet growing demands. Now, with growing competition for all supplies and with substantial cost and difficulty impeding the procurement of additional supplies, the options for continued expansion of those new or imported supplies are severely limited and are more difficult and expensive to acquire. Additional augmentation will be a necessary part of solution sets: in 2021, the Arizona Legislature passed a bill (SB1822) which created the Drought Mitigation Revolving Fund to provide financial support for water supply augmentation projects and to create the Drought Mitigation Board which would establish criteria to evaluate applications for this funding. In addition, a renewed

focus on the development and implementation of demand side solutions will be necessary in order to balance the supply/demand equation. Many assumptions within the existing frameworks will need to be re-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. All water uses must be reconsidered and prioritized, including the existing allowable groundwater uses that have enabled ongoing overdraft in the AMAs.

It is unclear what might result from those considerations and prioritizations, but it is clear that hard, non-parochial discussions will be needed to find innovative methods to move the state forward. Creative solutions are already being seen through complex exchange and lease agreements, considerations of regional collaboration, and expanded agreements to better leverage 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 when the need arises by making hard compromises, and finding a way to survive and thrive in an increasingly arid environment.