

San Antonio's Desalting Adventure

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Project Coordinator – Water Resources

Multi-State Salinity Conference

February 27, 2020

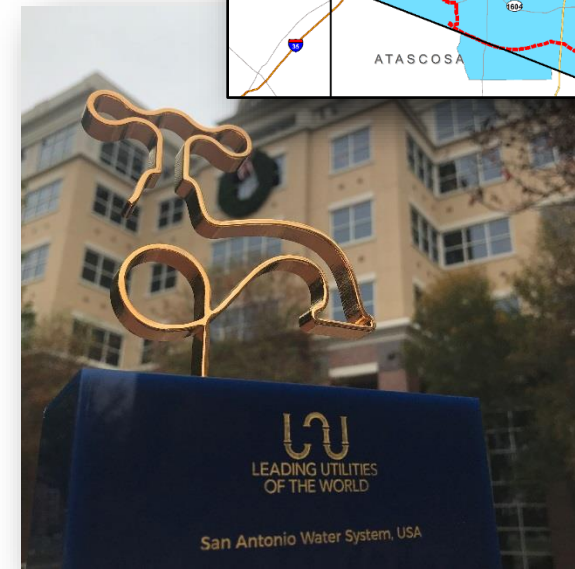
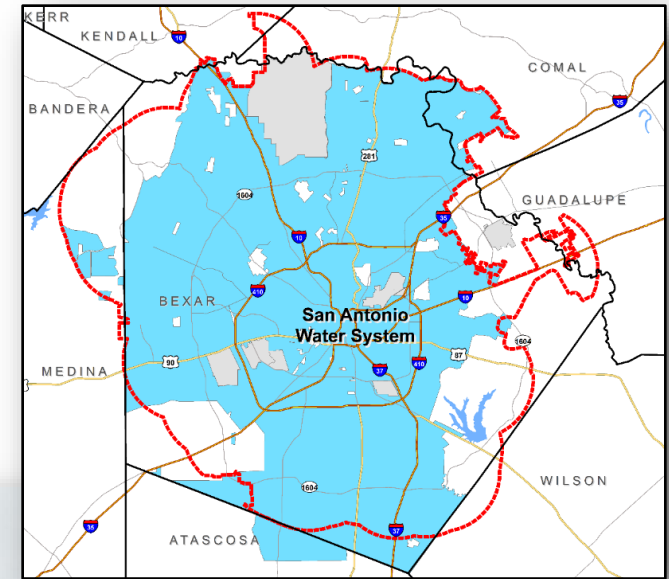


MAKING SAN ANTONIO
WATERFUL 

SAWS by the Numbers

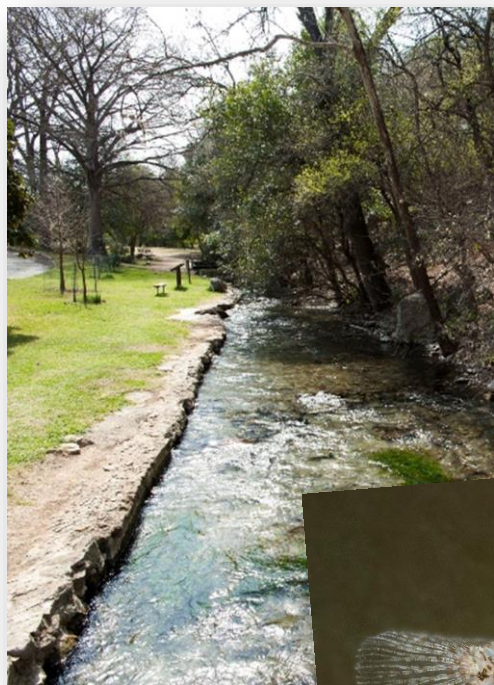
One of the nation's largest municipally owned utilities

- 1.9 million population
- 939 square mile service area
- 977,000+ total customers
- 13,000 miles of pipe
- \$929 million budget
- \$2.6 billion 5-year capital program
- 1,700 employees

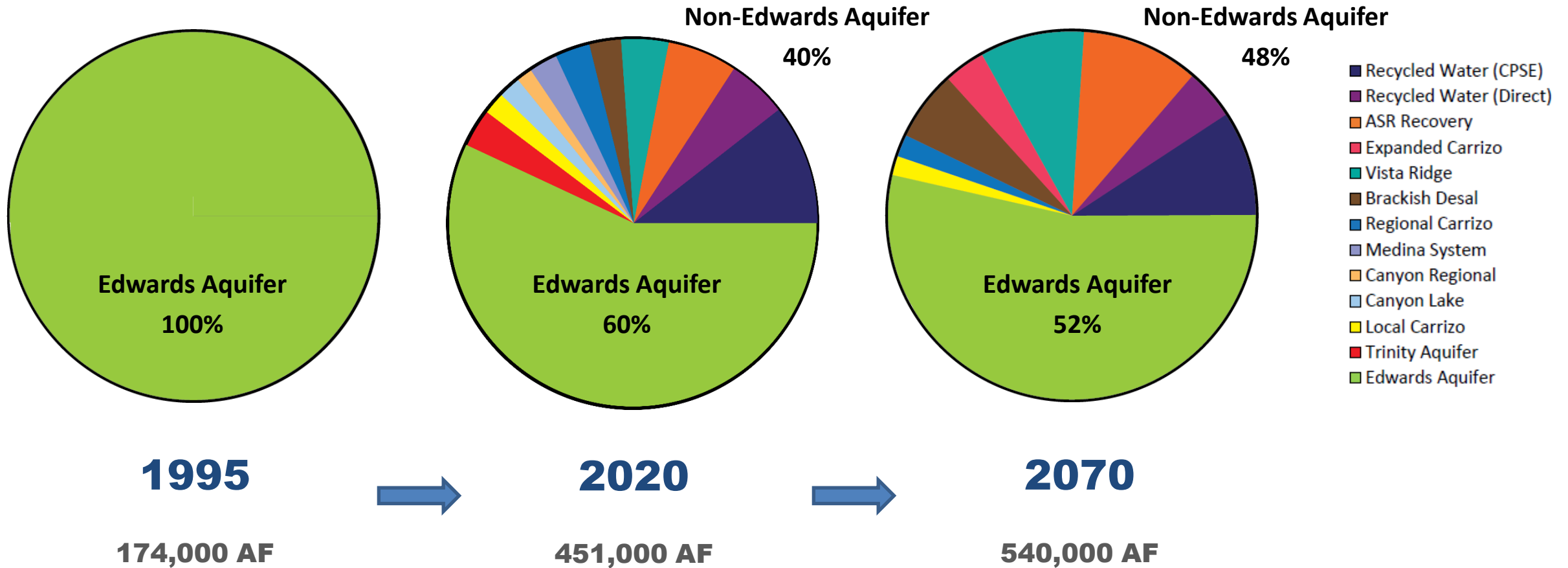


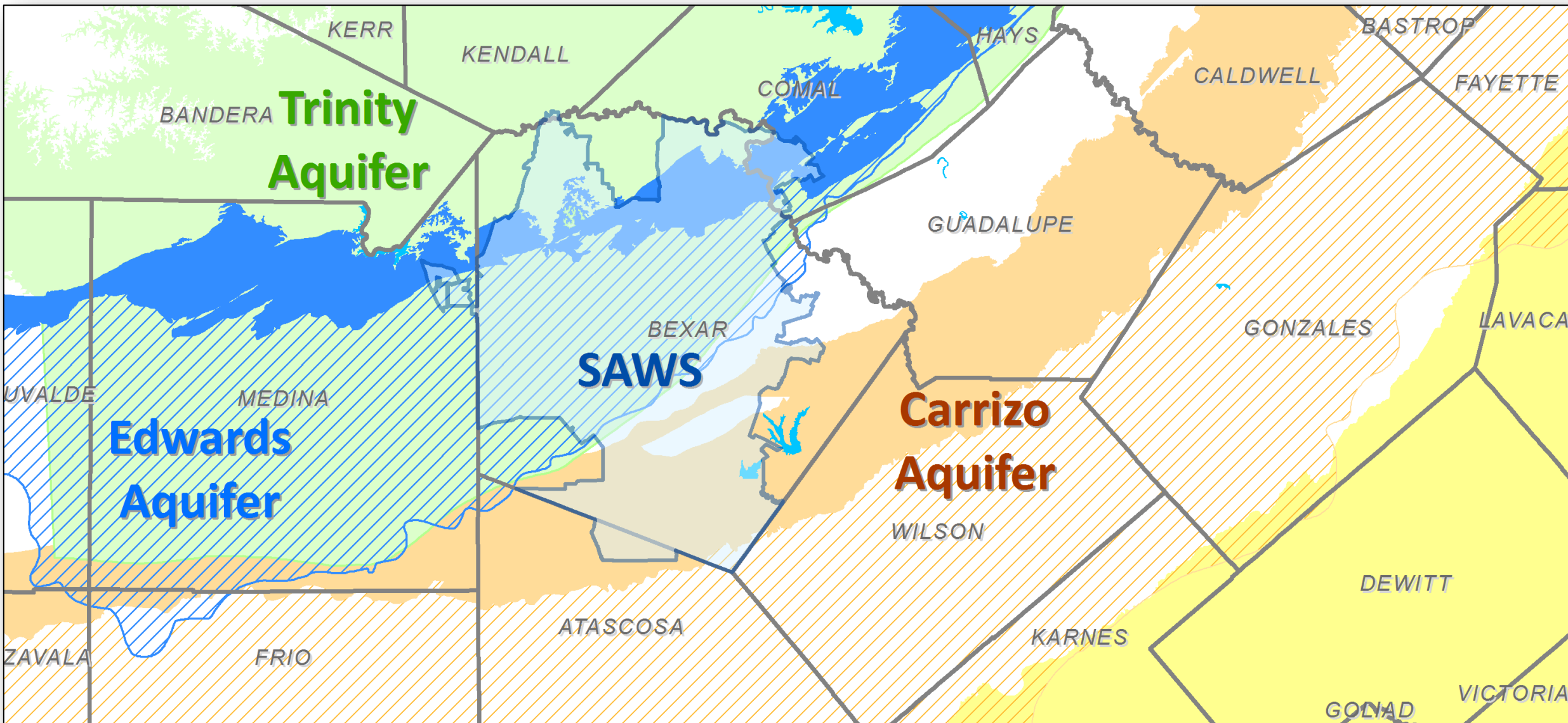
Regulating the Edwards Aquifer

Challenges



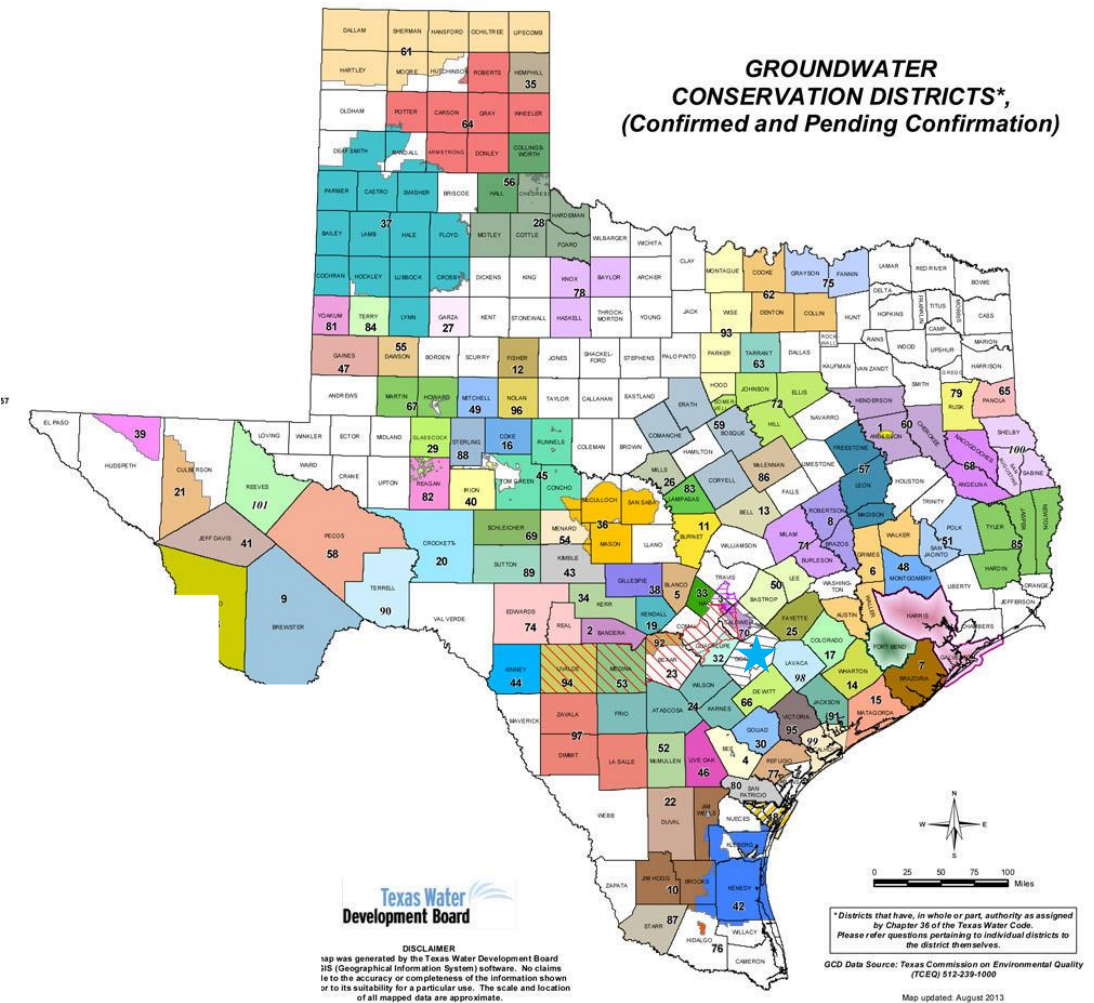
Diversification and Long Term Water Supply Planning

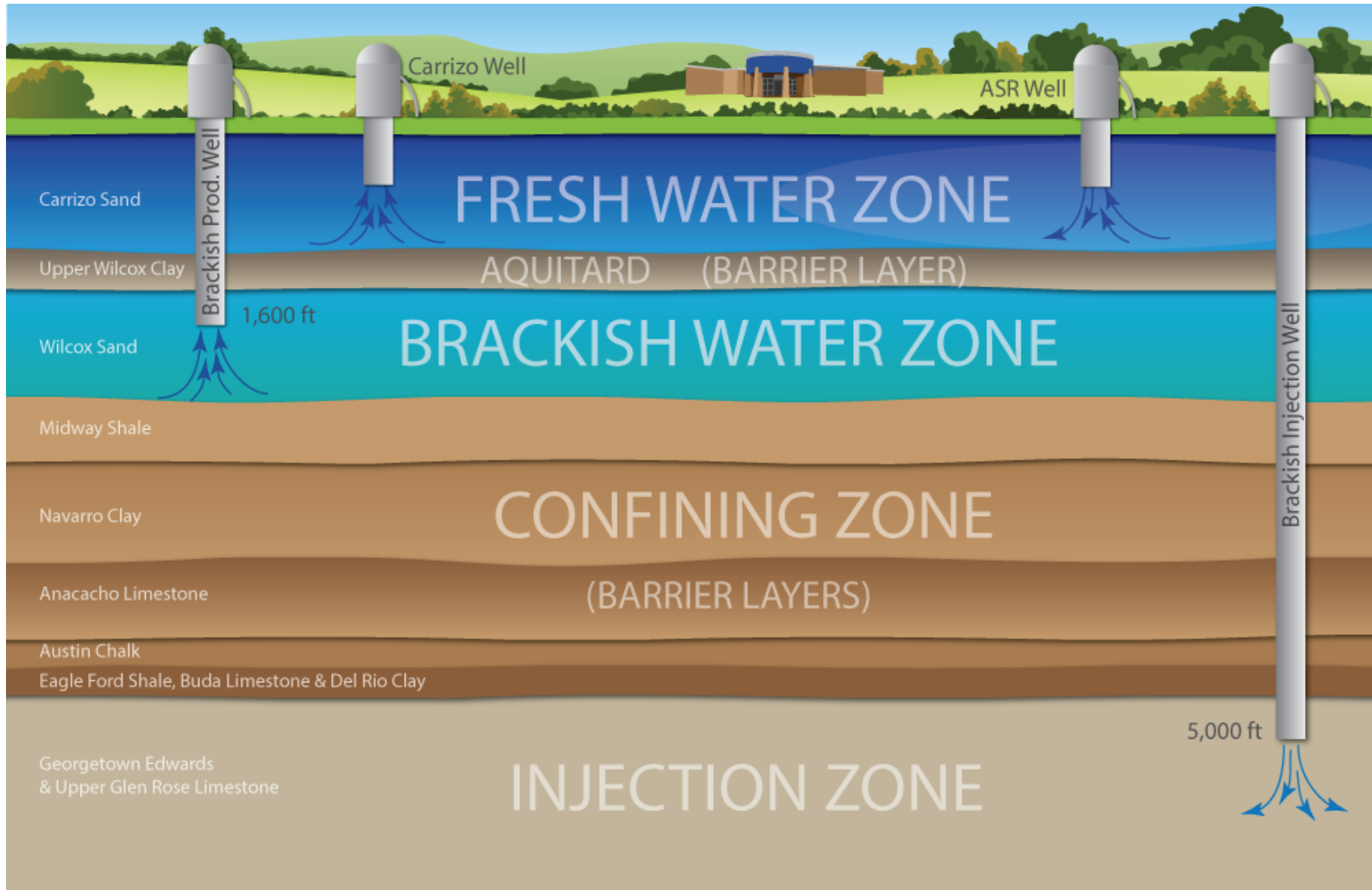




Brackish Development Challenges

- Groundwater district regulations
- Public Opposition and Response
 - Concerns from public in adjacent county
 - Created a Science Committee to assist with education
- No aquifer data to design around





Brackish Program (Phase I)

General Information

- Program costs to date: \$201M
- Began producing water November 9, 2016



Brackish Program

Multi Phase Long Term Supply

- Ultimate build out of approx. 33,000 AFY
 - Phase I at 11,200 AFY
- Source water from the Lower Wilcox formation
- Reverse osmosis treatment process
- Wells
 - 12 production (+2)
 - 2 injection



Membrane Pilot Testing

Pilot Testing Goals

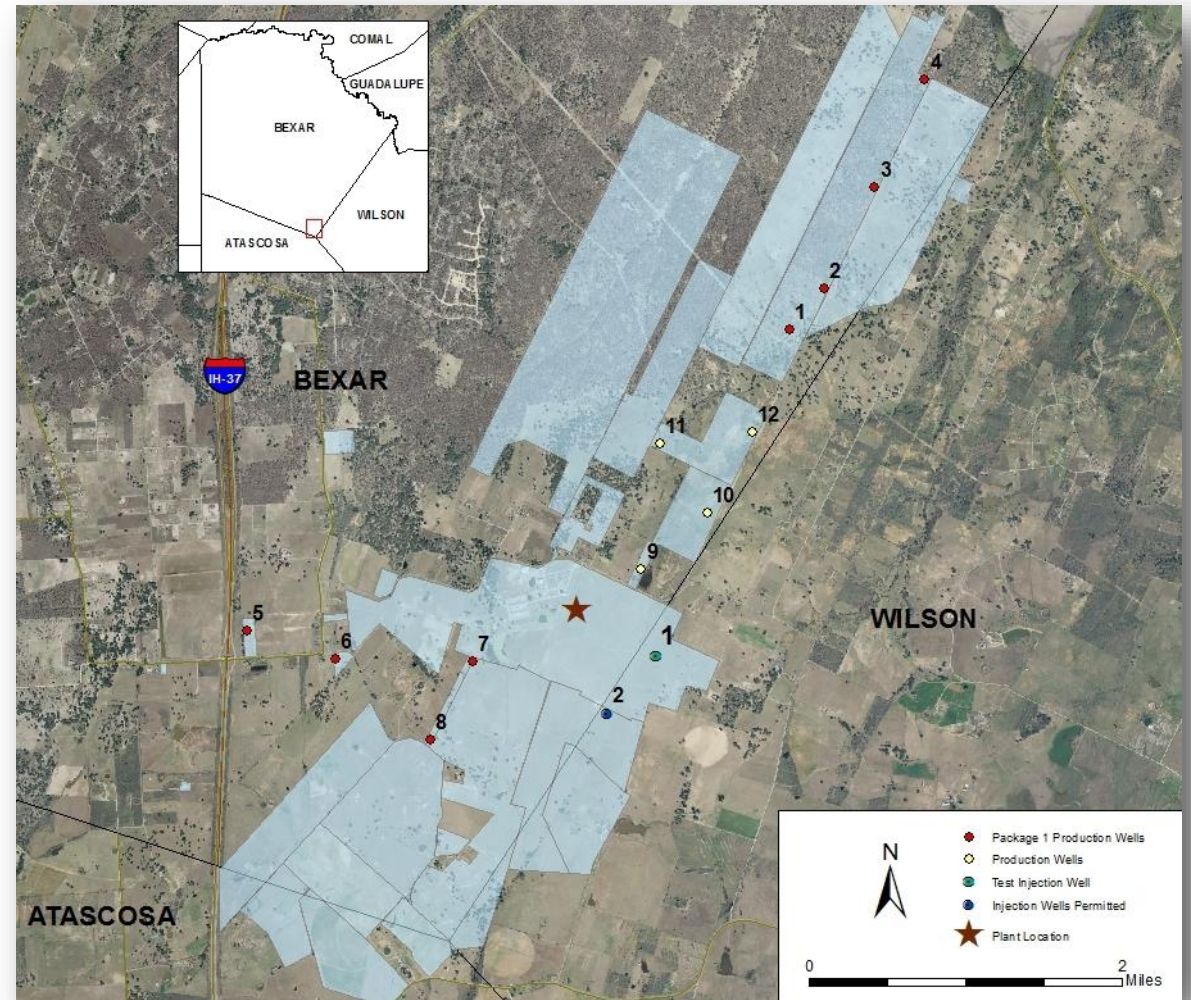
- Receive TCEQ capacity rating and permit
- Test membranes from three manufacturers
- Test pre-treatment/post treatment options
 - “Open System” vs. “Closed System”
- Additional Investigations
 - Concentrate Pipe Loop Study
 - Air Leak Testing
 - System fouling trend and membrane autopsy



SAWS Membrane Pilot Test Unit

Brackish Program

- Project Components
 - 12 Production Wells
 - 2 Injection Wells
 - Conveyance Piping
 - Treatment Plant
 - Access Roads
 - Electrical System
 - SCADA System



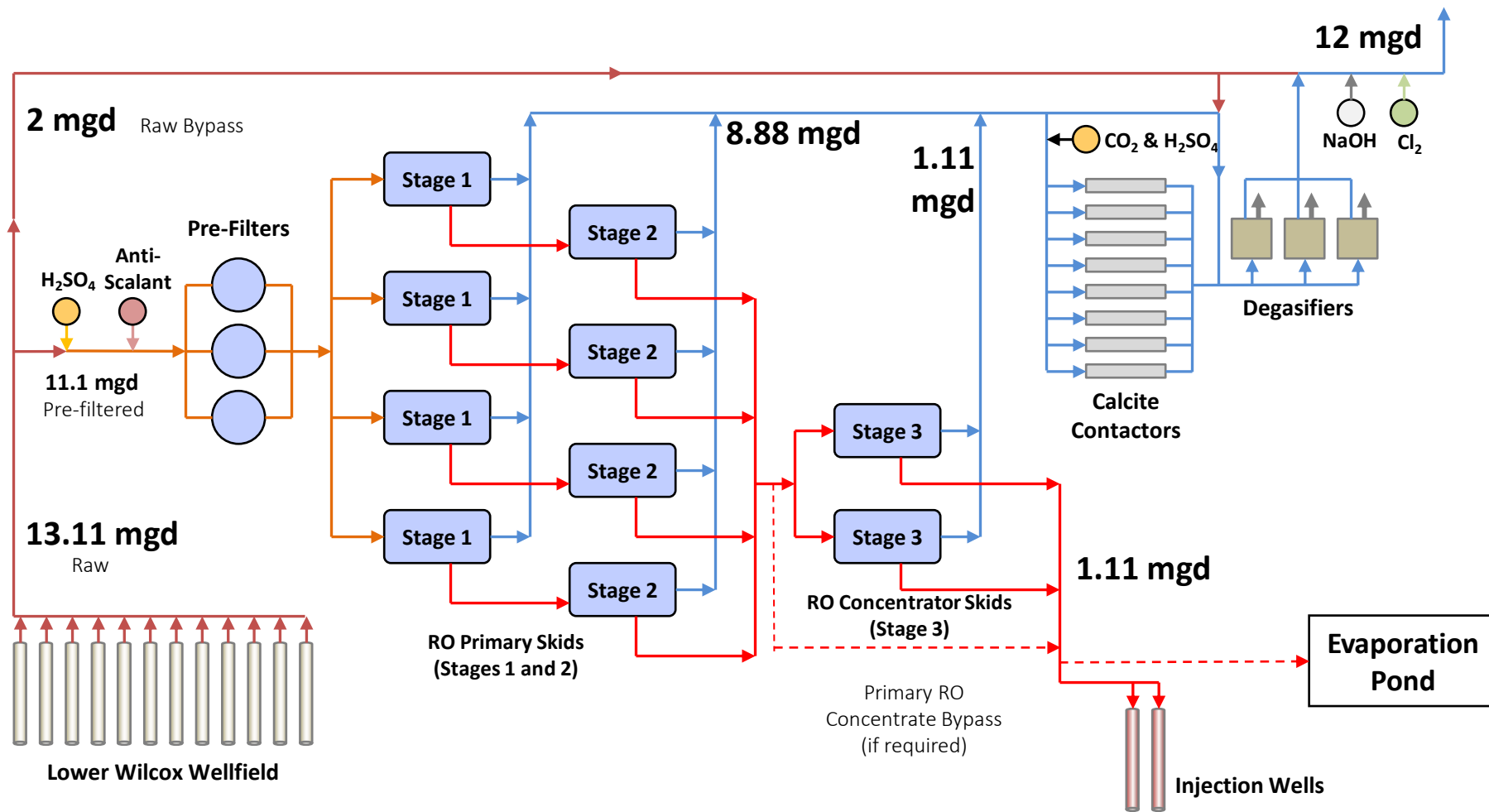
Brackish Construction Challenges

County Boundaries

Concentrate Disposal



Reverse Osmosis Process Diagram



Post Treatment

- Calcite Contactors
- Degasifiers
- Chlorine Contact Chamber
- Source Water Bypass



Operational Challenges

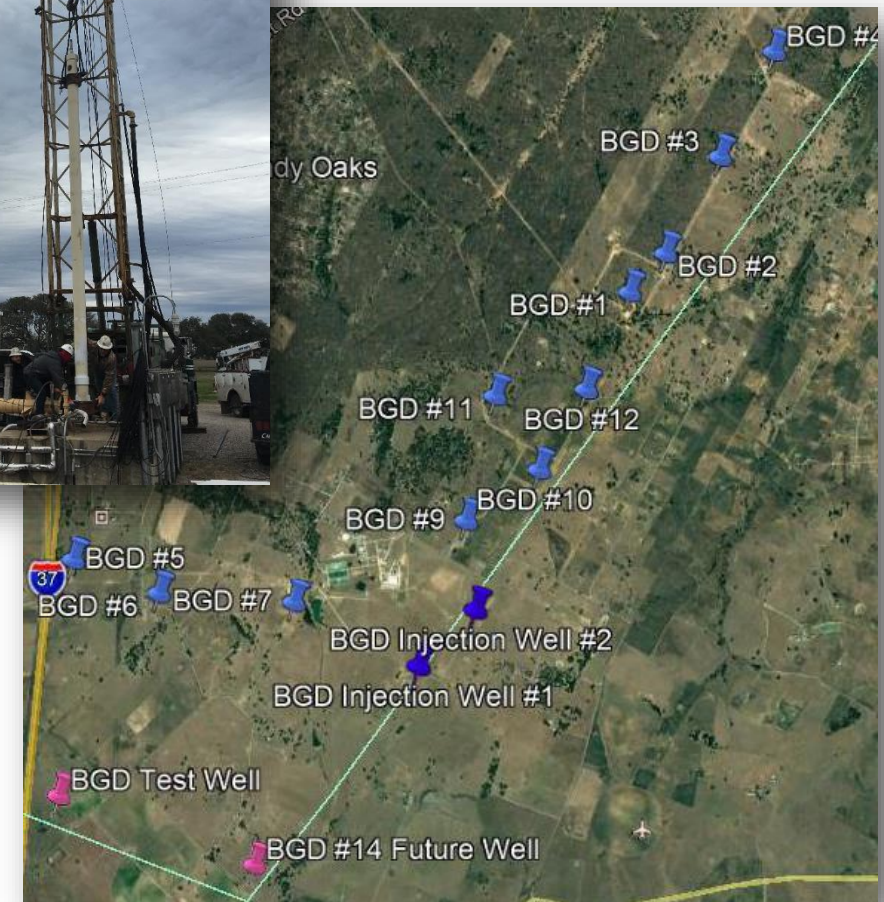
- Turbidity Control
 - Well Operation
 - Plant Operational Strategy
- Membrane Fouling
 - Iron
 - Turbidity (fine sand & silt)



Additional Work

2019-2020

- Modeling of the aquifer conditions did not match actual performance
 - Lowered seven pumps
 - Drilling additional production well and retrofit test well



Summary

- New water resource developed
- Additional science developed for a new central Texas water supply
- Development of new resources will occasionally provide a few surprises
- Much of the success of the project was due to the assistance of the staff from plants at El Paso, Phoenix, and Florida



Questions?



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