City of Casa Grande

Effluent Generation and Recharge

A joint presentation from the City of Casa Grande and Arizona Water Company

June 11, 2025

City of Casa Grande

ARIZONA WATER COMPANY

Wastewater Treatment Process: Collection to Recharge

Kevin Louis, Public Works Director
Clifton Sanders, Chief Wastewater Operator
City of Casa Grande

CITY OF CASA GRANDE

Mission Statement

- To provide and maintain an effluent that meets or exceeds all Federal, State, and local regulations.
- To maintain an efficient collection system that adequately serves our customers.
- Monitor industrial dischargers into our system.

Wastewater Collections

The City of Casa Grande is responsible for the collection and conveyance of wastewater from residential, commercial, and industrial sources throughout the community. This wastewater is transported via an extensive network of over 500 miles of sewer lines, 9 lift stations, and approximately 5,500 manholes to the City's Water Reclamation Facility for treatment.

- Collection system supports over 55,000 service connections
- Lift Stations operate with SCADA and remote monitoring
- Proactive maintenance ensures regulatory compliance and system reliability
- Current projects include manhole rehabilitation and sewer line cleaning and condition assessment.

CITY OF CASA GRANDE

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Water Reclamation Facility

- 18 MGD of treatment capacity
- 2.05 BG of Wastewater Treated in 2024
- Produces class A+ quality Reclaimed Water

CITY OF CASA GRANDE
STRONGER UNITED



ADEQ Certified Operators

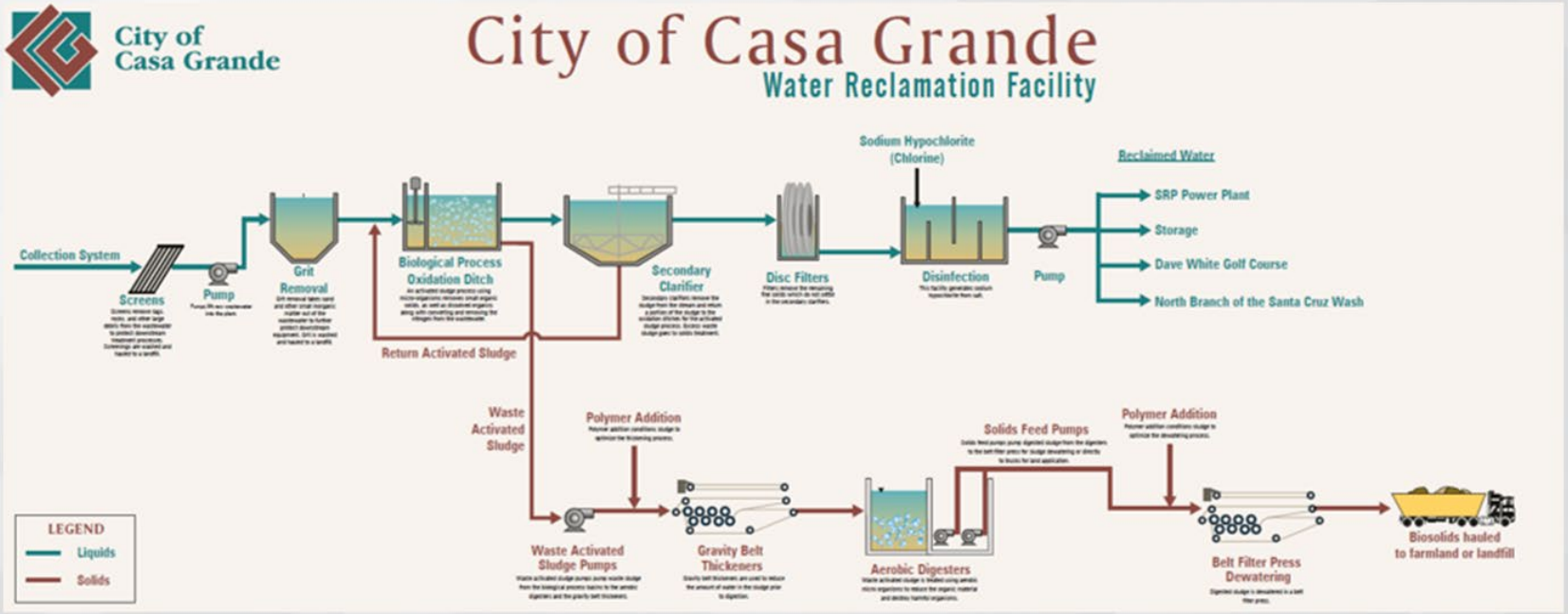
The City of Casa Grande employs 12 ADEQ Certified Operators:

	Wastewater Treatment	Wastewater Collections	Water Treatment	Water Distribution
Grade level 4	2	2	1	1
Grade level 3		1		1
Grade level 2	2	4	1	1
Grade level 1	7	4	3	5

Treatment Process Overview

- **Preliminary Treatment** – Screens and grit removal eliminate debris and sand
- **Secondary Treatment**
  - Biological Treatment using oxidation ditches (activated Sludge Process)
  - Settling of solids in Clarifiers
- **Tertiary Treatment** - Filtration to remove fine suspended solids
- **Disinfection** – Sodium Hypochlorite is used to destroy pathogens
- **Key stats**
  - Serves approx. 60,000 residents / Designed for future growth / Meets ADEQ: APP and AZPDES permit requirements

Process Flow Diagram



WRF Upgrades – Commitment to the future

- **Phase 4A expansion (scheduled to conclude in 2025)**
  - $32 million investment
  - Increased treatment capacity to 18 mgd
  - Expanded solids handling capabilities
  - Implemented key odor control measures
- **Phase 4B expansion (Upcoming)**
  - Estimated at $80 million
  - Long-term upgrades and modernization
  - Rehabilitation and replacement of aging equipment
  - Facility-wide odor control implementation
  - Construction of a new administration building to support staff growth

Class A+ Reclaimed Water

- **Treatment Level:**

- Secondary treatment
- Filtration
- Disinfection
- **Plus** total nitrogen removal to ≤10 mg/L (hence the "+")

- **Approved Uses (Most Permissive):**
  - Landscape and agricultural irrigation (including food crops eaten raw)
  - Spray irrigation in public access areas (parks, golf courses)
  - Dust control
  - Toilet and urinal flushing
  - Decorative fountains
  - Fire protection systems
  - Cooling towers (with drift control)
  - Soil compaction
  - Livestock watering (with Department of Agriculture approval)
  - Artificial snowmaking (with approval)

Managed Recharge Facility

- Stores effluent discharged into the North Branch of the Santa Cruz Wash through percolation into the groundwater basin.
- 5.8 Miles long
- Facility may store up to 3,500 AF of water annually for long-term storage credits
- Credits may be recovered / withdrawn for use through groundwater wells

Managed Recharge Facility

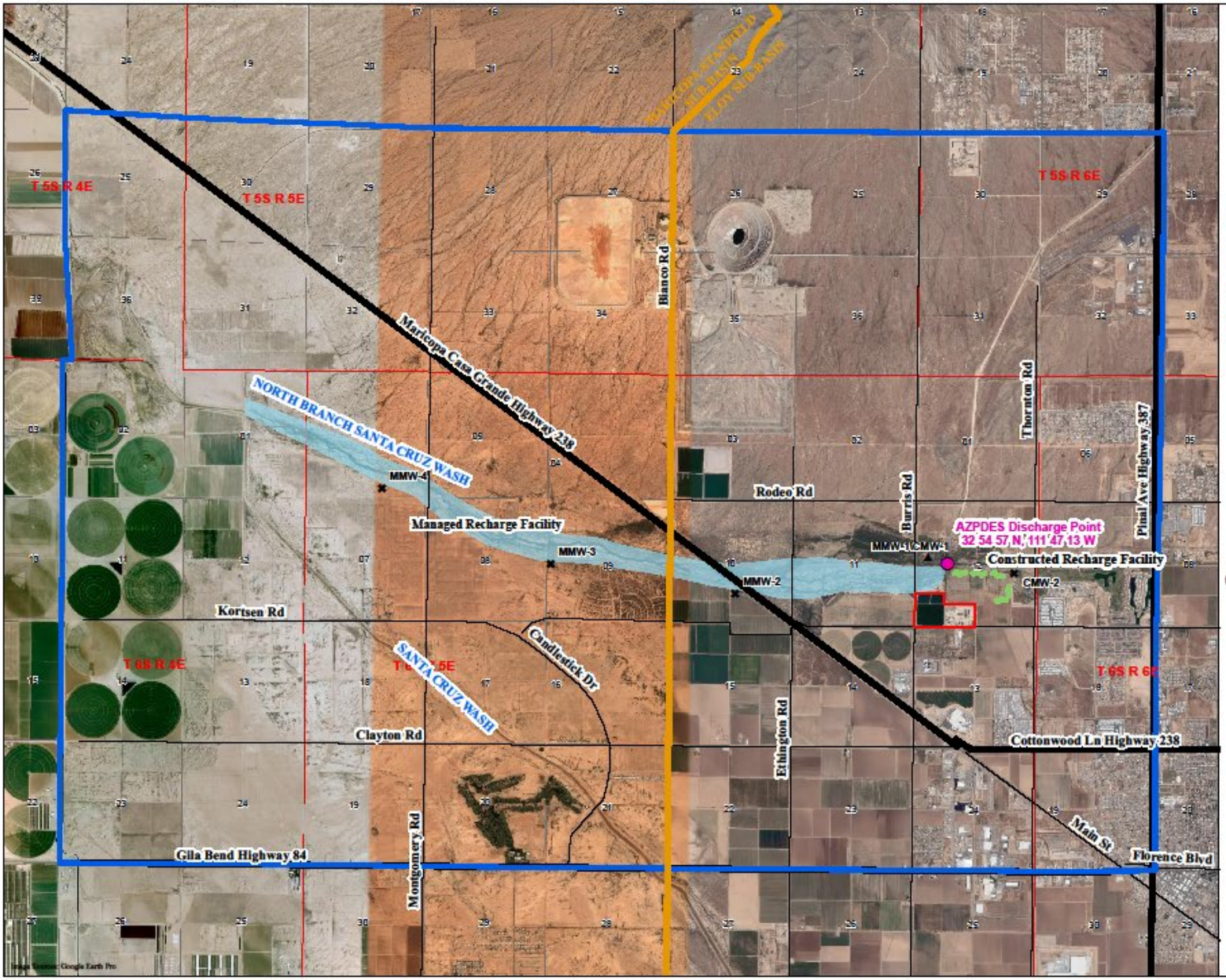


Figure 2

Soil Aquifer Treatment (SAT)

- **Soil Aquifer Treatment (SAT)** is a natural and engineered process that improves the quality of reclaimed water by filtering it through soil layers as it percolates down to a groundwater aquifer.
- **Benefits of SAT:**
  - **Natural, passive treatment** requiring minimal energy or chemicals
  - **Enhances water quality** beyond conventional tertiary treatment.
  - **Supports aquifer recharge** and long-term groundwater sustainability.
  - Can be part of **indirect potable reuse** strategies.
- SAT in Arizona:
  - Widely used due to:
    - Arid climate
    - High demand for groundwater recharge
  - Often permitted under the Arizona Department of Environmental Quality (ADEQ) aquifer protection programs

City of Casa Grande

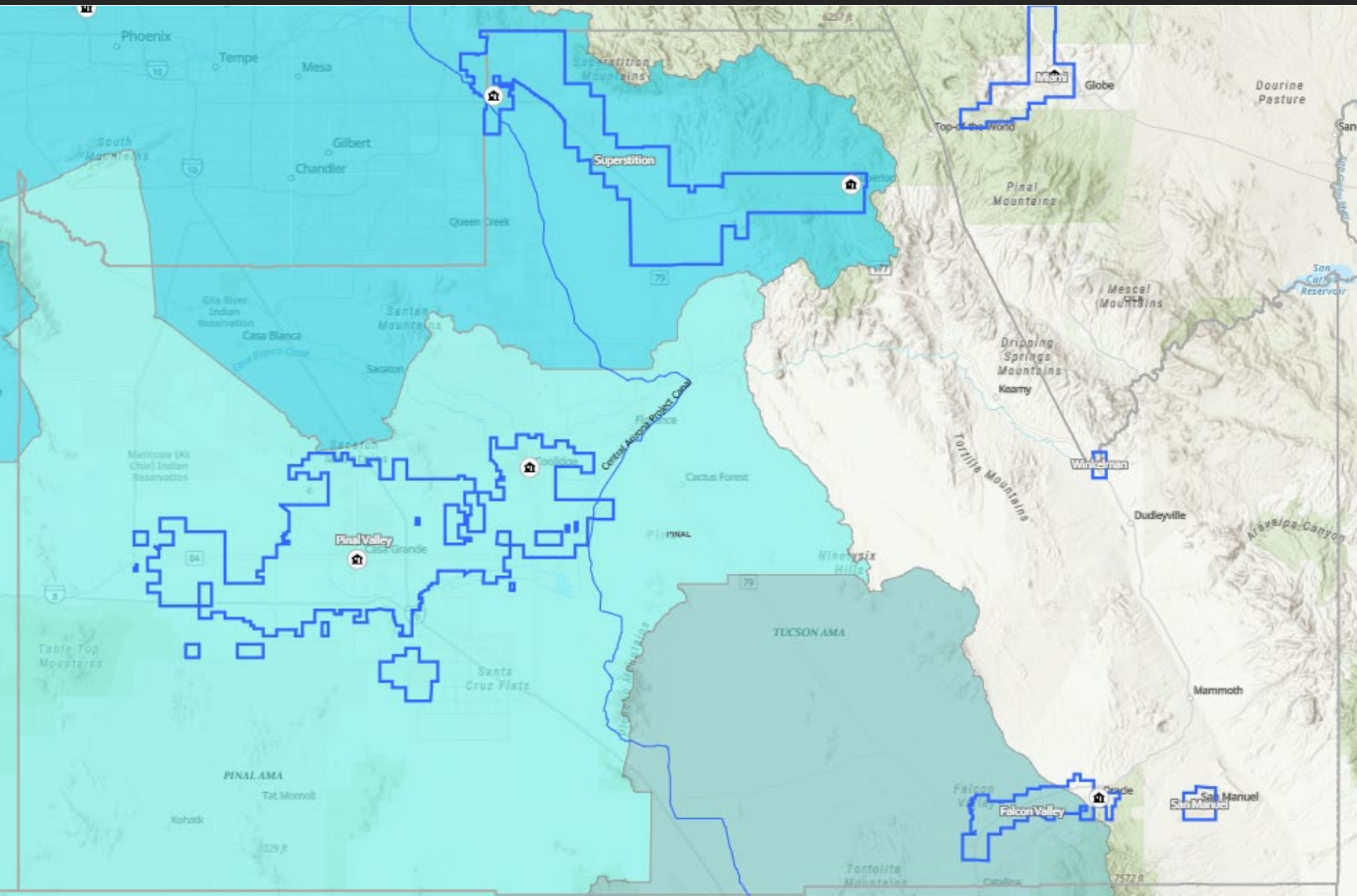
Recharge and Replenishment

Terri Sue C. Rossi, Vice-President – Water Resources
Arizona Water Company

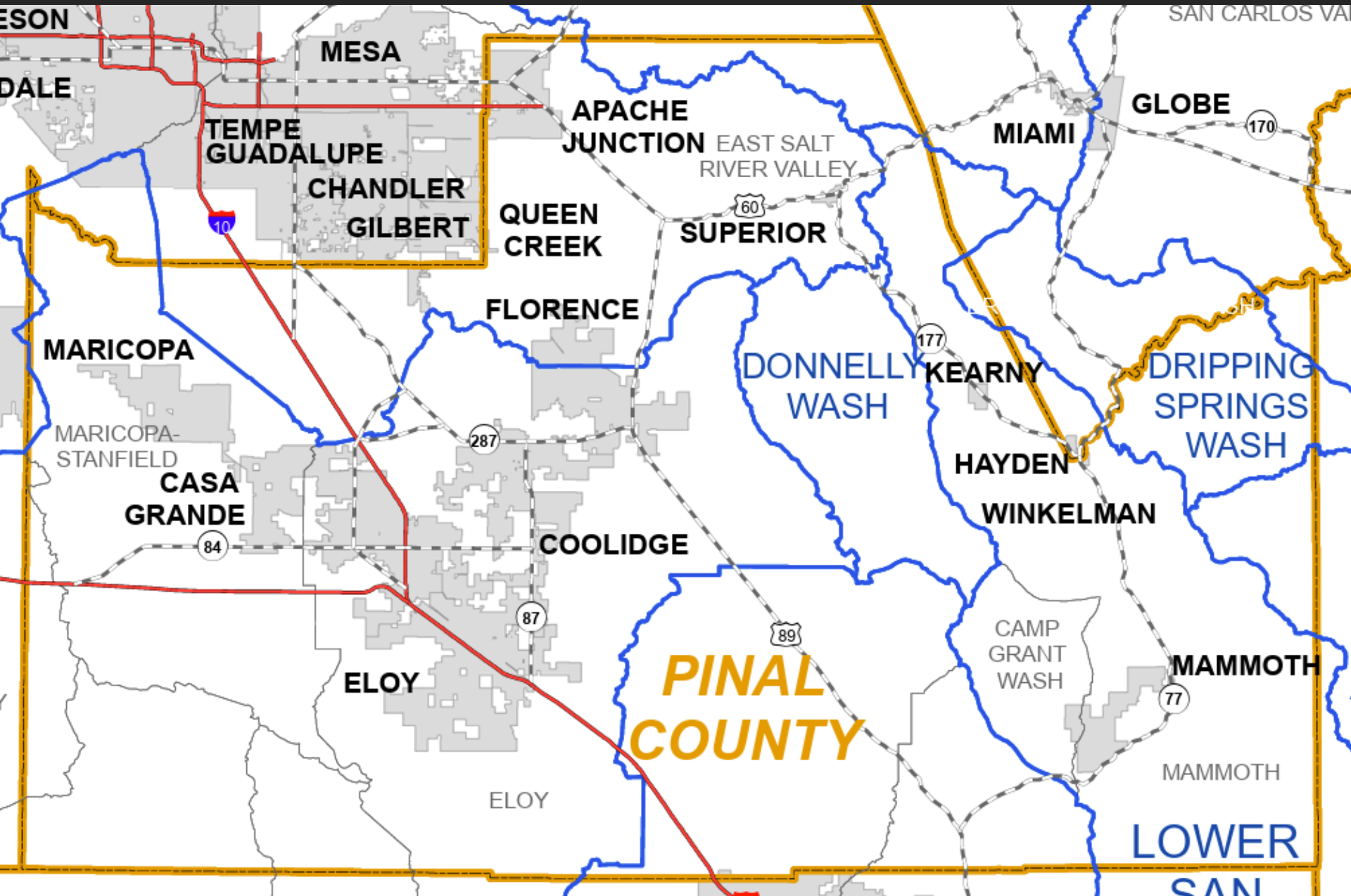
History of Program

- 1986 - Underground Water Storage and Recovery Program
- 1993 – Creation of Central Arizona Groundwater Replenishment District (CAGRD)
- 1994 – Underground Water Storage, Savings and Replenishment Act
  - Protect general economy and welfare of state by encouraging use of renewable water supplies
  - Provide a more efficient and cost-effective method of using renewable water supplies instead of constructing surface water treatment plants
- First permits were issued in the late 80s and recharge has been a foundational element of water management in Arizona since

Complicated Hydrology of Pinal County



Complicated Hydrology of Pinal County



What is groundwater recharge?

- Groundwater recharge refers to replenishment of groundwater aquifers through either natural, incidental or artificial means:
  - Natural = happens through infiltration of water into the soil and eventually to aquifers through precipitation, snow, rivers and lakes
  - Incident recharge = water used by municipal, industrial and agricultural users that makes its way to aquifer
  - Artificial recharge = where water providers and others intentionally add non-groundwater supplies to aquifer in order to offset groundwater pumping or to augment water supplies using legally permitted recharge facilities
    - Constructed recharge facilities
    - Managed recharge facilities
    - Groundwater savings facilities

What is replenishment?

- Replenishment is the function of replacing groundwater pumping considered in excess of sustainable levels
  - Conducted through artificial recharge at legally permitted recharge facilities
    - Constructed recharge facilities
    - Managed recharge facilities
    - Groundwater savings facilities
  - Happens after groundwater pumping occurs
  - Responsibility of replenishment currently lies solely with Central Arizona Groundwater Replenishment District (CAGRD)

Legal Sources of Water for Recharge or Replenishment

Allowable sources:

- Central Arizona Project or CAP Water
- Colorado River water
- Surface water
- Effluent – requires an Aquifer Protection Permit

Not allowed:

- Groundwater



Superstition Mountains Recharge Project located in Phoenix AMA
Owned and operated by CAP



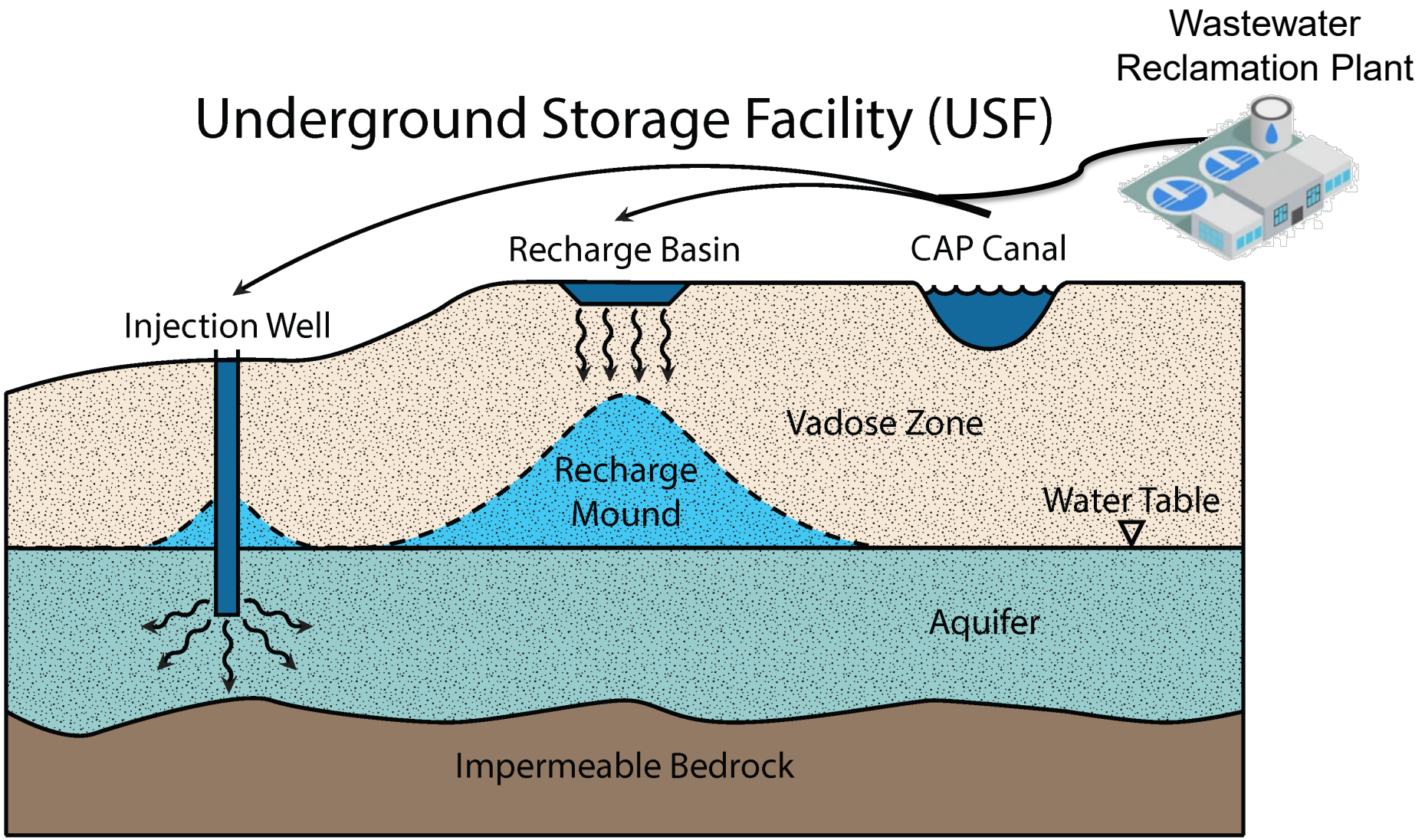
Pinal Valley Recharge and Recovery Project located in Pinal AMA
Owned and operated by Arizona Water Company

Types of Permits Required

- **Underground storage facility permits**
  - Constructed
    - 12 facilities in Pinal AMA
    - 2 facilities store CAP; 10 store effluent*
  - Managed
    - 3 in Pinal AMA
    - 1 facility stores CAP; 3 store effluent*
- **Groundwater savings facility permits**
    - 4 in Pinal AMA
    - 3 store CAP; 1 stores effluent*
- **Water storage permits (50 in Pinal AMA)**
  - Annual storage and recovery
  - Long-term storage and recovery
  - Long-term storage account
- **Recovery well permits (207 wells in Pinal AMA)**

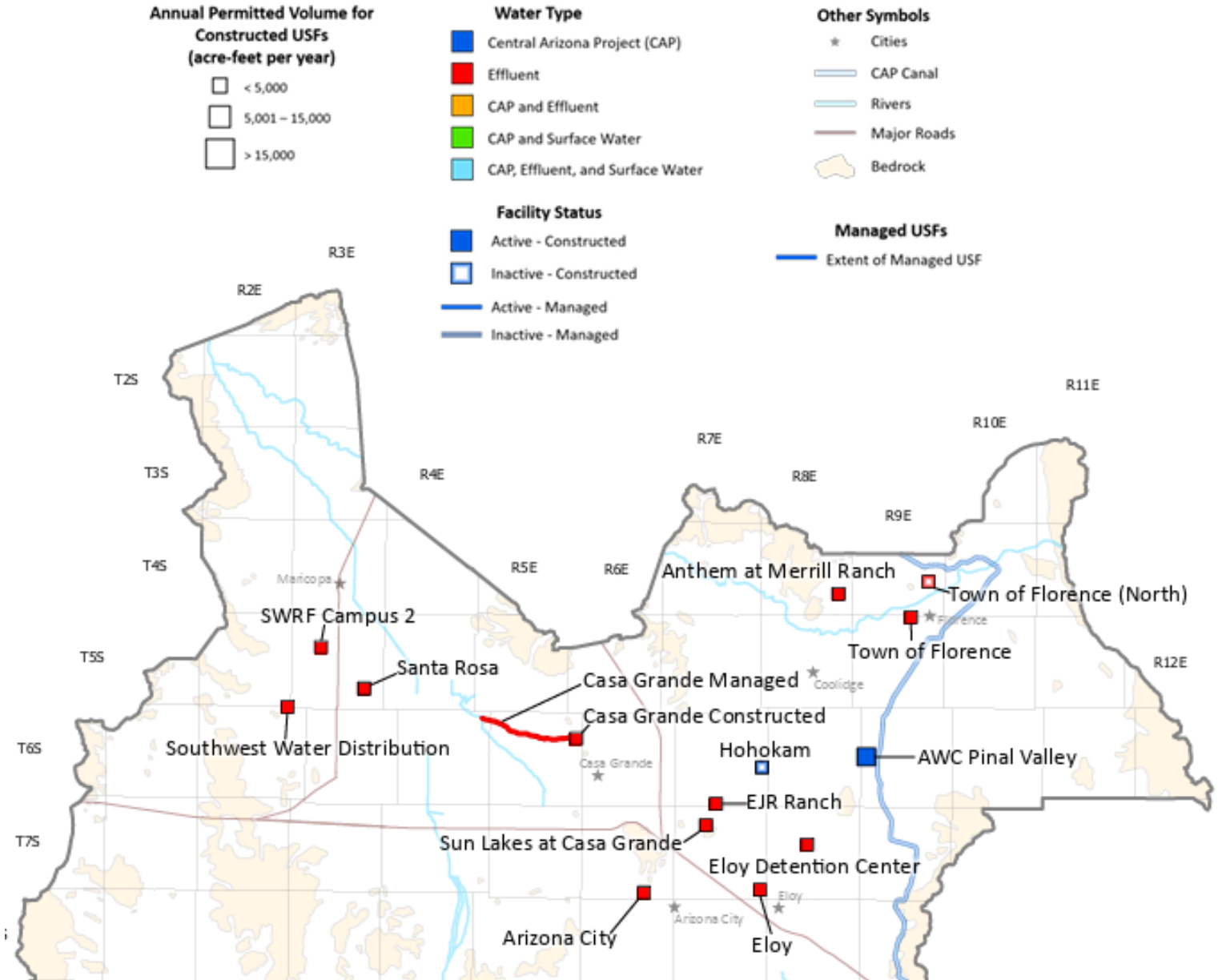
*** Effluent projects all require an Aquifer Protection Permit or APP in addition to these other permits**

Types of Recharge Methods - USF

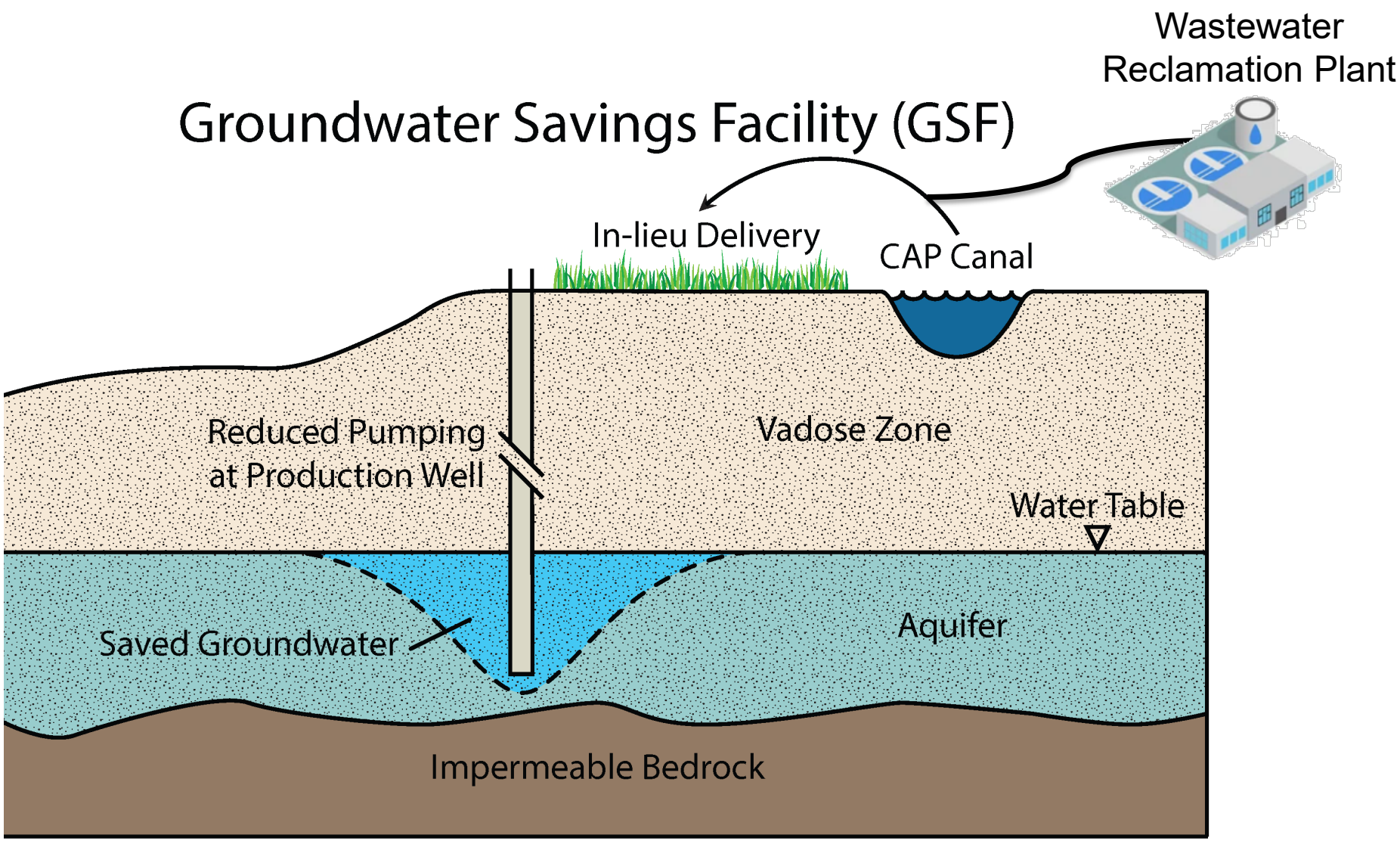


PINAL ACTIVE MANAGEMENT AREA
UNDERGROUND STORAGE FACILITIES

Active and Inactive USFs

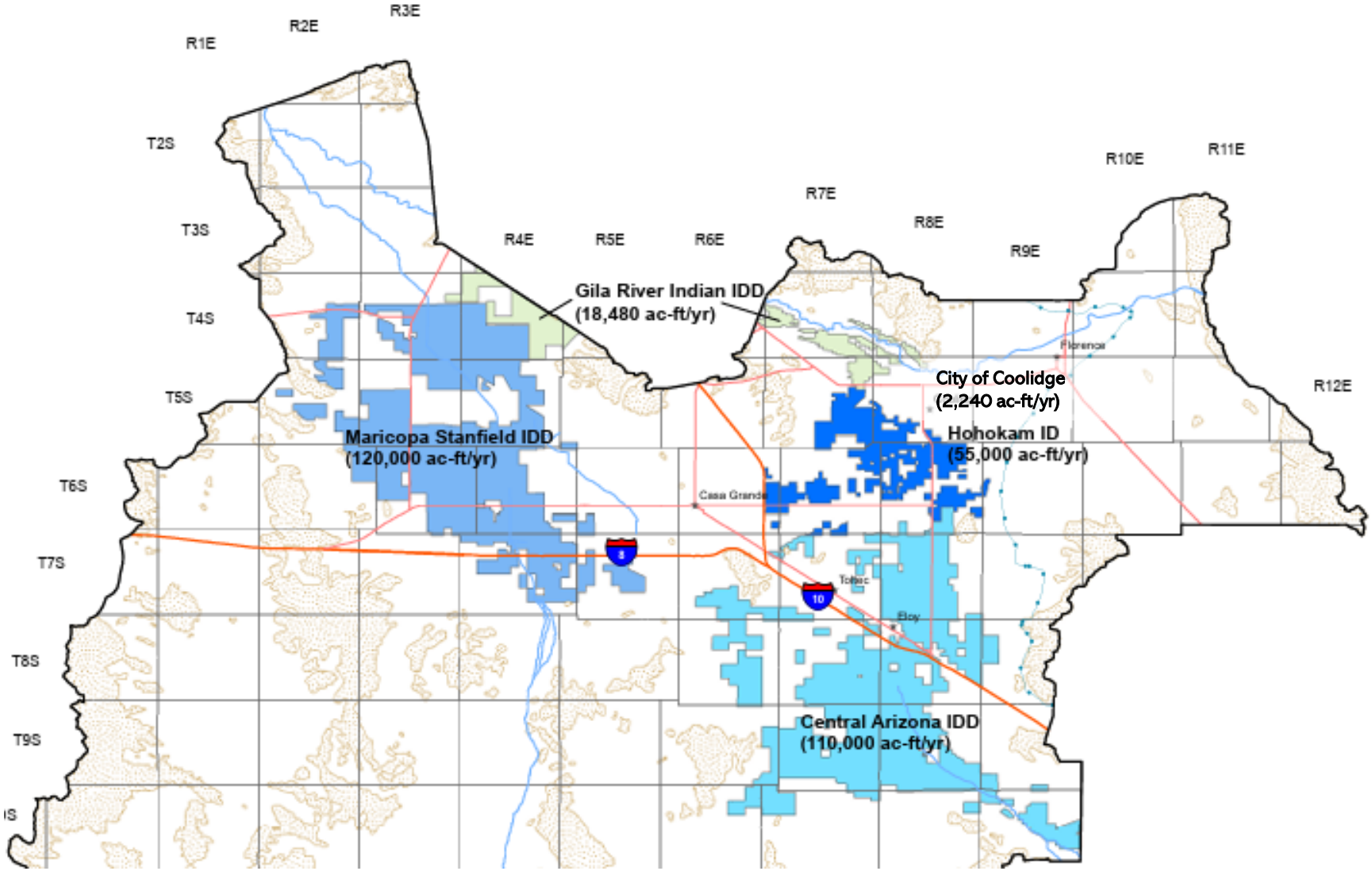


Types of Recharge Methods - GSF

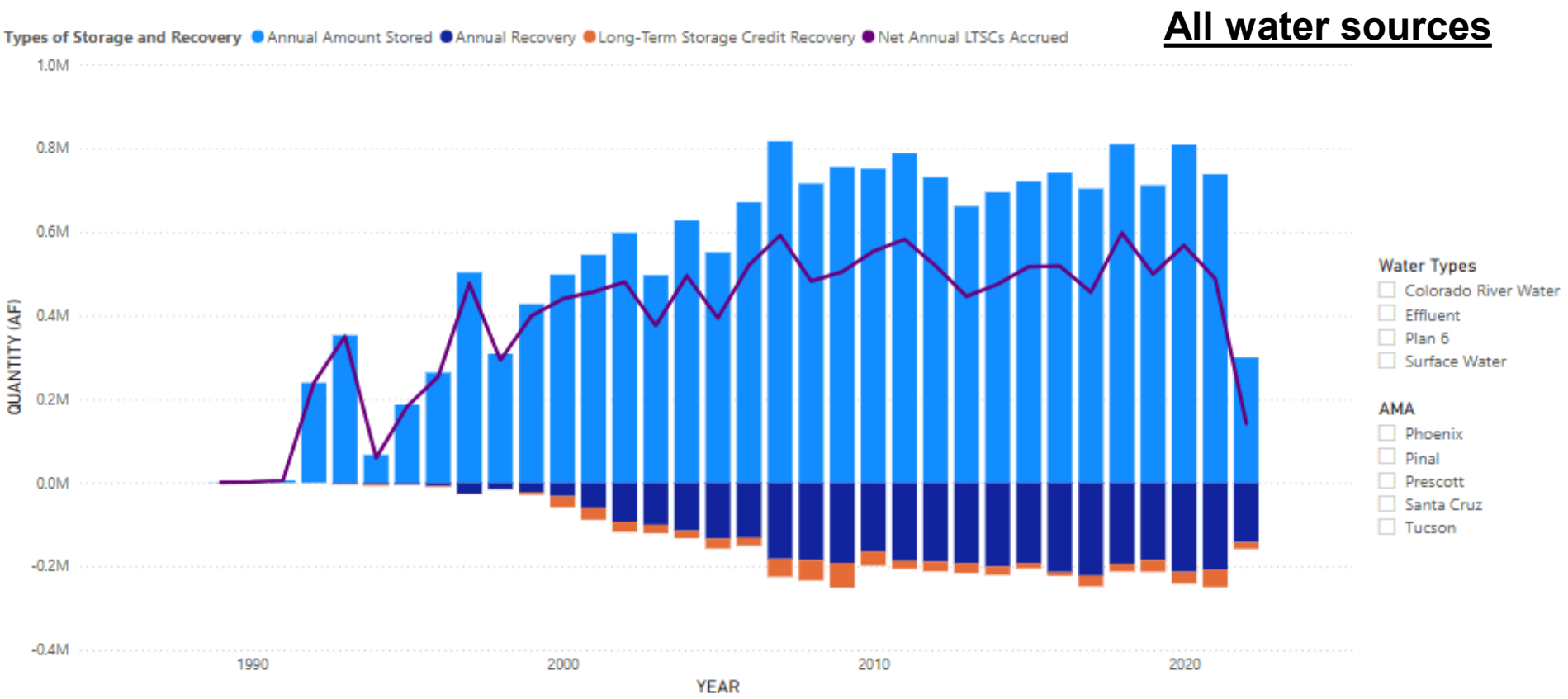


PINAL ACTIVE MANAGEMENT AREA
GROUNDWATER SAVINGS FACILITIES

Underground Water Storage, Savings, and Replenishment Program



Storage and Recovery in all Active Management Areas

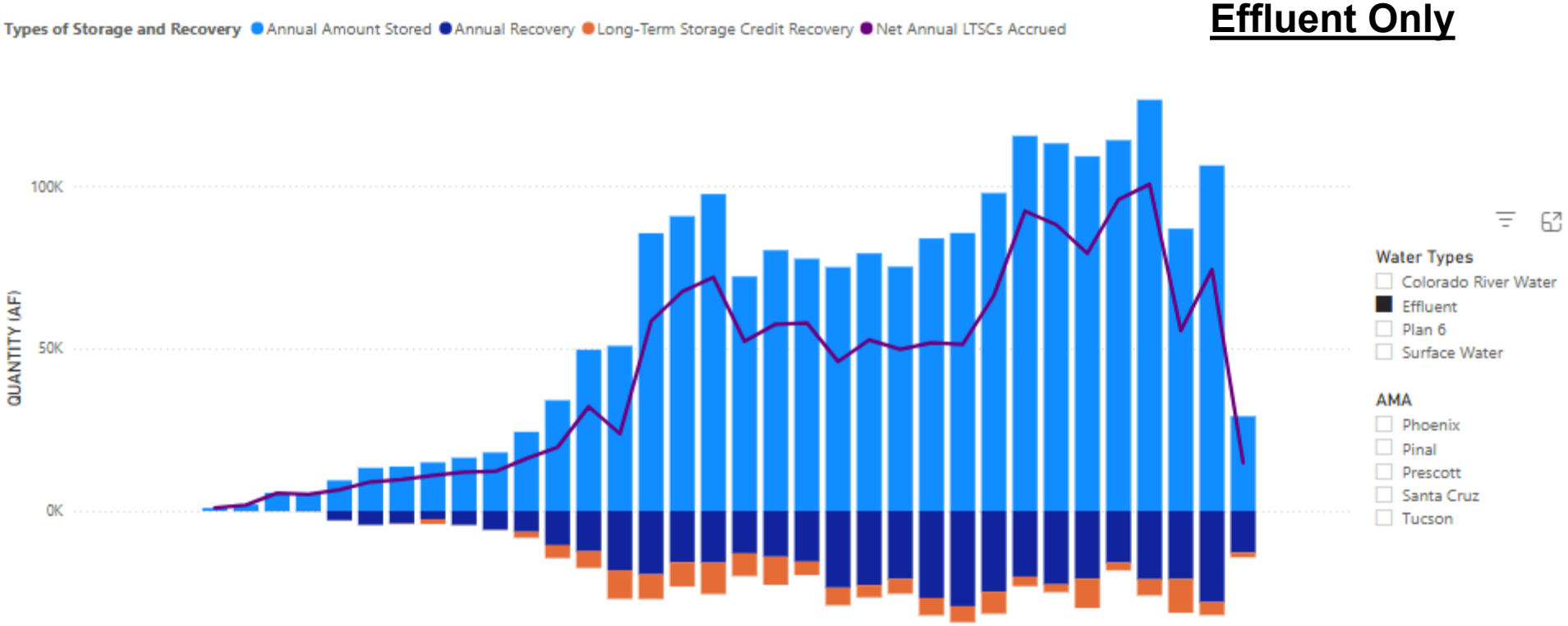


Net Total Long-term Storage Credit Balance
Available for Recovery through 2022 all water sources

13,360,000 acre-feet or 13.36 million acre-feet
4,353,369,360,000 gallons or 4.35 trillion gallons

Storage and Recovery in all Active Management Areas

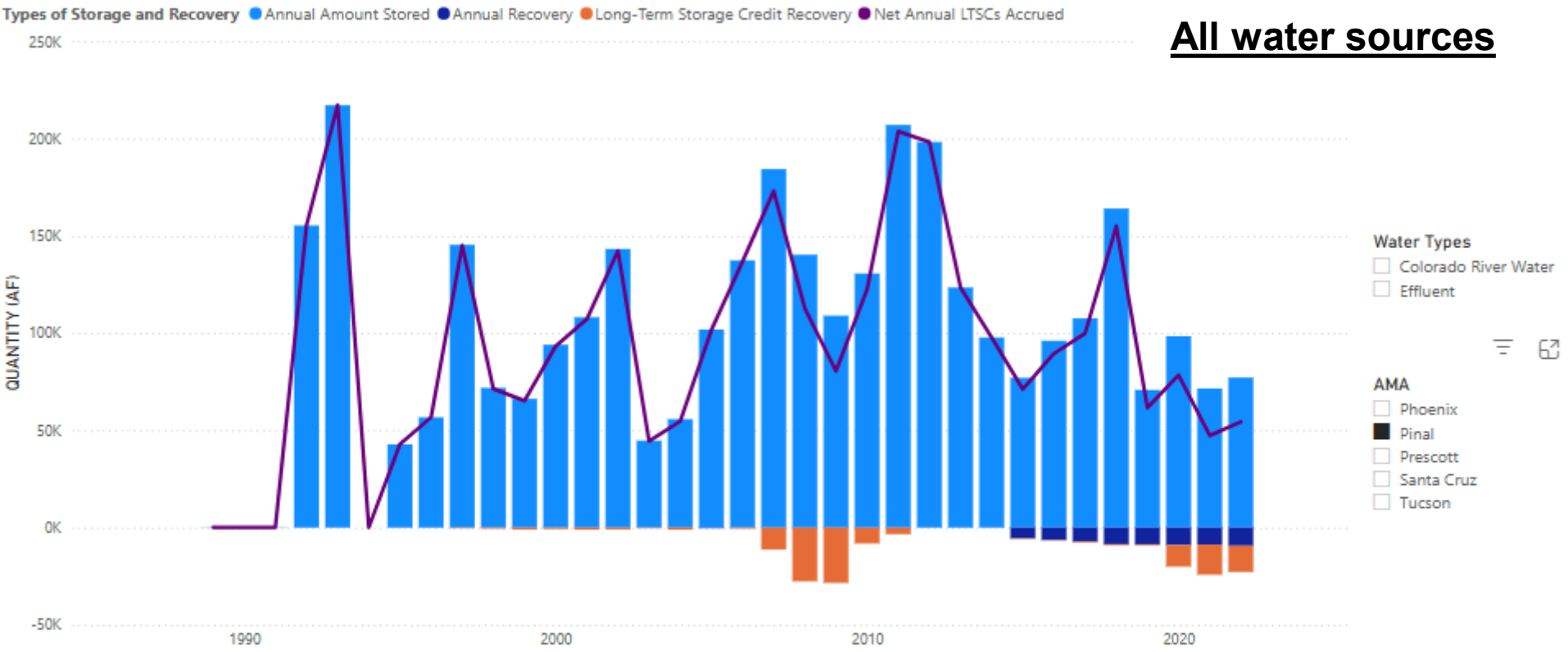
Effluent Only



Net Total Long-term Storage Credit Balance
Available for Recovery through 2022 – effluent only

1,450,000 acre-feet or 1.45 million acre-feet
472,483,950,000 gallons or 472.5 billion gallons

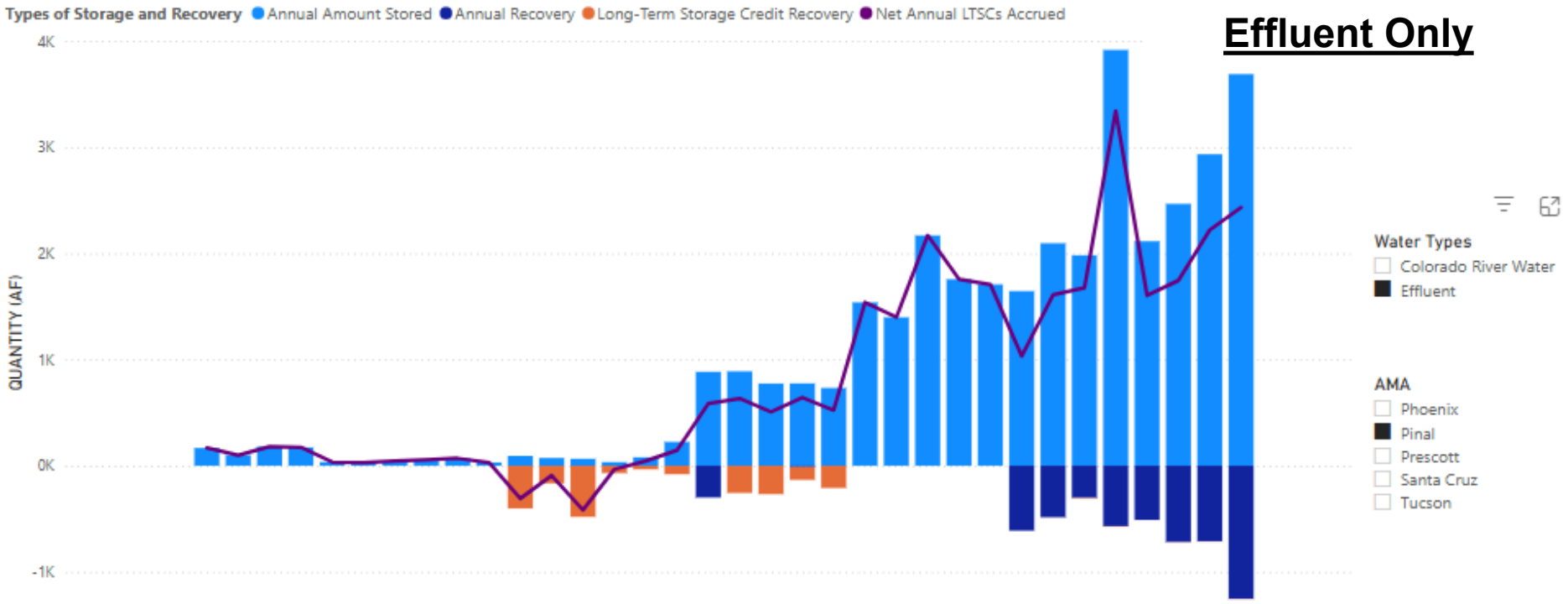
Storage and Recovery in Pinal Active Management Area



Net Total Long-term Storage Credit Balance
Available for Recovery through 2022 all water sources

3,200,000 acre-feet or 3.2 million acre-feet
1,042,723,200,000 gallons or 1.04 trillion gallons

Storage and Recovery in Pinal Active Management Area



Effluent Only

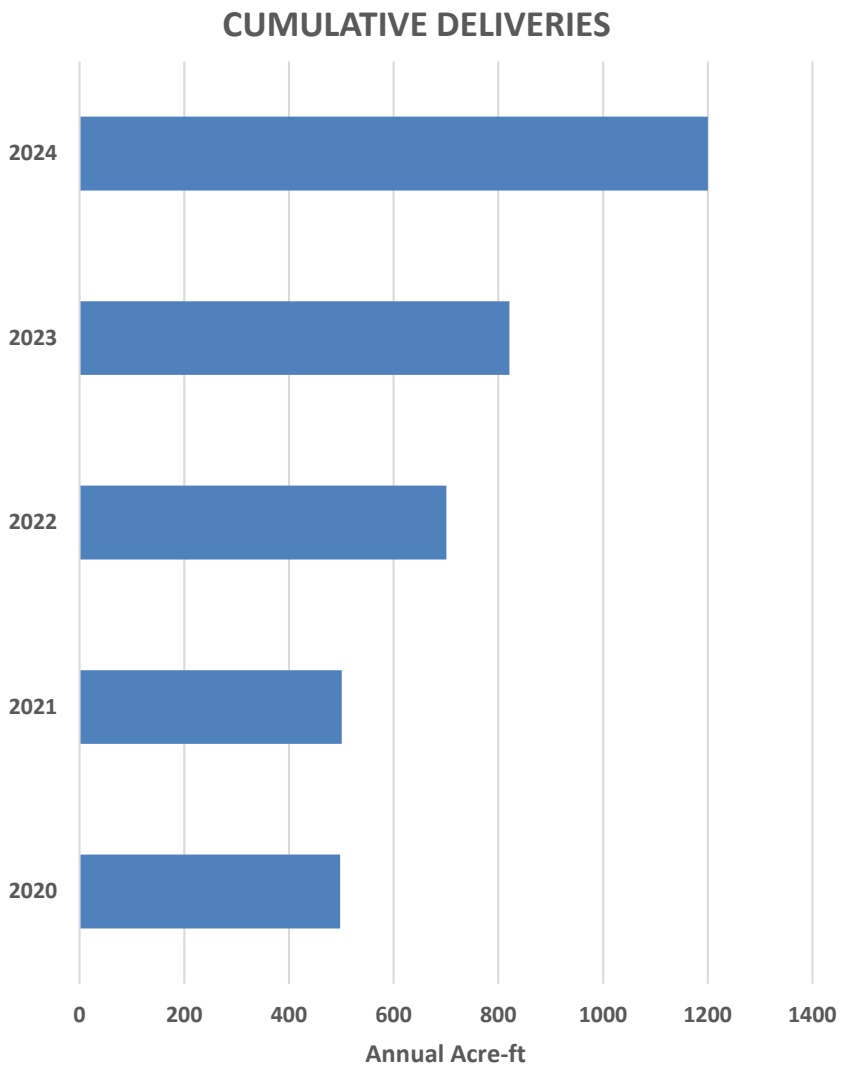
Net Total Long-term Storage Credit Balance
Available for Recovery through 2022 – effluent only

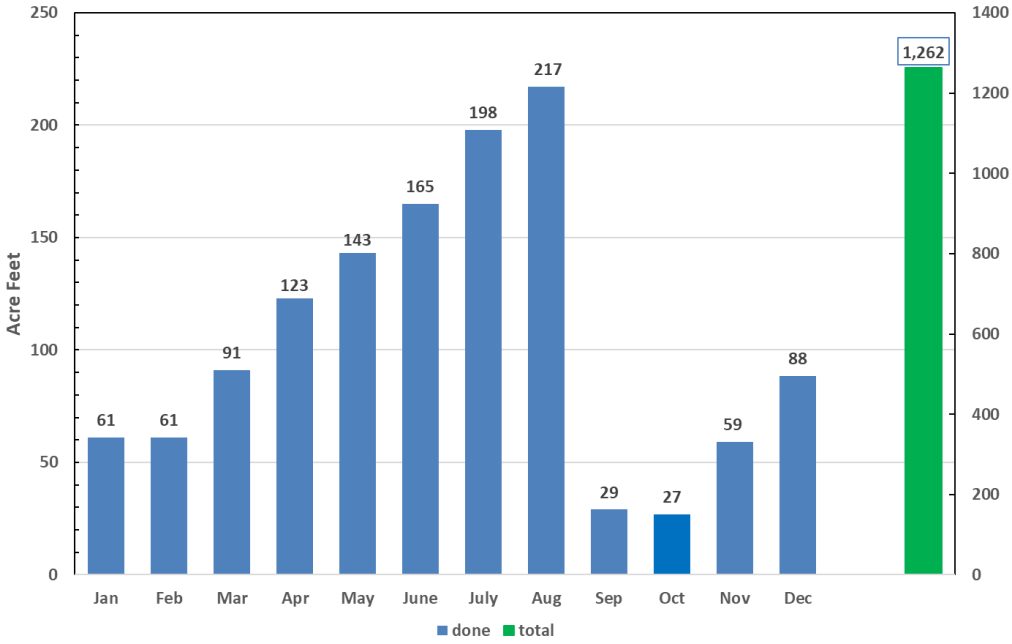
27,350 acre-feet
8,912,024,850 gallons or 8.9 billion gallons

AWC's Pinal AMA Recharge Program

- **Storing CAP in 3 groundwater savings facilities since 2015:**
  - Hohokam Irrigation and Drainage District GSF
  - Central Arizona Irrigation and Drainage District GSF
  - Maricopa Stanfield Irrigation and Drainage District GSF
- **Own and operate Pinal Valley Recharge and Recovery Facility**
  - Storing CAP water since 2020
- **Future sewer provider in Pinal AMA; will include effluent storage and recovery**
- **Own and operate 42 recovery wells**

Pinal Valley Recharge and Recovery Facility







AWC Water Resources Strategy

- **Secure and maintain a diverse water supply portfolio**
  - Reliable and sustainable under a variety of hydrologic and operational conditions
    - Importance of groundwater
    - Importance of effluent
    - Importance of recharge
  - Balance redundancy with affordable prices
- **Promote efficient use of all water supplies**
  - Any type of customers whether existing or future
  - Any type of use including system use
  - Any type of supply source

City of Casa Grande

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Providing Safe Drinking Water: Wells to Faucets

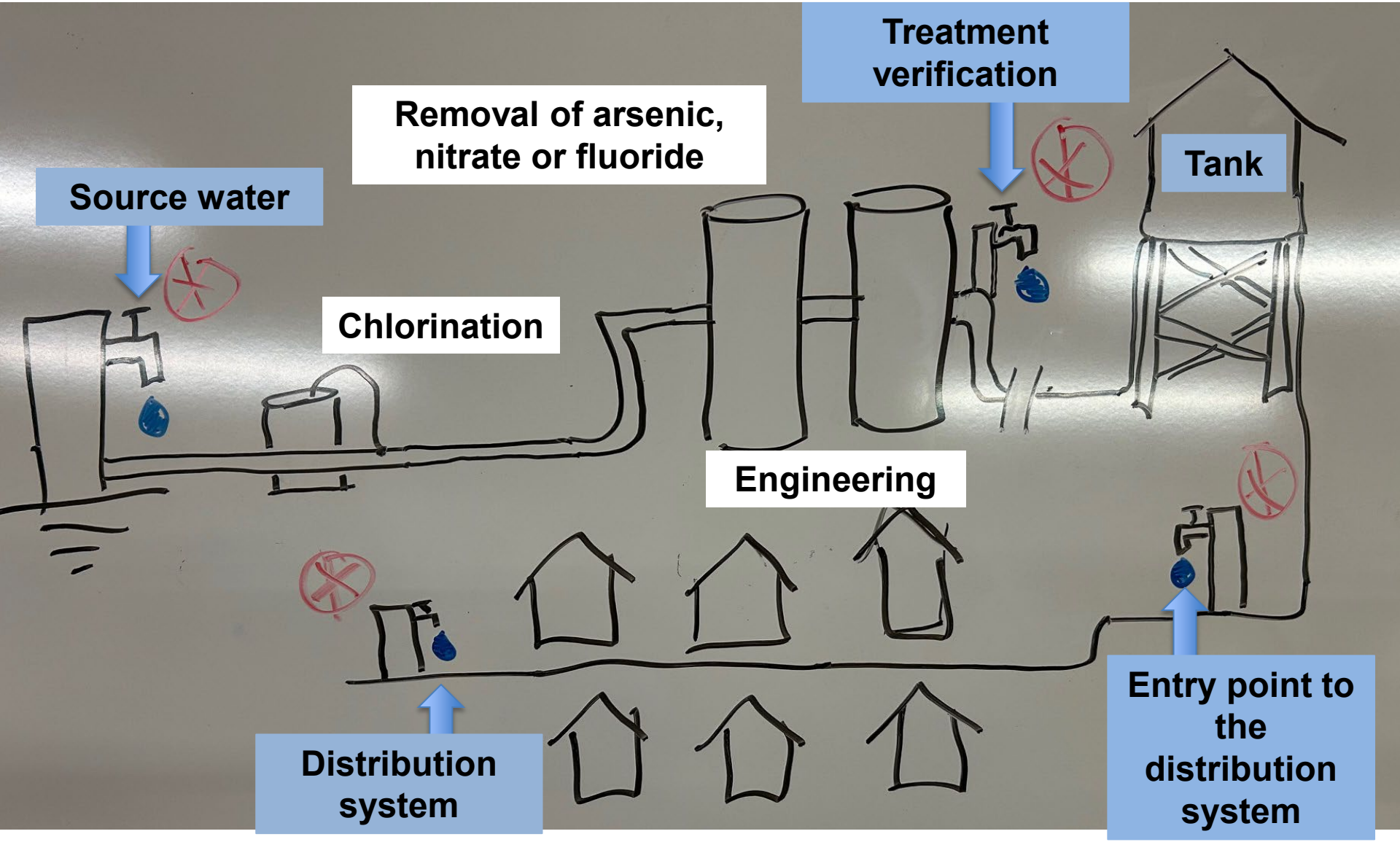
David Dunaway, General Manager – Pinal Valley
Arizona Water Company

Regulations



Safe Drinking Water Act,
Code of Federal Regulations,
Arizona Statute,
Arizona Rule,
Regulatory Bulletins,
Substantive Policy Statements,
Non-substantive Policy Statements

Real Life


Treatment verification
Removal of arsenic, nitrate or fluoride
Tank
Source water
Chlorination
Engineering
Distribution system
Entry point to the distribution system

Operational versus Compliance Testing

Type of Test	Source water	Treatment verification	EPDS	Tank	Distribution System	Totals
Regulatory	24	0	569	0	345	938
Operational	1,121	717	328	223	948	3,337
Totals	**1,145**	**717**	**897**	**223**	**1,293**	**4,275**

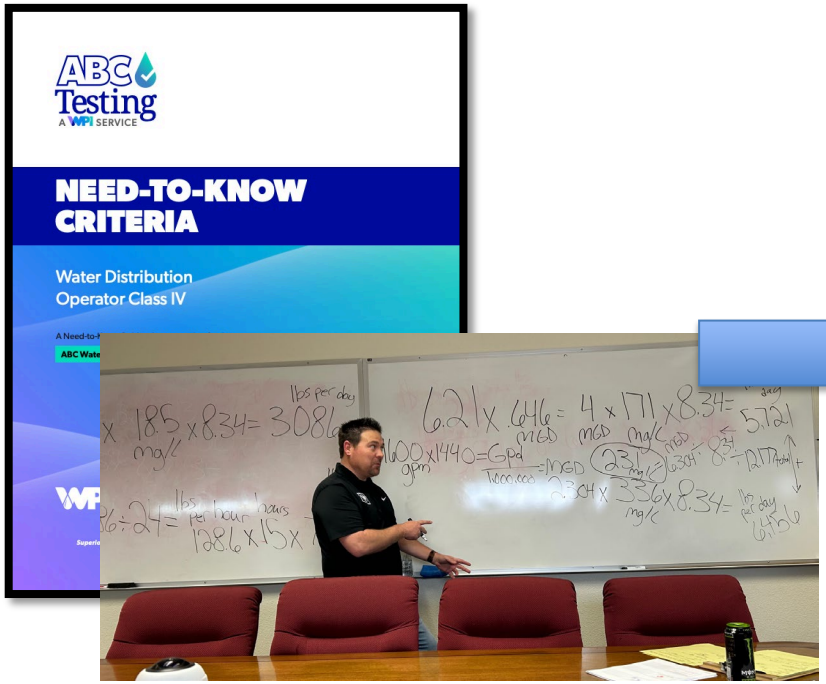
“Regulatory” - ADEQ told us to take it.

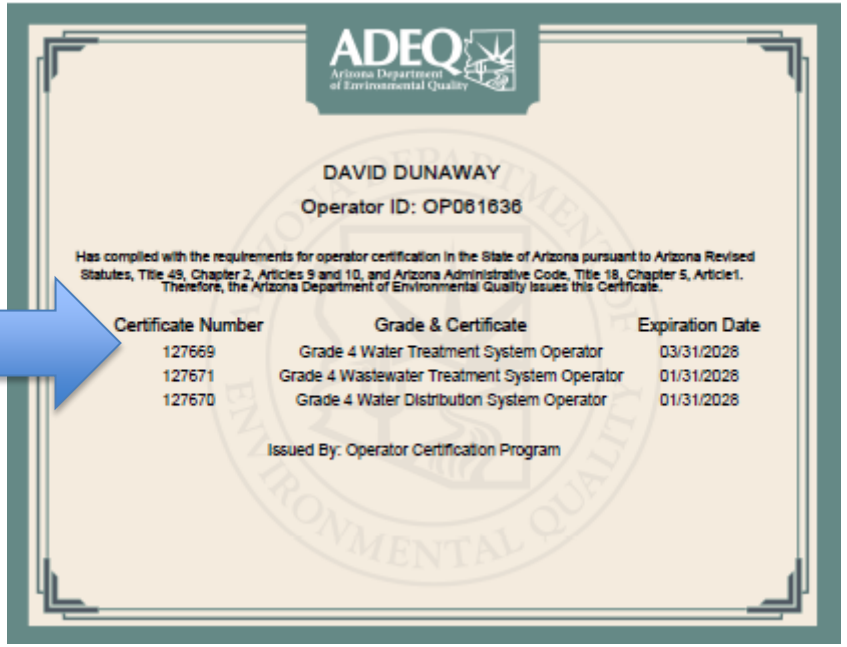
“Operational” - checking the water quality

All samples analyzed by certified labs.

Water Treatment and Distribution Operators

Grade	T1	T2	T3	T4	D1	D2	D3	D4
AWC Overall	26	20	21	26	47	23	26	39
Pinal Valley	8	5	7	8	15	6	7	8





Treatment







The Proof


Accounts & Billing
Locations & Contacts
Development Services
Doing Business With Us
Water Quality
Conservation
Water Rates
Careers
About Us
Pay a Bill
View Your Bill
Start Service
Alerts &
Consumer Confidence Reports
Backflow Prevention/ Cross-Connection Control
Lead-Safe Communities
ARIZONA WATER COMPANY
1964
1973
1980
2000
2007
2023
Proudly Serving Arizona for 70 Years

City of Casa Grande

ARIZONA WATER COMPANY

QUESTIONS

Effluent Generation and Recharge

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