2021 ANNUAL OPERATIONS REPORT

SUPPLEMENT TO THE 2021 CONSERVATION DISTRICT ANNUAL REPORT

CAGRD
CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT
A Division of Central Arizona Project

www.cagrd.com

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Abbreviations and Glossary

TERM	*DEFINITION*
ADWR	Arizona Department of Water Resources
AF	acre-feet
AF/yr	acre-feet per year
AMA	Active Management Area
A.R.S.	Arizona Revised Statutes
AWS	Assured Water Supply
Board	The Central Arizona Water Conservation District Board of Directors
CAP	Central Arizona Project
CAGRD	Central Arizona Groundwater Replenishment District
CAWCD	Central Arizona Water Conservation District
CAWS	Certificate of Assured Water Supply
CDAR	Conservation District Annual Report
DAWS	Designation of Assured Water Supply
FMYN	Ft. McDowell Yavapai Nation
GRIC	Gila River Indian Community
GRWS	Gila River Water Storage, LLC
GSF	Groundwater Savings Facility
HOA	Homeowners Association
LARF	Liberty Aquifer Replenishment Facility, now referred to as SEAP
LPSCO	Litchfield Park Service Company
LTSCs	Long-term Storage Credits
M&I	Municipal and Industrial
MDWID	Metropolitan Domestic Water Improvement District
ML	Member Land
MSA	Member Service Area
NIA	Non-Indian Agricultural (CAP Priority Pool)
NMIDD	New Magma Irrigation and Drainage District
PSA	Purchase and Sale Agreement
Reclamation	The United States Bureau of Reclamation, a federal agency overseeing water resource management as it applies to western infrastructure projects
Report Year	The year in which Excess Groundwater was delivered to each ML or withdrawn from each MSA, the year covered by the report as opposed to the year report was issued
SEAP	Sustainable Effluent to Aquifer Project – former LARF site renamed following upgrades
SMCFD	Superstition Mountains Community Facilities District
TON	Tohono O'odham Nation
USF	Underground Storage Facility

Executive Summary

Each year, CAGRD releases its Annual Operations Report as a supplement to the required reporting to the Arizona Department of Water Resources (ADWR) and as a way of capturing water supply status and administrative activities of note. As with the Conservation District Annual Report (CDAR), it covers the activities of the previous year. This report covers CAGRD operations for 2021.

Enrollment and Activation Since 2017

YEAR	LOTS ENROLLED	LOTS ACTIVATED
2021	8,854	24,192
2020	4,674	15,279
2019	6,508	18,500
2018	8,436	13,910
2017	3,972	9,530

Enrollment and Activation: Following a pandemic influenced 2020, enrollment of lots in Member Lands and activation of lots in Member Lands and Member Service Areas nearly doubled in 2021 compared to the previous year. This was part of a generalized increase in Arizona home prices and construction activity in late 2020 and continuing through at least mid-2022. Although increases in enrollment and activation were significant in a year-to-year sense, it's important to understand the totals were much less than in the housing boom period from 2000 – 2007.

Replenishment Obligation Since 2017

YEAR	OBLIGATION (AF)
2021	35,438
2020	35,101
2019	30,604
2018	29,922
2017	31,233

Replenishment: In 2021, CAGRD incurred a replenishment obligation of 35,438 acre-feet (AF), and very similar to the reported 2020 obligation but significantly less than the 49,100 AF projected in the 2015 Plan of Operation. Replenishment has been completed for all incurred obligation through 2020, per standard CAGRD practices and within statutory requirements.

Water Supply Program: With the Colorado River operating under Tier 1 shortage conditions in 2022 and the likelihood of deepening shortages in the next few years, CAGRD's Water Supply team worked to firm existing water supplies. In September of 2021, CAGRD received the fully executed NIA CAP subcontract totaling 18,185 AF/year from the Bureau of Reclamation. Additionally, CAGRD added over 40,000 long-term storage credits (LTSCs) to its portfolio through contracts with City of Tucson, Gila River Indian Community, Liberty Utilities, Metropolitan Domestic Water Improvement District, Tohono O'odham Nation, and Town of Florence. LTSCs can be extinguished to meet CAGRD's replenishment obligations and will be increasingly used to mitigate shortage impacts to CAGRD's wet water supplies in future years.

Additional Activities: Although 2021 may not have been a full "return to normal" from the COVID-19 pandemic, CAGRD continued its efforts in support of sensible water management policy, including developing a set of guiding principles for the Post-2025 AMA Committee following stakeholder input and revising its Water Supply Program principles. CAGRD operational processes were also strengthened through completion of a project to document its processes and procedures to improve resilience and allow for succession planning.

Brief Introduction to CAGRD

The Central Arizona Groundwater Replenishment District (CAGRD) was established in 1993 to provide a mechanism for landowners and water providers to demonstrate one of the requirements necessary to secure a 100-year Assured Water Supply (AWS) under Arizona law. CAGRD recharges Central Arizona Project (CAP) water and other water supplies to replenish groundwater used by its members in excess of the limits established by the Arizona Department of Water Resources (ADWR) AWS Rules.

The AWS Rules limit the quantity of mined groundwater that an applicant may use to demonstrate an AWS. This groundwater use limitation prevents new development from relying solely on mined groundwater to satisfy its water demands. If a landowner or water provider has access to sufficient groundwater to demonstrate an AWS, it must also demonstrate that groundwater use will be consistent with groundwater management goals of that area. As a member, the landowner or water provider pays CAGRD to replenish any groundwater pumped by the member which exceeds the pumping limitations (referred to as "Excess Groundwater") imposed by the AWS Rules.

CAGRD is operated by the Central Arizona Water Conservation District (CAWCD) throughout the portion of CAWCD's three-county service area that is within an Active Management Area (AMA). It is governed by the CAWCD Board of Directors, yet CAGRD's finances are completely separate from the rest of CAWCD's finances, and all costs incurred by CAGRD must be paid by CAGRD members.

Membership

Enrollment in CAGRD is voluntary. Any city, town, private water company or subdivision located in the Phoenix, Pinal or Tucson AMA may join CAGRD so long as it meets the State's requirements. CAGRD is comprised of two types of members: Member Service Areas (MSAs) and Member Lands (MLs).

- MSA - The service area of a city, town, district or private water company, including any extensions of the service area. The municipal water provider is required annually to submit a report to CAGRD identifying the volume of total water delivered and the volume of groundwater pumped within the service area and must pay CAGRD replenishment taxes on groundwater volumes pumped in excess of the pumping limitations imposed by the AWS rules. When applying to enroll a service area in CAGRD, the applicant provides a projection of future population, water demands and renewable supplies available to meet those demands. These projections serve as a basis for estimating CAGRD's long-term replenishment obligation for the service area. Membership in CAGRD enables the water provider to receive a Designation of Assured Water Supply (DAWS), issued by ADWR, for its service area.

- ML – An individual subdivision with a defined legal description. The water provider agrees to annually submit water delivery information necessary to calculate the replenishment assessment for each parcel of land enrolled within the subdivision. A ML water provider does not have a DAWS. Instead, each individual subdivision must receive its own, separate Certificate of Assured Water Supply (CAWS) from ADWR, and enrollment in CAGRD enables it to do so.

Replenishment Obligation

CAGRD must replenish in each AMA the amount of Excess Groundwater[1] that has been pumped by or delivered to its members in that AMA. The replenishment may be accomplished through: 1) the operation of underground storage facilities, where water is recharged underground into existing aquifers; 2) through groundwater savings facilities, where water is used directly by irrigation districts in lieu of pumping groundwater; or 3) through the extinguishment of long-term storage credits (LTSCs) held by CAGRD. Water used for replenishment may be CAP water or water from any other lawfully available source, except groundwater withdrawn from within an AMA. A.R.S. § 48-3771.A requires CAGRD to "complete" the replenishment of its Replenishment Obligation within three calendar years after it is incurred. By statute, CAGRD Replenishment Obligation is fulfilled or "complete" when CAGRD's conservation district account has been credited to reflect either the storage of replenishment water or the transfer of LTSCs in sufficient volume to meet the replenishment obligation.

Revenue Sources

All operations of CAGRD must be funded completely by its members. These costs are covered by a combination of up-front fees, annual membership dues, and replenishment taxes and assessments. Each type of revenue source is dedicated to specific purposes and helps cover costs associated with replenishment activities, such as development of infrastructure, recharge facility construction, water supply acquisition, operation and maintenance, replenishment reserve accruals and administration. CAGRD also has the authority to issue revenue bonds to develop infrastructure and acquire water rights necessary to perform its replenishment obligation.

MSAs pay CAGRD for replenishment services performed on behalf of their service area, as well as annual membership dues. Individual property owners in MLs each pay a special assessment to CAGRD based on their excess groundwater use, as well as annual membership dues, collected through the annual property tax assessment.

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[1] Excess Groundwater is defined in A.R.S. § 48-3701.7 as the amount of groundwater delivered to a member in a calendar year in excess of the amount of groundwater that may be used by the member in that calendar year consistent with the applicable Assured Water Supply rules adopted by ADWR for the AMA where the member is located.

Planning

Plan of Operation - Every ten years, CAGRD is required to submit a Plan of Operation to the Director of ADWR. The primary purpose of the Plan is to document the actions of CAGRD over the past ten years and to describe the activities that CAGRD proposes to undertake in each AMA during the ten-year and 100-year periods following Plan submission. CAGRD's 2015 Plan of Operation ("2015 Plan") was approved by the Director of ADWR on August 5, 2015 and covers the ten-year period from 2015-2024. CAGRD continues to operate under this Plan until the next plan is submitted by 2025. Given the importance of the 2025 Plan of Operation, CAGRD staff began preliminary planning efforts in late 2021.

Board Strategic Plan - On December 3, 2020, the CAWCD Board of Directors unanimously adopted the 2022 CAWCD Board Strategic Plan, following a series of planning meetings and collecting stakeholder feedback. The 2022 Strategic Plan carries over many of the strategic issues from the 2016 CAWCD Strategic Plan, albeit with additional emphasis on the relationship between CAGRD member pumping and replenishment and conservation messaging considering potential Colorado River shortages. CAGRD will continue the process of a five-year formal review of its operations, completing an annual operations report and quarterly updates to the CAGRD and Underground Storage Committee under the 2022 CAWCD Strategic Plan.

Mid-Plan Review - The Mid-Plan Review is a comprehensive assessment of the mid-term trends in CAGRD operations under the Plan of Operation. The Mid-Plan Review provides indications of where these trends may lead CAGRD over the remaining five years of the Plan. The first Mid-Plan Review was completed in 2011 during the 2005 Plan of Operation period. CAGRD published its second Mid-Plan review in 2020.

Annual Reporting - The Conservation District Annual Report (CDAR) is submitted to ADWR by August 31 of each year for the previous calendar year (A.R.S. § 48-3775.E). The CDAR details numerical information in a series of tables showing water storage amounts, credit transfers, account balances, groundwater replenishment obligations, contract replenishment obligations and contract replenishment credit accounting.

The Board has directed staff to develop an enhanced annual report, this document, referred to as the CAGRD Annual Operations Report, serving to supplement the CDAR with additional information on CAGRD operations. More specifically, this report provides further details in a narrative format on new enrollment, up-to-date replenishment obligations, water supply and replenishment reserve activities and any new legislation and administrative activities that occurred in the report year.

The first CAGRD Annual Operations Report was completed in late 2015 for calendar year 2014, which was the final year covered under the 2005 Plan of Operation. This eighth CAGRD Annual Operations Report was completed in fall 2022 for calendar year 2021, the seventh year covered under the 2015 Plan of Operation. Completion of the Annual Operations Report will always

follow submittal of the CDAR to ADWR. This report was submitted to ADWR in December 2022 and posted at the CAGRD website (CAGRD.com).

1. Enrollment and Activation

A. Enrollment

Member Land enrollment in 2021 increased significantly from 2020, nearly doubling from year to year and part of a trend of increased construction activity starting in late 2020 and continuing into 2022. The 8,854 enrolled lots indicated on the below table was the most since 2008, although far less than the almost 60,000 lots enrolled in 2006. The majority of 2020 enrollment took place in the Phoenix AMA, with less than three hundred activated parcels in the remainder of the CAGRD service area.

TABLE 1.1

NEW MEMBER LAND (ML) ENROLLMENT IN 2021

AMA	ML Subdivisions	ML Lots*	Projected Demand (AF/yr)
Phoenix	28	8,560	4,461
West Phoenix	*11*	*3,487*	*1,709*
East Phoenix	*17*	*5,073*	*2,752*
Pinal	0	0	0
Tucson	1	294	81
TOTAL		**8,854**	**4,542**

TABLE NOTE: *The term Member Land (ML) refers to a subdivision enrolled in CAGRD; numbers reflect the number of lots or homes within the subdivisions.

No enrollment occurred in the Pinal AMA due to ongoing issues with proving physical availability of groundwater.

No new Member Service Areas enrolled in 2021, however Metropolitan Domestic Water Improvement District's Main system de-enrolled from CAGRD following a modification to its Designation of Assured Water Supply. One Member Land, Wingate and Wingate East, de-enrolled from CAGRD following confirmation a public report had not been issued for the subdivision.

Comparison of Actual ML Enrollment in 2021 to Projected ML Enrollment in 2021 (as projected in 2015 Plan of Operation)

Despite an increase in construction activity in 2021, enrollment remained lower than the level projected in the 2015 Plan of Operation. Following the acceptance of the 2015 Plan of Operation, actual enrollment has typically been less than half of the projected amount, with 2021 being one of the closer projected years in recent memory. Projections on enrollment used in the Plan of Operation stem from data provided by the Central Arizona Association of Governments, Maricopa Association of Governments, and Pima Association of Governments and 2014-era official population projections from the State of Arizona.

TABLE 1.2

COMPARISON OF ACTUAL ML ENROLLMENT IN 2021 TO PROJECTED 2021 ML ENROLLMENT

AMA	Actual 2021 ML Enrollment [a]	Projected 2021 ML Enrollment [b]
Phoenix	8,560	10,779
Pinal	0	1,143
Tucson	294	1,019
TOTAL	**8,854**	**12,941**

TABLE NOTES:

[a]2021 CAGRD Annual Operations Report, Table 1.1.

[b]2015 Plan of Operation. For the housing unit projection methodology, refer to the New Demand Section 3.2.2 (pg. 3-2) of the 2015 Plan of Operation.

B. Activation

The Arizona Department of Real Estate issues a public report allowing the sale and lease of lots within subdivisions. Prior to the issuance of the public report for subdivisions within CAGRD MLs and MSAs, an Activation Fee must be paid to CAGRD for each residential unit offered for sale. In 2021, the number of lots activated totaled 24,192 (Member Land lots = 10,838; Member Service Area lots = 13,354). As with enrollment activity, there was a significant increase over 2020. **Table 1.3** provides a breakdown by AMA of previously enrolled lots activated in 2021.

TABLE 1.3

NUMBER OF LOTS ACTIVATED IN 2021

AMA	MLs	MSAs	Combined
Phoenix	9,661	8,125	17,786
Pinal	355	257	612
Tucson	822	4,972	5,794
TOTAL	**10,838**	**13,354**	**24,192**

2. Replenishment Obligation Incurred and Replenishment Obligation Completed

A municipal water provider serving MLs is required by statute to file an annual report with CAGRD for each ML subdivision that it serves; this report must indicate the volume of total water and the volume of groundwater delivered to each parcel in the subdivision, as well as a calculation of Excess Groundwater delivered. MSAs also are required by statute to file an annual report with CAGRD indicating the volume of total groundwater and the volume of Excess Groundwater pumped within their service areas. These reports must be submitted to CAGRD by March 31st of each year, and the volumes reported represent pumping or deliveries from the previous year ("the Report Year"). CAGRD must complete its Replenishment Obligation within three calendar years after it is incurred. Therefore, at any given point in time there may be one or more years of obligation unfulfilled.

Current CAGRD practice is to complete replenishment in the calendar year after it is reported. As an example, groundwater pumped in 2020 by a water provider would be reported to CAGRD in 2021 and then replenished in 2022. Depending on operational circumstances, it may be prudent for CAGRD to prioritize replenishment in certain areas or delay its replenishment. CAGRD replenishment has always been completed within statutory time frames.

The replenishment obligation reflects the volume of Excess Groundwater delivered by municipal water providers serving CAGRD ML subdivisions and withdrawn by MSA providers within their service areas. In 2021, CAGRD incurred a replenishment obligation of 35,438 acre-feet (AF). This was less than a 1% increase over 2020's obligation and the highest replenishment obligation since 2008, albeit lower than the 49,100 AF projected in the 2015 Plan of Operation. **Table 2.1** shows the distribution of obligation between MLs and MSAs by AMA.

CDAR and Annual Operations Reports

Each year, CAGRD receives updated information from water providers and keeps the records of replenishment current. Corrections and revisions from water providers occasionally come after the CDAR is submitted to ADWR. This document is intended to mirror the CDAR but can report more recent changes.

As of October 20, 2022, there was a reported decrease of 4 AF in the West Phoenix AMA, making the total 2021 Phoenix AMA obligation 32,096 acre-feet.

These changes will be reflected in the 2022 CDAR next year.

Table 2.1
REPLENISHMENT OBLIGATION FOR MLs AND MSAs in 2021 (AF) by AMA

AMA	MLs	MSAs	Combined
Phoenix	22,199	9,901	32,100
Pinal	34	558	593
Tucson	1,355	1,236	2,746
TOTAL	**23,743**	**11,695**	**35,438**

Tables 2.2 through **2.4** list the volumes of Excess Groundwater reported delivered from 2018 through 2021 along the top row. The tables also identify the year and extent to which the replenishment obligation resulting from those deliveries has been completed. Recent activity is shown in order to demonstrate CAGRD has met its obligation within the statutory replenishment timeframe. In 2021, CAGRD fulfilled 35,105 AF of replenishment obligation as shown in **Tables 2.2** through **2.4** (refer to 2021 rows).

The following explanation may assist in interpreting these tables: The top row (light blue) shows the year in which deliveries or withdrawals of Excess Groundwater occurred. In the Phoenix AMA (Table 2.2) the 2018 column illustrates 25,798 AF of Excess Groundwater was delivered to MLs and/or withdrawn by MSAs in 2018 for the Phoenix AMA. Fulfillment of this obligation occurred over a two-year period: 21,591 AF was replenished in 2018 and 4,207 was replenished in 2019. The two rows along the bottom of the table showing the "Amount Completed to Date" and "Amount Unmet to Date" (light green) reflect ongoing replenishment activities to fulfill or complete the obligation associated with Excess Groundwater deliveries. The 2018 column illustrates a total of 25,798 AF of Excess Groundwater was delivered in 2018; by 2019, all the obligation was fulfilled, completing replenishment in the Phoenix AMA.

Table 2.2
COMPLETION OF REPLENISHMENT OBLIGATION - Phoenix AMA

PHOENIX AMA		**EXCESS GROUNDWATER OBLIGATION BY REPORT YEAR (AF)**			
		2018	**2019**	**2020**	**2021**
		25,798	26,378	31,098*	32,100
YEAR AND VOLUME (AF) OBLIGATION COMPLETED	**2018**	21,591			
	2019	4,207	17,029		
	2020		9,185		
	2021		165	31,098	52
Amount Completed to Date		25,798	26,378	31,098	52
Amount Unmet to Date		0	0	0	32,048

**Reflects a decrease in obligation of 475.56 AF due to incorrect reporting from a water provider from 2017 through 2019. CAGRD previously reported a replenishment obligation of 31,573.51 AF.*

East Phoenix AMA and West Phoenix AMA

A.R.S. §48-3772.I compels CAGRD to:

> *"In the Phoenix active management area, the district [CAGRD], to the extent reasonably feasible, shall replenish groundwater in the east portion of the active management area and in the west portion of the active management area in the approximate proportion that the groundwater replenishment obligation attributable in a particular year to member lands and member service areas located in the east portion of the active management area bears to the groundwater replenishment obligation attributable in that year to member lands and member service areas located in the west portion of the active management area."*

Year-to-year operational decisions, contractual requirements and availability of recharge locations dictate the amount of replenishment occurring in each portion of the Phoenix AMA. Table 2.2 shows the overall obligation versus replenishment occurring in the Phoenix AMA from the years 2018 – 2021. Table 2.3 provides a breakdown of the obligation versus replenishment conducted to date.

Table 2.3

WEST PHOENIX AND EAST PHOENIX OBLIGATION AND REPLENISHMENT (in acre-feet)

	West Phoenix			East Phoenix		
Year	Obligation	Completed Replenishment	Balance	Obligation	Completed Replenishment	Balance
2021	15,965	0	15,965	16,135	52	16,083
2020	15,854	9,437	6,417	15,244	21,661	-6,417
2019	13,457	17,355	-3,898	12,922	9,023	3,899
2018	14,200	14,200	0	11,598	11,598	0

Over the past four years, replenishment has been slightly skewed towards the West Phoenix AMA, with an over-replenishment of 2,519 acre-feet. With a total obligation over this time frame of 115,374 acre-feet this imbalance reflects roughly two percent of total obligation in the Phoenix AMA. As underground storage facility or groundwater savings facility capacity opens in the next few years, it is likely CAGRD will be able to mitigate this minimal difference. As explained in the 2020 Annual Operations Report, research done by CAP staff have indicated the sub-basin level differences of CAGRD related pumping and replenishment to be relatively minor and the slight bias towards West Phoenix replenishment will be consumed by residential development in coming years.

Table 2.4
COMPLETION OF REPLENISHMENT OBLIGATION - Pinal AMA

PINAL AMA		EXCESS GROUNDWATER OBLIGATION BY REPORT YEAR (AF)			
		2018	**2019**	**2020**	**2021**
		552	899	331*	593
YEAR AND VOLUME (AF) OBLIGATION COMPLETED	**2018**				
	2019	552			
	2020		899		
	2021			331	
Amount Completed to Date		552	899	331	0
Amount Unmet to Date		0	0	0	593

Table Note: *Reflects a decrease in obligation of 283.03 AF for the City of Casa Grande due to incorrect reporting from 2007 through 2019. Actual Replenishment Obligation for 2020 is 614 AF.

Table 2.5
COMPLETION OF REPLENISHMENT OBLIGATION - Tucson AMA

TUCSON AMA		EXCESS GROUNDWATER OBLIGATION BY REPORT YEAR (AF)			
		2018	**2019**	**2020**	**2021**
		2,571	2,476	2,913*	2,746
YEAR AND VOLUME (AF) OBLIGATION COMPLETED	**2018**				
	2019				
	2020	2,571	2,471		
	2021		6	2,913	540
Amount Completed to Date		2,571	2,476	2,913	540
Amount Unmet to Date		0	0	0	2,206

Table Note: *Reflects a decrease of 0.38 AF due to incorrect reporting by a water provider in 2020.

Comparison of Actual Obligations in 2021 to Projected Obligations in 2021 (as projected in 2015 Plan of Operation)

Much as described in the section on enrollment numbers, the 2015 Plan obligation projections are tied to housing unit growth; thus, actual obligations in 2021 (35,438 AF) were lower than the Plan projection of 49,100 AF (**Table 2.5**). Beyond a continued per capita drop in residential demand for water, other factors contributed to lower-than-anticipated obligation. Examples include obligation avoidance strategies by certain ML water providers through increased use of groundwater allowance along with the elimination of a contractual minimum reporting requirement for MLs enrolled before 2004.

TABLE 2.6

ACTUAL VS. PROJECTED REPLENISHMENT OBLIGATION IN 2021

AMA	MLs		MSAs	
	Actual 2021 Obligation [a]	**Projected 2021 Obligation [b]**	**Actual 2021 Obligation [a]**	**Projected 2021 Obligation [b]**
Phoenix	22,198	32,052	9,901	8,798
Pinal	35	413	558	1,428
Tucson	1,510	3,734	1,236	2,638
TOTAL	**23,743**	**36,200**	**11,695**	**12,865**

TABLE NOTES: [a]2021 CAGRD Annual Operations Report, Table 2.1.
[b]2015 CAGRD Plan of Operation.

3. Water Supply Program

A description of CAGRD's Water Supply Program for 2021 is provided under two headings: Section A - **Water Supply Activity** and Section B - **Summary of Water Supplies**. Section A describes both new and on-going activity in the program for 2021. Discussion of new activity in 2021 will identify whether new physical supplies became available during the reporting year or will become available at some future date as specified in the associated contract or agreement. Section B serves to show an overall picture of CAGRD's water supplies for 2021, summarizing the volume of water supplies CAGRD had available going into the year, water accrued or acquired during the year and the total volume available at the end of the year.

A. Water Supply Activity

New NIA CAP Water Supply Acquisition

In September 2021, CAWCD, for the benefit of CAGRD replenishment, received the fully executed Non-Indian Agricultural (NIA) subcontract from the Bureau of Reclamation. In 2022, despite a Tier 1 Colorado River shortage, CAGRD ordered and delivered the full subcontract volume of 18,185 AF. NIA mitigation provisions of the Arizona Drought Contingency Plan (DCP) will limit the amount of NIA water available to CAGRD in the future if shortage conditions deepen.

Gila River Indian Community (GRIC) and Gila River Water Storage, LLC (GRWS) Agreements

CAGRD has obtained all necessary regulatory approvals from ADWR to implement the GRIC agreements, which included two water storage permits at GRIC's Olberg Dam Underground Storage Facility (USF) (issued October 2019), a Recovery Well Permit in the Pinal AMA (issued April 2020) and a Notice of Water Exchange (issued May 2020).

In November 2018, the CAWCD Board approved three water supply acquisition agreements and a $2.5 million contributed funds agreement between CAGRD, Gila River Indian Community (GRIC) and Gila River Water Storage, LLC. (GRWS). These acquisitions, excluding potential shortage impacts, provide CAGRD with an annual renewable water supply of 33,185 AF/YR for 25 years (2020 through 2044) plus 70,375 AF of Phoenix AMA LTSCs, for a combined 900,000 AF of water over the duration of the agreements. Subsequently, on May 20, 2019, the water supply acquisition agreements (discussed in detail below) were formally executed as part of the Lower Basin Drought Contingency Plan signing ceremony held at Hoover Dam.

The GRIC/GRWS water supply acquisitions are comprised of the following agreements:

1) A CAP Non-Indian Agricultural (NIA) Priority Water lease for 18,185 AF/YR for 25 years commenced in 2020. In the event of a shortage declaration, the volume will be reduced at the same proportion of GRIC's NIA Priority supply. CAGRD will primarily store the leased water at GRIC-owned Phoenix AMA USFs and/or at other mutually agreed upon USFs located within the CAWCD service area for the creation of LTSCs,

2) A Recovery and Exchange Agreement, whereby GRIC will recover 15,000 AF of Pinal AMA LTSCs purchased by CAGRD (in 2019) and exchange the recovered water for an equal volume of GRIC's CAP Indian Priority water each year for 25 years commenced in 2020. GRIC will use the recovered water for on-reservation irrigation, and the exchanged CAP Indian Priority water will be stored in the Phoenix AMA to create LTSCs for CAGRD,

3) The purchase of 375,000 AF of Pinal AMA LTSCs and 70,375 AF of LTSCs of Phoenix AMA LTSCs from GRWS, LLC.

4) A Contributed Funds Agreement in the form of a one-time $2.5 million payment for well and infrastructure development on GRIC reservation to facilitate GRIC's participation in the Recovery and Exchange Agreement.

City of Peoria – LTSC PSA and 1,885 AF CAP M&I Transfer and Assignment: Background

In 2020, CAGRD and the City of Peoria (Peoria) executed a LTSC Purchase and Sale Agreement (PSA) under which CAGRD will acquire from Peoria 35,911 LTSCs over five consecutive years from 2021 through 2025 or an annualized total of 7,182.20 LTSCs during the term. The LTSC PSA was the result of extensive negotiations between CAGRD and is contingent upon successful approval of a transfer and or assignment of 1,885 acre-feet of CAP M&I Priority Water from CAGRD to Peoria. The transfer and assignment of up to 1,885 acre-feet of CAP M&I Priority Water is contractual under section 5.5 of CAGRD's Supplemental Contract and a result of Peoria's acquisition and successor in interest status of New River Utility Company (NRUC) since 2016. CAGRD acquired the former-NRUC M&I subcontract in 2007.

In December 2020, the parties filed a joint application to ADWR requesting a review of the transfer and assignment. ADWR determined that the proposed transfer was consistent with applicable "Water Management Objectives and Review Criteria of the CAP Subcontract Transfer Policy" and recommended the Bureau of Reclamation initiate the process to assign the 1,885 acre-feet entitlement to Peoria.

In 2021, CAGRD and the City of Peoria awaited a final determination from the Bureau of Reclamation on the issuance of their amended M&I Subcontracts. The parties received their amended M&I subcontracts

in 2022 and began implementation of the LTSC PSA. This water supply acquisition will be elaborated upon in the 2022 Annual Operations Report.

2021 Long-Term Storage Credits Accrual Activities

In 2021, CAGRD acquired a total of ***40,758 AF*** of LTSCs through several Purchase and Sale Agreements (PSAs), ongoing water leases and Recovery and Exchange Agreement. **Table 3.1**, found below, details the LTSC transactions that CAGRD completed by the seller's name and AMA location.

TABLE 3.1

LTSCs ACQUIRED IN 2021

AMA	LTSCs (AF)
Phoenix AMA	
Tohono O'odham Nation	20,000
Gila River Indian Community	7,455
Florence, Town of	1,937
Liberty Utilities	866
Phoenix AMA Subtotal	***30,258***
Tucson AMA	
Tohono O'odham Nation	5,000
City of Tucson	5,000
MDWID (Metro)	500
Tucson AMA Subtotal	***10,500***
AMAs Total	***40,758***

Tohono O'odham Nation

In 2020, CAGRD and the Tohono O'odham Nation (TON) entered into a LTSC PSA under which CAWCD will acquire a total of 50,000 LTSCs, purchased in two equal annual installments in 2020 and 2021. Of the 50,000 LTSCs included in the agreement, 40,000 LTSCs are located in the Phoenix AMA (NMIDD and Hieroglyphic Mountain Recharge Project) and 10,000 LTSCs are located in the Tucson AMA (Pima Mine Road Recharge Project). In 2021, CAGRD completed the second acquisition of 25,000 LTSCs from TON.

Gila River Indian Community

In 2021, CAGRD acquired a total of 7,455 LTSC from the Gila River Indian Community (Community) in two separate transactions in accordance with our 25-year (2020 through 2024) NIA Lease Agreement and Recovery & Exchange Agreement.

A majority of CAGRD's 18,185 AF/year NIA Lease water is delivered and stored annually at the Community-owned MAR-5 USF. The MAR-5 USF primarily discharges water into the Gila River just upstream of the Olberg Dam at the Phoenix and Pinal AMAs boundary. Due to the unique location of the MAR-5 USF, each year a percentage of CAGRD's water deliveries is attributed to LTSCs in both the Phoenix and Pinal AMAs, approximately 75% to 25%, respectively. Therefore, each year CAGRD performs a LTSC transfer whereby CAGRD transfers its Pinal AMA LTSCs to the Community for an equal amount of the Community's Phoenix AMA LTSCs. In 2021, the amount of the LTSC transfer for water stored at MAR-5 totaled 3,182 LTSCs. Also in 2021, the Community transferred 4,273 of Phoenix AMA LTSCs to CAGRD to fulfill its' 15,000 AF/year obligations as required in the Recovery & Exchange Agreement.

Town of Florence

In 2016, CAWCD and the Town of Florence (Florence) entered into an agreement where Florence agreed to sell CAGRD all storage credits accrued by delivering its 2,048 AF/YR CAP M&I subcontract entitlement water to Tonopah GSF, located in the Phoenix AMA, from 2018 through 2022. The agreement consists of a 5-year initial term with three successive 5-year rights of renewal for a total term of 20 years. This agreement is expected to add approximately 9,730 AF of LTSCs during the initial term. [2] In 2021, CAGRD purchased 1,936.77 LTSCs from the Town of Florence. In 2022, CAGRD will fully satisfy its contractual obligations associated with this LTSCs acquisition.

Litchfield Park Service Company (Liberty)

A 2013 agreement between CAWCD and Litchfield Park Service Company (LPSCO) resulted in the purchase of nearly 18,500 AF of LTSCs accrued by delivering effluent to Roosevelt Irrigation District from 2013 to 2017. That agreement was superseded in 2017 by the "Agreement for Development of Effluent Recharge Facility, Effluent Disposal and Purchase and Sale of Effluent," completed in 2014 between CAWCD and Liberty Utilities (owner of LPSCO). This agreement provides a separate framework for purchase of LTSCs that Liberty generates at their effluent recharge facility (the Liberty Aquifer Replenishment Facility) for 100 years, starting in 2017. As part of that agreement CAGRD also acquired a lease of 2,400 AF/YR of effluent produced by Liberty and delivered to the effluent recharge facility. This agreement was amended in 2019 to provide Liberty with an additional method of remedying any shortfall in delivery of CAGRD's leased effluent and to include Liberty's current water storage permit for the Liberty Aquifer Replenishment Facility.

City of Tucson

In 2013, CAWCD and the City of Tucson ("Tucson") entered into an agreement where Tucson agreed to sell and transfer 100,000 AF of Tucson AMA LTSCs to CAGRD. CAGRD has committed to purchasing 4,000 AF of credits each year for 25 years and retains an option to purchase up to an additional 1,000 AF of LTSCs in any given year. Through 2021, CAGRD has acquired 40,000 AF of LTSCs through this agreement.

[2]On August 18, 2021, CAGRD provided notice to the Town of Florence that CAGRD will not renew the LSTC PSA beyond the initial term expiration on December 31, 2022. CAWCD will fulfill its obligation of purchasing LTSCs from Florence for the remaining two-years of the initial term in 2021 and 2022.

Metro Water

CAWCD and Metropolitan Domestic Water Improvement District (Metro) entered into a credit purchase agreement in 2015. Under this Agreement, Metro will sell to CAGRD a minimum of 250 LTSCs, up to a maximum of 1,000 LTSCs, each year. The Agreement was amended in 2017 to change the storage facility at which the credits would be accrued. This agreement will be effective until 2061 if the option for two additional 10-year terms is exercised beyond the initial 25-year term. CAGRD has acquired 2,250 AF of LTSCs through 2021 under this agreement.

B. Summary of Water Supplies

In addition to the water supplies described in Section A, CAGRD has the following supplies which it utilizes to fulfill its annual replenishment obligations.

CAGRD CAP Entitlement

Since March 14, 2016, CAWCD, for benefit of CAGRD, holds an annual entitlement to 6,426 AF (as of April 2022[3]) of CAP Municipal & Industrial (M&I) Priority water pursuant to the "Supplemental Contract between the U.S. and CAWCD for Delivery of CAP Water, Contract No. 14-06W-245, Exhibit A, Amendment No. 2, Supplement No. 1 as amended," ("Supplemental Contract"). The Supplemental Contract is for permanent water service.

CAGRD Effluent Entitlement

CAWCD acquired 2,400 AF annually of effluent produced at the Palm Valley Water Reclamation Facility in Goodyear as part of the "Agreement for Development of Effluent Recharge Facility, Effluent Disposal and Purchase and Sale of Effluent" completed with Liberty Utilities in 2014. This 100-year lease of the effluent entitlement became effective in 2017 with the completion of the Liberty Aquifer Replenishment Facility (LARF), where the leased effluent is recharged. Approximately 1,717 AF of this effluent supply was recharged at the LARF in 2021, with the balance being recharged at the Roosevelt Irrigation District Groundwater Savings Facility (GSF). Modifications to the facility implemented in 2020 (renamed the Sustainable Effluent to Aquifer Project, or SEAP) have increased recharge rates. It is anticipated that all CAGRD's effluent entitlement will be recharged there in future years.

CAGRD Long-Term Storage Subaccount

In 2021, CAGRD began the year with a cumulative (Phoenix, Tucson and Pinal AMAs) LTSC balance of 899,168 LTSCs in the Long-Term Storage Subaccount and ended 2021 with a balance 913,084 LTSCs. **Table 3.2** and the narrative below provide an AMA-by-AMA summary of water supply deliveries and LTSC accrual for calendar year 2021.

Phoenix AMA

As discussed in the previous section subtitled, "2021 Long-Term Storage Credits Accrual Activities" a total of 30,258 LTSCs were accrued in the Phoenix AMA in 2021. These LTSCs were acquired through LTSC PSAs and attributed to CAGRD's two water supply agreements with GRIC. An additional 7,091 LTSCs

[3] 1,885 AF Transfer and Assignment of CAP M&I Water to City of Peoria was executed in April 2022.

were accrued through annual water deliveries and storage at various Phoenix AMA USFs and GSFs. In total, CAGRD accrued 37,349 LTSCs in the Phoenix AMA in 2021.

Tucson AMA

A total of 10,500 LTSCs were accrued by CAGRD in the Tucson AMA in 2021 via LTSC Purchase and Sale Agreements. Additionally, 2,195 LTSCs, were transferred to CAGRD's Conservation District Account (replenishment account) to fulfill outstanding replenishment obligations incurred in years 2019 through 2021. In 2021, the net accrual of LTSCs in the Tucson AMA LTSC Sub-Account totaled 8,305 LTSC.

Pinal AMA

In 2021, CAGRD, pursuant to our Recovery and Exchange Agreement recovered 15,000 of Pinal AMA LTSCs on behalf of GRIC for irrigation purposes. The water CAGRD recovered was then exchanged on a 1:1 per acre-foot basis for Indian priority water deliveries to several Phoenix AMA GSFs and 2,000 AF to two Tucson AMA USFs (Lower Santa Cruz and Pima Mine Road).

Additionally, CAGRD, pursuant to our GRIC NIA Lease (18,185 AF total), delivered 14,000 acre-feet to the Community-owned MAR-5 USF. After ADWR calculations (cut-to-the aquifer, evaporation losses) and the Phoenix/Pinal AMA credit split (due to MAR-5's location near the AMA boundary) this resulted in CAGRD's accrual of 1,989 LTSCs in the Pinal AMA and 11,325 LTSCs in the Phoenix AMA. Upon ADWR's LTSC certification for the MAR-5 USF each following year, CAGRD and GRIC will complete a LTSC transfer on a 1:1 basis to reconcile the Phoenix and Pinal AMA LTSC accrual split which occurs at the MAR-5 USF.

In 2021, the deduction of 22,728 LTSCs in the Pinal AMA occurred because of the following activities: 1) recovery of 15,000 LTSCs pursuant to our Recovery & Exchange Agreement, 2) 3,182 LTSCs transferred to GRIC pursuant to the unique Phoenix/Pinal AMA LTSC accreditation ratio of NIA Lease water stored at MAR-5 in 2020 (GRIC transferred 3,182 Phoenix AMA LTSCs to CAGRD), and 3) 4,546 LTSCs transferred to GRIC for the under-recovery (10,474 AF recovered in 2020 vs. 15,000 AF) which resulted in 4,273 Phoenix AMA (after cut-to-the-aquifer applied) LTSCs transferred from GRIC to CAGRD to reconcile the recovery deficit.

TABLE 3.2

2021 CAGRD LONG-TERM STORAGE SUBACCOUNT

AMA	2020 Year End Balance	2021 LTSC Accrual Agreements	2021 Net LTSC Activities Storage/Recovery/Replenishment	2021 Year End Balance
Phoenix	380,750	30,258	7,091	418,099
Pinal	367,728	1,989	(-22,728)	346,989
Tucson	139,690	10,500	(-2,195)	147,995
TOTAL	**888,168**	**42,747**	**(-17,832)**	**913,083**

4. Replenishment Reserve

The Replenishment Reserve consists of LTSCs that CAGRD accrues in a Replenishment Reserve Subaccount established for each AMA where CAGRD operates. The purpose of the Replenishment Reserve is to help ensure that CAGRD will be able to meet its replenishment obligation and to enhance rate stability. During periods of water supply shortage or infrastructure failure, CAGRD may use LTSCs from the Replenishment Reserve to offset its replenishment obligation rather than purchasing spot market water. Water purchased on the spot market is likely be more costly during shortage or outage conditions.

CAWCD LTSCs Dedicated for CAGRD Replenishment Reserve

The Board has dedicated LTSCs held by CAWCD for exclusive use by CAGRD to meet its legal requirements to establish and maintain the CAGRD Replenishment Reserve Subaccounts for each AMA or to meet its annual replenishment obligations. CAGRD purchased over 21,000 AF of CAWCD LTSC in 2021. Thus, approximately 526,000 AF of CAWCD LTSCs remain reserved for CAGRD purchase and use under CAWCD Board policy. These credits are primarily in the Pinal (312,269 AF) and Phoenix (212,678 AF) AMAs, with a small balance remaining in the Tucson AMA (561 AF).

CAGRD Replenishment Reserve Subaccount

CAGRD accrues LTSCs through a combination of storage in constructed Underground Storage Facilities (USFs), storage at Groundwater Savings Facilities (GSFs), purchases of pre-existing LTSCs, and LTSC transfers from MSAs who wish to offset the replenishment reserve component of their Replenishment Tax. **Table 4** provides the Replenishment Reserve balance at the end of 2020, the number of credits accrued during 2021, and the resulting balance of LTSCs in the Replenishment Reserve at year-end, by AMA. Also shown is the percent of the Reserve Target goal achieved through the end of 2021. The volume of LTSCs to be accrued in the Replenishment Reserve is known as the "Reserve Target." A Reserve Target must be identified for each AMA based on that AMA's projected obligation and the water supplies planned to be used to meet that obligation as described in the Plan of Operation (refer to the 2015 Plan for additional explanation and calculation of the Reserve Target).

In 2021, CAGRD began the year with a balance of 274,363 AF in the Replenishment Reserve Subaccounts (2021 CDAR) and accumulated an additional 22,688 AF through the year. CAWCD credits constituted all of the additions to the Replenishment Reserve in the Phoenix and Pinal AMAs while the Tucson AMA additions were from the CAGRD Long-Term Storage Account. These actions resulted in an overall increase of 2% towards achieving CAGRD's Replenishment Reserve target.

TABLE 4
Replenishment Reserve Balance and Target Achieved for 2019 (AF)

AMA	Replenishment Reserve Balance (12/31/20)	Replenishment Reserve Accruals During 2021	Replenishment Reserve Balance (12/31/21)	Reserve Target	% of Reserve Target Achieved (12/31/21)
Phoenix	229,373	21,012	250,385	603,866	41%
Pinal	5,383	400	5,783	48,036	12%
Tucson	39,607	1,276	40,883	112,600	36%
TOTAL	**274,363**	**22,688**	**297,051**	**764,502**	**38%**

5. Operational Efforts and Successes

As expected, August 2021 saw the declaration of a Tier 1 shortage on the Colorado River by the Bureau of Reclamation for 2022. CAGRD's operational efforts took place under the expectation that the first ever shortage would be declared and then working to ensure continued service to members in 2022.

Early 2021 saw the transition from the development of the 2022 Strategic Plan in 2020, to developing the strategies for each department to implement the new Strategic Plan and the development of the 2022 – 2023 biennial budget. Budgeting for CAGRD included earmarking funds for future conservation activities and the development of the 2025 Plan of Operation. The earliest planning efforts towards the Plan of Operation began at the tail end of 2021.

Throughout the year, CAGRD staff continued their efforts towards the Post-2025 AMA Committee of the Governor's Water Augmentation, Innovation and Conservation Council. CAGRD contributions to the Post-2025 AMA Committee were shaped by a set of guiding principles adopted by the CAGRD and Underground Storage Committee of the CAWCD Board. These guiding principles were developed following the collection of stakeholder perspectives at three CAGRD Committee meetings. At the same time, the CAGRD developed a revised set of principles for the CAGRD Water Supply Program.

On the administrative side, CAGRD staff emphasized preparation for the future. A project towards capturing the documentation of all CAGRD processes helped pave the way for cross-training and succession planning, with disaster recovery and mass workplace absences still in the forefront of many people's minds. Preparation for the future was also behind a migration of the CAPTR database to Microsoft Office365. This migration was a success through diligent testing of the new platform by CAGRD staff and efforts of CAP's IT team and the vendor providing support to CAPTR.

6. Conservation Activities

With a return to in-person work in July of 2021, CAGRD staff were able to access records of previous conservation activities and perform a deep dive into the historic activities of the program. This review, coupled with data analysis, showed previous CAGRD conservation activities were successful, leading to a savings of over 400 AF of water since the program's inception. This analysis and research also led to the development of a strategy for the next phase of the program, where the program developed messaging on CAGRD and conservation of groundwater, and designed approaches to lower the water demand of existing water users, such as HOA common areas, as well as prevent some replenishment obligation from occurring by incentivizing water-efficient construction. As a member of the Water – Use It Wisely Steering Committee, CAP and CAGRD participated in the re-branding of Water – Use It Wisely, giving its logo and marketing materials a fresh, colorful and modern look.

7. Legislative Action

A relatively small amount of 2021 legislation impacted CAGRD operations, most notably was HB2041 which revised and streamlined calculation of the Replenishment Reserve target (see Section 4, above). Other successful legislation with impact to CAGRD or its stakeholders included SB1147, allowing the direct transfer of AWBA LTSCs to enable independent recovery during shortage conditions, and SB2336, which modified ADWR's Assured Water Supply program processes in the Pinal AMA.

8. Other Activity

Third-Party Marketing of LTSCs to ML Homeowners Associations

First described in the 2015 Annual Operations Report, third-party entities began marketing LTSCs to homeowners associations (HOAs) within CAGRD MLs in 2015 as an alternative to receiving excess groundwater and paying CAGRD assessments. The concept involves individual ML property owners, such as an HOA, obtaining a recovery permit for one of their water provider's wells, purchasing LTSCs from a third-party, and entering into an agreement whereby the water provider would recover the LTSCs on behalf of the property owner and "wheel" the recovered water in lieu of groundwater that would otherwise be delivered to the property. The LTSCs may be used to reduce or eliminate the property's replenishment obligation and thereby reduce the CAGRD assessment for that year.

In 2021, the total amount of credits wheeled and recovered within Member Land subdivisions, in order to reduce or eliminate a property's replenishment obligation, was 641 AF within the Phoenix AMA. No wheeled and recovered LTSCs were reported in the Pinal or Tucson AMAs.

Appendix I: Acceptance of 2021 CDAR

CAGRD received notification from ADWR on October 31, 2022 the CDAR has been accepted and confirmed that CAGRD has completed its groundwater replenishment obligation as required by statute. A copy of the letter is included on the following page.

DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
1110 West Washington Street, Suite 310
Phoenix, AZ 85007
602.771.8500
azwater.gov

Via electronic mail

October 31, 2022

Central Arizona Groundwater Replenishment District
Attn: Ms. Laura Grignano, Manager
lgrignano@cap-az.com
P.O. Box 43020
Phoenix, Arizona 85080-3020

Re: CAGRD Accounting Status for 2021

Dear Ms. Grignano:

The Arizona Department of Water Resources (Department) has reviewed the Central Arizona Groundwater Replenishment District (CAGRD) 2021 Conservation District Annual Report, dated August 29, 2022. As prescribed by A.R.S. § 45-859.01(I), the Department determined in October of 2022 that the CAGRD completed the groundwater replenishment obligation, as specified in A.R.S. §48-3771, for each Active Management Area (AMA). This letter is to inform you of that determination.

If you have any questions regarding this determination, please feel free to contact Shannon Reif at (602) 771-8517 or by email at slreif@azwater.gov.

Sincerely,

David L McKay

David L McKay, Manager
Recharge, Assured and Adequate Supply Programs

cc via email: Jeni Martin, CAGRD
Terri Boxley, CAGRD

Adobe Acrobat Sign Transaction Number: CBJCHBCAABAAURgQQmlDT5gbOCLLnGnIdj9Wh0ITmMPm