

Appendix - CAGR D

CAGR D must replenish (or recharge) within each AMA the amount of groundwater pumped by or delivered to its members which exceeds the pumping limitation imposed by the assured water supply rules. Water used for replenishment may be Central Arizona Project water or water from any other lawfully available source, except groundwater withdrawn from within an AMA. CAGR D has three years to meet the replenishment obligation.

Membership in the CAGR D is voluntary. Any city, town, water provider, subdivision or homeowner's association located in Pima, Pinal or Maricopa counties may join the CAGR D. The CAGR D is comprised of two types of members; Member Lands and Member Service Areas.

TAMA Member Lands - Member Lands are typically subdivisions. As can be seen from Figure 1, member lands are often located in areas beyond the reach of existing integrated infrastructure. The CAGR D facilitates development in areas lacking in renewable water supply infrastructure. Additionally these member lands are typically far from the recharge facilities where replenishment occurs. This means that groundwater being withdrawn from the aquifer by these subdivisions is not being replaced in a way that will eventually give the subdivisions access to the replenished water.

The subdivision agrees to record covenants that include the land in the CAGR D. This land is subject to a replenishment assessment that is included in each resident's property tax bill. The replenishment assessment is collected by the County treasurer and transferred to the CAGR D. The assessment pays for CAGR D's replenishment costs. The water provider gives the CAGR D and the County Assessor the water delivery information necessary to calculate the replenishment assessment for each tax parcel. As of December 2008, there were 132 member land subdivisions including 26,593 homes.

By joining the CAGR D as a member land, a subdivision can receive a certificate of assured water supply. The CAGR D will replenish the groundwater pumped by the local water utility serving the subdivision by purchasing renewable water (currently CAP water) and recharging it in one of the underground storage facilities in the TAMA that are permitted by ADWR.

As a CAGR D Member Land, a subdivision avoids the need to build the water infrastructure to deliver a potable and renewable water supply directly to the subdivision. Although the CAGR D replenishes the groundwater pumped to serve the subdivision, CAGR D's costs are assessed to the homeowner through property taxes and are not reflected in the development costs.

Based on the amount of groundwater used by a Member Land home in a year, the average CAGR D assessment in Pima County is \$305 per acre-foot. The CAGR D assessment is projected to increase by 28 percent to \$391 per acre-foot in 2013-14. This translates to an average per home property tax assessment of between \$60 and \$70 per year in 2008 and could increase between \$77 and \$90 by 2013-14. As CAGR D's costs to purchase and recharge CAP water increases, the replenishment assessment and property tax bill will also increase.

The location of member lands within the TAMA is shown in Figure 1 as Subdivisions Lands with a Certificate of Assured Water Supply. Because the TAMA boundary extends beyond the boundaries of Pima County, there are member lands located in Pinal County.

A survey conducted in 2006 by the Pima County Regional Flood Control District showed that of the subdivision plats approved in Pima County between 2000 and 2005, ten percent were enrolled as Member Lands of the CAGRDR. This represents 5,698 parcels or 35 percent of the parcels platted during this period. Member lands are a significant portion of the development that occurs in Pima County.

TAMA Member Service areas - Member Service Areas are typically a city, town or municipal water provider. Seven member service areas in Pima County are enrolled in the CAGRDR. They are:

1. Town of Marana
2. Metropolitan Domestic Water Improvement District
3. Town of Oro Valley
4. Rancho Sahuarita Water Company
5. Spanish Trail Water company
6. City of Tucson
7. Vail Water Company

When a water provider receives a designation of Assured Water Supply by joining the CAGRDR, the CAGRDR assumes the responsibility for acquiring a renewable water source and replenishing it on behalf of the water provider, while the water provider can continue to pump groundwater. The CAGRDR's costs to acquire and recharge water are assessed to the water provider and the water provider, in turn, includes the costs in the water rates charged to the customers. As the costs to replenish and recharge water increases, rates will increase correspondingly. Tucson Water has built infrastructure to take direct delivery of CAP water and has used the CAGRDR as a bridge source of supply to serve as a reserve. Similarly, several other member service areas are planning to build the infrastructure to take direct delivery of CAP water; meanwhile, they will continue to rely on the CAGRDR to replenish at recharge facilities near the CAP until their new infrastructure is in place. Attached is a map showing the service areas of the water providers that are CAGRDR members in the TAMA. CAGRDR is under contract with the City of Tucson to replenish up to 12,500 acre feet of groundwater should it be needed to meet its service area needs. However, the City of Tucson does not plan to utilize this replenishment supply source for many years and when it does; it would be used as a renewable supply source to replenish groundwater pumped from CAVSARP, SAVSARP, and/or Pima Mine Road. It is assumed that this annual volume will be provided as per statute even though there are questions about how the CAGRDR will ultimately meet its total obligation and at what cost.

CAGRDR Replenishment - In the Tucson Active Management Area, CAGRDR replenishes CAP water at three underground storage facilities (USF). These facilities have a cumulative recharge capacity of 91,000 acre feet per year. Figure 3 shows their location.

1. Avra Valley Recharge Project (AVRP) was Central Arizona Water Conservation District's (CAWCD) first recharge project. CAWCD constructed and began operating AVRP in July 1996 as a 2-year pilot project. The facility was permitted as a full-scale project in March 1998. The project is located near the Marana Airport. Water users that can store water at AVRP include the Arizona Water Banking Authority (AWBA),

CAWCD (for CAGR), Metro Water, the Town of Marana, Tucson Water, and Augusta Resource Corporation. The facility is permitted to recharge up to 11,000 acre-feet per year.

Lower Santa Cruz Recharge Project (LSCR) was developed in a partnership between CAWCD and the Pima County Regional Flood Control District and is also located near the Marana Airport. The facility was constructed in conjunction with a flood control levee along the Santa Cruz River. Recharge operations began in 2000. Water users that can currently store water at this facility include the Arizona Water Banking Authority, CAWCD (for the CAGR), Metro Water, the Town of Marana, Robson Communities, Tucson Water, and Augusta Resource Corporation. The facility is permitted to recharge up to 50,000 acre-feet per. Water users that can currently store water at this facility include the Arizona Water Banking Authority, CAWCD (for the CAGR), Metro Water, the Town of Marana, Robson Communities, Tucson Water, and Augusta Resource Corporation.

2. The facility is permitted to recharge up to 50,000 acre-feet per year.
3. Pima Mine Road Recharge Project (PMRR) is located approximately 15 miles south of Tucson. CAWCD and the City of Tucson jointly own the project located on the Santa Cruz River flood plain. Water users that can store water currently include the Arizona Water Banking Authority, CAWCD, the City of Tucson, Green Valley Domestic Water Improvement District, the Tohono O'odham Nation and Augusta Resource Corporation. The recharge capacity is fully utilized each year with priority given to the City of Tucson and CAWCD who co-own the facility. Pima Mine Road is permitted to recharge up to 30,000 acre-feet per year.

CAGR also has replenished relatively minor amounts of its obligation at groundwater savings facilities (GSFs) in the Tucson AMA.

CAGR Replenishment Capacity and Resources to Meet Obligation - Eleven recharge facilities are permitted by ADWR to store water underground. Of these, six facilities recharge effluent. Currently, no facilities are permitted to store both effluent and CAP water simultaneously. Doing so would require review and approval from the Arizona Department of Environmental Quality. The two largest recharge facilities in the TAMA were developed by and are owned exclusively by Tucson Water. They recharge only CAP water and have a combined permitted capacity of 160,000 acre-feet.. CAGR replenishes at the remaining three USFs described above.

The combined permitted capacity of the three USF is 91,000 acre-feet. However, many entities are using these recharge facilities. There are preliminary discussion of converting the AVRP and LSCR to recharge effluent. The PMRR is jointly owned by CAWCD and Tucson Water and much of the capacity is used by TW. Operationally, the amount of recharge capacity can vary depending on actual infiltration rates, mounding potential and other factors, so achieving the full permitted capacity may not be physically possible.

Replenishment at AVRP and LSCR is occurring at the downstream end of the basin, while much of the withdrawal is occurring at member lands; upstream and hydrologically disconnected from the areas of replenishment. CAGR has a policy of recharging as

close as possible to the areas where withdrawals take place, but the lack of recharge facilities makes this difficult to implement.

CAGRDR has three years to meet its annual replenishment obligation and is currently meeting its obligation in the TAMA by recharging excess CAP water in the three underground storage facilities and groundwater savings facilities described above. As more members join, the question becomes how will CAGRDR meet its replenishment obligation in future years and at what cost?

CAGRDR's ability to meet future growth is described in a Plan of Operation, which must be updated every ten years and approved by ADWR. The CAGRDR cannot continue to enroll members if it cannot demonstrate through its Plan of Operation that it has the capability to meet its replenishment obligations. Even if the Plan is determined to be deficient, the CAGRDR is legally obligated to continue replenishing on behalf of current members. The Plan of Operation must provide estimates of current and projected replenishment obligations up to 100 years into the future. However, the Plan of Operation need not demonstrate that CAGRDR has physical, continuous and legal rights to the replenishment water. This is a source of concern to many.

CAGRDR's current strategy to meet its replenishment obligation includes securing its own CAP subcontracts for M&I priority CAP water through transfers from water providers currently holding a CAP subcontract. Additionally, CAGRDR is interested in obtaining non-Indian agricultural priority CAP water. The difficulty with this plan is that this water would only be available during non-shortage years on the Colorado River (only about 70% of the time after 2025). CAGRDR will be competing with numerous other entities for this supply; many municipal water providers in the CAP service area believe that the CAGRDR has an advantage over other water interests in acquiring these additional resources. The CAWCD and the CAGRDR are the same entity, and have significant financial resources with which to purchase water supplies, especially if CAGRDR's revenue bonding proposal obtains legislative approval during the present session.

As entities use their full CAP allocation, excess CAP water will become less available. Each year water users with a CAP subcontract place orders for CAP water deliveries with the Central Arizona Water Conservation District (CAWCD). In the past, excess CAP water was redistributed to water providers one year at a time. In 2009 requests for excess CAP water exceeded the amount available. Access to Arizona's excess CAP water is being addressed by the CAWCD through implementation of a policy that would set aside four pools of water to be distributed on an annual basis after subcontract orders are received. Two pools would include a fixed pool of water capped at 35,000 acre-feet for CAGRDR's annual replenishment obligations and a 175,000 acre-foot fixed pool of water shared between CAGRDR and the Arizona Water Banking Authority. CAGRDR recognizes that it cannot rely on excess CAP water to meet its future obligations and is exploring alternative water supplies.

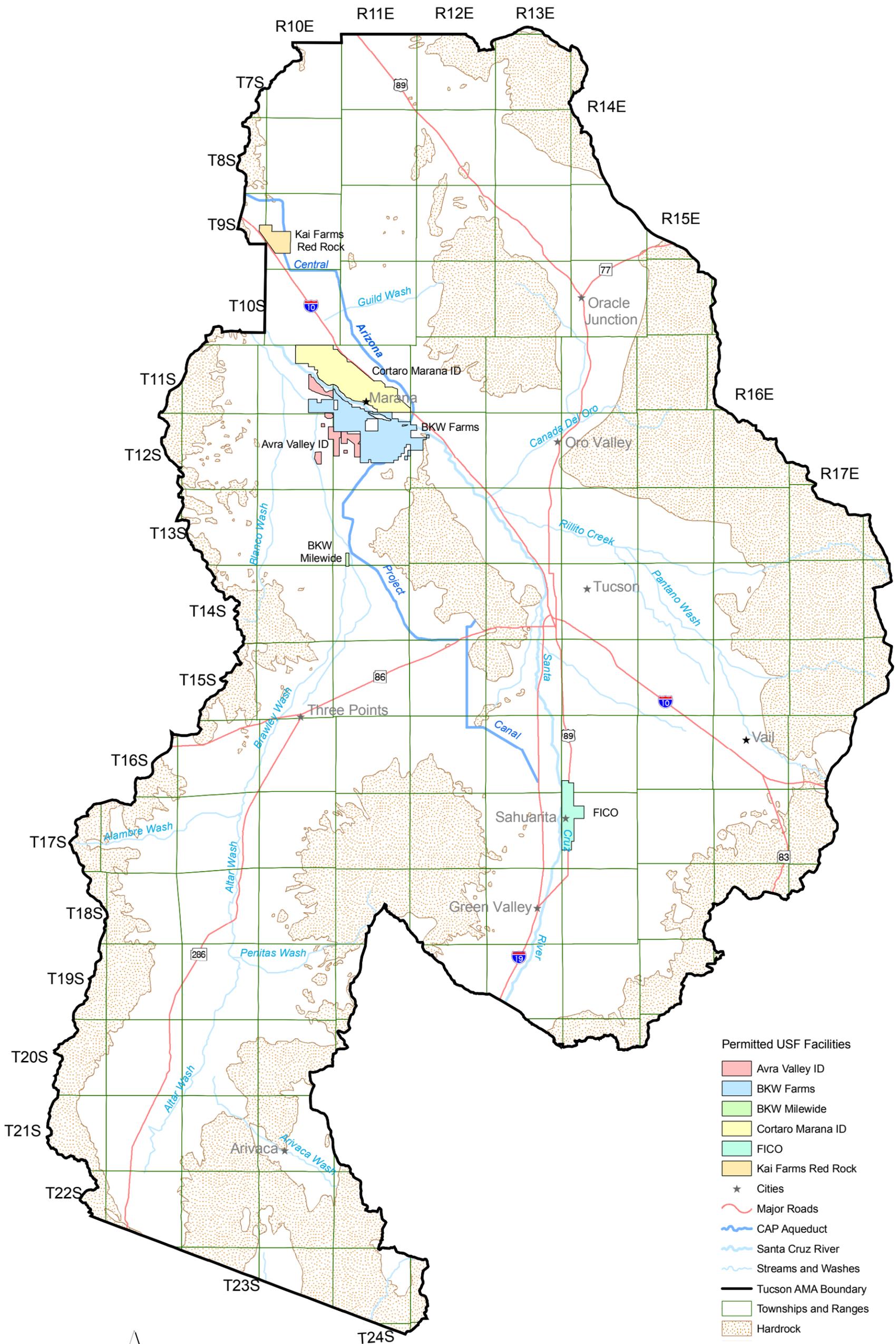
Other strategies include:

- Long term leases of Indian water
- Agreements to use reclaimed effluent
- Imported groundwater
- Following agreements with agriculture
- Access to CAWCD's Project ADD Water

Based on the current member enrollment, CAGR D estimates their 2025 replenishment obligation will be 11,700 acre-feet in the TAMA.

TUCSON AMA PERMITTED GROUNDWATER SAVINGS FACILITIES

Groundwater Storage, Savings, and Replenishment Program



Permitted USF Facilities

- Avra Valley ID
- BKW Farms
- BKW Milewide
- Cortaro Marana ID
- FICO
- Kai Farms Red Rock
- Cities
- Major Roads
- CAP Aqueduct
- Santa Cruz River
- Streams and Washes
- Tucson AMA Boundary
- Townships and Ranges
- Hardrock

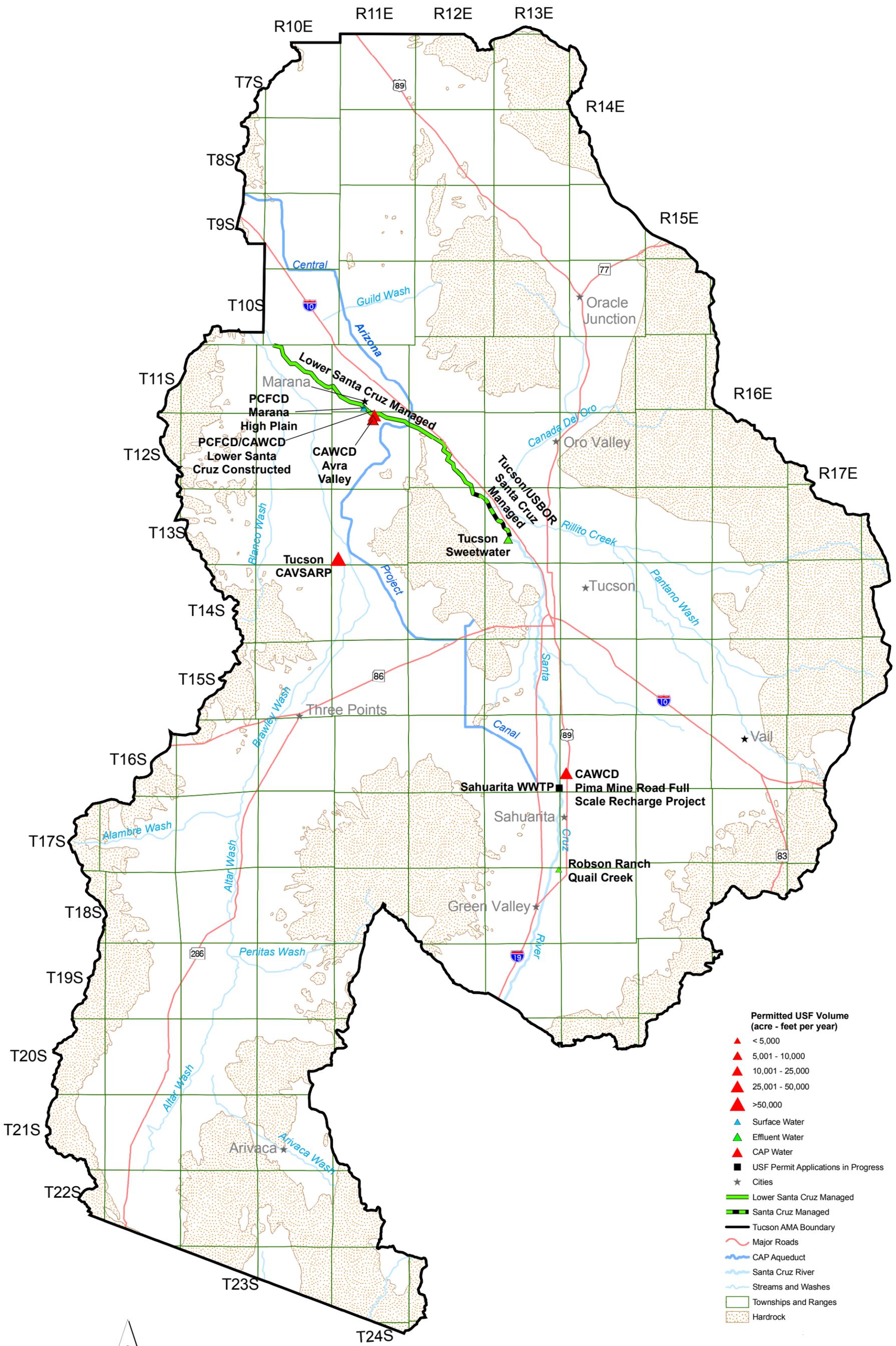


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City of Tucson Water Resources Department

TUCSON AMA PERMITTED UNDERGROUND SAVINGS FACILITIES

Groundwater Storage, Savings, and Replenishment Program



- Permitted USF Volume (acre - feet per year)**
- ▲ < 5,000
 - ▲ 5,001 - 10,000
 - ▲ 10,001 - 25,000
 - ▲ 25,001 - 50,000
 - ▲ >50,000
 - ▲ Surface Water
 - ▲ Effluent Water
 - ▲ CAP Water
 - USF Permit Applications in Progress
 - ★ Cities
 - Lower Santa Cruz Managed
 - Santa Cruz Managed
 - Tucson AMA Boundary
 - Major Roads
 - CAP Aqueduct
 - Santa Cruz River
 - Streams and Washes
 - Townships and Ranges
 - Hardrock

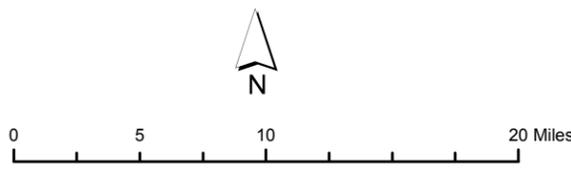


Figure 2.3

**CAGRD Members
in the
Tucson AMA**

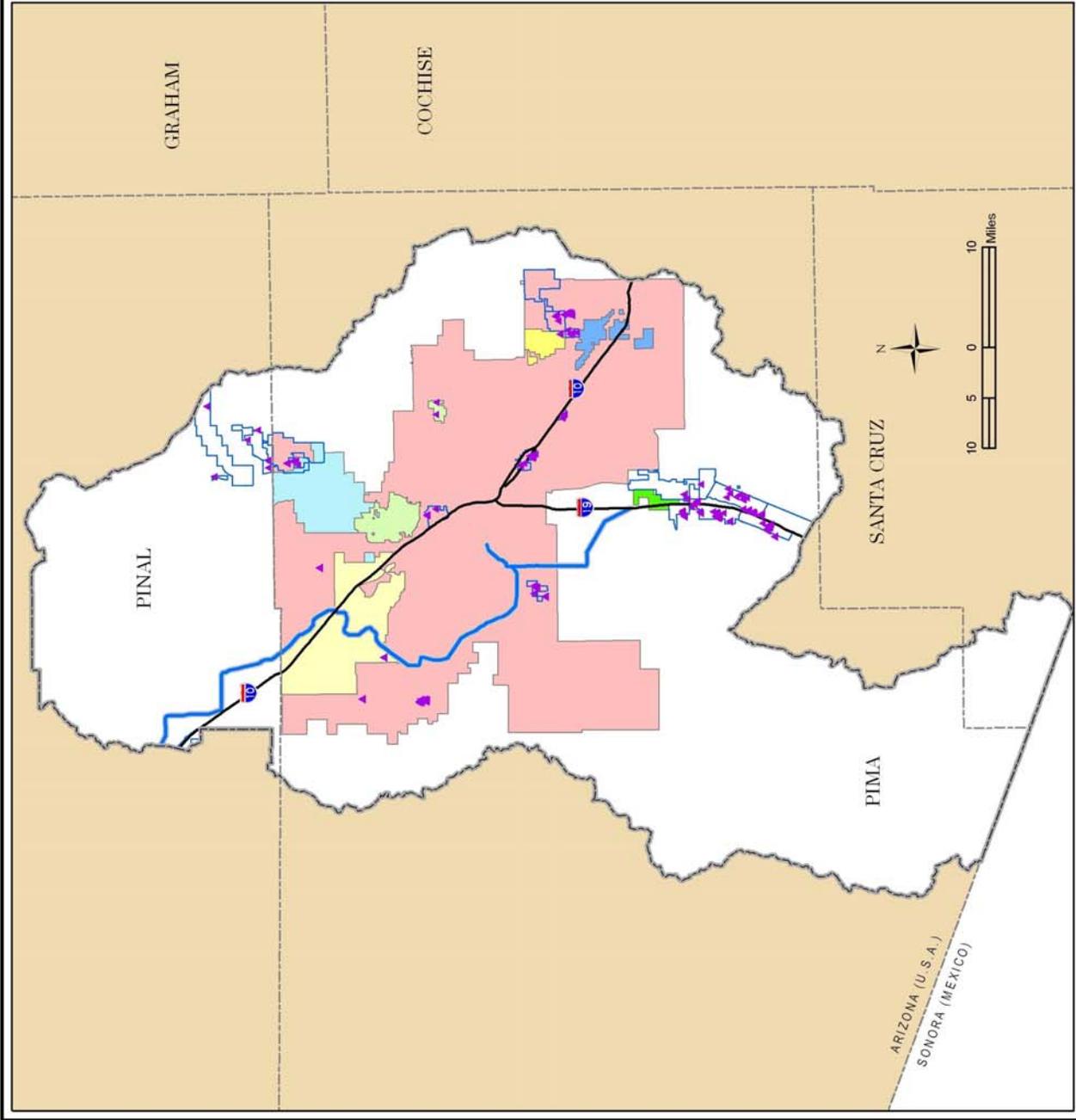
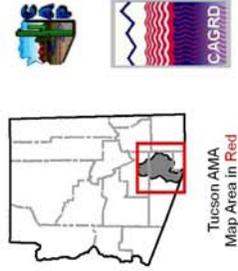
▲ CAGRD Member Lands

CAGRD Member Service Areas

- City of Tucson
- Town of Marana
- Town of Oro Valley
- Metropolitan Domestic Water Improvement District
- Rancho Sahuarita Water Company
- Spanish Trail Water Company
- Vail Water Company

Water Providers Serving Member Lands

- AMA Boundary
- CAP Canal
- County Boundary
- Major Highways



CAGR Member Land Enrollment Summary

Year	Phoenix AMA - West		Phoenix AMA - East		Pinal AMA		Tucson AMA		Total	
	#MLs	#Homes	#MLs	#Homes	#MLs	#Homes	#MLs	#Homes	#MLs	#Homes
1995	1	132	1	16	0	0	2	36	4	184
1996	11	2,714	18	1,831	1	11	7	529	37	5,085
1997	18	4,628	23	2,551	5	404	17	1,247	63	8,830
1998	10	1,888	38	2,767	5	361	2	389	55	5,405
1999	21	4,900	35	3,845	10	776	5	672	71	10,193
2000	24	9,527	30	3,740	18	15,004	8	6,554	80	34,825
2001	28	10,076	12	2,097	12	2,913	9	3,509	61	18,595
2002	30	6,536	11	4,454	5	490	7	2,534	53	14,014
2003	76	16,984	18	2,882	6	1,331	16	2,041	116	23,238
2004	91	13,046	10	2,453	9	2,509	13	2,042	123	20,050
2005	99	13,666	27	4,603	14	3,509	15	2,682	155	24,460
2006	94	28,057	34	5,502	25	23,832	16	2,310	169	59,701
2007	26	9,900	12	4,140	13	7,803	10	1,377	61	23,220
2008	11	5,531	19	1,340	10	3,092	5	671	45	10,634
2009	2	867	0	0	0	0	0	0	2	867
Pending*	4	3,468	4	2,100	2	63	1	8	11	5,639
Total	546	131,920	292	44,321	135	62,098	133	26,601	1,106	264,940

* As of March 31, 2009

ML = Member Land Subdivision

Note: This table does not include those Member Lands whose water providers have subsequently applied for and received a Designation of Assured Water Supply for their Service Areas. The number of Homes shown is subject to change, based on subsequent changes to the final plat(s) after enrollment.