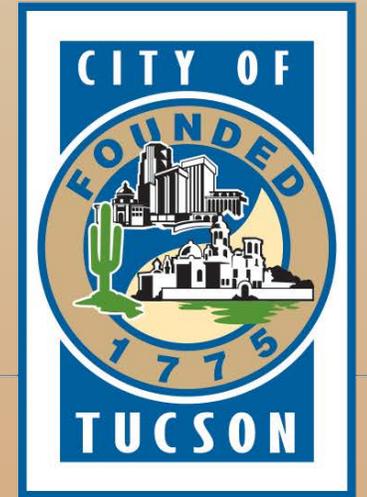


History of Tucson's Recycled Water System



A proud part of the City of Tucson



John Kmiec, Interim Director, Tucson Water
Water Resources Research Center

April 14, 2021

1979 IGA With Pima County



Mayor & Council Communication

June 25, 1979

Subject: TRANSFER OF CITY SEWAGE SYSTEM TO PIMA COUNTY page 1 of 4

On December 18, 1978 the Mayor and Council, by a majority of 4/3, voted to transfer the City Sewerage System to Pima County subject to the following four conditions:

- 1) County acceptance of the City's terms on the effluent issue.
- 2) County acceptance of the responsibility for existing City sewer debt.
- 3) County commitment to the Regional Facilities Plan for a period of three (3) years and award of a construction contract for the Roger Road Plant by September 30, 1979. (End of Federal fiscal year)
- 4) County commitment to not turn the sewerage system over to an independent agency for a period of ten (10) years.

On this same date, the Board of Supervisors voted unanimously to accept the City's proposed transfer and the four conditions.

A City-County Intergovernmental Agreement (IGA), which provides for the above conditions, was presented to and adopted by the Mayor and Council on June 18, 1979. Mayor and Council adoption of the IGA was the first formal action required to implement the sewerage system transfer and to settle the effluent controversy.

Today, Mayor and Council are requested to approve a series of resolutions that are required to implement the terms of the IGA.

Required Actions of the Mayor and Council

The following attached Resolutions and transfer documents are recommended for adoption and execution:

- Resolution authorizing Application to EPA for Grant Transfers; Successor in Interest Agreement
- Resolution authorizing assignment of sewer contracts
- Resolution authorizing execution of deed to Roger Road Treatment Plant; Deed
- Resolution authorizing execution of deed to Randolph Treatment Plant; Deed
- Resolution authorizing execution of License to County for use of City Rights-of-Way; License
- Resolution authorizing the acceptance of a License from the County for City use of County Rights-of-Way; License
- Resolution authorizing the sale of certain motor vehicles to County; Bill of Sale

IGA HIGHLIGHTS

IGA Title: Relating to water and sewers; repealing resolution number 10838 and authorizing the execution of an intergovernmental agreement with Pima County providing for the transfer of the City sewerage system and for the disposition of treated and reclaimed water.

Resolution Number and Date: 10860 (Adopted by the Mayor and Council, 6-26-79)

Signed Parties:
City of Tucson (Water Department), Pima County (Wastewater Management Department)

Related IGAs:
City of Tucson --Pima County Supplemental Intergovernmental Agreement Relating to Effluent (Resolution 18507, Adopted by the Mayor and Council, 2-7-00)

Resolution 11774, Relating to the transfer of the City of Tucson's sewerage system to Pima County; authorizing the execution of first supplement to license agreements between Pima County and City of Tucson for use of the public right-of-way in Pima County and the City of Tucson (Adopted by Mayor and Council 3-15-82). *Note to file: A copy of a similar draft agreement dated August 2005 was found in the files but it is unclear whether this was ever finalized.*

Key Points:

(TBC)

Key obligations of parties (summary, denote timeframe--annually, case by case basis, etc.)



INFORMATION ON ITEM #16 ON THE REGULAR AGENDA OF JUNE 18, 1979

Mayor & Council Communication

June 18, 1979

Subject: Transfer of City Sewerage System to Pima County page 1 of 4

On December 18, 1978 the Mayor and Council, by a majority of 4/3, voted to transfer the City Sewerage System to Pima County subject to the following four conditions:

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On this same date the Board of Supervisors voted unanimously to accept the City's proposed transfer and the four conditions.

A City-County Intergovernmental Agreement (IGA), which provides for the above conditions, is presented for adoption at today's meeting. The IGA is the first formal action required to implement the sewerage system transfer and to settle the effluent controversy.

CURRENT STATUS OF TRANSFER

The City and County staffs have negotiated an IGA which has been reviewed by the Mayor and Council and the Board of Supervisors. The City and County have previously indicated concurrence with all terms of the IGA with the exception of Article III dealing with Effluent (Re-claimed Water).

Contrary to the unanimous vote of the Board of Supervisors on December 18, 1978, on June 12, 1979, the County indicated they do not accept the City's terms on the effluent issue and have submitted their terms. Moreover, staff has been advised that the County has specifically withheld approval on all parts of the IGA until accord is reached on the effluent section of the IGA. County correspondence relative to their June 12, 1979 meeting is included as Attachment A to this communication.

EFFLUENT ISSUES

Article III of the IGA that is presented for adoption at today's meeting is based on effluent terms determined by the Mayor and Council on May 7, 1979 and transmitted to the County by the Mayor on May 11, 1979. Since May 11, 1979, the Mayor and Council approved IGA has been updated with clarifying language and other changes as follows:

1980 Ground Water Management Act

- Established laws that allowed the State to manage and protect groundwater for the benefit of all Arizona residents.
 - Created ADWR
 - Established Active Management Areas
 - Initiated Assured Water Supply Program
 - Mandated Reductions in Water Use





Construction of Recycled Water Plant, First Test Basins

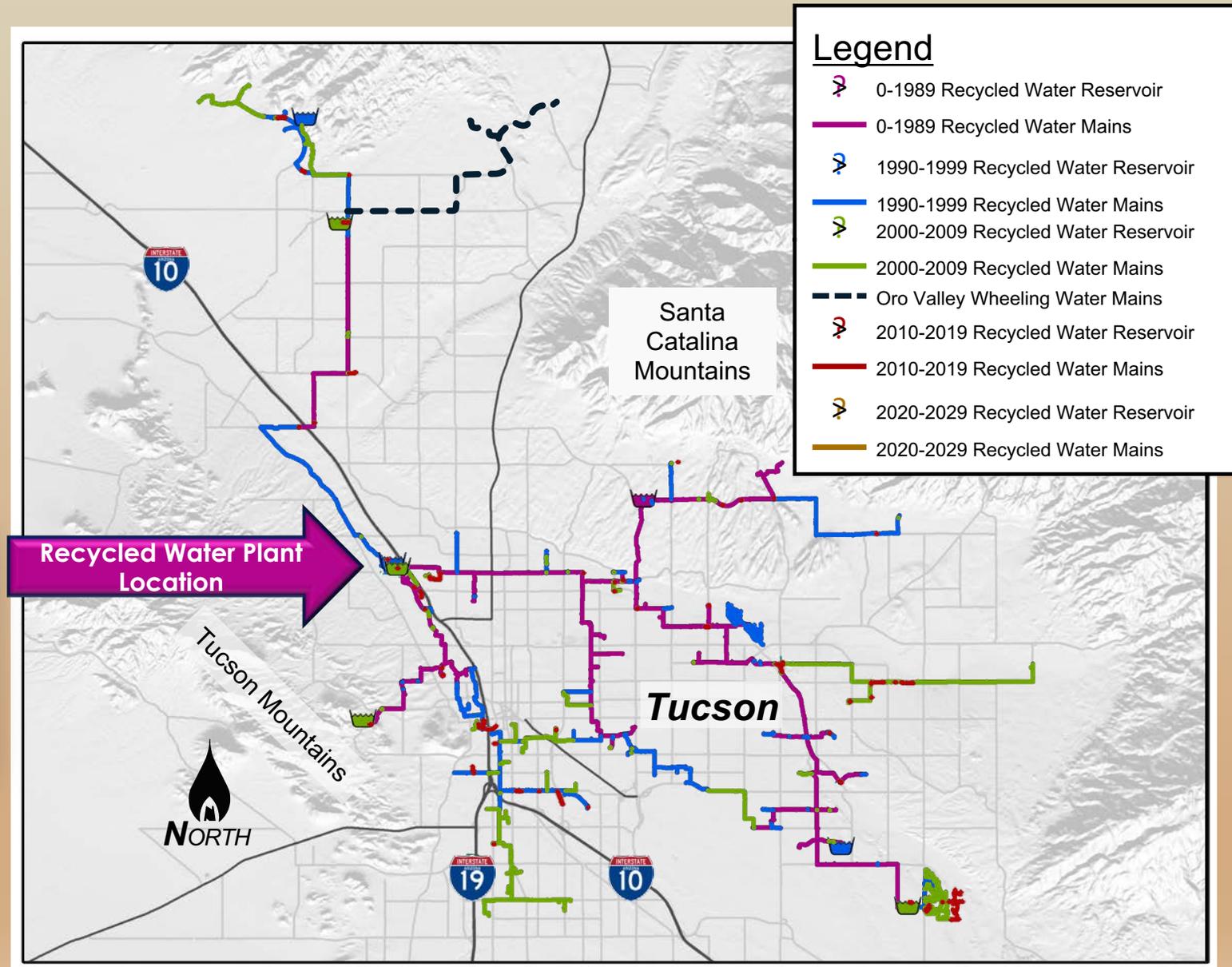
Recycled Water Treatment Plant

- Secondary Effluent received from Pima County
- Treat 6,000 AF/YR
- Peak daily rate of 10 MGD
- Dual-media filtration (Sand, Coal)
- Disinfection

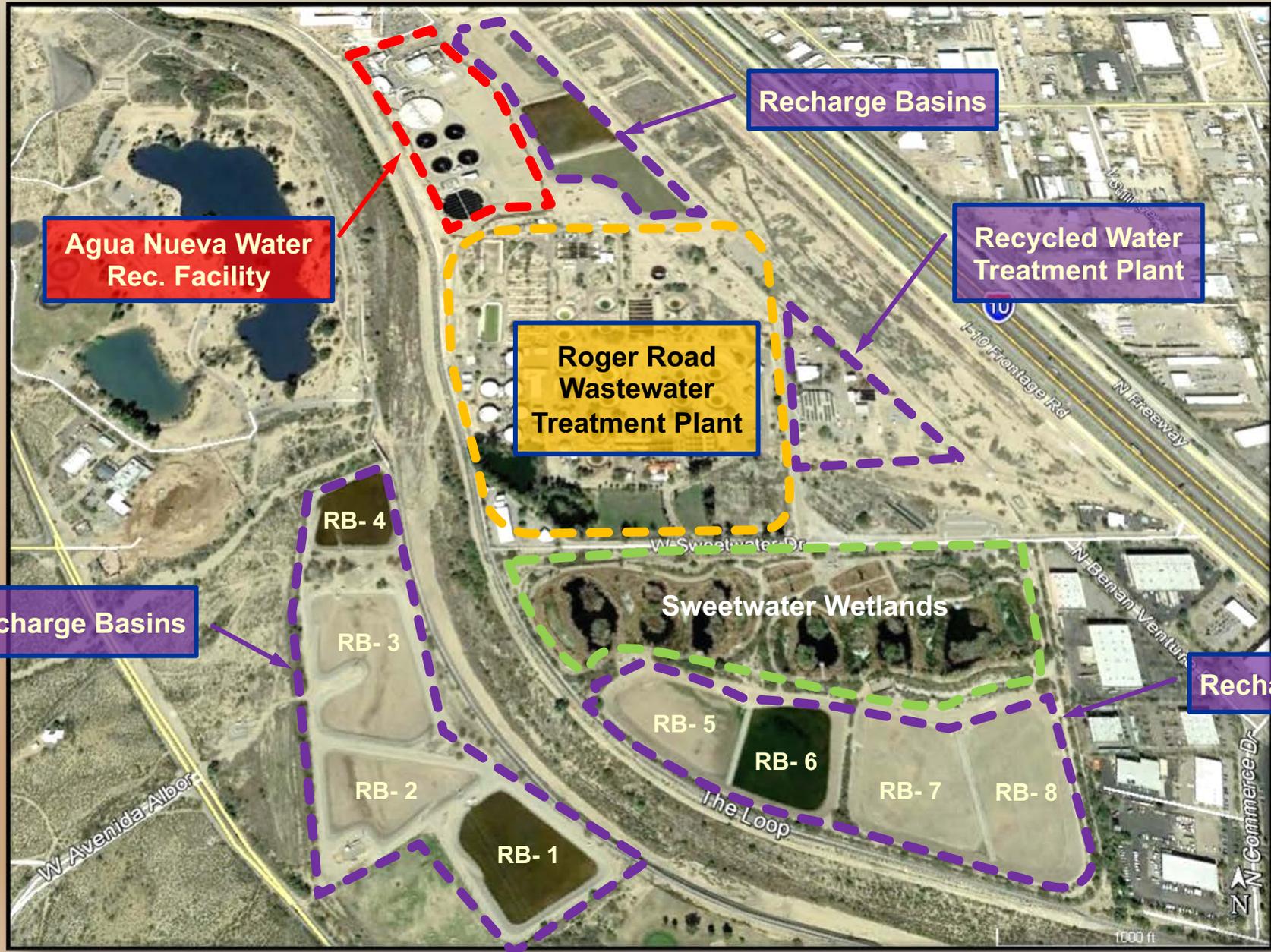


Tucson Water's Recycled Water System

- All 6 Public (City And County) Golf Courses & 11 Private Courses
- 62 Schools
- 37 Parks



Tucson Water's Recycled Water Plant, Recharge Basins & Pima County Agua Nueva Water Reclamation Facility



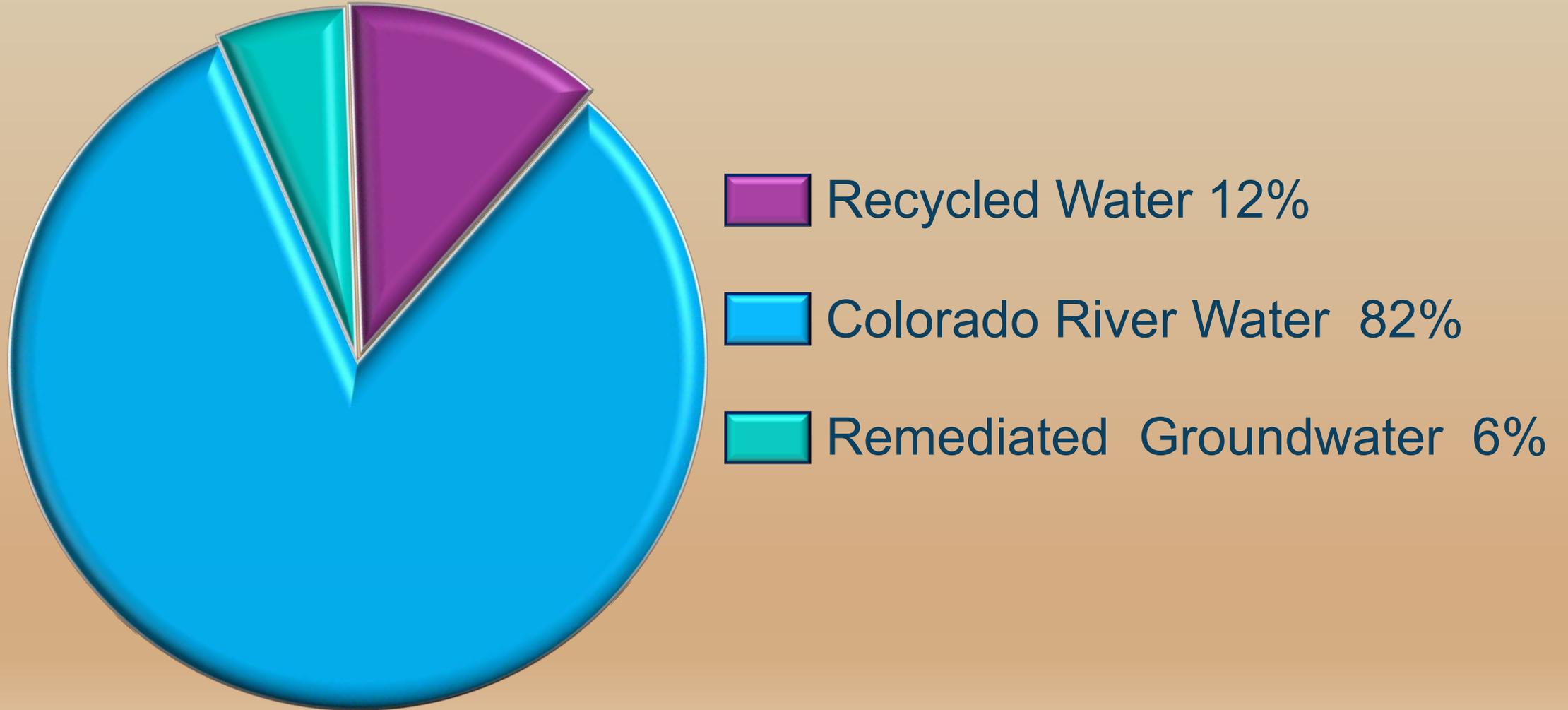
Our Recycled Water System Today

- 1000+ Customers
- 173 Miles of Pipe
- 15 Boosters
- Over 30 MGD Delivery Capacity

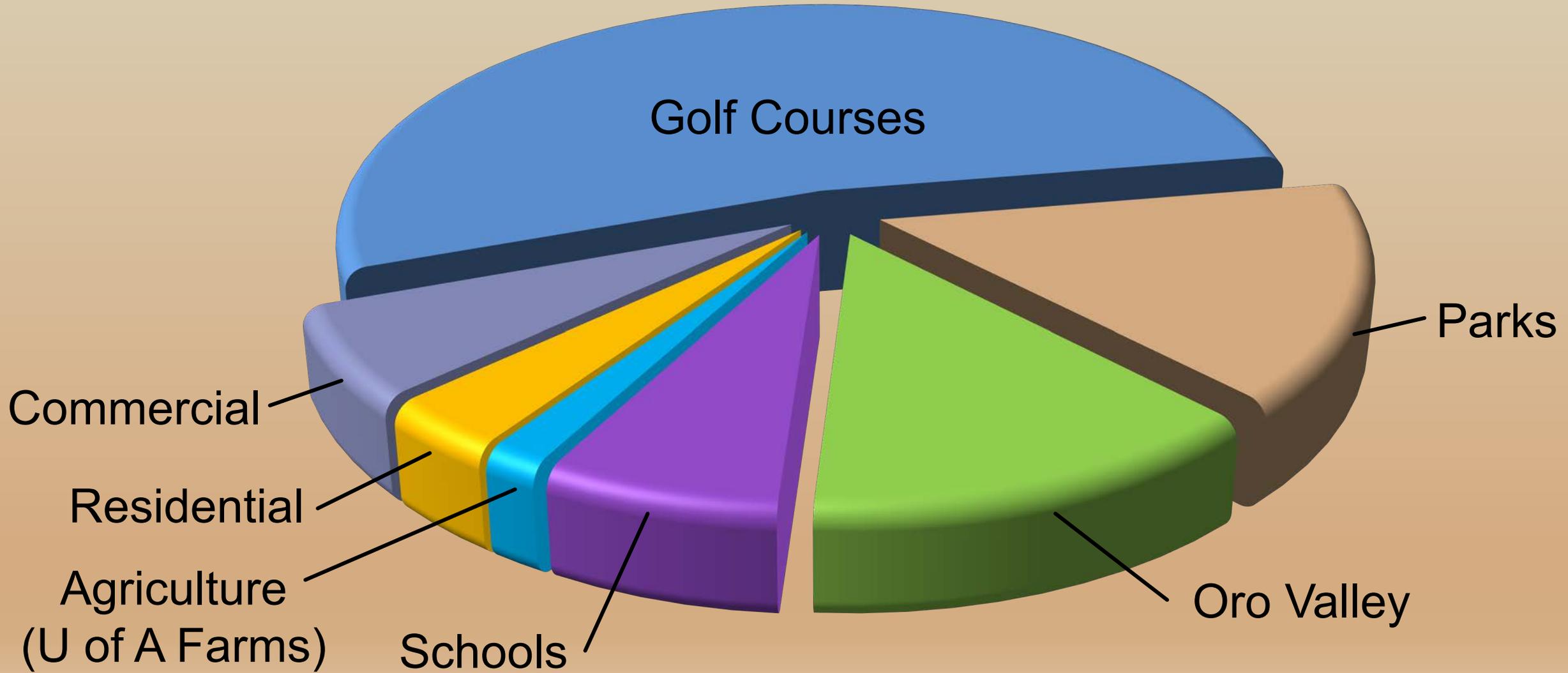


Tucson Water Total Water Production (2020)

112,095 AF



Recycled Water Use By Sector (% Volume)



Recycled Water Revenues and Operational Budget

- Recycled Water revenues are about \$9 Million a year
- Operational budget averages \$4 Million
- Total cost about \$13 Million a year including
 - \$16.4 Million Planned in Capital Improvement Projects in next 5 years
 - Includes Reservoir and Tank Rehabilitation
 - Filter modification
 - Main replacements and system enhancements

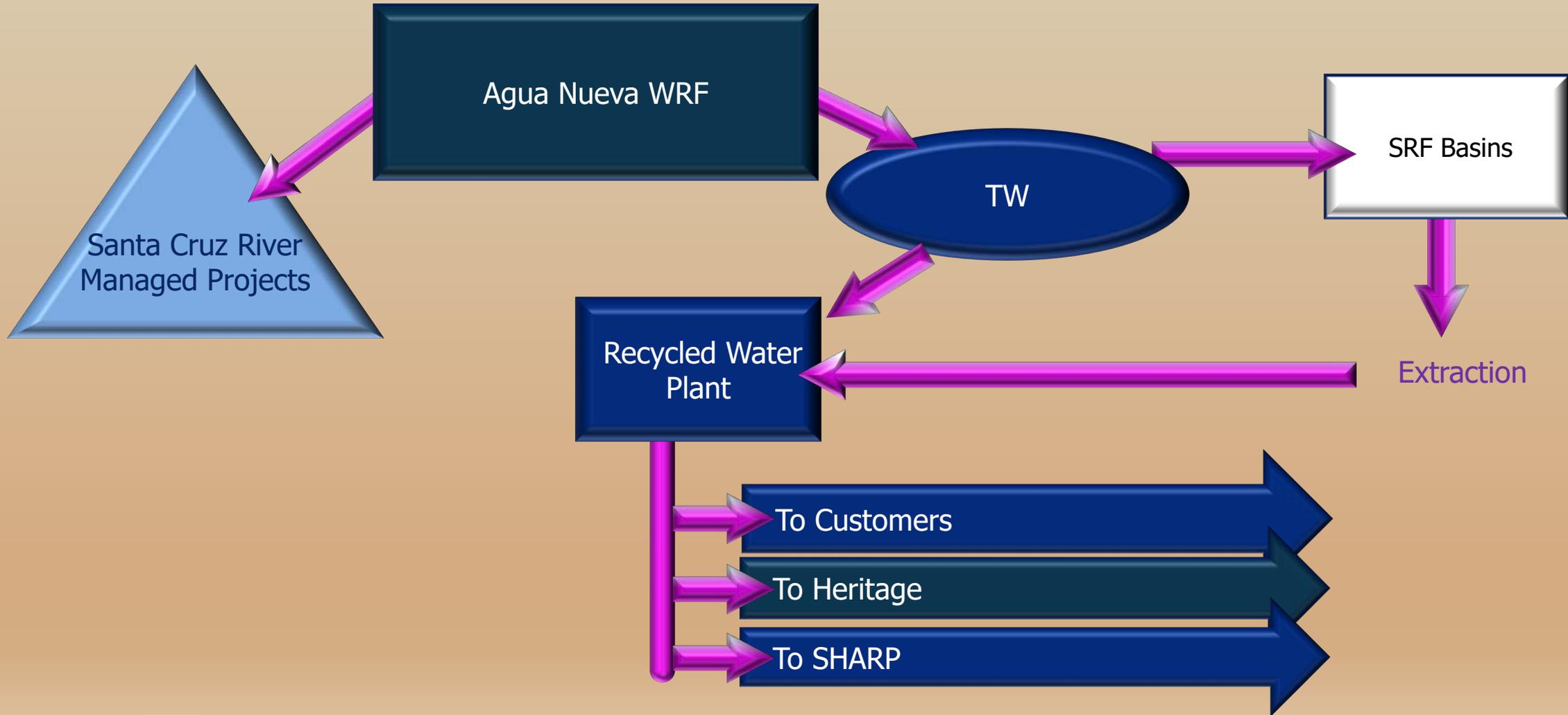


Incentives to Convert Loan Program

- Tucson Water Advances Funds For On-site Improvements
- Funds Repaid From Savings
- No Increased Cost For School District Taxpayers



Tucson Water Recycled Water System Schematic



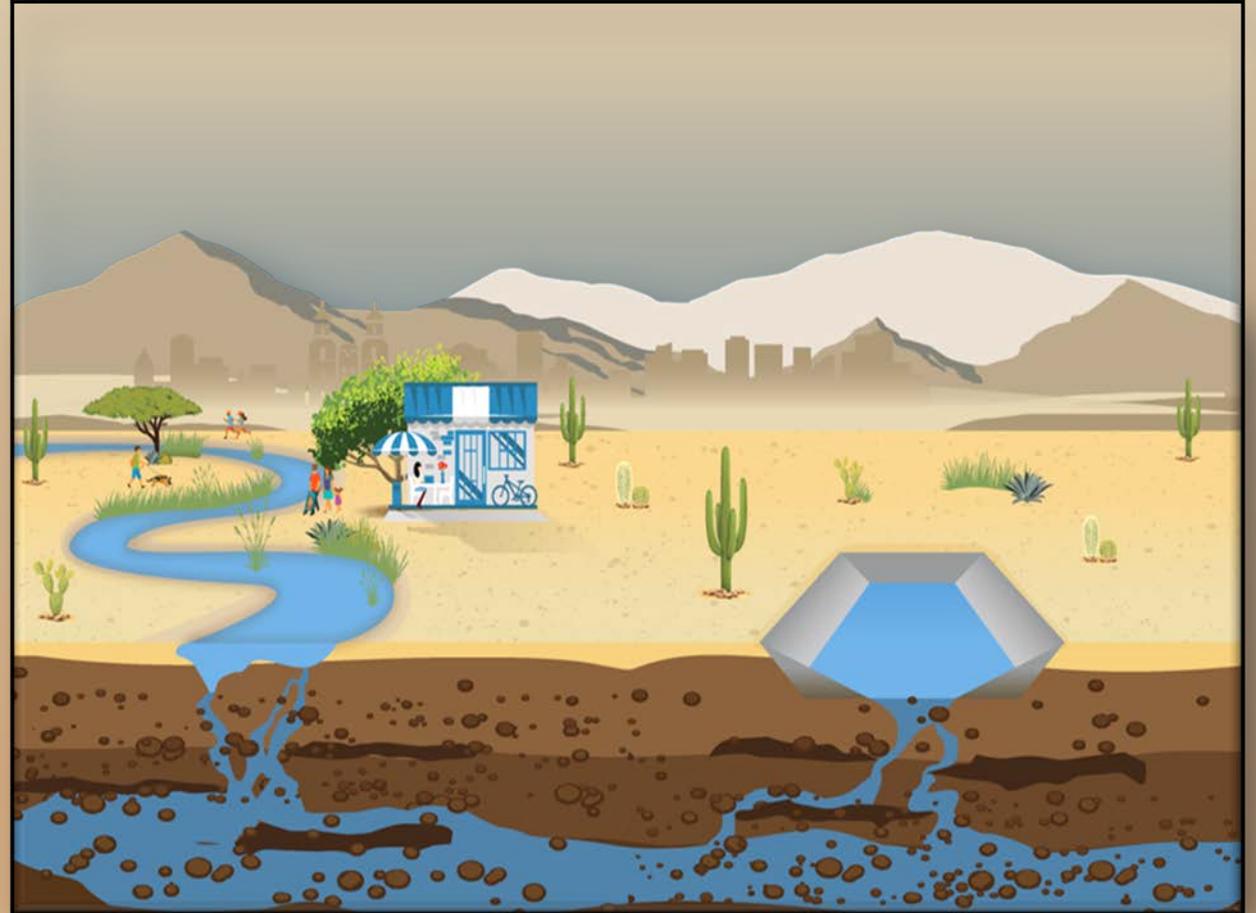
Benefits of Recycled Water Recharge

Flexibility:

- Seasonal Storage for Peak Usage Months
- Long-Term Storage

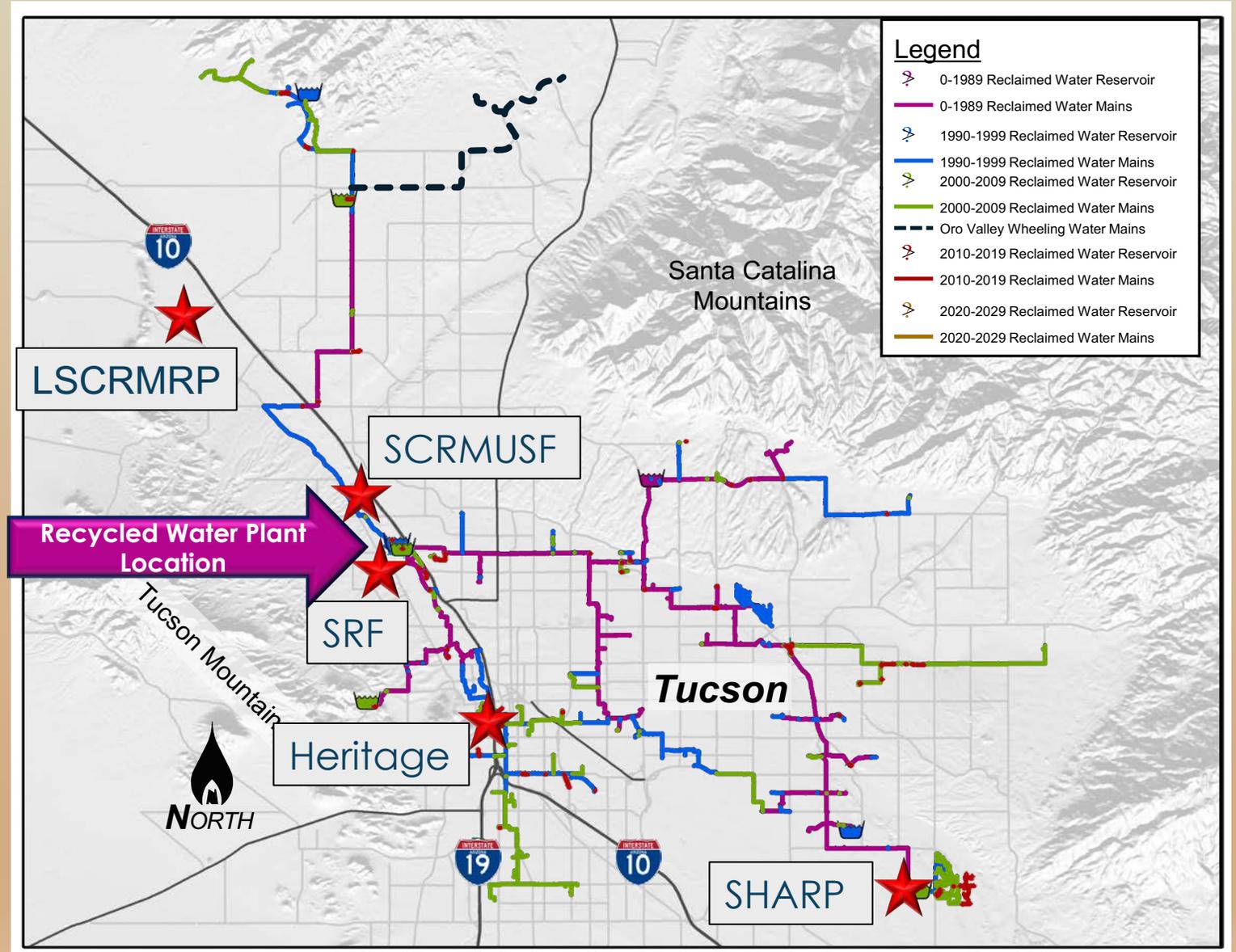
Water Quality Improvements:

- Total Nitrogen
- Turbidity
- Bacteria
- Total Organic Carbon



Recycled Water Recharge Projects

- Sweetwater Recharge Facilities (SRF) 1984
- Santa Cruz River Managed Underground Storage Facility (SCRMUSF) 1999
- Lower Santa Cruz River Managed Recharge Project (LSCRMRP) 2003
- Santa Cruz River Heritage Project (Heritage) 2019
- Southeast Houghton Area Recharge Project (SHARP) 2020



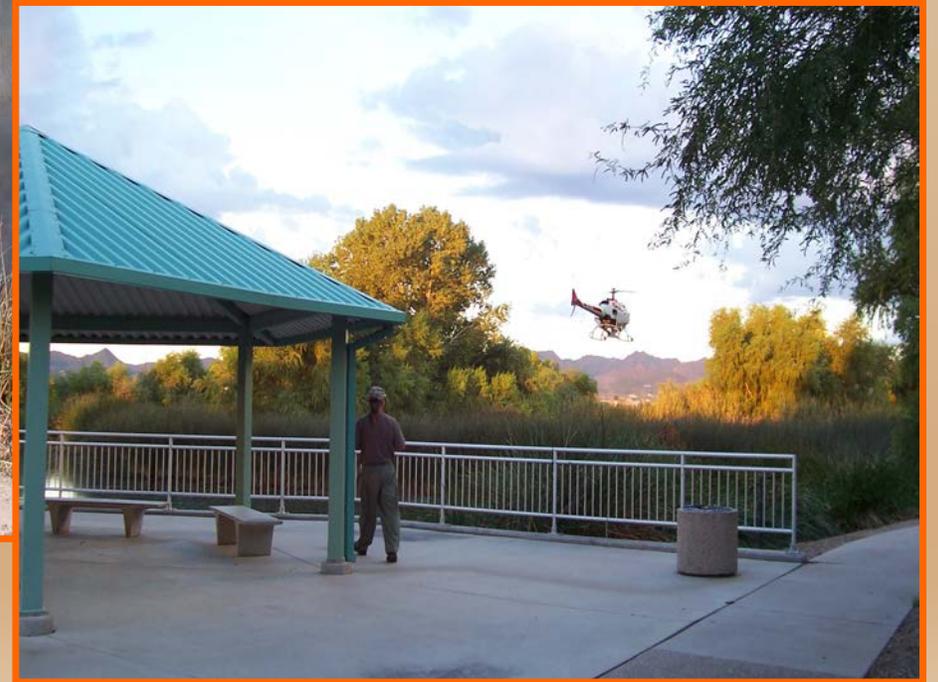
Sweetwater Wetlands Designed to be A Wastewater Backwash Treatment Facility



Recycled Water Recharge Basins



Sweetwater Wetlands and Recharge Basin Facility Maintenance

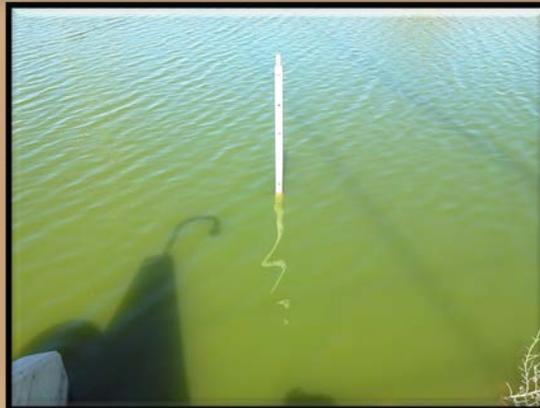


Recharge Basin Maintenance

Schmutzdecke



Chisel plowing to maintain Infiltration



Algae



Managing Mosquitos?

Trapping Mosquito's

- Dry ice lure
- Battery operated
- Over night deployed
- Once a week
- U of Arizona
 - ▶ Counts
 - ▶ And identifies



Tucson Water
Hydrologist and
Mosquito Wrangler



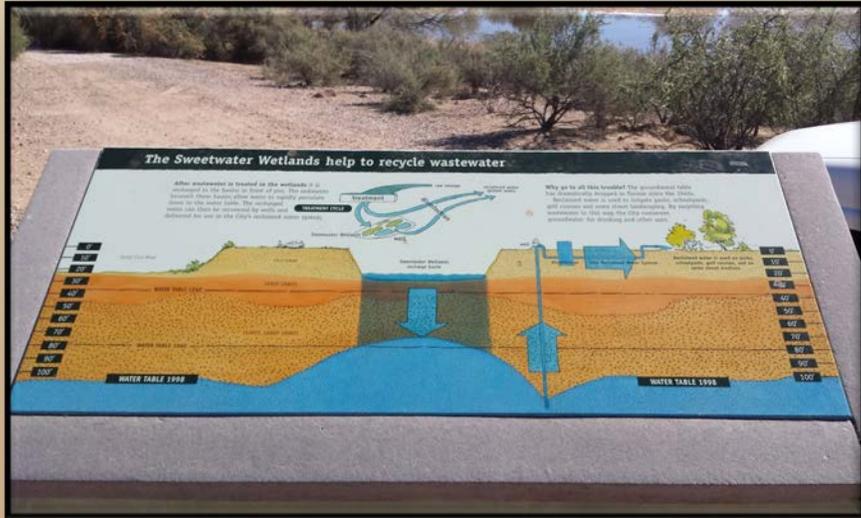
Once a Year We Burn Excess Vegetation



After the Burn



Sweetwater: A Multi-Benefit Project



Educational Signs

Group Educational Opportunities



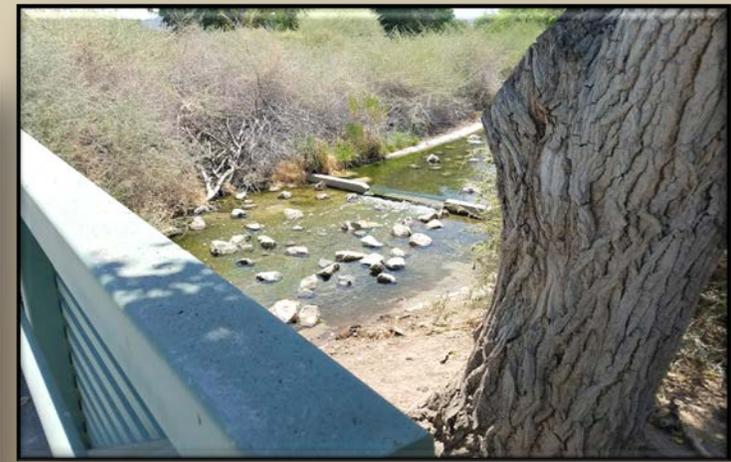
USGS with
Bureau of Indian
Affairs Students



An Outdoor Classroom



Outdoor Opportunities



Tucson Meet Your Birds

Come to Sweetwater Wetlands and let us show you the birds!

Saturday, March 3 | 7 AM to noon

[Learn more](#)



Managed Recharge



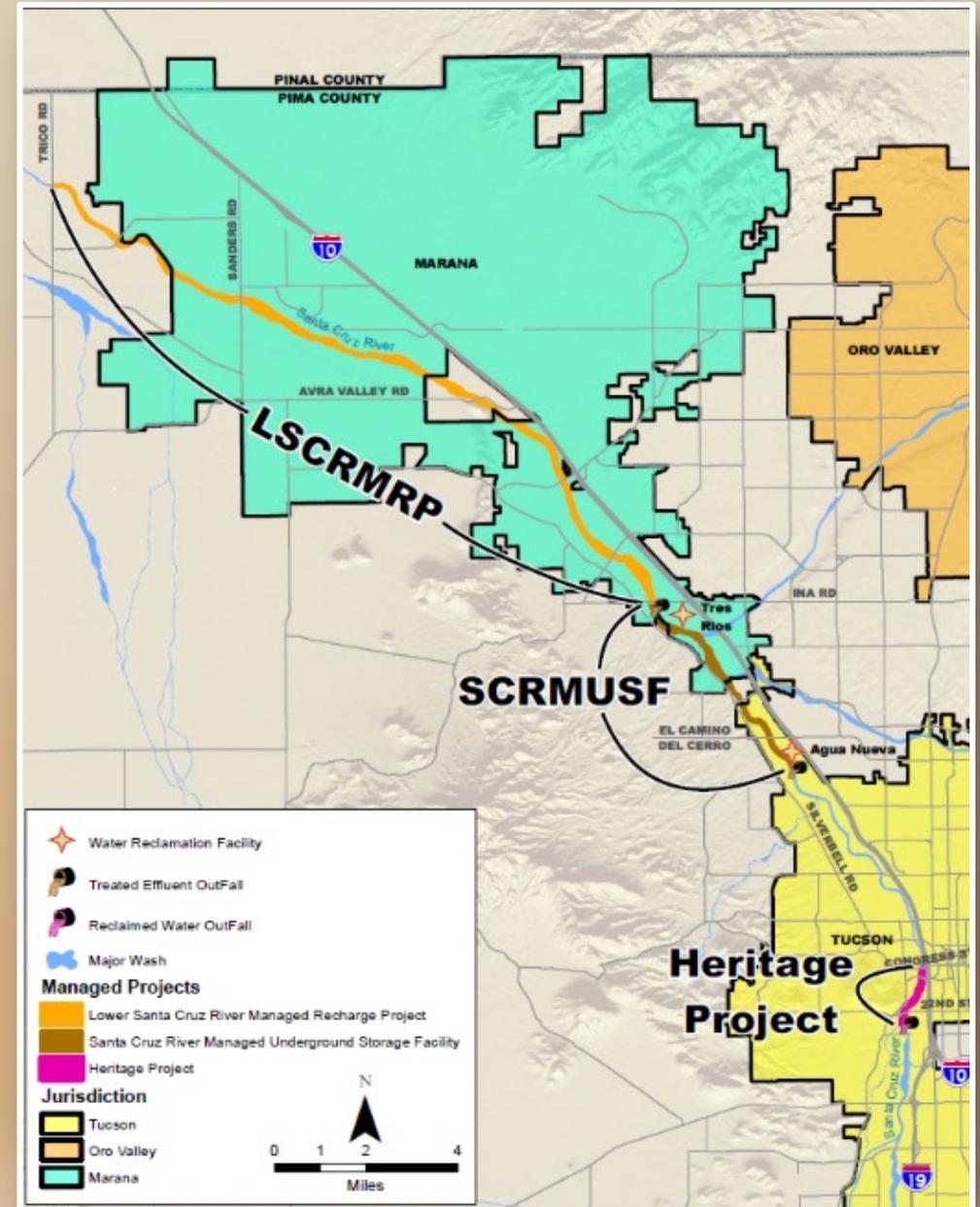
Managed Recharge Projects

Legal Framework

- 1989 Arizona Public Service V. Long
- 1994 ADWR Authorized To Issue Facility Permits
- 2019 Legislative Change to Cut-to-the-Aquifer (50% - 5%)

Institutional Framework

- 1979 COT Transfers RRWTP To PC
- COT Retains Ownership Of 90% Of Effluent
- PC Retains 10% Of Effluent
- SAWRSA - 28,200 AF/YR

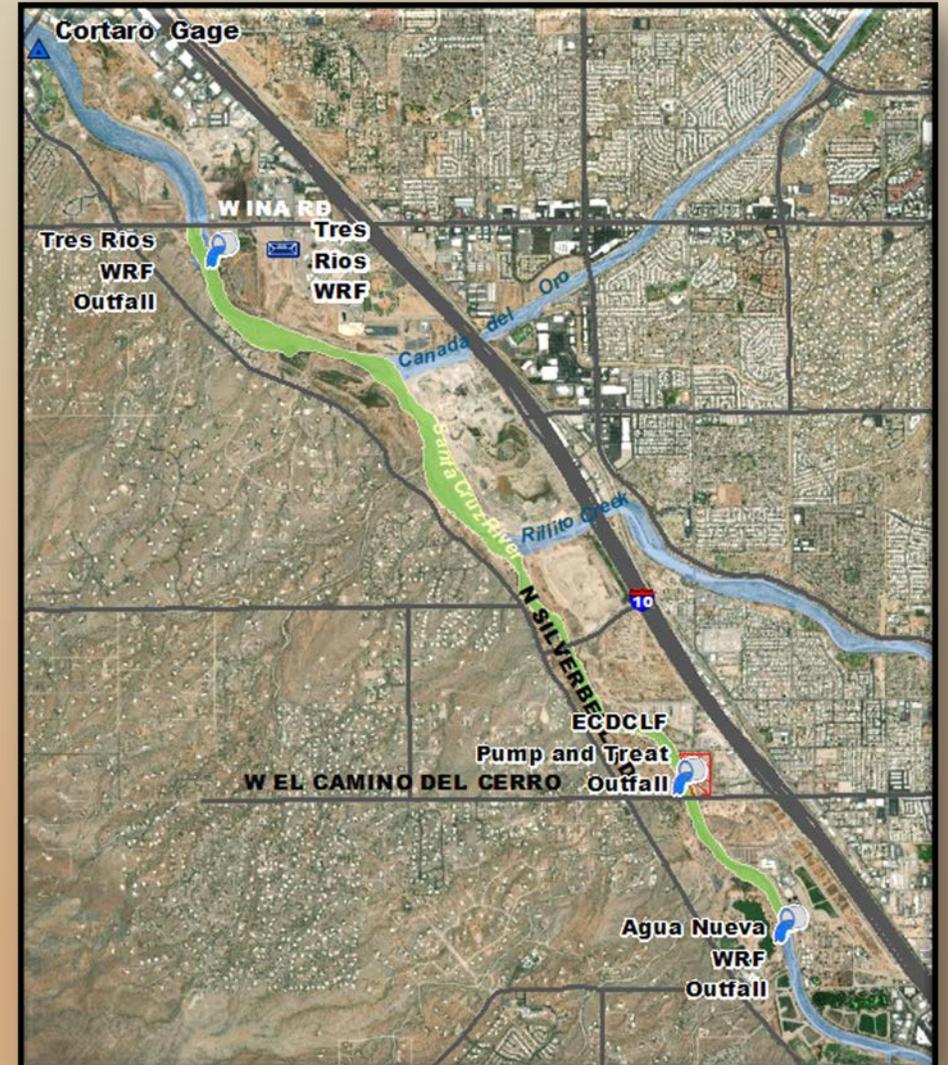




SCRMUSF

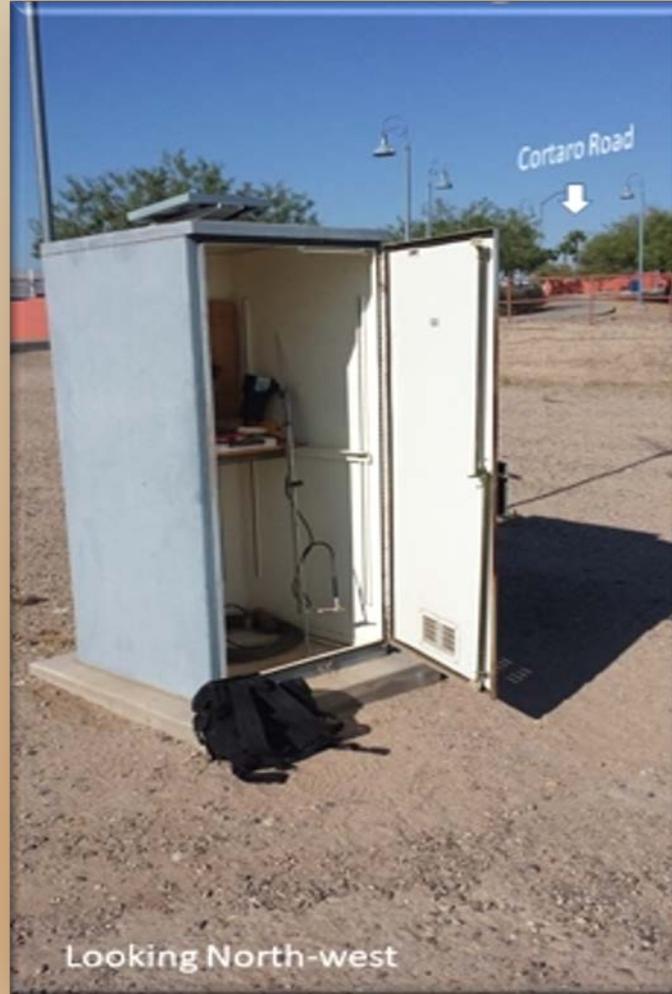
SCRMUSF Layout

- 5.1 Miles of the Santa Cruz River
- ANWRF Outfall
- TRWRF Outfall
- Permitted Volume of 9,307 AF/YR
- Source Water Average Delivery 2015-2020 - 5,744 AF/YR
- Recharge Rates: Average 3.38 AF/mile
- Evapotranspiration: ~1.54 Feet/day (Average of 580 AF/YR)



No recharge calculated on storm days

SCRMUSF Monitoring



Stream Flow measured at
USGS Cortaro Gaging Station



LSCRM RP

LSCMRP Description

- 17.9 Miles of the Santa Cruz River
- Average Delivery 32,000 AF/YR
- Permitted Volume 43,000 AF/YR
- Average Recharge Rate 43,000 AF/YR
- Average Recharge Rate 4.3 AF/mile
- Evapotranspiration ~3.5% (Average of 1,020 AF/YR)



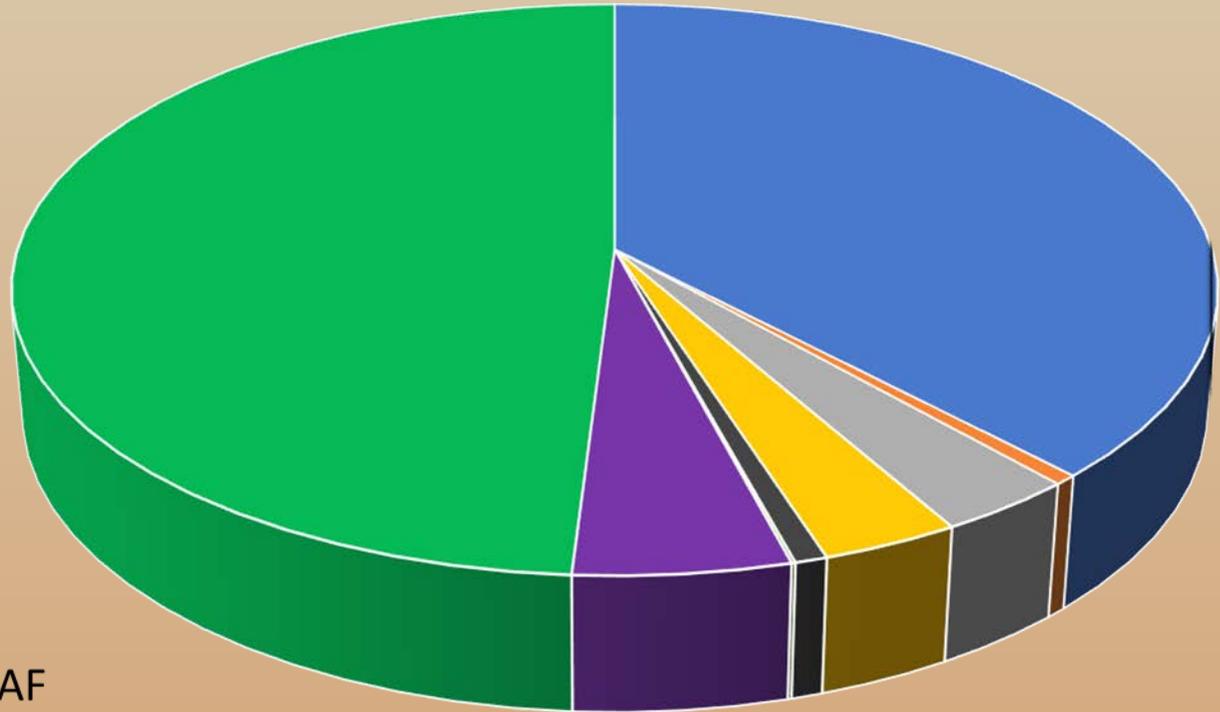
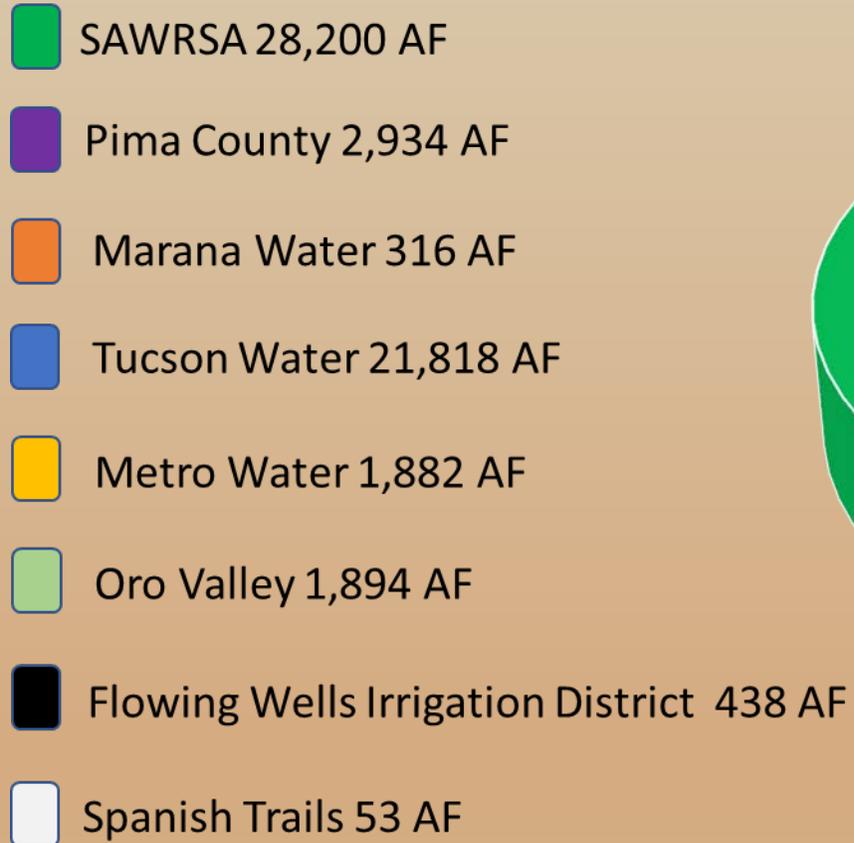
No recharge calculated on storm days

LSCMRP Monitoring



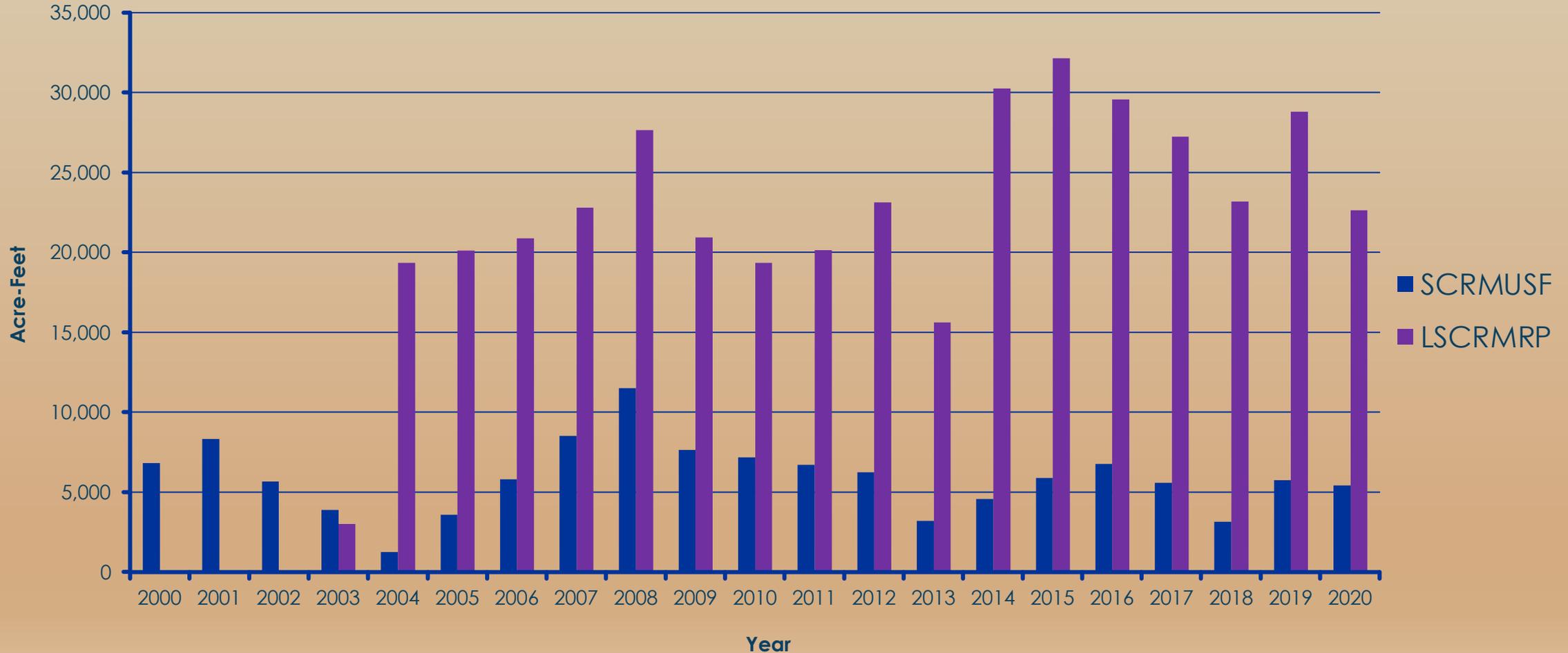
Stream Flow measured at USGS Trico Gaging Station

2019 Effluent Entitlement



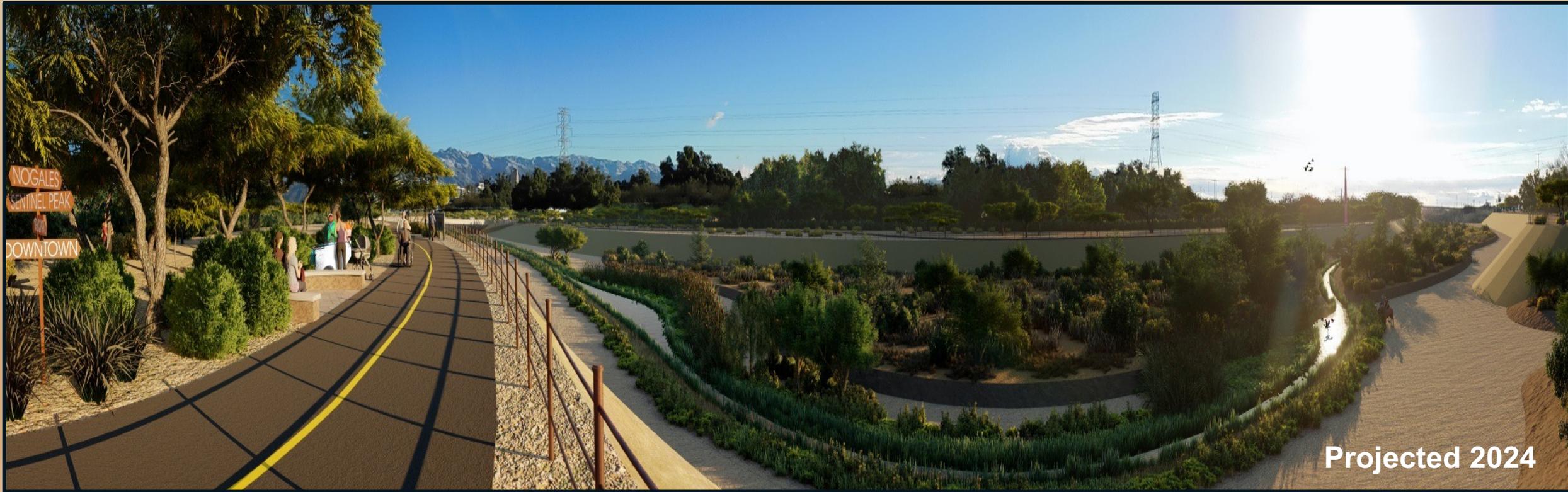
Managed Recharge Projects

Yearly Project Delivery



Starting February 2019 Cut to the Aquifer changed from 50% to 5%

Santa Cruz River Heritage Project



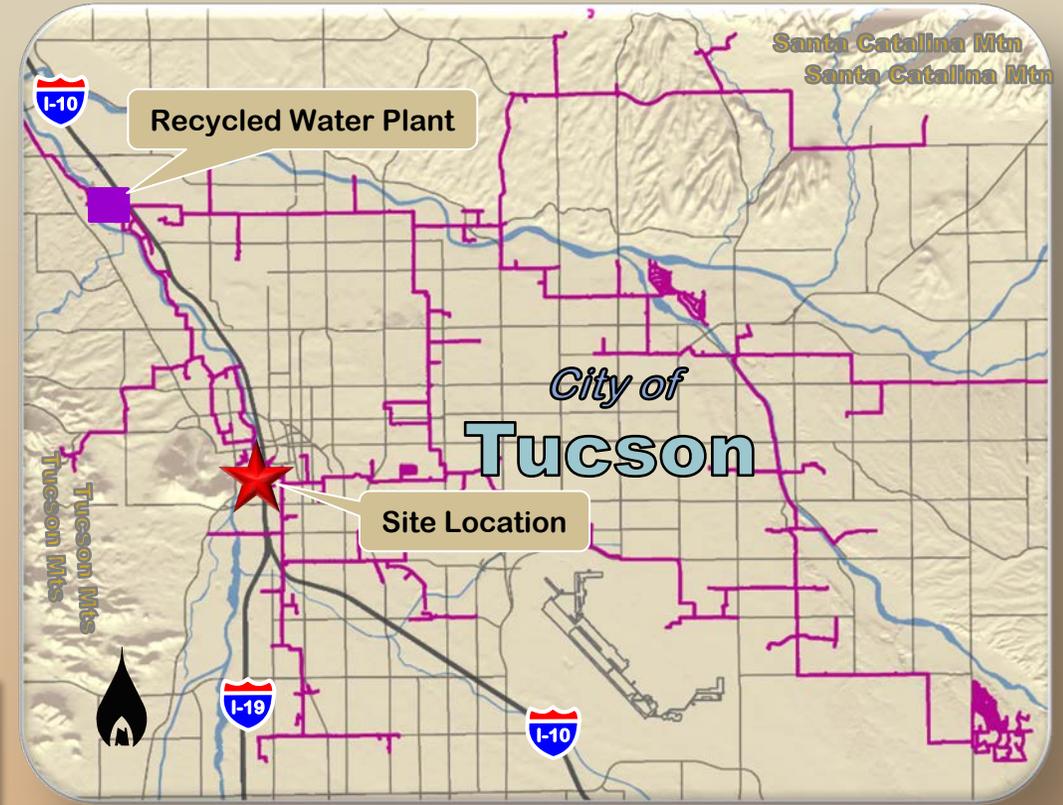
Projected 2024

Historic Santa Cruz River



Heritage Project Overview

- Construction Cost – less than \$1 million
- Approximately 3,800 AF/YR
- Maximum flow rate of 3.4 MGD

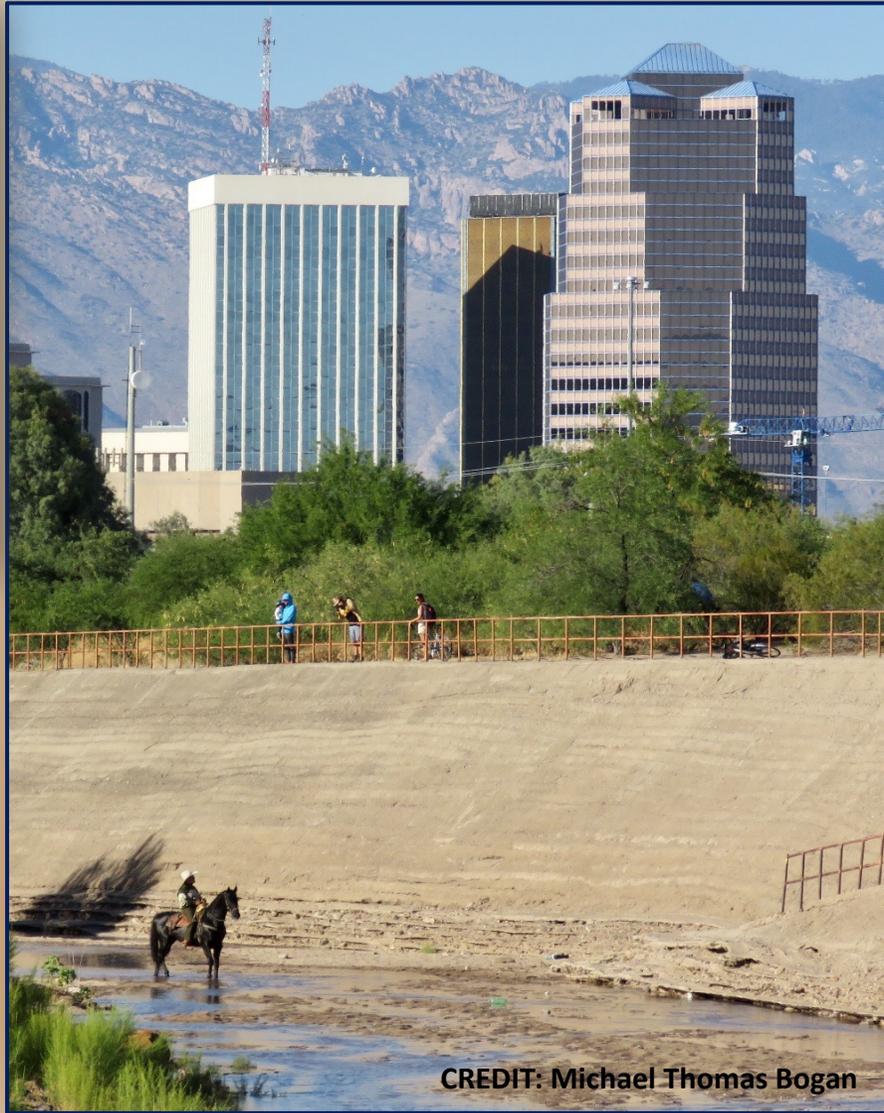


Project Location Map

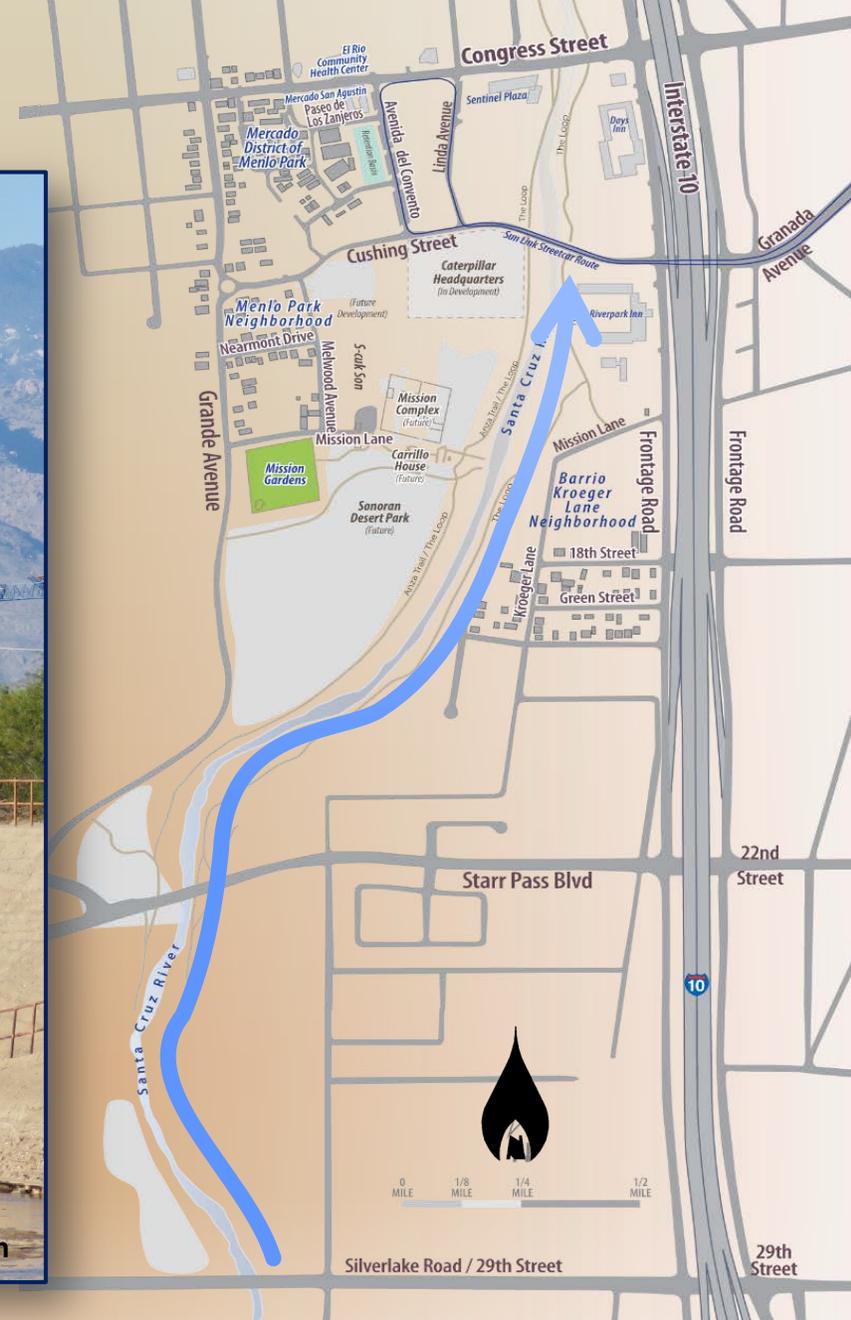


Release Party - June 24, 2019 Over 300 attendees

Community Response and Impact



CREDIT: Michael Thomas Bogan



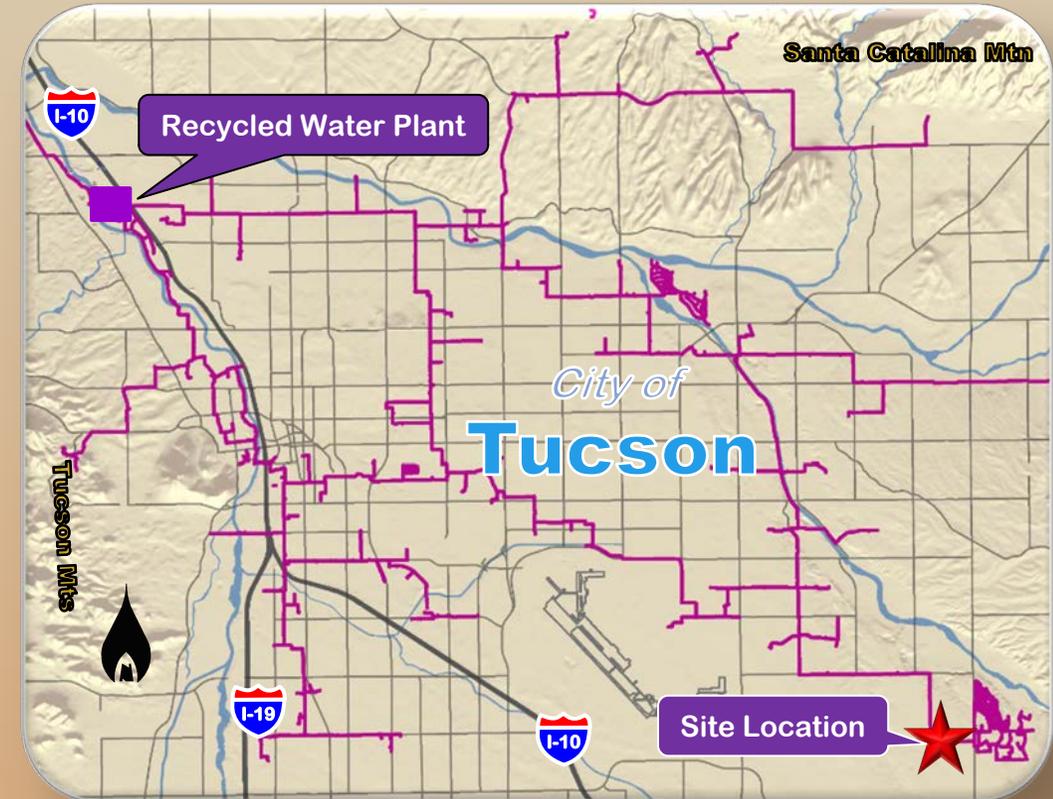


Southeast Houghton Area Recharge Project (SHARP)

Southeast Houghton Area Recharge Project (SHARP) Tucson's Newest One Water Constructed Recharge Project



Site Plan



Project Location Map

SHARP: A Multi-Benefit Project



Recreation

- Walking trails
- ADA Compliant
- Mt. Bike Trails



Education

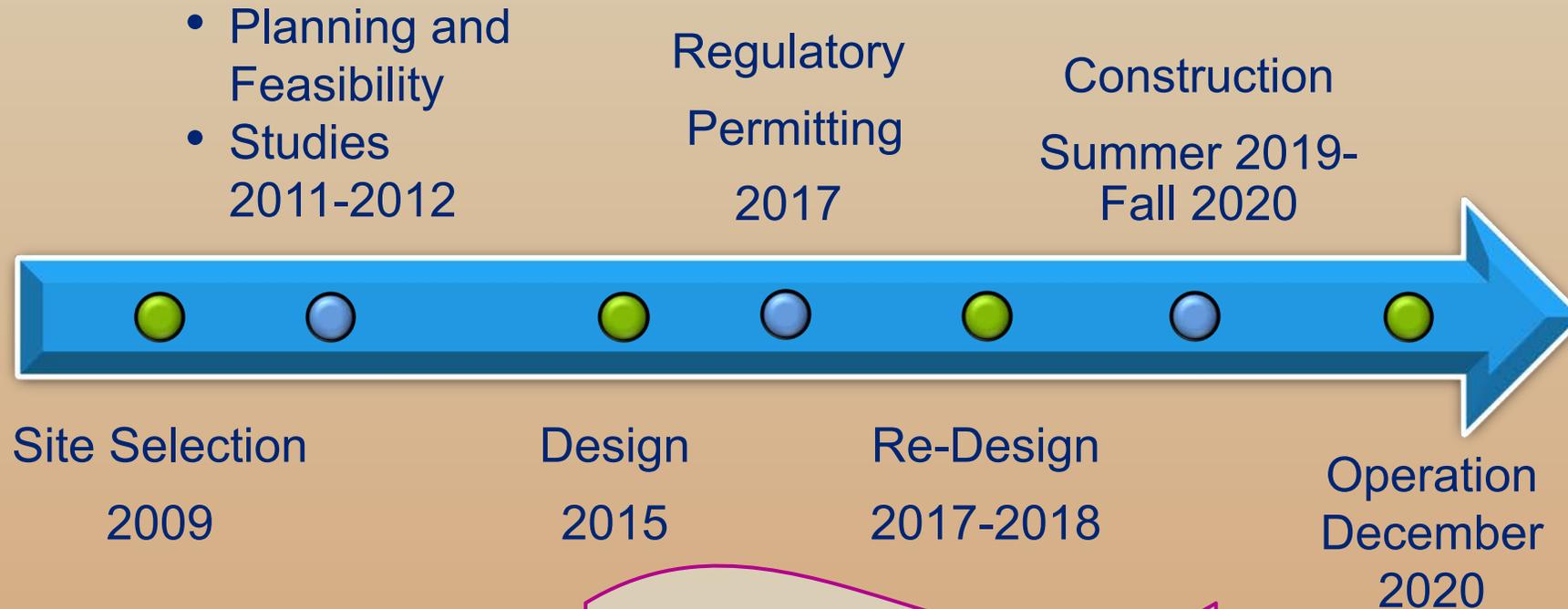
- Public
- Schools
- Rainwater Harvesting



Recharge

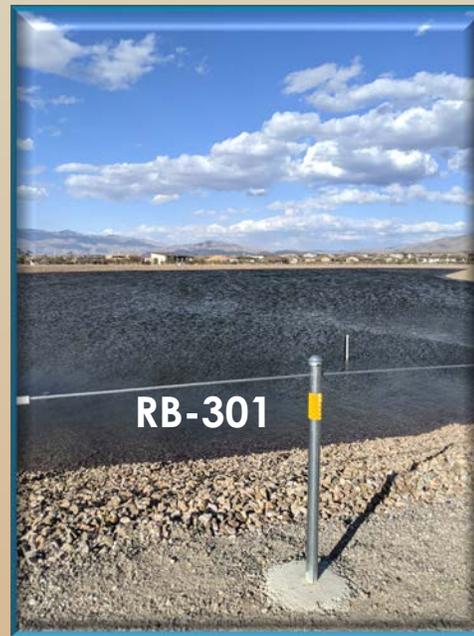
- Permitted-Annual 4,000 AF (6-months) Recycled Water
- Replenish the Aquifer
- Store for Future

SHARP: TimeLine



**11-Years from Vision
to Completion**

SHARP Recharge Basins & Rainwater Harvesting



Recharge Basins

Rainwater Harvesting



Passive



Active



RB-302



RB-303

SHARP - Sustainable and Recreational



A Desert Oasis

Native Plants

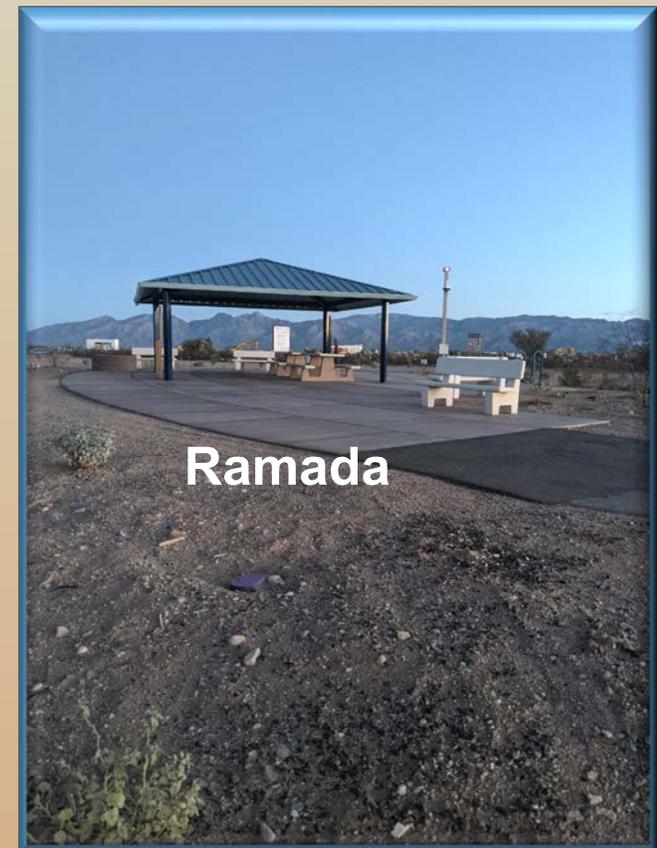
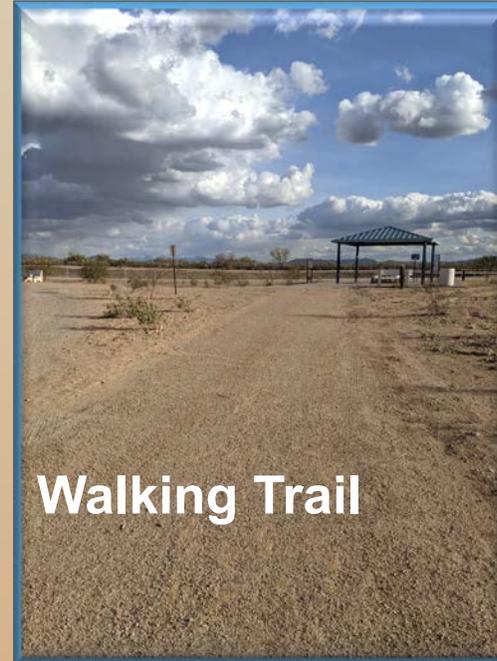
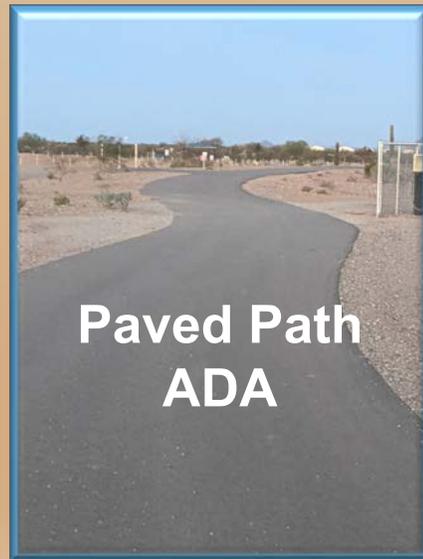
- 100 plants transplanted

Planted

- 491 Trees
- 906 Flowering Shrubs
- 338 Cactus/Bush
- Wildflower Mix

SHARP - Recreational Amenities

- Bike Trails
- 0.6 Miles of Paved Path
- 1 Mile of Walking Trails
- ADA Compliant Access to Basin 1
- Ramadas
- Benches
- Drinking Fountains
- Public Restrooms



What Does the Future of Reuse Look Like?

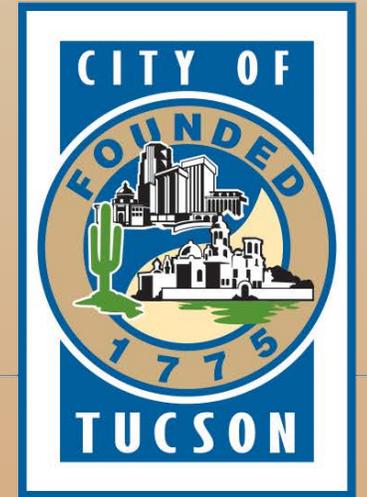
- Expansion of Commercial/Industrial Uses
- On-Site Non-Potable Reuse
- Expansion of Constructed Recharge Projects
- Expansion of Riparian/Aquifer Recharge Projects



History of Tucson's Recycled Water System



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