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# ARIZONA WATER BANKING AUTHORITY

## ANNUAL REPORT 2019

Submitted  
July 1, 2020





# Arizona Water Banking Authority

## Annual Report 2019

**Honorable Douglas A. Ducey**  
**Governor of Arizona**

### **Members**

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*Chair*

**Ray L. Jones**  
*Vice-chair*

**Kathryn A. Sorensen**  
*Secretary*

**Alexandra Arboleda**  
*Member*

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**Senate President Karen Fann**  
**Representative Gail Griffin**



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## Acronyms and Abbreviations

ADWR	Arizona Department of Water Resources
Agreement to Firm	2005 Agreement to Firm Future Supplies between the Arizona Water Banking Authority and the Mohave County Water Authority
Ag	Agriculture
Amended Agreement to Firm	Amended Agreement to Firm Future Supplies executed March 17, 2010.
AMA	Active Management Area
APO	Annual Plan of Operation
AMWUA	Arizona Municipal Water Users Association
AWBA	Arizona Water Banking Authority
AWB Fund	Arizona Water Banking Fund
AWSA	Arizona Water Settlements Act of 2004
CAGR D	Central Arizona Groundwater Replenishment District
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
CRSS	Colorado River Simulation System Model
GRIIDD	Gila River Indian Irrigation and Drainage District
GSF	Groundwater Savings Facility
ICS	Intentionally Created Surplus
ICUA	Intentionally Created Unused Apportionment
IRPG	Interagency Recovery Planning Group
IGA	Intergovernmental Agreement
JRM	Joint Recovery Model
LBDCP	Lower Basin Drought Contingency Plan
LTSCs	Long-term storage credits
M&I	Municipal and Industrial
MAF	Million Acre-feet
MCWA	Mohave County Water Authority
NIA	Non-Indian Agricultural
PSCP	Pilot System Conservation Program
Quantification Act	White Mountain Apache Tribe Water Rights Quantification Act
Reclamation	U.S. Bureau of Reclamation
RPAG	Recovery Planning Advisory Group
SNWA	Southern Nevada Water Authority
the Community	The Gila River Indian Community
USF	Underground Storage Facility
WMAT	White Mountain Apache Tribe



## Summary

The operation of the Arizona Water Banking Authority (AWBA) continues to evolve. In its initial phase, the AWBA primarily stored excess Central Arizona Project (CAP) water to create long-term storage credits (LTSCs) to mitigate the effects of future Colorado River shortages on municipal and industrial (M&I) water users, provide groundwater management benefits, assist the State in the settlement of Indian water rights claims, and assist both California and Nevada through interstate banking arrangements. In time, what began as opportunities to beneficially utilize the State's full entitlement of Colorado River water grew in certain cases into obligations the AWBA must fulfill. With reductions in excess CAP water supplies and increased probability of Colorado River shortages, the AWBA is transitioning to its next phase, focusing on making its LTSCs available to mitigate potential shortages.

Calendar year 2019 was the first year that there was no excess CAP water available to the AWBA for storage. Still, the AWBA continued to make progress on its firming goals through other means. The AWBA purchased 19,257 acre-feet of LTSCs: 13,100 acre-feet in the Phoenix AMA and 6,157 acre-feet in the Tucson AMA. Cumulatively, the AWBA has accrued or acquired 4.28 million acre-feet (MAF) of LTSCs. Of this amount, 3.67 MAF are for Arizona uses and 0.61 MAF are interstate credits stored on behalf of the State of Nevada.

The AWBA also participated in the planning efforts for implementing the Lower Basin Drought Contingency Plan (LBDCP) in Arizona. Through new statutes, policy, and agreements among Arizona water users, the AWBA will play a key role in supporting the implementation of the LBDCP. Actions taken by the AWBA will not only help protect Lake Mead elevations and provide certainty to CAP water users but will also give the AWBA additional means for firming shortages to CAP Non-Indian Agricultural (NIA) Priority water supplies used by the Gila River Indian Community.

Throughout 2018, AWBA staff continued to work cooperatively with the Arizona Department of Water Resources (ADWR) and Central Arizona Water Conservation District (CAWCD) on the next steps necessary for implementing the 2014 Joint Recovery Plan. A fourteen-member Recovery Planning Advisory Group (RPAG) was convened in January 2018 to assist in these efforts. These discussions have resulted in additional opportunities that provide cost-saving measures while also allowing CAP M&I subcontractors greater operational flexibility. The RPAG also proposed legislative amendments to AWBA statutes that aim to further simplify AWBA credit distributions for firming during Colorado River shortages.

Although conservation efforts under the LBDCP and the 2007 Guidelines in addition to the previous year's heavy winter snowpack have improved water elevations in Lake Mead, the potential for drier conditions in the near-term persists. While near-term Colorado River water supply projections indicate Arizona will likely operate under Tier zero conditions, there is a moderate probability (30 percent) that a Tier 1 shortage could be declared in the Lower Basin beginning in 2023. Under a Tier 1 condition, the AWBA could have a firming requirement ranging from an estimated 14,000 acre-feet to 18,000 acre-feet per year over the next ten years. This requirement would only affect the AWBA's obligation to firm supplies allocated to Indian Tribes under the Arizona Water Settlements Act.



## AWBA Commission Members – Calendar Year 2019

**Thomas Buschatzke – Chair**  
As Director of Arizona Department of Water Resources



**Ray L. Jones – Vice-Chair**  
Representing a person knowledgeable  
in water resource management



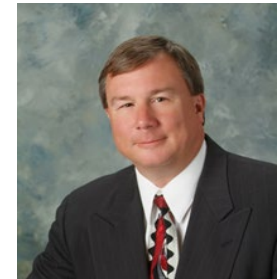
**Kathryn Sorensen – Secretary**  
Representing CAP M&I subcontracts



**Alexandra Arboleda**  
Representing CAWCD, designated by  
CAWCD Board President Lisa Atkins



**Mark Clark**  
Representing mainstream Colorado  
River contractors



### *Ex-officio Members*



**Senate President Karen Fann**



**Representative Gail Griffin**



## 2019 Activities

The AWBA continued its quarterly meeting schedule in 2019 with meetings held on March 20, June 19, September 25, and December 4. Special meetings were held on January 17, March 4 and May 10 for discussion and actions related to the Lower Basin Drought Contingency Plan (LBDCP).

### Lower Basin Drought Contingency Plan

AWBA participation in the planning efforts for implementing the LBDCP in Arizona continued into 2019. On Jan. 31, 2019, Governor Ducey signed legislation authorizing Arizona’s participation in the LBDCP, as well as legislation necessary to implement the LBDCP. On March 19, 2019, the Upper and Lower Basin States formally submitted the Drought Contingency Plans (DCPS) to Congress for immediate action. Federal legislation authorizing the DCPs was signed by President Trump on April 16, 2019. The Drought Contingency Plans became effective on May 20, 2019.

The LBDCP will be in effect through December 31, 2026, the Interim Period, concurrent with the 2007 Interim Guidelines.<sup>1</sup> It has several key elements including:

1. Additional contributions to Lake Mead from Arizona and Nevada, along with new contributions from California and the United States.
2. Incentives for additional storage in Lake Mead by creating flexibility for water users to store water and take delivery of storage even during lower reservoir conditions.
3. A commitment by parties in the Lower Basin to protect elevation 1,020 feet in Lake Mead, implemented through consultation to determine what additional measures would be necessary to protect that elevation.

**Table 1** identifies the incremental contributions that Arizona will make in addition to the shortage reductions already imposed under the 2007 Interim Guidelines.

*Table 1. Arizona Shortage Reductions under 2007 Interim Guidelines and Additional LBDCP Contributions*

Lake Mead Elevation (ft.)	Tier	2007 Interim Guidelines (AF)	Tier	LBDCP Contribution (AF)	Total (AF)
≤ 1090 > 1075		0	Tier zero	192,000	192,000
≤ 1075 > 1050	Tier 1	320,000	Tier 1	192,000	512,000
≤ 1050 > 1045	Tier 2	400,000	Tier 2a	192,000	592,000
≤ 1045 > 1025	Tier 2	400,000	Tier 2b	240,000	640,000
≤ 1025	Tier 3	480,000	Tier 3	240,000	720,000

<sup>1</sup> Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead signed December 13, 2007.

Arizona’s LBDCP Implementation Plan incorporates two components. The first is a mitigation component that is structured to provide both fixed and variable quantities of mitigation water to the CAP agricultural (Ag) pool and CAP NIA priority pool, respectively.<sup>2</sup> It does not fully mitigate all anticipated reductions because sufficient resources are not available and because mitigation is intended to provide a temporary bridge for addressing a drier future. The mitigation component includes wet water supplies, monetary compensation, and funding for new groundwater infrastructure for CAP Ag Pool users. The second component is an offset component that leaves water in Lake Mead through system conservation and the creation of new Intentionally Created Surplus (ICS) that replaces CAP ICS used for mitigation purposes. The AWBA plays an important role in both the mitigation and offset components of the Implementation Plan. The following are policy and agreements related to the AWBA that became effective in 2019:

### *Arizona LBDCP Framework Agreement*

This agreement captures the components of the Implementation Plan. It describes the mitigation component as well as the offset component and references numerous agreements as exhibits. The AWBA is included as a party due to the vital role it plays in the implementation framework as indicated by the policy and agreements described below.

### *CAP NIA Mitigation Agreement<sup>3</sup>*

This agreement describes the mitigation supplies for the CAP NIA priority pool, including the reduction in mitigation percentages in subsequent years. It also captures the mitigation commitments applicable to the CAP Agricultural pool. As a key provision, it clarifies that the AWBA will calculate its statutory firming obligations and commitments prior to the inclusion of mitigation resources, thereby ensuring that mitigation resources are not used for firming purposes.

### *Agreement to Exchange LTSCs<sup>4</sup>*

This agreement facilitates water storage by Phoenix and Tucson AMA CAP M&I Priority subcontractors at groundwater savings facilities (GSFs) located in the Pinal Active Management Area (AMA) to provide partial wet water mitigation during Tier 1 and Tier 2a shortages that might occur between 2020 and 2022. The AWBA agreed to exchange long-term storage credits (LTSCs) accrued in the Phoenix and Tucson AMAs for an equal volume of LTSCs accrued by the storing entities in the Pinal AMA. This allows storing entities the ability to recover and use the water in the AMA where they are located.

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<sup>2</sup> Ag mitigation provides 105 KAF under Tier 1 shortages and 70 KAF under Tier 2a. shortages (2020 – 2022). CAP NIA mitigation provides 100% (2020 – 2022), 75% under Tier1 & Tier 2a shortages and 50% under Tier 2b shortages (2023 - 2025) until no supplies are remaining under each. There is no mitigation in 2026 or under Tier 3 shortages.

<sup>3</sup> *Agreement Among the United States of America Represented by the Secretary of the Interior Acting through the Regional Director of the Lower Colorado Region of the Bureau of Reclamation, the Arizona Department of Water Resources, the Arizona Water Banking Authority, the Central Arizona Water Conservation District, the Gila River Indian Community, City of Chandler, Town of Gilbert, City of Glendale, City of Mesa, City of Phoenix, City of Scottsdale and City of Tempe for the Mitigation of Reductions to CAP NIA Priority Water Under the Drought Contingency Plan*

<sup>4</sup> *Lower Basin Drought Contingency Plan (“LBDCP”) 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.*

The AWBA has agreed to exchange up to 42,750 acre-feet of LTSCs per year (from 45,500 acre-feet of storage less 5 percent cut to the aquifer) for the three-year period. Legislation authorizing the AWBA to exchange its water management LTSCs for this purpose expires Dec. 31, 2026. Therefore, all exchanges must be completed by this date. The agreement also allows for other unplanned mitigation water supplies, if available, to be used to substitute storage deliveries in order to reduce the amount of LTSCs exchanged by the AWBA.

The Bureau of Reclamation's (Reclamation) 2019 August 24-Month Study determined a Tier zero condition for the Colorado River in 2020. There is no mitigation provided under a Tier zero condition. Therefore, AWBA LTSCs will not be exchanged for this purpose in 2020.

### *Intergovernmental Agreement (IGA) between the AWBA and the Gila River Indian Community for the Development of ICS Firming Credits*

To facilitate the offset component of the Implementation Plan, the Gila River Indian Community (the Community) will create at least 200,000 acre-feet of ICS by 2020 that will remain in Lake Mead for the duration of the Interim Period. The IGA allows the AWBA to pay for the creation of 50,000 acre-feet of that ICS in order to satisfy a future firming obligation to the Community. The 50,000 acre-feet of ICS will result in 45,000 acre-feet of ICS credits due to a one-time ten percent reduction for system and evaporation losses. Payments for the creation of this ICS started at a rate of \$240 per acre-foot in 2019 and have an annual escalator of three percent in following years. These ICS credits are referred to as ICS Firming Credits under the IGA.

In 2019, the AWBA purchased 14,660 acre-feet of ICS for \$3,518,400, exceeding the minimum required first-year payment of \$2.5 million. The purchased ICS resulted in 13,194 acre-feet of ICS Firming Credits after losses. Withdrawal fees were used to purchase the ICS Firming Credits, which included \$2,152,800 in funds collected in the Phoenix AMA and \$1,365,600 collected in the Pinal AMA.

### *Policy Regarding the Distribution of Long-Term Storage Credits for firming CAP Municipal and Industrial Subcontractors*

Under this policy, the AWBA will distribute LTSCs pursuant to A.R.S. 45-2457(B)(7) to meet all reductions to scheduled CAP M&I Priority water due to a shortage condition or required LBDCP contributions, regardless of use. Consequently, this policy provides the certainty desired by CAP M&I subcontractors that there will be water supplies available to meet demand and to ensure sufficient resources for mitigating water reductions resulting from the LBDCP. The operating experience gained during this time will inform future AWBA policies on LTSC distribution after 2026.

## **AWBA 2019 Water Availability**

The AWBA Plan of Operation (Plan) for 2019 did not include storage of excess CAP water because there were no supplies made available to CAWCD's Statutory Firming Pool. Excess CAP water supplies were instead conserved in Lake Mead to benefit system storage. Additionally, no supplies were made available during the year from CAP water turned back by higher priority water users.

The total consumptive use of Colorado River water by Arizona in 2019 was 2.49 MAF and accounted for approximately 1.06 MAF of direct uses along the Colorado River and 1.43 MAF in CAP diversions (Calendar Year 2019 U.S. Bureau of Reclamation, Lower Colorado River Operations, Colorado River Accounting and Water Use Report Arizona, California, Nevada, dated May 2020). Efforts to mitigate declining water elevations in Lake Mead continued in 2019 with Arizona conserving an estimated 308,293 acre-feet of water in Lake Mead. This amount included 40,794 acre-feet conserved under the Pilot System Conservation Program (PSCP), 147,557 acre-feet of ICS<sup>5</sup> and 119,942 acre-feet of additional reductions to CAP supplies.

## Long-term Storage Credit Purchases

In the absence of excess CAP water supplies, the AWBA focused on alternative options to continue to meet its firming objectives including purchasing LTSCs.

### *Purchases Pursuant to A.R.S. § 45-841.01*

The Tohono O’odham Nation (Nation) must offer the AWBA 10 percent of any credits deemed accruable from water stored at the Mission Mine Complex before ADWR can issue a final volume of LTSCs to the Nation. The price for each credit is equal to the AWBA’s per acre-foot cost to deliver and store water at a state demonstration project located within 10 miles of the Nation’s storage (i.e. Pima Mine Road Recharge Project) at the time of sale. These LTSCs may be used by the AWBA for M&I firming or for water management purposes. However, there is a restriction that they cannot be recovered within five miles of the exterior boundary of the reservation. In 2019, the Nation offered 1,342 acre-feet of LTSCs for \$288,180, which the AWBA purchased using withdrawal fees collected in the Tucson AMA.

### *Other LTSC Purchases*

In 2019, the AWBA purchased 17,915 acre-feet of LTSCs for CAP M&I firming: 13,100 acre-feet in the Phoenix AMA and 4,815 acre-feet in the Tucson AMA. Expenditures totaled \$4.05 million and included \$2.95 million and \$1.1 million in Maricopa County and Pima County water storage tax funds, respectively.

Cumulative LTSC purchases and expenditures are identified in **Appendix A**.

## Indian Firming Program

Colorado River modeling projections have shown that NIA Priority CAP water would be the first supplies the AWBA will need to firm. To prepare, the AWBA has focused on accomplishing the steps necessary to ensure the state’s Indian firming obligations will be met when the need arises. Staff also kept apprised of the status of other ongoing settlement discussions, particularly any need to firm water supplies that may result from those settlements.

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<sup>5</sup> This volume includes 24,283 acre-feet of Extraordinary Conservation ICS created by CAWCD, 117,000 acre-feet of ICS created by the Gila River Indian Community, and 6,274 acre-feet of ICS created by the Colorado River Indian Tribes.



### *Gila River Indian Community*

Under the Arizona Water Settlements Act of 2004 (AWSA), the AWBA, as agent for the State, has a 100-year requirement (until 2108) to firm up to 15,000 acre-feet per year of NIA Priority CAP water for the Community when supplies are insufficient to meet demand. The *Agreement between the Secretary and the State of Arizona for the Firming of CAP Indian Water*, executed on November 15, 2007, defines the AWBA's firming responsibilities, but also includes a provision that allows the AWBA to enter into separate agreements with the Community to carry out its firming obligation. Accordingly, an IGA for firming was executed on June 16, 2015. The 2015 IGA uses the AWBA Ten-Year Plan as the basis for evaluating potential future shortages and outlines the steps that must be taken by each party as the potential for shortage approaches. By offering alternative firming options, the 2015 IGA provides flexibility in how a firming obligation can be satisfied during a shortage year.

Concurrent with the execution of the 2015 IGA, the AWBA and the Community executed a separate letter agreement to implement one of the firming options identified under the IGA. The firming option allows for the reimbursement of CAP water delivered to the Community for which the Community paid full cost. In turn, the AWBA receives "firming credits" for each acre-foot of water delivered. The process for using this firming method was consequently formalized in a three-year agreement (2016 IGA).<sup>6</sup> In 2019, as discussed under LBDCP activities, the AWBA and the Community added the use of ICS firming credits as another agreed-upon firming method. Cumulative firming credits and expenditures under these agreements are identified in **Appendix A**.

### *Southside Replenishment Bank*

In addition to firming requirements, the AWSA required that the AWBA deliver 15,000 acre-feet of water to the Community to establish the Southside Replenishment Bank. The Replenishment Bank can be used to satisfy a replenishment obligation that may be incurred from excess groundwater pumping in the Southside Protection Zones, an area adjacent to the southern portion of the Community reservation. This obligation was fully satisfied in 2015. Cumulative expenditures for meeting this obligation totaled \$2,339,000.

### *Southside Replenishment Obligations*

In October 2019, ADWR informed the AWBA that a replenishment obligation of 9.78 acre-feet was incurred in the Municipal and Industrial Eastern Protection Zone South for the 2018 reporting year. This was the first time an obligation was incurred since the Protection Zones were established under the AWSA. Pursuant to A.R.S. § 45-2623(A), the AWBA must satisfy the replenishment obligation by June 1 of the third calendar year following the year the obligation was created, or in this instance, 2021. This obligation was included in the AWBA's 2020 Plan of Operation and will be met by extinguishing an equal volume of LTSCs accrued at the Hohokam Irrigation and Drainage District Groundwater Savings Facility using withdrawal fees collected in the Pinal AMA.<sup>7</sup>

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<sup>6</sup> Agreement between the AWBA and the Community for the Development of Firming Credits effective June 30, 2016 through December 31, 2018. Firming credits developed under the agreement remain available until utilized to meet a firming obligation.

<sup>7</sup> This obligation was satisfied February 26, 2020.

### *White Mountain Apache Tribe (WMAT)*

The White Mountain Apache Tribe Water Rights Quantification Act of 2010 (Quantification Act) was enacted on Dec. 8, 2010. The Quantification Act requires the AWBA firm up to 3,750 acre-feet per year of NIA Priority CAP water made available under the agreement. This obligation is part of the 8,724 acre-feet per year firming requirement identified for future settlements under the AWSA. This water is intended to be leased. Therefore, the AWBA's firming obligations will accrue to the lessees.<sup>8</sup> In 2017, AWBA staff initiated individual meetings with the lessees to discuss potential firming opportunities relative to their operational needs. Based on these discussions, flexibility will be a key consideration in developing firming agreements

An Environmental Impact Statement on the construction and operation of the WMAT Rural Water System (RWS Project) including the proposed Minor Flat Dam, reservoir, pipeline, and water treatment plant, must be completed before enforceability conditions can be met. In January 2018, the WMAT was given the authority under federal legislation (S.140) to utilize funds from another part of the Quantification Agreement for the planning, design, and construction of the RWS Project. In December 2019, due to unforeseen conditions at the site of the proposed dam, the Senate passed legislation extending the enforceability date of the Quantification Agreement by two more years to April 30, 2023.

### *Hualapai Tribe*

Legislation to approve and authorize the settlement of the Hualapai Indian Tribe's claims to the Colorado River (H.R.2459) was introduced to Congress by Rep. Tom O'Halleran (D-AZ-1) on May 1, 2019. A companion bill (S.1277) was introduced by Sen. Martha McSally (R-AZ) and co-sponsored by Sen. Kyrsten Sinema (D-AZ) in the Senate Committee on Indian Affairs. The House Natural Resources Subcommittee on Water, Oceans, and Wildlife held a hearing on June 26, 2019. However, no further progress was made on the bill. If approved, the AWBA would have an obligation to firm 557.5 acre-feet per year of NIA Priority water through 2107. The federal government would have an equivalent firming obligation.

## **Recovery Planning**

In 2014, the Interagency Recovery Planning Group (IRPG), which consists of AWBA, CAWCD and ADWR staff, in cooperation with stakeholders, released the 2014 Joint Recovery Plan for the recovery of AWBA LTSCs.<sup>9</sup> The IRPG continues to work cooperatively on the next steps of the plan to ensure recovery implementation is achievable when needed. In January 2018, ADWR, in coordination with the AWBA and CAWCD, convened the Recovery Planning Advisory Group (RPAG) to assist with these efforts. The RPAG consists of 14 members that represent various interests in the water community. Discussions have included a review of updated Colorado River hydrologic modeling projections, the timing and magnitude of future recovery, an examination of alternative recovery and firming methods, an analysis of credit sustainability, and the potential need for policies and agreements.

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<sup>8</sup> Lessees receiving firmed NIA Priority CAP water under the Quantification Agreement include the cities of Avondale, Chandler, Gilbert, Glendale, Mesa, Peoria, Phoenix and Tempe.

<sup>9</sup> Recovery of Water Stored by the Arizona Water Banking Authority: A Joint Plan by AWBA, ADWR and CAP, dated 4/14/2014 (2014 Joint Recovery Plan).

In 2019, the IRPG outlined updates to the 2014 Joint Recovery Plan that provide greater clarity on both recovery planning and implementation including options for “independent recovery” supported by RPAG stakeholders. During RPAG discussions, many CAP M&I subcontractors signified a preference, when possible, to recover AWBA LTSCs independently through their own infrastructure or with a partner. The intent is to create greater operational flexibility while also minimizing the need for costly recovery infrastructure. To facilitate independent recovery, the Arizona Municipal Water Users Association (AMWUA), in consultation with AWBA, ADWR and CAWCD, proposed modifications to AWBA governing statutes for the 2020 legislative session. The proposed amendment would allow AWBA ad valorem water storage tax credits to be distributed directly to CAP M&I subcontractors for firming purposes. Presently, statute requires that these LTSCs be distributed only to CAWCD.<sup>10</sup> The proposed amendment stipulates that LTSCs assigned to CAP M&I subcontractors cannot be sold, and that the subcontractor would be responsible for all recovery costs as well as fees assessed by ADWR for the assignment of the LTSCs.<sup>11</sup>

As the AWBA’s recovery agent, CAWCD has also entered into several partnership agreements to secure recovery capacity. These include an agreement with the Roosevelt Water Conservation District in the Phoenix AMA along with two separate agreements for recovering AWBA interstate LTSCs, one with the City of Tucson and the other with Arizona Water Company located in the Pinal AMA.<sup>12</sup> In 2019, the CAWCD board approved four additional agreements with irrigation districts in the Phoenix and Pinal AMAs including the Central Arizona Irrigation and Drainage District, Maricopa-Stanfield Irrigation and Drainage District, New Magma Irrigation and Drainage District and Queen Creek Irrigation District. While these four agreements secure recovery capacity, they also satisfy the \$5 million commitment made by the CAWCD Board to support groundwater infrastructure development as part of Arizona’s DCP implementation. Collectively, all agreements account for up to 35,000 acre-feet per year of recovery capacity for the near to mid-term planning horizon. CAWCD has also been evaluating the potential for developing its own recovery well field within the Tonopah Desert Recharge Project and at locations outside the recharge project, to address issues associated with higher than anticipated arsenic and fluoride concentrations previously identified.

Commensurate with the execution of the CAP System Use Agreement between CAWCD and the Bureau of Reclamation (Reclamation) in 2017 that establishes a legal basis for delivery of AWBA firming water through the CAP system, CAWCD Board President Lisa Atkins established a Water Quality Standards Task Force (Task Force) comprised of CAWCD Board members to review the legal, operational and policy matters associated with the introduction of non-project water into the CAP system. The water quality standards developed by the Task Force, through stakeholder involvement, were approved by the full Board and submitted as a recommendation to Reclamation in 2018. After further discussion, in 2019, the CAWCD Board approved the numeric standards for an expanded list of water quality constituents. Discussion of these standards will be included as part of Reclamation’s tribal consultation process.

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<sup>10</sup> A.R.S § 45-2457(B)(7).

<sup>11</sup> SB 1301, introduced by Senator Frank Pratt, passed the Senate unanimously. The bill died when the legislature adjourned sine die May 2020.

<sup>12</sup> SNWA is responsible for paying the recovery costs associated with developing ICUA and has therefore, under separate agreements, provided CAWCD \$1 million for advancement to both AWC and the City of Tucson for this purpose.

## Adoption of 2020 Plan of Operation

The AWBA 2020 Annual Plan of Operation (APO) was adopted on Dec. 4, 2019. In calendar year 2020, consistent with the provisions of the LBDCP, the Colorado River will operate under a Tier zero condition. Accordingly, Arizona must contribute 192,000 acre-feet in water savings to Lake Mead. Since these contributions come largely from excess CAP water supplies, there was no water available to CAWCD's Statutory Firming Pool that is utilized by the AWBA. As a result, the APO focuses on LTSC purchases and developing ICS firming credits, to make progress on its M&I and Indian firming goals. The 2020 APO provides for the development of an estimated 35,600 acre-feet of credits at a total estimated cost of \$8.86 million.

Credit acquisitions are anticipated to occur in the Phoenix and Tucson AMAs. Potential LTSC purchases total 27,460 acre-feet and are estimated to cost just over \$6.62 million. LTSCs will be purchased using \$3 million each in Maricopa and Pima County Water Storage Tax funds and an estimated \$622,100 in withdrawal fees collected in the Tucson AMA. Additionally, the AWBA anticipates developing 8,140 acre-feet of ICS Firming credits for roughly \$2.23 million: \$1.35 million in withdrawal fee revenues collected in the Phoenix AMA and \$882,400 collected in the Pinal AMA.

Since there are no Colorado River shortages in 2020, the APO does not include the distribution of AWBA credits for firming purposes. Additionally, the Southern Nevada Water Authority did not request the development of intentionally created unused apportionment. Therefore, there will be no credits recovered for interstate purposes.

## Revenues and Expenditures

A.R.S § 45-2425 mandates the various sources of monies for the Arizona Water Banking (AWB) Fund. The AWB Fund is administered by the AWBA. In 2019, the AWBA obtained its funding from the following sources:

1. Fees for groundwater pumping, known as withdrawal fees, are collected within the Phoenix, Pinal and Tucson AMAs and charged for water banking purposes at \$2.50 per acre-foot in the Phoenix and Tucson AMAs and up to \$2.50 per acre-foot in the Pinal AMA. Withdrawal fees can be used by the AWBA for water-management purposes, including firming for CAP NIA Indian Priority and CAP M&I Priority supplies. LTSCs accrued with these funds must be used to benefit the AMA in which the monies were collected.

The Arizona Legislature authorized the use of approximately \$1.4 million in the AWB Fund to support both ADWR (\$1.2 million) and the Arizona Navigable Stream Adjudication Commission (\$200,000) for the 2018/2019 fiscal year. Any unused monies are redistributed to the AWBA the following fiscal year. Additionally, as a component of DCP, fees levied in the Pinal AMA during calendar years 2020 through 2026 will not be made available to the AWBA but will be used by ADWR to support groundwater infrastructure and irrigation efficiency projects in the Pinal AMA.<sup>13</sup>

2. As in previous years, the CAWCD Board resolved to retain the water storage taxes levied and collected for the 2018-2019 tax year and to use the funds for meeting operating, maintenance (O&M) and replacement and/or repayment costs of the Central Arizona Project, which includes water storage by the AWBA. The CAWCD Board also reserved approximately \$7.33 million in water storage tax revenues to support AWBA purchases of LTSCs for CAP M&I Priority firming. Of this amount, just over \$4 million was deposited to the AWB Fund for this purpose. LTSCs accrued using water storage tax funds must be used to benefit the county in which the funds were collected.
3. The AWBA did not receive a general fund appropriation in 2019.

**Table 2** shows the monies the AWBA collected, monies made available by CAWCD and the monies expended in 2019 by source of funds. **Table 3** shows the total monies received, expended and remaining through December 2019 by source of funds. Remaining funds are committed to activities identified in the Plan of Operation adopted for the current year.

<sup>13</sup> A.R.S. § 45-611(C)(3), § 45-613(D) and § 45-615.01

**Table 2. Monies Collected, Made Available, and Expended in 2019 by Source of Funds**

Source of Funds	Carryover	Collected/Made Available	Expended
<b>General Funds</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>State Indian Firming</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Interstate Water Banking<sup>1</sup></b>	<b>\$20,923</b>	<b>\$2,492</b>	<b>\$0</b>
<b>Water Storage Tax<sup>2</sup></b>			
Maricopa County		\$2,954,455	\$2,954,443
Pinal County		\$0	\$0
Pima County		\$1,096,183	\$1,096,183
Subtotal		<b>\$4,050,638</b>	<b>\$4,050,626</b>
<b>Groundwater Withdrawal Fees<sup>3</sup></b>			
Phoenix AMA	\$498,026	\$1,650,680	\$2,152,800
Pinal AMA	\$427,002	\$939,011	\$1,365,600
Tucson AMA	\$413,425	\$298,452	\$288,180
Subtotal	<b>\$1,338,453</b>	<b>\$2,888,143</b>	<b>\$3,806,580</b>
<b>TOTAL<sup>4</sup></b>	<b>\$1,359,376</b>	<b>\$6,941,273</b>	<b>\$7,857,206</b>

<sup>1</sup> Includes \$2,194 in interest for 2019 and Lehman Brothers bankruptcy distribution of \$298.

<sup>2</sup> Monies deposited to the AWB Fund by CAWCD for LTS credit purchases.

<sup>3</sup> Carryover includes revenue adjustments of \$10,164, \$2,740 and \$3,257 for the Phoenix, Pinal and Tucson AMAs, respectively. Funds collected includes \$400,000 in legislative allocations unused by ADWR in FY 2019.

<sup>4</sup> Totals may not sum due to rounding.

**Table 3. Cumulative Monies Collected, Made Available, Expended and Remaining Available through 2019**

Source of Funds	Collected/Made Available	Expended	Remaining <sup>1</sup>
<b>General Funds</b>	<b>\$11,100,865</b>	<b>\$11,100,865</b>	<b>\$0</b>
<b>In-Lieu Fund - MCWA Pre-payments</b>	<b>\$5,123,480</b>	<b>\$5,123,480</b>	<b>\$0</b>
<b>State Indian Firming</b>	<b>\$2,578,389</b>	<b>\$2,578,389</b>	<b>\$0</b>
<b>Interstate Water Banking-NV<sup>2</sup></b>	<b>\$112,408,345</b>	<b>\$112,384,930</b>	<b>\$23,415</b>
<b>Shortage Reparations – NV</b>	<b>\$8,001,948</b>	<b>\$8,001,948</b>	<b>\$0</b>
<b>Water Storage Tax<sup>3</sup></b>			
Maricopa County	\$131,455,128	\$131,455,116	\$12
Pinal County	\$14,461,741	\$14,461,741	-
Pima County	\$59,289,837	\$59,289,837	-
Subtotal	<b>\$205,206,706</b>	<b>\$205,206,694</b>	<b>\$12</b>
<b>Groundwater Withdrawal Fees</b>			
Phoenix AMA	\$33,126,904	\$33,120,834	\$6,069
Pinal AMA	\$25,201,309	\$25,200,897	\$412
Tucson AMA	\$10,573,844	\$10,150,146	\$423,698
Subtotal	<b>\$68,902,056</b>	<b>\$68,471,877</b>	<b>\$430,179</b>
<b>TOTAL<sup>4</sup></b>	<b>\$413,321,790</b>	<b>\$412,868,183</b>	<b>\$453,607</b>

<sup>1</sup> Remaining funds include monies committed for the 2020 AOP.

<sup>2</sup> Pursuant to the Third Amended Agreement, remaining funds are non-reconcilable for interstate purposes. They include accrued interest and recovered Lehman Brothers bankruptcy monies and are subject to legislative authorization prior to use by the AWBA.

<sup>3</sup> Monies collected by CAWCD made available to AWBA through direct deposit into the AWB Fund or as an expenditure by CAWCD to offset AWBA delivery and storage costs as part of CAP O&M costs.

<sup>4</sup> Totals may not sum due to rounding.

## Long-term Storage Credits

The AWBA has established LTSC accounts with ADWR for each AMA. LTSCs are issued for 95 percent of the water that is stored. After LTSCs are issued, AWBA staff allocates the LTSCs to the appropriate sub-accounts based on source of funding used to accrue the LTSCs. The AWBA also purchases LTSCs stored by other entities. The number and location of LTSCs for 2019, which were limited to purchase acquisitions, are listed in Table 4. Cumulative LTSCs accrued or acquired by the AWBA through December 2019 are listed in Table 5.

**Table 4. Number and Location of LTSCs Acquired in 2019 (AF)**

Funding Source	Phoenix AMA	Pinal AMA	Tucson AMA	Total
Water Storage Tax	13,100	-	4,815	17,915
Withdrawal Fees	-	-	1,342	1,342
General Fund	-	-	-	-
<b>Intrastate TOTAL</b>	<b>13,100</b>	<b>-</b>	<b>6,157</b>	<b>19,257</b>
Interstate - Nevada	-	-	-	-
<b>TOTAL</b>	<b>13,100</b>	<b>-</b>	<b>6,157</b>	<b>19,257</b>

**Table 5. Cumulative LTSCs Accrued or Acquired through December 2019 (AF)**

Funding Source	Phoenix AMA	Pinal AMA	Tucson AMA	Total
Water Storage Tax	1,519,147	223,571	485,028	2,227,745
Withdrawal Fees	339,724	434,530	110,182	884,436
General Fund <sup>1</sup>	42,316	306,968	54,546	403,830
<b>Other Intrastate:</b>				
Indian Firming Appropriation	-	-	28,481	28,481
Shortage Reparation	20,642	60,507	28,340	109,489
GSF Operator Full Cost Share	-	14,125	-	14,125
<b>Intrastate TOTAL</b>	<b>1,921,828</b>	<b>1,039,701</b>	<b>706,577</b>	<b>3,668,106</b>
Interstate - Nevada	60,021 <sup>2</sup>	440,241 <sup>3</sup>	113,584	613,846
<b>TOTAL<sup>4</sup></b>	<b>1,981,849</b>	<b>1,479,942</b>	<b>820,161</b>	<b>4,281,952</b>

<sup>1</sup> Pursuant to the AWBA Agreement to Firm with Mohave County Water Authority (MCWA) dated February 4, 2005, 230,280 acre-feet of LTSCs were transferred to the AWBA long-term storage subaccount for the MCWA in 2005. An additional 25,894 acre-feet of LTSCs were reserved under Exhibit C the Amended Agreement to Firm, dated December 8, 2010, for a total of 256,174 acre-feet.

<sup>2</sup> ADWR issued an additional 314 acre-feet of LTSCs in 2019 upon reconciliation of 2018 GSF annual reports.

<sup>3</sup> Includes 50,000 acre-feet of LTSCs transferred from CAWCD pursuant to Amended Agreement for Interstate Water Banking.

<sup>4</sup> Totals may not sum due to rounding.



Since its inception, the AWBA has focused its efforts on developing LTSCs for firming purposes. The AWBA identified 2.7 MAF of LTSCs as a reasonable amount of credits to firm the CAP M&I subcontracts for 100 years. This volume is divided based on a pro-rata distribution of CAP M&I subcontracts by county as follows: 58 percent Maricopa County, 32 percent Pima County, and nine percent Pinal County.

The AWBA also identified 420,000 acre-feet of LTSCs as a reasonable amount to firm the on-River communities for 100 years. In 2002, the AWBA adopted a resolution that identified on-River firming as the highest priority for use of the general fund LTSCs. Consequently, all or part of the general fund LTSCs could be utilized to firm on-River M&I users. When used for this purpose, the AWBA will collect reimbursement for the replacement cost of the LTSCs used. In 2008, the AWBA executed Resolution 2008-1 that established a long-term storage credit replacement account for fourth priority Colorado River M&I users. Under the Resolution, as LTSCs are used and replaced, the replacement LTSCs will be placed in a separate subaccount and earmarked for the entity that reimburses the AWBA for the replacement of those LTSCs.

With enforceability of the AWSA in December 2007, the AWBA, as agent for the State, assumed the obligation to firm up to 23,724 acre-feet per year of CAP NIA Priority water supplies. Of this amount, up to 15,000 acre-feet per year will be made available to the Gila River Indian Community and 8,724 acre-feet per year is allocated for future settlements. The AWBA must firm these supplies for a 100-year period and ensure that the water is delivered to the same priority as CAP M&I priority supplies. In 2005, the Arizona State Legislature created an Indian Firming Study Commission (Study Commission) to develop a Firming Program for Arizona. The analysis performed by the Study Commission estimated a firming target of approximately 550,000 acre-feet: 350,000 acre-feet for the Community and 200,000 acre-feet for future settlements. The AWBA periodically re-evaluates these targets to ensure they are still applicable. While the AWBA has focused its future firming efforts on the accrual of LTSCs, the AWBA may also use other methods to meet this obligation including contracting for delivery of water supplies other than excess CAP water, engaging in water exchanges, and/or entering into lease agreements with Indian communities and others.

In addition to firming, the AWSA also required that the state contribute \$3 million in cash or in-kind services to assist the Secretary in meeting the Federal obligation to the Tohono O'odham Nation. Pursuant to the AWBA's firming agreement with the Secretary, the parties agreed to accomplish this requirement through the accrual of an equivalent amount of LTSCs that would be distributed to the Secretary during shortages. This obligation was satisfied in 2009. Lastly, as discussed earlier, the AWBA is required to directly deliver 15,000 acre-feet of water to the Community to establish the Southside Replenishment Bank. This obligation was satisfied in 2015.

**Table 6** illustrates the progress made by the AWBA towards meeting its established goals and obligations. Progress on individual goals varies due to the availability of funds, limitations of how each funding source may be used, and storage capacity that has been available in each AMA historically. The AWBA has nearly achieved its M&I firming goal in the Phoenix and Pinal AMAs at 97 percent and 92 percent, respectively. The AWBA has met just over half its firming goal in the Tucson AMA at 56 percent. Groundwater management LTSCs could also be used for this purpose and if applied, would increase the percent goal achieved to 68 percent. This level of progress has been historically anticipated and is



attributed to the volume of entitlements relative to the amount of revenues collected in the AMA. Water management credits can also be used to satisfy the AWBA’s Indian settlement obligations.

**Table 6. Uses of Credits Accrued through December 2019 and Percentage of Goal Achieved**

Location and Objective	Funding Source	Estimated Goal	Non-Credit Goal Achieved	Credits <sup>1</sup> Accrued (AF)	Goal Achieved
<b>CAP M&amp;I Firming</b>					
Phoenix AMA	Water Storage Tax collected by County	1,566,000 AF		1,519,147	97%
Pinal AMA		243,000 AF		223,571	92%
Tucson AMA		864,000 AF		485,028	56%
<b>On-River M&amp;I Firming<sup>2</sup></b>	General Fund	420,000 AF		403,830	96%
<b>Indian Settlement Obligations:</b>					
Gila River Indian Community <i>up to 15 KAF/year</i>	General Fund Withdrawal Fees	350,000 AF <sup>3</sup>		162,584 <sup>4</sup>	46%
				0	
Future Settlements - <i>up to 8.7 KAF/year</i>	General Fund Withdrawal Fees	200,000 AF <sup>3</sup>		0	N/A
				0	
Federal Assistance (SAWRSA)- <i>\$3 million</i>	General Fund Tucson W/Fees Cost of Services <sup>5</sup>		\$3,000,000	34,102	100%
			\$2,338,171	28,481	
			\$630,490	5,621	
			\$31,339	n/a	
Southside Replenishment Bank <i>15 KAF direct delivery</i>	General Fund Pinal W/Fees			15,000	100%
				1,342	
				13,658	
<b>Groundwater Management<sup>6</sup></b>					
Phoenix AMA	Withdrawal Fees collected by AMA			251,411	
Pinal AMA				417,453	
Tucson AMA				104,561	
<b>Other:</b>					
Shortage Reparations	Agreement with Nevada	\$8,000,000	\$8,001,948	109,489	100%
Pinal Redirect Credits <sup>7</sup>	N/A			14,125	N/A

<sup>1</sup> Includes purchased LTSCs and firming credits, including ICS firming credits, developed pursuant to IGAs with the Gila River Indian Community.

<sup>2</sup> A total of 256,174 acre-feet of LTSCs reserved for MCWA.

<sup>3</sup> Based on estimates from the Indian Firming Study Commission Report dated January 6, 2006.

<sup>4</sup> LTSCs accrued from storage at the Gila River Indian Irrigation and Drainage District GSF: Phoenix AMA 88,313 AF, Pinal AMA 17,077. Also includes 44,000 AF of firming credits developed on Community lands and 13,194 AF of ICS Firming credits.

<sup>5</sup> Expenditures include \$14,883 and \$16,456 deducted for payment of cost of services for FY 08 and FY 09, respectively.

<sup>6</sup> Withdrawal fees could be utilized in addition to water storage tax revenues for M&I firming if needed to reach firming goals and for Indian settlement obligations in the absence of general fund appropriations.

<sup>7</sup> LTSCs accrued from AWBA water provided to Pinal AMA GSFs at full cost to the GSF operators. These credits are currently identified for use in the Tucson AMA.

The average annual cost for the AWBA to obtain one acre-foot of credit for intrastate storage is presented in **Figure 1** and illustrates that the unit cost per credit is influenced by the type of storage facility used as well as the increase in water delivery costs over time. The significant increase beginning in 2010 reflects CAWCD’s elimination of the incentive recharge rate. Due to the low volume of excess CAP water supplies available to the AWBA, storage in 2017 was predominantly at GSFs, which have reduced storage rates. Indirect storage at these facilities provides water management benefits through the continued use of renewal supplies in lieu of groundwater for agricultural irrigation. There was no AWBA storage in 2019.

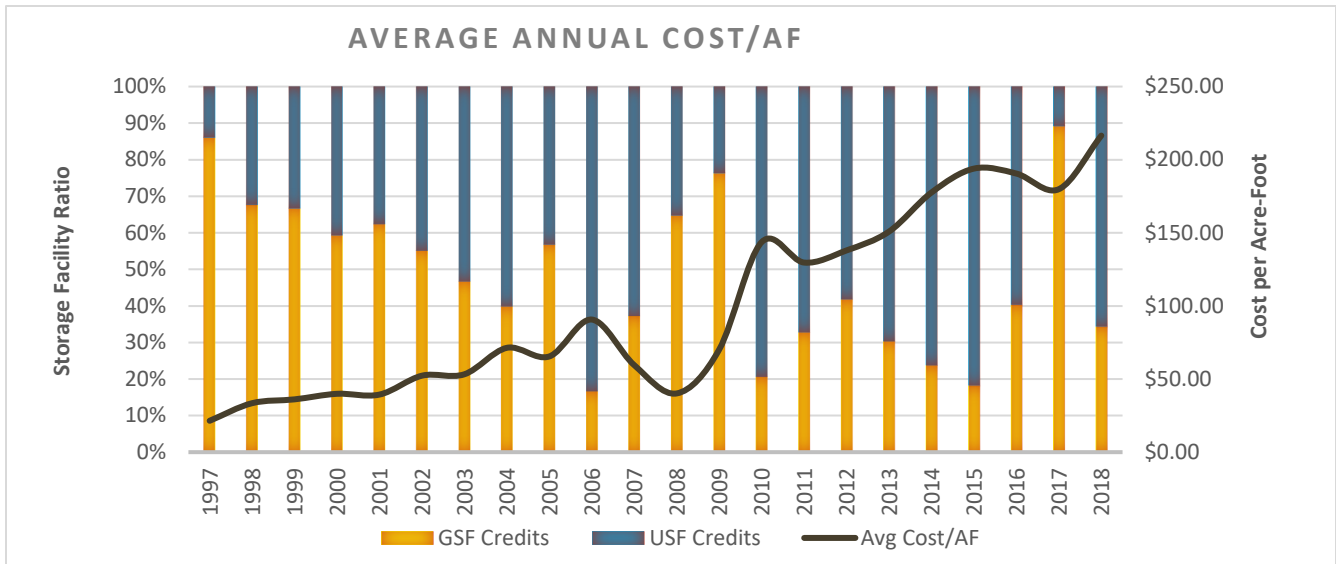


Figure 1. AWBA average cost per acre-foot to accrue one LTSC

Total annual storage costs since inception are identified in **Figure 2**.

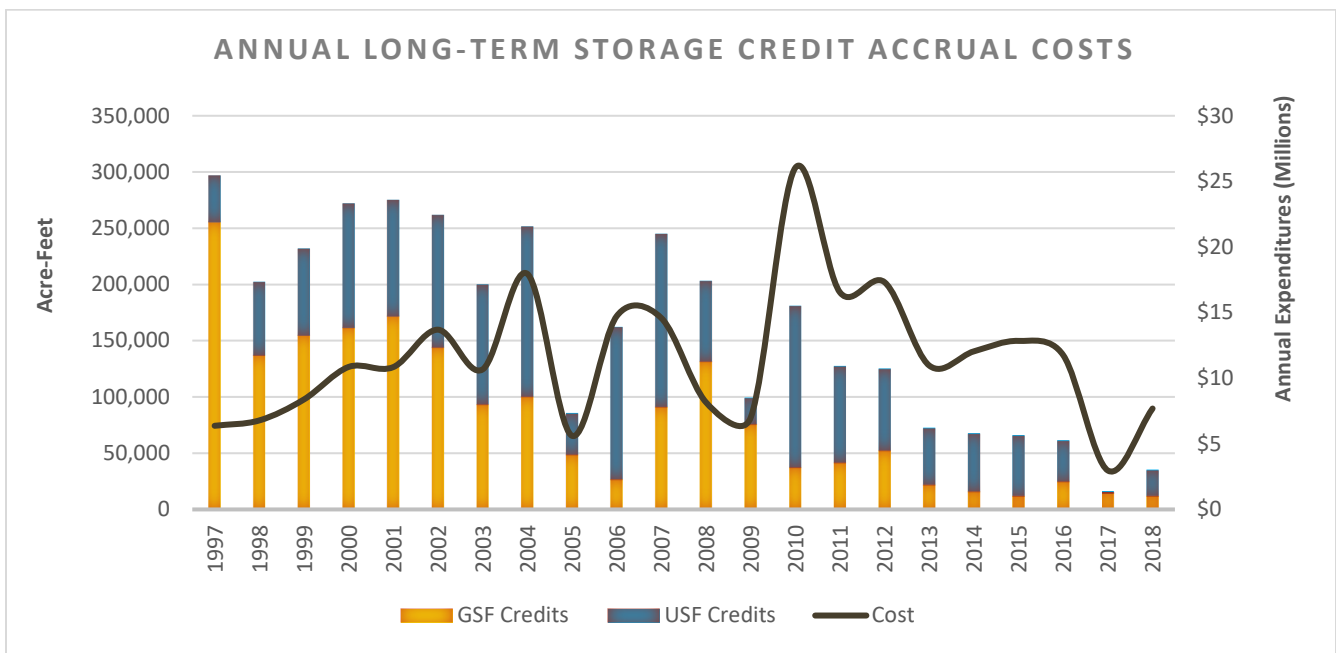


Figure 2. AWBA annual LTSC accrual costs.

## Long-term Storage Credits Distributed or Extinguished

The LTSCs developed by the AWBA have been identified for five purposes:

- Firming CAP M&I priority subcontracts;
- Firming post-1968 Colorado River domestic use contracts;
- Firming the State's obligation under the AWSA, including LTSCs accrued specifically for the State's obligation to the United States;
- Assisting in fulfilling the water-management objectives set forth in Chapter 2 of Title 45 (Arizona Revised Statutes); and
- Interstate water banking purposes pursuant to agreements with Nevada.

LTSCs accrued by the AWBA for firming purposes may be distributed or extinguished under the following circumstances: if a shortage is declared on the Colorado River system and demand exceeds supply, if there is a water shortage as defined under the AWSA, or if there is an operational disruption of the CAP. As there were no shortages or unplanned CAP outages in 2019, the AWBA did not distribute or extinguish LTSCs for these purposes. Additionally, no LTSCs were distributed or extinguished in 2019 for water-management purposes or the development of intentionally created unused apportionment for interstate banking purposes.

Although the AWBA is authorized to develop or loan LTSCs pursuant to water banking services agreements, the AWBA has not yet entered into such agreements, therefore no LTSCs were developed or distributed for this purpose in 2019.



## Ten-Year Plan

Pursuant to A.R.S. §45-2426, the AWBA is required to prepare a ten-year plan (Ten-Year Plan) that describes any water banking services and interstate water banking it intends to undertake during the ten-year period in addition to storing Colorado River water for its three main purposes: (1) protecting Arizona's M&I water users against future water shortages on the Colorado River and disruptions of operation of the CAP, (2) fulfilling Arizona's water-management objectives as set forth in the Groundwater Code and (3) making water available to implement the settlement of water rights claims by Indian communities within the state. The Ten-Year Plan must also provide an analysis of the AWBA's ability to complete those activities. The Ten-Year Plan is prepared only for planning purposes and is updated annually based on current information.<sup>14</sup>

This Ten-Year Plan analyses potential activity for the planning period 2021 through 2030 and is an important tool to be utilized in the development of the 2021 Annual Plan of Operation. Additionally, as the AWBA transitions to its next phase of operation, distributing LTSCs for firming, the Ten-Year Plan becomes essential for providing advance notice of potential near-term firming obligations or commitments, and in developing future policies to guide AWBA activities.

Based on the likelihood of remaining in a Tier zero or greater operating condition, the AWBA is not expected to have excess CAP water available under this Ten-Year Plan. Consequently, the AWBA will rely on alternative resources to make progress on its firming goals. This Ten-Year Plan estimates the AWBA could develop approximately 193,000 acre-feet of credits for M&I and Indian firming purposes. Based on hydrologic modeling projections, the AWBA may have a requirement to firm approximately 133,000 acre-feet of NIA Indian priority supplies under the Full hydrology scenario. However, under the Stress Test scenario that is used to evaluate a drier future, the AWBA could have a requirement to firm up to 487,000 acre-feet, which affects NIA Indian priority, M&I priority and on-River supplies.

Recognizing the potential transition in AWBA activities, this Ten-Year Plan comprises two components, credit development and the distribution of AWBA credits for firming purposes or the creation of intentionally created unused apportionment (ICUA) associated with interstate water banking.

### Credit Development

When storing water, the AWBA must consider the availability of funding and storage capacity as they are interdependent. The availability of one, or lack thereof, will ultimately affect the significance of the other in developing the Ten-Year Plan. For example, if there is no excess CAP water available to the AWBA, the availability of storage capacity will be less relevant. Similarly, if water is available for storage, funding limitations could affect the amount of water stored in an AMA. The availability of funding, however, will be especially important in demonstrating how the AWBA can meet its objectives using credit development methods other than traditional water storage.

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<sup>14</sup> AWBA APOs and Annual Reports for past years can be accessed on the AWBA website.

### *Water Availability*

Due to forecasted hydrologic conditions and implementation of the LBDCP, the AWBA is not expected to have excess CAP water available during the next ten years. Consequently, this Ten-Year Plan does not include water storage estimates for meeting its existing objectives or for additional water banking purposes. While the AWBA could store CAP water that is turned back during a year, the availability of this water cannot be known in advance and is therefore not a consideration in the Ten-Year Plan. Likewise, the AWBA could store water on behalf of others using supplies made available by those entities, such as Nevada's unused Colorado River entitlement. However, since that storage would not impact the use of excess CAP supplies, it is also not a consideration in this Ten-Year Plan. If water does become available, the AWBA should have sufficient funding and storage capacity available to store the water.

### *Funding*

Funding for water storage that benefits Arizona (intrastate storage) comes from three sources: water storage taxes (i.e. 4-cent water storage tax), groundwater withdrawal fees and general fund appropriations. The availability of revenues from each source varies annually. Additionally, there are restrictions on how each funding source can be used. Funding for interstate banking is received at the time of storage.

### *Water Storage Taxes*

Pursuant to A.R.S. § 48-3715.03(B), ad valorem taxes for water storage levied and collected by CAWCD, not utilized for repayment or O&M costs of the Project, shall be deposited into three subaccounts held by the AWBA for each of the three counties in which the taxes are collected. This Ten-Year Plan assumes CAWCD will continue to retain the water storage tax revenues collected during the next ten years, but continue to offset AWBA water delivery and storage costs as part of O&M if water becomes available, and deposit funds into the AWB Fund for LTSC purchases. In accordance with the IGA between the AWBA, ADWR and CAWCD<sup>15</sup>, the AWBA must request funds from CAWCD annually for all planned LTSC purchases for the following year. For calendar year 2021, the AWBA requested \$4 million in Maricopa County Water Storage Tax funds to develop approximately 16,500 acre-feet of LTSCs in the Phoenix AMA, and \$6 million in Pima County Water Storage Tax funds to develop approximately 24,500 acre-feet of LTSCs in the Tucson AMA.

CAWCD has the authority to levy the water storage tax through 2030. Therefore, this Ten-Year Plan assumes the collection of the water storage tax throughout the planning period. CAWCD is authorized to levy the tax at a rate of up to 4-cent per \$100 of assessed property value through tax year 2024 and up to 3-cent for the remainder of the term. Credits accrued with these funds are used to firm CAP M&I supplies during shortages.

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<sup>15</sup> Intergovernmental Agreement among the Arizona Department of Water Resources, Arizona Water Banking Authority and Central Arizona Water Conservation District, executed January 3, 2019.

### *Groundwater Withdrawal Fees*

Pursuant to A.R.S. § 45-611(3), the Director of ADWR collects a groundwater withdrawal fee for water banking purposes in the Phoenix and Tucson AMAs equal to \$2.50 per acre-foot per year and up to \$2.50 per acre-foot per year in the Pinal AMA. In recent years, the Arizona Legislature has authorized the use of withdrawal fees for other purposes. While future actions of the legislature cannot be known, this Ten-Year Plan assumes withdrawal fee monies will continue to be allocated for other purposes. In the past, legislative transfers have been distributed proportionally among the three funds based on the revenues collected. However, during this planning period, the transferred funds will likely be made available primarily from the Phoenix AMA because monies from the Pinal AMA will not be available until 2027. This affects what can be accomplished over the next ten years. Any changes will be addressed on an annual basis.

This Plan assumes an estimated \$2.4 million in withdrawal fees is collected annually with \$2.0 million collected in the Phoenix AMA and \$390,000 collected in the Tucson AMA<sup>16</sup>. The AWBA can utilize withdrawal fees to further the water management objectives of the AMAs, including firming for CAP M&I subcontracts and implementing Indian water rights settlements when legislative appropriations are not available. When distributed or extinguished, these credits can only be used for the benefit of the AMA in which the monies were collected.

### *General Fund Appropriations*

Pursuant to A.R.S. § 45-2423.B.10, the AWBA can submit a request for a General Fund appropriation each year. While the AWBA may request General Fund appropriations during this planning period, receipt of an appropriation cannot be expected. Absent future General Fund appropriations, any credit development for Indian firming would require the use of groundwater withdrawal fees.

### *Funding for Interstate Storage*

Pursuant to the Third Amended and Restated Agreement for Interstate Water Banking among the AWBA, SNWA and the Colorado River Commission of Nevada (Third Amended Agreement), the AWBA will collect all charges for administrative services, and for delivery and storage of water. Costs for interstate banking will be incorporated into the Annual Plan of Operation.

### *Storage Capacity*

Based on recharge permit volumes and discussions with AWBA storage partners, the AWBA could have a cumulative volume of 151,500 acre-feet of storage capacity available at GSFs and 139,000 acre-feet of capacity available at USFs. However, actual storage capacity volumes available to the AWBA in any given year will depend on use of the facilities by other storing entities. Recently, there has been an increase in storage by higher priority water users, which has reduced storage capacity available to the AWBA. In the event there is excess CAP water available to the AWBA, or CAP water is turned back during a year, the AWBA should have enough capacity available for storage as these would likely be smaller volumes of

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<sup>16</sup> Withdrawal fee revenues vary from year to year. The assumptions used in this Ten-Year Plan are based on the average revenues over the last five years (2015 through 2019).

water than the AWBA has historically stored. Although storage capacity for individual AMAs, such as the Tucson AMA, could be limited. Details on storage partners, storage permits, and capacity available to the AWBA are further described in Appendix B. Additionally, an assessment of storage capacity availability will be included in the AWBA’s Water Storage Facility Inventory report that is due next year.

*Progress on Firming Goals*

The Ten-Year Plan assumes the AWBA will continue to utilize alternative methods of credit development to make progress on its firming goals. Table 7 identifies all AWBA credits accrued or acquired through 2020 for meeting its objectives, including LTSCs and firming credits developed pursuant to the AWBA’s agreements with the Gila River Indian Community (Community).

*Table 7. Existing AWBA Credits through 2020 (acre-feet)*

<b>Objective<sup>1</sup></b>	<b>Phoenix AMA</b>	<b>Pinal AMA</b>	<b>Tucson AMA</b>	<b>Total</b>
M&I Firming	1,565,749	231,941	499,217	2,296,907
Indian Firming	144,949	25,393	34,102	204,444
Water Management	251,411	417,453	106,732	775,596
Shortage Reparation	20,642	60,507	28,340	109,489
On-River Firming	42,316	306,968	54,546	403,830
Other	-	14,125	-	14,125
Interstate	<u>60,021</u>	<u>440,241</u>	<u>113,584</u>	<u>613,846</u>
<b>Total</b>	<b>2,085,088</b>	<b>1,496,628</b>	<b>836,521</b>	<b>4,418,237</b>

<sup>1</sup> Credit accrual for 2020 is based on estimates of credits developed in the 2020 Plan of Operation, including ICS firming credits and LTSC purchases.

Because the AWBA is behind in achieving its numeric M&I firming goal in the Tucson AMA, this Ten-Year Plan focuses on the development of LTSCs in the Tucson AMA, maximizing all available funds during the planning period. As a result, the AWBA expects to develop up to 139,000 acre-feet of M&I firming credits and 14,000 acre-feet in water management credits in the Tucson AMA. As indicated in table 8, the development of these LTSCs will result in achieving 74 percent of the Tucson AMA firming goal, or 86 percent when combined with Tucson AMA water management LTSCs. In the Phoenix AMA, credit purchases are limited to the use of Maricopa Water Storage Tax funds reserved for 2021 and are not anticipated in the Pinal AMA. The AWBA anticipates purchasing 16,500 acre-feet of LTSCs in the Phoenix AMA in 2021 and expects to reach or exceed its Phoenix AMA M&I firming goal. Although additional Phoenix AMA credit purchases are not included in this Ten-Year Plan, the decision to purchase credits will be determined annually while developing the Plan of Operation.

The AWBA will continue to fund the development of the remaining 24,000 acre-feet of the 45,000 total acre-feet of ICS firming credits identified under its agreement with the Community. As such, the AWBA



will have achieved 55 percent of its firming goal for the Community. Although this Ten-Year Plan focuses on the development of credits through purchases, if water supplies become available anytime during the planning period, the AWBA will continue to store water in all AMAs consistent with its established priorities.

**Table 8. Uses of Credits Accrued through December 2030 and Percentage of Goal Achieved**

Location and Objective	Funding Source	Estimated Goal	Non-Credit Goal Achieved	Credits <sup>1</sup> Accrued (AF)	Goal Achieved
<b>CAP M&amp;I Firming</b>					
Phoenix AMA	Water Storage Tax collected by County	1,566,000 AF		1,582,249	101%
Pinal AMA		243,000 AF		231,941	95%
Tucson AMA		864,000 AF		638,343	74%
<b>On-River M&amp;I Firming<sup>2</sup></b>	General Fund	420,000 AF		403,830	96%
<b>Indian Settlement Obligations:</b>					
Gila River Indian Community <i>up to 15 KAF/year</i>	General Fund Withdrawal Fees	350,000 AF <sup>3</sup>		194,390 <sup>4</sup>	55%
				0	
Future Settlements - <i>up to 8.7 KAF/year</i>	General Fund Withdrawal Fees	200,000 AF <sup>3</sup>		0	N/A
Federal Assistance (SAWRSA)- <i>\$3 million</i>	General Fund Tucson W/Fees			\$3,000,000	100%
				\$2,338,171	
	Cost of Services <sup>5</sup>		\$630,490	5,621	
Southside Replenishment Bank <i>15 KAF direct delivery</i>	General Fund Pinal W/Fees			15,000	100%
				1,342	
				13,658	
<b>Groundwater Management<sup>6</sup></b>					
Phoenix AMA	Withdrawal Fees collected by AMA			251,411	
Pinal AMA				417,453	
Tucson AMA				106,732	
<b>Other:</b>					
Shortage Reparations	Agreement with Nevada	\$8,000,000	\$8,001,948	109,489	100%
Pinal Redirect Credits <sup>7</sup>	N/A			14,125	N/A

<sup>1</sup> Includes purchased LTSCs and firming credits, including ICS firming credits, developed pursuant to IGAs with the Gila River Indian Community.

<sup>2</sup> A total of 256,174 acre-feet of LTSCs reserved for MCWA.

<sup>3</sup> Based on estimates from the Indian Firming Study Commission Report dated January 6, 2006.

<sup>4</sup> LTSCs accrued from storage at the Gila River Indian Irrigation and Drainage District GSF: Phoenix AMA 88,313 AF, Pinal AMA 17,077. Also includes 44,000 AF of firming credits developed on Community lands and 45,000 AF of ICS Firming credits.

<sup>5</sup> Expenditures include \$14,883 and \$16,456 deducted for payment of cost of services for FY 08 and FY 09, respectively.

<sup>6</sup> Withdrawal fees could be utilized in addition to water storage tax revenues for M&I firming if needed to reach firming goals and for Indian settlement obligations in the absence of general fund appropriations.

<sup>7</sup> LTSCs accrued from AWBA water provided to Pinal AMA GSFs at full cost to the GSF operators. These credits are currently identified for use in the Tucson AMA.

## AWBA Credit Distribution or Extinguishment

As the AWBA transitions to its next phase of operation, distributing LTSCs for firming, the Ten-Year Plan becomes an important tool for providing advance notice of potential near-term firming obligations and developing future policies. Factors affecting the AWBA firming obligations include Colorado River hydrologic conditions, the supply available to Arizona and Colorado River demands within Arizona. Firming projections for the Ten-Year Plan are developed based on an analysis of supply and demand under a variety of hydrologic conditions. The United States Bureau of Reclamation's (Reclamation) Colorado River Simulation System (CRSS) model is used to estimate Colorado River supply to Arizona. The Joint Recovery Model (JRM), developed by ADWR, AWBA, and CAWCD, is used to estimate Colorado River demands within the Arizona priority system and evaluate the timing, frequency and magnitude of shortages that require AWBA firming. To prepare for a broad range of future hydrologic possibilities, the AWBA evaluated two different supply and demand scenarios based on Full hydrology and Stress Test hydrology.

### *CRSS Modeling*

The CRSS model is used to project the supply available to Arizona and predict the likelihood of a supply reduction, which could trigger a firming obligation for the AWBA. Water Bank firming is required when an Arizona supply reduction intersects with demand by Central Arizona Project (CAP) users and on-River fourth priority Municipal & Industrial users, for which the AWBA has firming responsibilities. The CRSS model is run using two different assumptions for future hydrology: the "Full" hydrology and the "Stress Test" hydrology. The CRSS Full hydrology samples the complete set of historical inflows on record from 1906-2018, while the CRSS Stress Test hydrology samples a shorter period of historical inflows on record from 1988-2018.

The most recent projection of future Colorado River system conditions was produced in April 2020. Reclamation's April 2020 model projections are developed using a combination of the Mid-Term probabilistic Operations Model (MTOM) and the CRSS model. The CRSS April 2020 Full hydrology model run is used as the baseline scenario for the AWBA Ten-Year Plan. As indicated in table 9, this model run projects a zero percent probability of shortage in 2021 and a nine percent probability of shortage in 2022. The most likely supply operating conditions reflect Tier zero or normal conditions. However, there is a moderate probability of a Tier 1 shortage beginning in 2023 (30 percent), with the likelihood of a Tier 1 shortage remaining between 27 percent to 31 percent for the rest of the planning period. To estimate potential firming volumes, the tier representing the highest probability of shortage in a given year is selected along with the corresponding firming requirement in that year as highlighted in the following tables. If Tier 1 shortage conditions occur, the AWBA could have firming requirements between 14,358 acre-feet and 18,387 acre-feet per year, affecting only NIA Indian priority supplies.

**Table 9. Projected Lower Basin Supply Conditions – CRSS April 2020 Full Hydrology**

**Full Hydrology<sup>1</sup>**

Operational Tier/Probability of Shortage <sup>2</sup>								NIA Indian Firming <sup>3</sup> (af)				Total <sup>3</sup> Potential Firming Volume
Year	Surplus	Normal	Tier 0	Tier 1	Tier 2a	Tier 2b	Tier 3	Tier 1	Tier 2a	Tier 2b	Tier3	
	≥ 1,145	>1090 and <1145	>1075 and ≤1090	≤1075 and >1050	≤1050 and >1045	≤1045 and >1025	≤1025					
			192 kaf	512 kaf	592 kaf	640 kaf	720 kaf					
2021	0%	6%	94%	0%	0%	0%	0%	-	-	-	-	-
2022	0%	14%	77%	9%	0%	0%	0%	-	-	-	-	-
2023	6%	19%	44%	30%	1%	0%	0%	14,358	18,348	17,251	15,600	14,358
2024	10%	18%	34%	28%	3%	7%	0%	15,148	18,317	17,221	15,575	15,148
2025	16%	17%	25%	28%	3%	8%	3%	15,969	18,698	17,577	15,898	15,969
2026	19%	16%	17%	30%	3%	11%	4%	16,056	18,667	17,546	15,872	16,056
2027	22%	12%	15%	30%	3%	12%	6%	17,582	19,961	18,761	16,972	17,582
2028	24%	10%	12%	31%	4%	11%	8%	17,780	19,880	18,683	16,903	17,780
2029	25%	9%	9%	30%	5%	14%	8%	17,979	19,800	18,605	16,835	17,979
2030	25%	11%	9%	27%	3%	17%	8%	18,387	19,720	18,527	16,766	18,387
<b>TOTALS</b>								<b>133,260</b>	<b>153,391</b>	<b>144,171</b>	<b>130,421</b>	<b>133,260</b>

<sup>1</sup> Hydrologic assumptions derived from US Bureau of Reclamation MTOM/CRSS April 2020 Model Run, Full hydrology includes historical inflows on record from 1906-2018

<sup>2</sup> Shortage probabilities derived from US Bureau of Reclamation CRSS/MTOM April 2020 Model Run, Lake Mead probabilities of future supply conditions for the period 2021 to 2030.

<sup>3</sup> Firming volumes derived from the Joint Recovery Model, developed by ADWR, AWBA and CAWCD: May 2020.

The AWBA also analyzed the CRSS April 2020 Stress Test hydrology model run, which produces a scenario based on a drier future. As identified in Table 10, the Stress Test hydrology model run also projects a zero percent probability of shortage in 2021 and only a 12 percent probability of shortage in 2022. However, the Stress Test model projects a higher probability of near-term shortages with a 44 percent probability of a Tier 1 shortage beginning in 2023 and a 26 percent probability of a Tier 3 shortage by 2027. The Stress Test hydrology model run projects the AWBA could have a maximum firming requirement of 487,000 acre-feet over the planning period.

**Table 10. Projected Lower Basin Supply Condition, CRSS April 2020 Stress Test Hydrology**

**Stress Test Hydrology<sup>1</sup>**

Operational Tier/Probability of Shortage <sup>2</sup>								Total AWBA Firming <sup>3</sup> (af)				Total <sup>3</sup> Potential Firming Volume
Year	Surplus	Normal	Tier 0	Tier 1	Tier 2a	Tier 2b	Tier 3	Tier 1	Tier 2a	Tier 2b	Tier 3	
	≥ 1,145	>1090 and <1145	>1075 and ≤1090	≤1075 and >1050	≤1050 and >1045	≤1045 and >1025	≤1025					
			192 kaf	512 kaf	592 kaf	640 kaf	720 kaf					
2021	0%	6%	94%	0%	0%	0%	0%	-	-	-	-	-
2022	0%	10%	78%	12%	0%	0%	0%	-	-	-	-	-
2023	0%	12%	42%	44%	2%	0%	0%	14,358	31,485	66,179	118,854	14,358
2024	1%	11%	32%	32%	5%	18%	0%	15,148	32,439	67,132	119,782	15,148
2025	3%	13%	18%	37%	5%	17%	7%	15,969	38,156	72,825	125,414	15,969
2026	6%	11%	10%	35%	5%	20%	13%	16,056	39,114	73,783	126,351	16,056
2027	5%	11%	9%	28%	4%	25%	18%	17,582	44,359	78,948	131,378	17,582
2028	5%	12%	6%	25%	6%	20%	26%	17,780	46,752	81,344	133,762	133,762
2029	4%	12%	4%	24%	3%	26%	27%	17,979	49,148	83,743	136,150	136,150
2030	1%	13%	4%	21%	3%	27%	30%	18,387	51,547	86,145	138,543	138,543
<b>TOTALS</b>								<b>133,260</b>	<b>333,000</b>	<b>610,098</b>	<b>1,030,233</b>	<b>487,568</b>

NIA Indian Firming <sup>3</sup> (af)				Total	CAP M&I Subcontract <sup>3</sup> (af)				Total	On-River Firming <sup>3</sup> (af)			
Tier 1	Tier 2a	Tier 2b	Tier 3		Tier 1	Tier 2a	Tier 2b	Tier 3		Tier 1	Tier 2a	Tier 2b	Tier 3
-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	
14,358	18,348	17,251	15,600	14,358	-	13,138	48,927	102,821	-	-	-	-	
15,148	18,317	17,221	15,575	15,148	-	14,121	49,911	103,660	-	-	-	-	
15,969	18,698	17,577	15,898	15,969	-	19,458	55,248	108,853	-	-	-	-	
16,056	18,667	17,546	15,872	16,056	-	20,447	56,236	109,696	-	-	-	-	
17,582	19,961	18,761	16,972	17,582	-	24,398	60,188	113,502	-	-	-	-	
17,780	19,880	18,683	16,903	16,903	-	26,872	62,662	115,830	115,830	-	-	1,028	
17,979	19,800	18,605	16,835	16,835	-	29,348	65,138	118,161	118,161	-	-	1,155	
18,387	19,720	18,527	16,766	16,766	-	31,828	67,617	120,493	120,493	-	-	1,284	
<b>133,260</b>	<b>153,391</b>	<b>144,171</b>	<b>130,421</b>	<b>129,617</b>	-	<b>179,609</b>	<b>465,927</b>	<b>893,017</b>	<b>354,484</b>	-	-	<b>3,467</b>	

<sup>1</sup> Hydrologic assumptions derived from US Bureau of Reclamation MTOM/CRSS April 2020 Model Run, Stress Test hydrology includes historical inflows on record from 1988-2018

<sup>2</sup> Shortage probabilities derived from US Bureau of Reclamation CRSS/MTOM April 2020 Model Run, Lake Mead probabilities of future supply conditions for the period 2021 to 2030.

<sup>3</sup> Firming volumes derived from the Joint Recovery Model, developed by ADWR, AWBA and CAWCD: May 2020.

### *Joint Recovery Model*

The AWBA is currently collaborating on an update to the 2014 Joint Recovery Plan, intended to assist with planning for future recovery of AWBA credits. In 2020, the IRPG completed updated Arizona modeling scenarios that are summarized in the updated Joint Recovery Plan. These modeling scenarios utilize the Joint Recovery Model (JRM) to estimate the likelihood, magnitude and timing of AWBA firming, based on supply and demand conditions within Arizona. The JRM utilizes the August 2019 CRSS model run, under Full hydrology and Stress Test hydrology. The results of these runs are similar to the CRSS April 2020 model runs discussed above. For scenario planning purposes, the JRM also utilized the August 2019 CRSS model run with a 15 percent reduction in future Upper Basin demand projections. The Arizona demand assumptions are held constant with P1-3 at a tenth of a percent growth rate and P4 M&I at a one percent growth rate. The results of these additional modeling scenarios are summarized in table 11 and 12 below.

The JRM Full hydrology scenario projects an eight percent probability of shortage in 2021 and a 22 percent probability of shortage in 2022. The most probable operating conditions are normal or surplus conditions for the entire planning period. The highest probability of shortage, a Tier 1 shortage, ranges from 20 percent to 28 percent in 2022 through 2030. As indicated in table 11, a Tier 1 shortage results in AWBA firming requirements which affect only the NIA Indian priority.

**Table 11. Joint Recovery Model (Aug 2019 CRSS Full Hydrology)**

**Full Hydrology<sup>1</sup>**

Operational Tier/Probability of Shortage <sup>2</sup>								NIA Indian Firming <sup>3</sup> (af)				Total <sup>3</sup> Potential Firming Volume
Year	Surplus	Normal	Tier 0	Tier 1	Tier 2a	Tier 2b	Tier 3	Tier 1	Tier 2a	Tier 2b	Tier 3	
	≥ 1,145	>1090 and <1145	>1075 and ≤1090	≤1075 and >1050	≤1050 and >1045	≤1045 and >1025	≤1025					
			192 kaf	512 kaf	592 kaf	640 kaf	720 kaf					
2021	1%	23%	68%	8%	0%	0%	0%	-	-	-	-	-
2022	12%	26%	41%	20%	2%	0%	0%	10,393	15,000	14,172	12,815	10,393
2023	18%	29%	23%	24%	1%	4%	1%	14,358	18,348	17,251	15,600	14,358
2024	23%	26%	20%	21%	3%	5%	2%	15,148	18,317	17,221	15,575	15,148
2025	30%	17%	19%	23%	1%	8%	2%	15,969	18,698	17,577	15,898	15,969
2026	33%	19%	14%	23%	1%	8%	2%	16,056	18,667	17,546	15,872	16,056
2027	33%	14%	19%	25%	1%	5%	3%	17,582	19,961	18,761	16,972	17,582
2028	31%	19%	18%	22%	3%	5%	2%	17,780	19,880	18,683	16,903	17,780
2029	34%	17%	13%	28%	4%	4%	1%	17,979	19,800	18,605	16,835	17,979
2030	34%	15%	17%	22%	4%	4%	3%	18,387	19,720	18,527	16,766	18,387
<b>TOTALS</b>								<b>143,652</b>	<b>168,391</b>	<b>158,344</b>	<b>143,236</b>	<b>143,652</b>

<sup>1</sup> Hydrologic assumptions derived from US Bureau of Reclamation CRSS Aug 2019 Model Run, Full hydrology includes historical inflows on record from 1906-2017

<sup>2</sup> Shortage probabilities are derived from the Joint Recovery Model, which utilizes the August 2019 CRSS model run, with a 15% reduction in Upper Basin demands. Arizona demand assumptions are held constant with P1-3 at a 0.1% growth rate and P4 M&I at a 1% growth rate.

<sup>3</sup> Firming volumes derived from the Joint Recovery Model, developed by ADWR, AWBA and CAWCD: May 2020.

The JRM Stress Test hydrology scenario projects a slight increase in the probability of shortage conditions. However, the most probable operating conditions still reflect Tier zero, normal or surplus conditions for the entire planning period. The likelihood of a Tier 1 shortage increases to 13 percent in 2021 and 30 percent in 2022, with the probability of a Tier 1 shortage remaining between 23 percent and 30 percent for the remainder of the planning period. As indicated in Table 12, this scenario projects the AWBA could have a maximum firming requirement of 143,000 acre-feet over the planning period.

**Table 12. Joint Recovery Model (Aug 2019 CRSS Stress Test)**

**Stress Test Hydrology<sup>1</sup>**

Operational Tier/Probability of Shortage <sup>2</sup>								NIA Indian Firming <sup>3</sup> (af)				Total <sup>3</sup> Potential Firming Volume
Year	Surplus ≥ 1,145	Normal >1090 and <1145	Tier 0 >1075 and ≤1090	Tier 1 ≤1075 and >1050	Tier 2a ≤1050 and >1045	Tier 2b ≤1045 and >1025	Tier 3 ≤1025	Tier 1	Tier 2a	Tier 2b	Tier3	
			192 kaf	512 kaf	592 kaf	640 kaf	720 kaf					
2021	0%	17%	70%	13%	0%	0%	0%	-	-	-	-	-
2022	0%	30%	37%	30%	3%	0%	0%	10,393	15,000	14,172	12,815	10,393
2023	13%	17%	30%	23%	3%	13%	0%	14,358	18,348	17,251	15,600	14,358
2024	13%	23%	17%	27%	3%	13%	3%	15,148	18,317	17,221	15,575	15,148
2025	20%	17%	13%	30%	0%	13%	7%	15,969	18,698	17,577	15,898	15,969
2026	27%	13%	13%	27%	0%	17%	3%	16,056	18,667	17,546	15,872	16,056
2027	30%	10%	10%	30%	0%	13%	7%	17,582	19,961	18,761	16,972	17,582
2028	23%	20%	13%	23%	7%	7%	7%	17,780	19,880	18,683	16,903	17,780
2029	30%	20%	7%	27%	0%	13%	3%	17,979	19,800	18,605	16,835	17,979
2030	30%	20%	7%	23%	7%	3%	10%	18,387	19,720	18,527	16,766	18,387
<b>TOTALS</b>								<b>143,652</b>	<b>168,391</b>	<b>158,344</b>	<b>143,236</b>	<b>143,652</b>

<sup>1</sup> Hydrologic assumptions derived from US Bureau of Reclamation CRSS August 2019 Model Run, Stress Test hydrology includes historical inflows on record from 1988-2017

<sup>2</sup> Shortage probabilities are derived from the Joint Recovery Model, which utilizes the August 2019 CRSS model run with a 15 percent reduction in Upper Basin projected future demands. Arizona demand assumptions are held constant with P1-3 at a 0.1% growth rate and P4 M&I at a 1% growth rate.

<sup>3</sup> Firming volumes derived from the Joint Recovery Model, developed by ADWR, AWBA and CAWCD: May 2020.

**NIA Indian Firming**

The AWBA, as the agent for the state under the Arizona Water Settlements Act, has an obligation to firm up to 15,000 acre-feet of NIA priority CAP water for the Gila River Indian Community and 8,724 acre-feet of NIA priority for future Indian Settlements. This Ten-Year Plan indicates the AWBA could have a firming obligation of 133,000 acre-feet in the event of a Tier 1 shortage. There are several options available for firming NIA Indian priority supplies, including entering into an agreement with CAWCD for the recovery and delivery of water, making water available through the extinguishment of LTSCs or firming credits accrued on-Reservation, or through the use of ICS firming credits. The AWBA has 105,390 acre-feet of water stored at the Gila River Indian Irrigation and Drainage District (GRIIDD) in the Phoenix and Pinal AMAs and has delivered 44,000 acre-feet of firming credits directly to the Community. Additionally, during the planning period, the AWBA will complete the development of 45,000 acre-feet of ICS firming credits, totaling approximately 200,000 acre-feet of credits available for NIA firming.

According to an IGA with the Community, the AWBA and the Community are required to initiate firming discussions when a firming requirement is expected in the third year of the Ten-Year Plan. With a high likelihood of remaining in a Tier zero operating condition, this provision of the IGA is not triggered.

### *Interstate Storage and Requests for Intentionally Created Unused Apportionment*

Pursuant to the Third Amended Agreement, there is no obligation to accrue a specified volume of LTSCs. Rather, storage is determined annually through mutual agreement and paid for by SNWA in a year storage occurs. LTSCs accrued under previous interstate water banking agreements with SNWA total 601,041 acre-feet and are held in a separate interstate subaccount for SNWA. In 2018, the AWBA stored 13,500 acre-feet of Nevada's unused Colorado River allocation, which resulted in 12,805 acre-feet of LTSCs, bringing the total volume of LTSCs in SNWA's subaccount to 613,846 acre-feet. Since decisions to store water for Nevada are made as part of the AWBA's Annual Plan of Operation, assumptions for interstate storage are not included in this Ten-Year Plan. Presently, interstate storage is not contemplated for the AWBA's 2021 Plan of Operation.

The Third Amended Agreement also authorizes Nevada to request development of ICUA, as follows: in the initial year, an amount not exceeding 20,000 acre-feet; the second year, an amount not exceeding 30,000 acre-feet and in all subsequent years, an amount not exceeding 40,000 acre-feet. However, if sufficient recovery capacity exists, SNWA may request the development of additional ICUA to replace reductions in supply during Colorado River shortages up to its annual entitlement of 300,000 acre-feet. This Ten-Year Plan assumes that SNWA will request 2,500 acre-feet of ICUA development per year beginning in 2025.<sup>17</sup> There are currently recovery agreements on behalf of SNWA for the development of ICUA that provide up to 12,500 acre-feet of recovery capacity per year.<sup>18</sup> Credits accrued prior to the Third Amended Agreement must be recovered by December 31, 2063. Credits accrued after, such as those accrued in 2018, must be recovered within 50 years of the date of storage with the oldest credits recovered first. The agreement terminates when all credits (i.e. existing and future) have been recovered.

## **Conclusion**

The Ten-Year Plan is intended to serve as a guide to assist the AWBA in the development of its Annual Plan of Operation, in which the AWBA is required to plan its activities for the following calendar year. The Ten-Year Plan is reviewed and updated annually and may change significantly depending on the goals set by the AWBA and the funding sources available each year.

During the planning period, the AWBA will shift its focus to credit distribution and making its LTSCs available to mitigate potential shortages. The AWBA will continue to work collaboratively with stakeholders on recovery planning and implementation. Based on a range of modeling scenarios, the AWBA anticipates it will likely operate under Tier zero conditions for most of the planning period. However, there is a moderate probability (30 percent) of a Tier 1 shortage beginning in 2023. Based on the April 2020 CRSS Full hydrology scenario, the likelihood of operating under non-shortage or shortage conditions is roughly equal. In the event of a shortage, the AWBA is well prepared to meet its firming obligations and will continue to make progress toward meeting its objectives.

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<sup>17</sup> Projections are based on communication with SNWA May 2020.

<sup>18</sup> This includes an agreement with Arizona Water Co. providing recovery capacity for up to 2,500 acre-feet per year and an agreement with Tucson Water providing recovery capacity for up to 10,000 acre-feet per year. SNWA has also prepaid CAWCD for the recovery of 50,000 acre-feet of LTSCs that were accrued in the Pinal AMA and transferred to the AWBA under the original interstate water banking agreement.



# APPENDICES

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**APPENDIX A**

**Table 1a. Annual and Cumulative Long-Term Storage Credit Purchases<sup>1</sup>**

Funding Source	2019		Cumulative	
	Funds Expended	Credits Accrued (AF)	Funds Expended	Credits Accrued (AF)
<b>Ad valorem Tax</b>				
Phoenix AMA	\$2,954,443.00	13,100	\$19,657,588	81,682
Pinal AMA	-	-	-	-
Tucson AMA	\$1,096,182.90	4,815	\$6,989,937	31,955
<b>Withdrawal Fees</b>				
Phoenix AMA	-	-	\$834,876	3,600
Pinal AMA	-	-	-	-
Tucson AMA	\$288,180.00	1,342	\$614,313	3,101
<b>Shortage Repairs</b>				
Phoenix AMA	-	-	-	-
Pinal AMA	-	-	-	-
Tucson AMA	-	-	\$579,842	3,665
<b>Total</b>	<b>\$4,338,805.90</b>	<b>19,257</b>	<b>\$28,676,556</b>	<b>124,003</b>

<sup>1</sup> Information on AWBA annual and cumulative LTSCs accrued from water storage at individual facilities can be found on the AWBA’s website, [www.azwater.gov](http://www.azwater.gov)

**Table 1b. Annual and Cumulative Firming Credits Developed with the Gila River Indian Community**

Credits	2019		Cumulative	
	Funds Expended	Credits Accrued (AF)	Funds Expended	Credits Accrued (AF)
Firming Credits <sup>1</sup>	-	-	\$7,032,000	44,000
ICS Firming Credits	\$3,518,400	13,194	\$3,518,400	13,194

<sup>1</sup> Agreement expired December 31, 2018



**APPENDIX B**

STORAGE FACILITIES AVAILABLE TO THE AWBA (as used in the Ten-Year Plan)					
Name of Facility	Facility Permit Expiration	Facility Permitted Capacity (AF)	Capacity Available to AWBA <sup>1</sup> (AF)	Year Water Last Stored	Volume of Water Last Stored <sup>2</sup> (AF)
<b>PHOENIX – GSF<sup>3</sup></b>					
New Magma Irrigation & Drainage District	Jan-23	59,506 - 80,000	3,000	2018	3,000
Queen Creek Irrigation District	Nov-21	22,000 - 25,000	2,500	2018	3,630
Tonopah Irrigation District	Sep-22	15,000 - 17,059	2,000	2018	1,541
<b>Subtotal for Phoenix AMA - GSF</b>		<b>0</b>	<b>4,500</b>		
<b>PHOENIX – USF</b>					
Agua Fria Recharge Project <sup>3</sup>	May-19	30,000	8,000	2018	4,637
Granite Reef Underground Storage Project	Mar-32	93,000	15,000	2016	10,120
Hieroglyphic Mountains Recharge Project	Dec-21	35,000	8,000	2018	7,011
Superstition Mountains Recharge Project	Jan-28	25,000	8,000	2018	8,687
Tonopah Desert Recharge Project	Sep-25	150,000	80,000	2014	13,548
<b>Subtotal for Phoenix AMA - USF</b>		<b>333,000</b>	<b>119,000</b>		
<b>PINAL – GSF</b>					
Central Arizona Irrigation & Drainage District	Oct-23	110,000	60,000	2017	3,800
Hohokam Irrigation & Drainage District <sup>3</sup>	Jul-19	82,000	20,000	2018	2,700
Maricopa-Stanfield Irrigation & Drainage District <sup>3</sup>	Dec-19	120,000	60,000	2018	8,400
<b>Subtotal for Pinal AMA - GSF</b>		<b>312,000</b>	<b>140,000</b>		
<b>TUCSON – GSF</b>					
BKW Farms	Mar-20	14,316	1,000	2016	1,000
Cortaro-Marana Irrigation District	Oct-24	20,000	4,000	2018	2,500
Kai-Farms – Red Rock <sup>3</sup>	Nov-16	11,231	2,000	2018	1,334
<b>Subtotal for Tucson AMA - GSF</b>		<b>45,547</b>	<b>7,000</b>		
<b>TUCSON – USF</b>					
Avra Valley Recharge Project	Jan-29	11,000	0	2016	1,150
Lower Santa Cruz Recharge Project	Feb-19	50,000	10,000	2018	6,666
Pima Mine Road Recharge Project	Sep-20	30,000	5,000	2018	1,300
SAVSARP	Jan-28	60,000	5,000	2016	8,160
<b>Subtotal for Tucson AMA - USF</b>		<b>151,000</b>	<b>20,000</b>		
<b>ALL AMAs - GSF</b>		<b>357,547</b>	<b>151,500</b>		
<b>ALL AMAs - USF</b>		<b>484,000</b>	<b>139,000</b>		

<sup>1</sup> This does not reflect the actual “permitted” volume for these facilities; instead for the purposes of this plan, staff relied on average historical storage volumes and potential for future storage and in some cases constraints provided by the facility operator.

<sup>2</sup> Storage volumes reflect the combined effect of water, funding, and storage capacity availability.

