

# Water Reuse in Texas Webinar

Erika Mancha  
Innovative Water Technologies

North Central Texas Council of Government's  
June 18, 2019

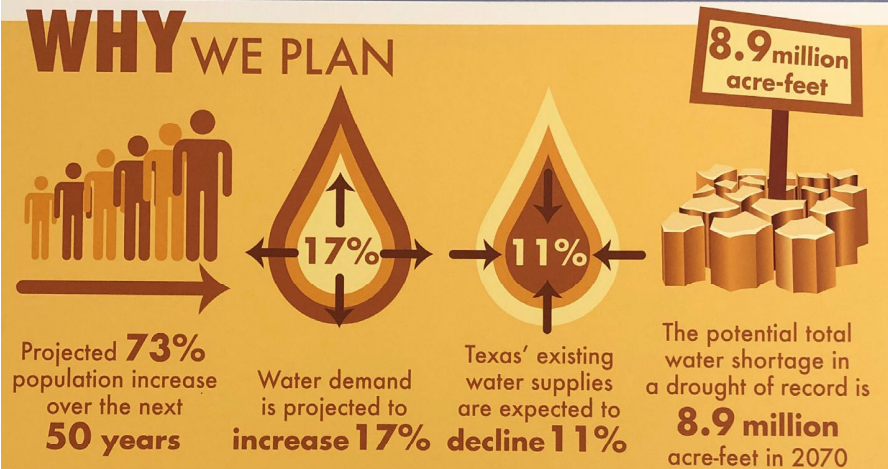
*Unless specifically noted, this presentation does not necessarily reflect official Board positions or decisions.*

*Mission: "To provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas"*

## HOW WE PLAN



## WHY WE PLAN

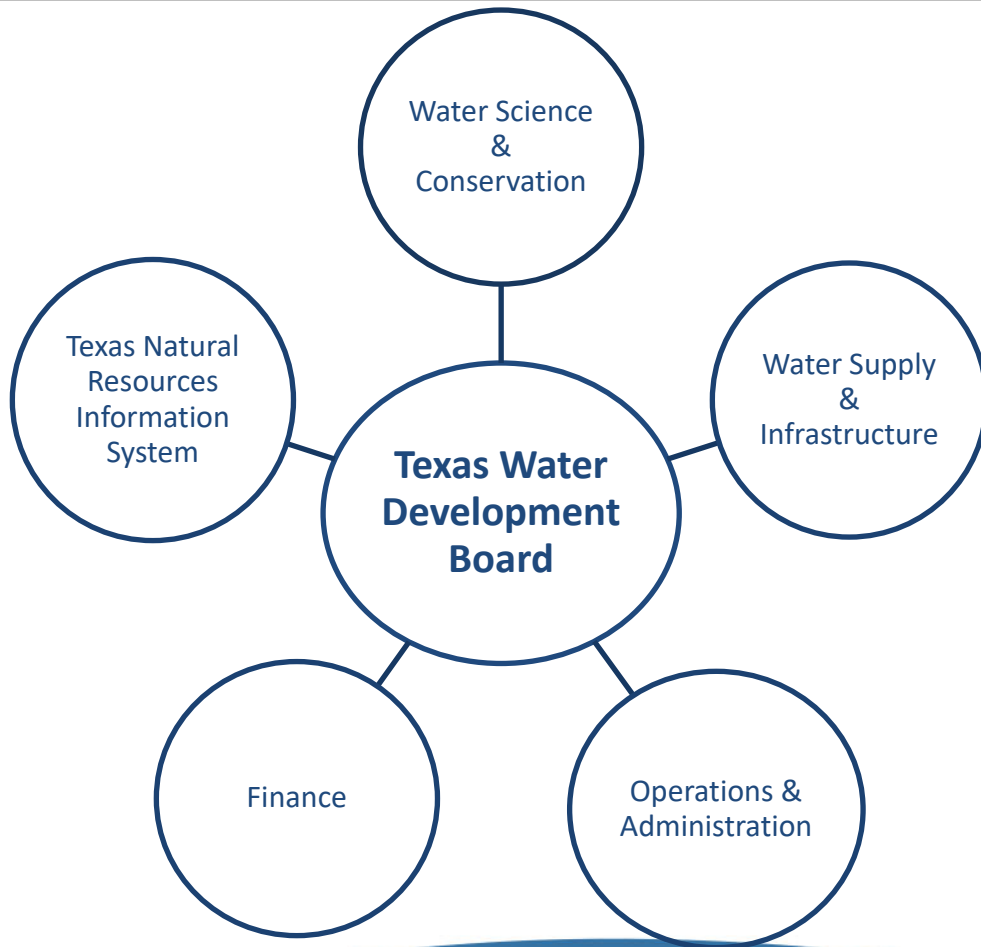


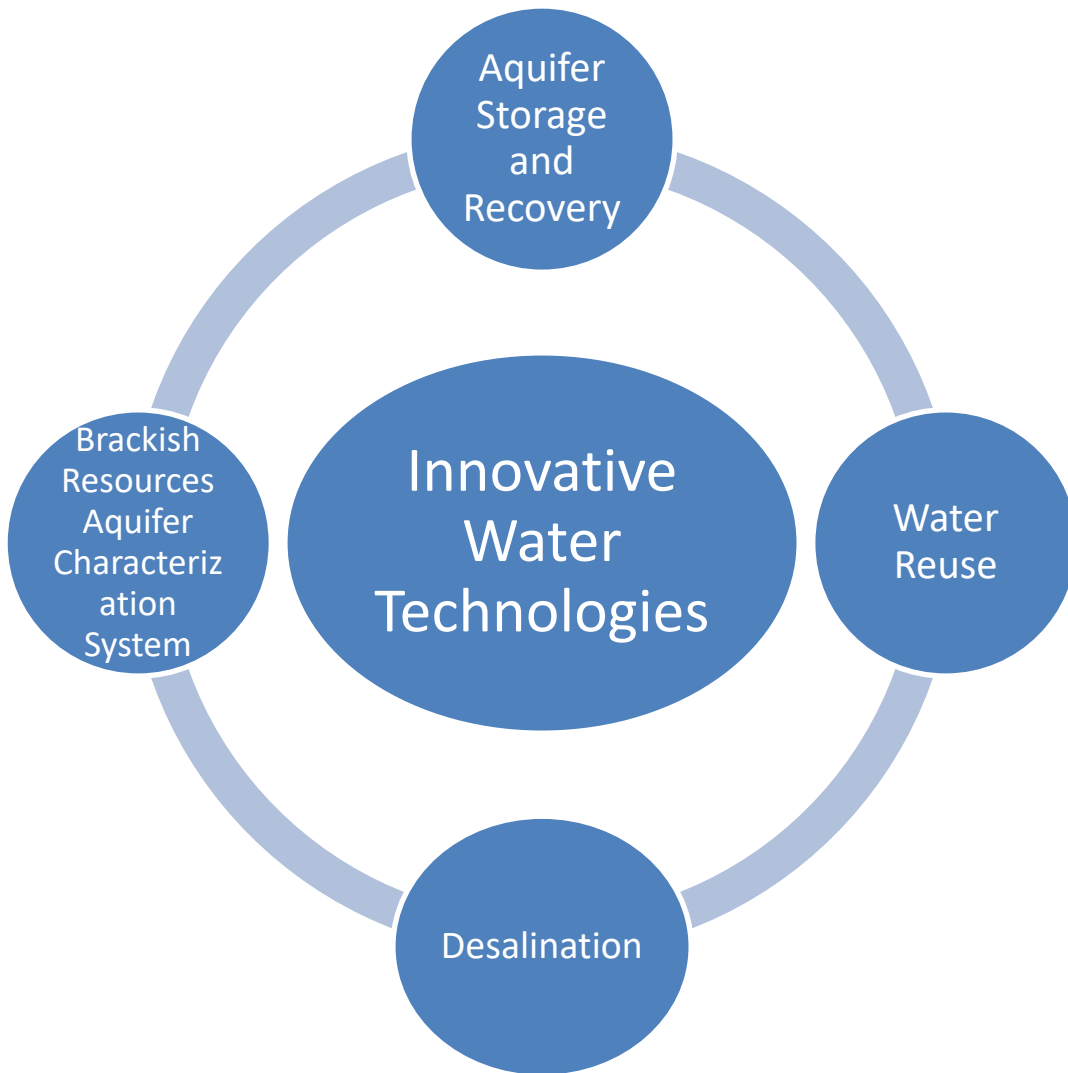
## SOURCES OF NEW WATER in 2070

The 2017 State Water Plan recommends 5,500 water management strategies



If implemented, these strategies would provide **8.5 million acre-feet per year** in additional water supplies by 2070

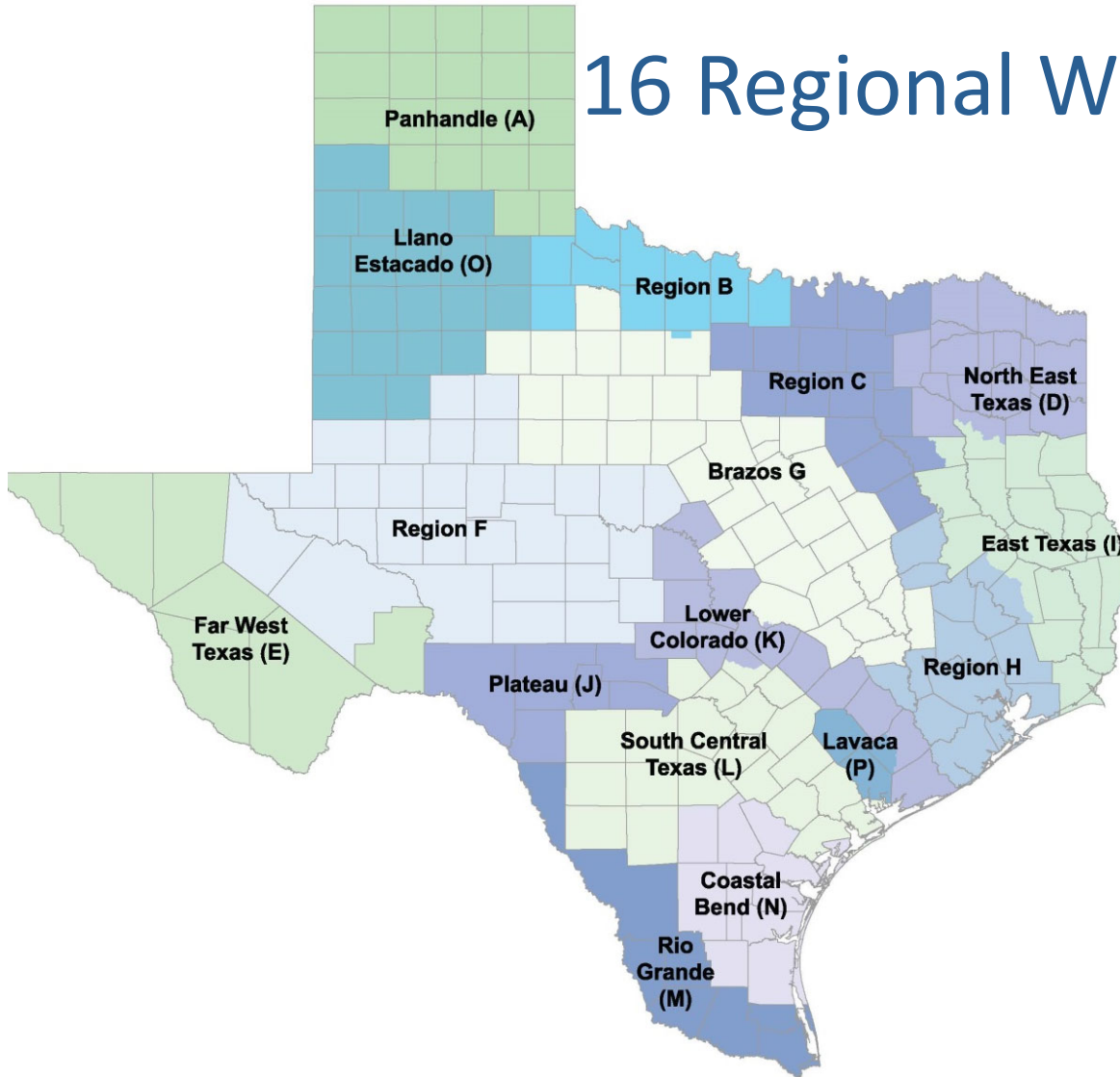




Our goal is to

- research,
- develop, and
- disseminate information to advance and promote the development and use of alternative water supplies in Texas.

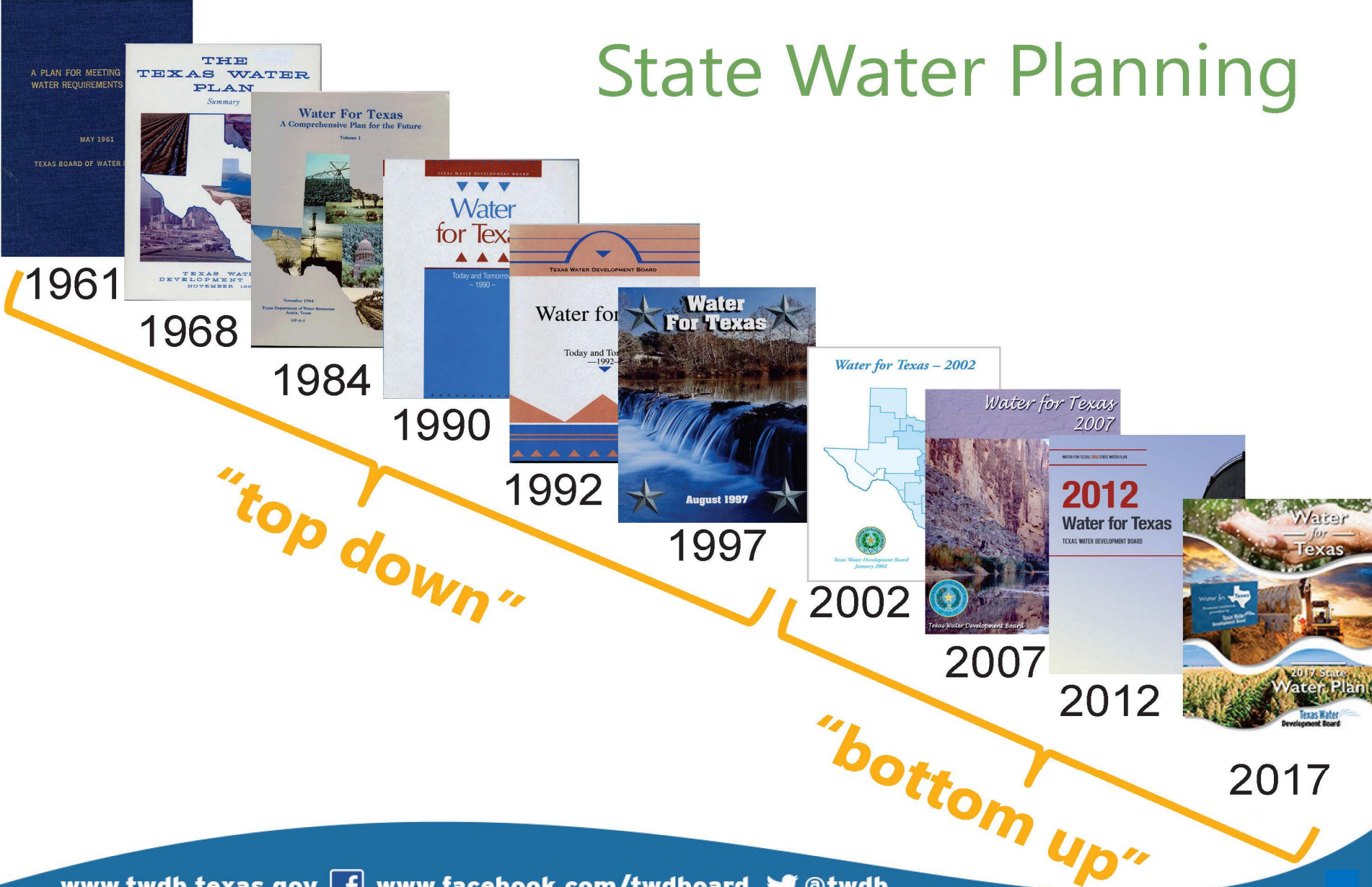
# 16 Regional Water Planning Areas



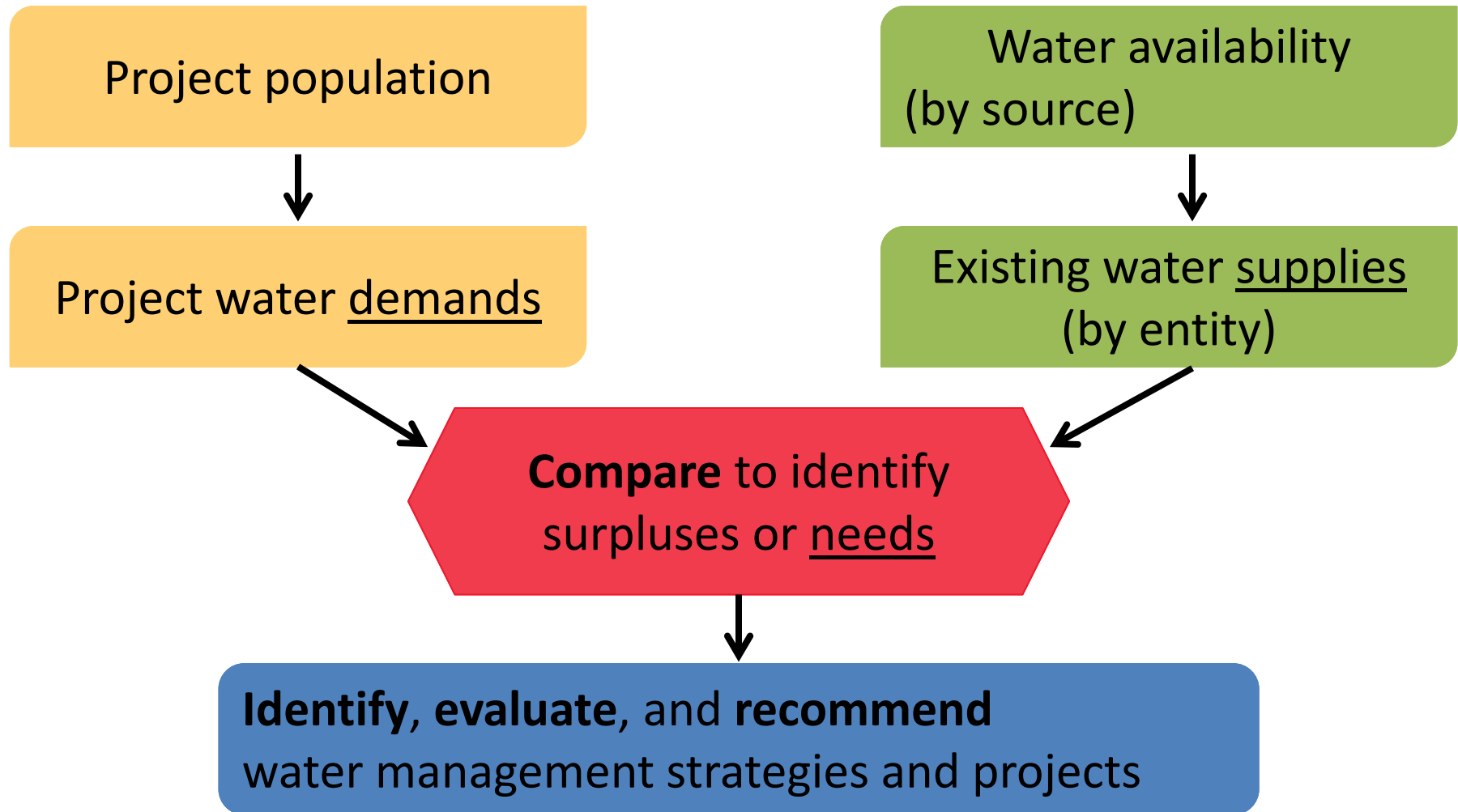
- Bottom up approach
- State Water Plan every five years
- Working on 2022 State Water Plan



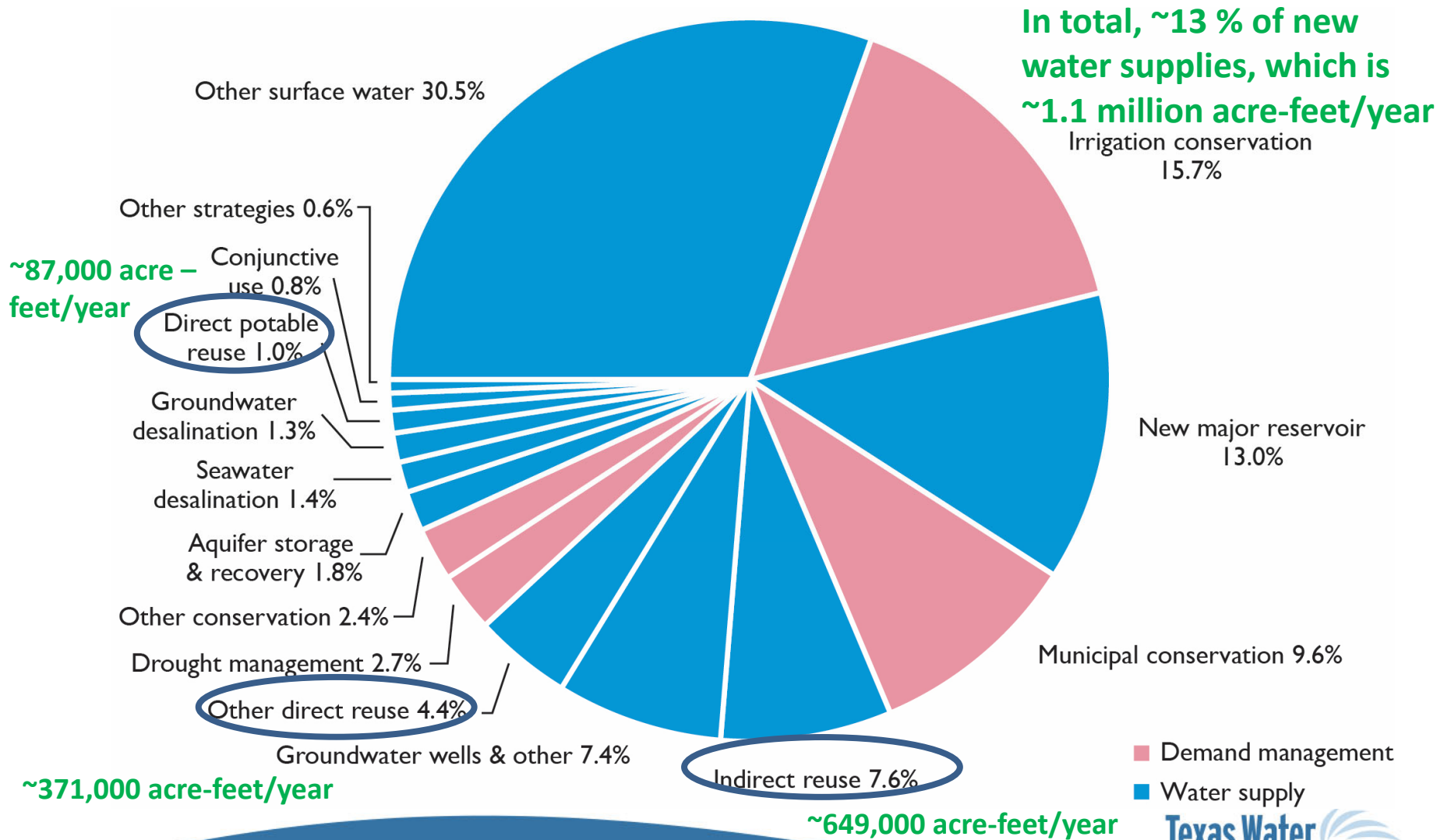
# State Water Planning



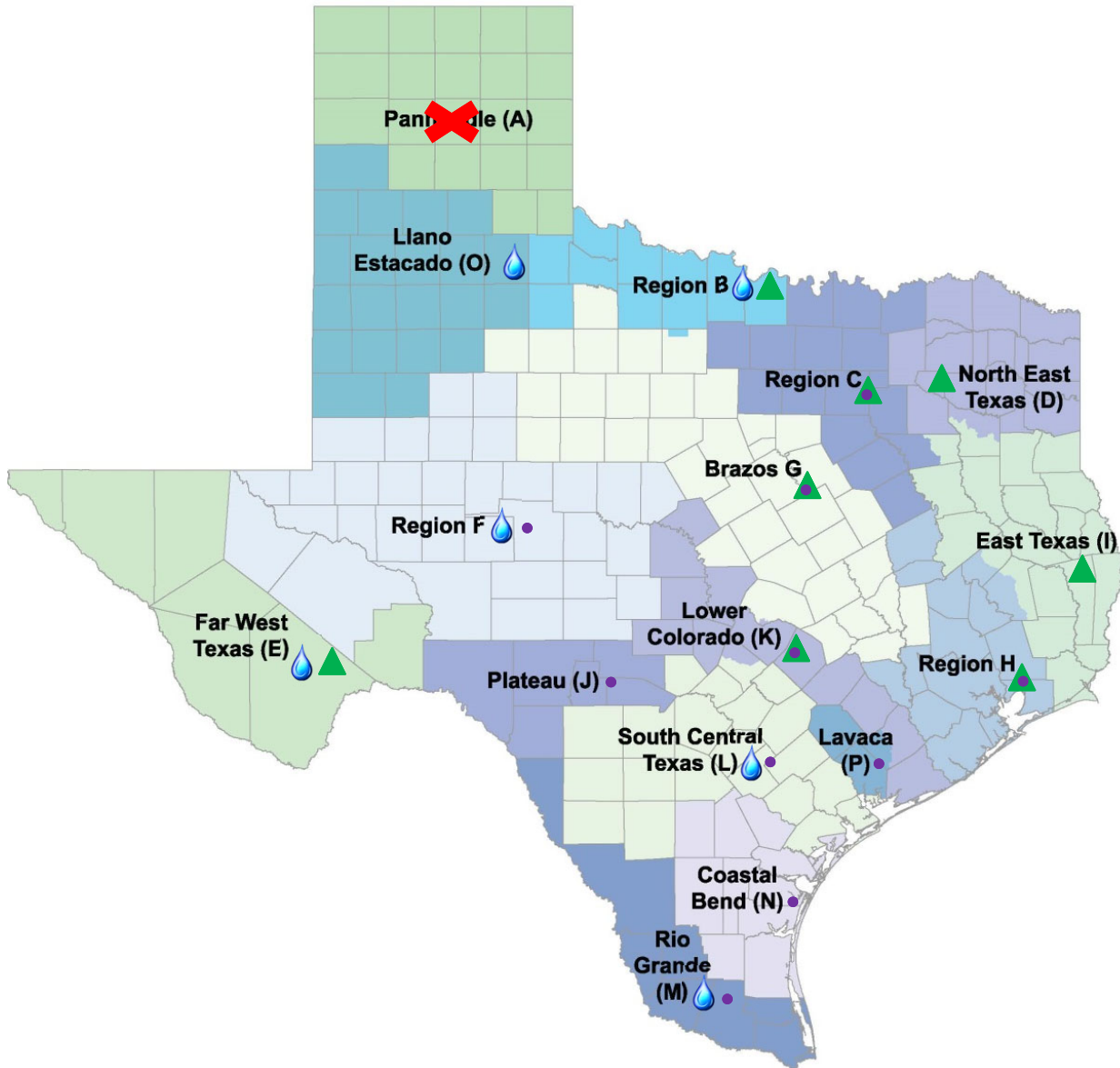
# Water Planning Basics



# Recommended Water Management Strategies by 2070 in the 2017 State Water Plan



# Reuse recommended water management strategies



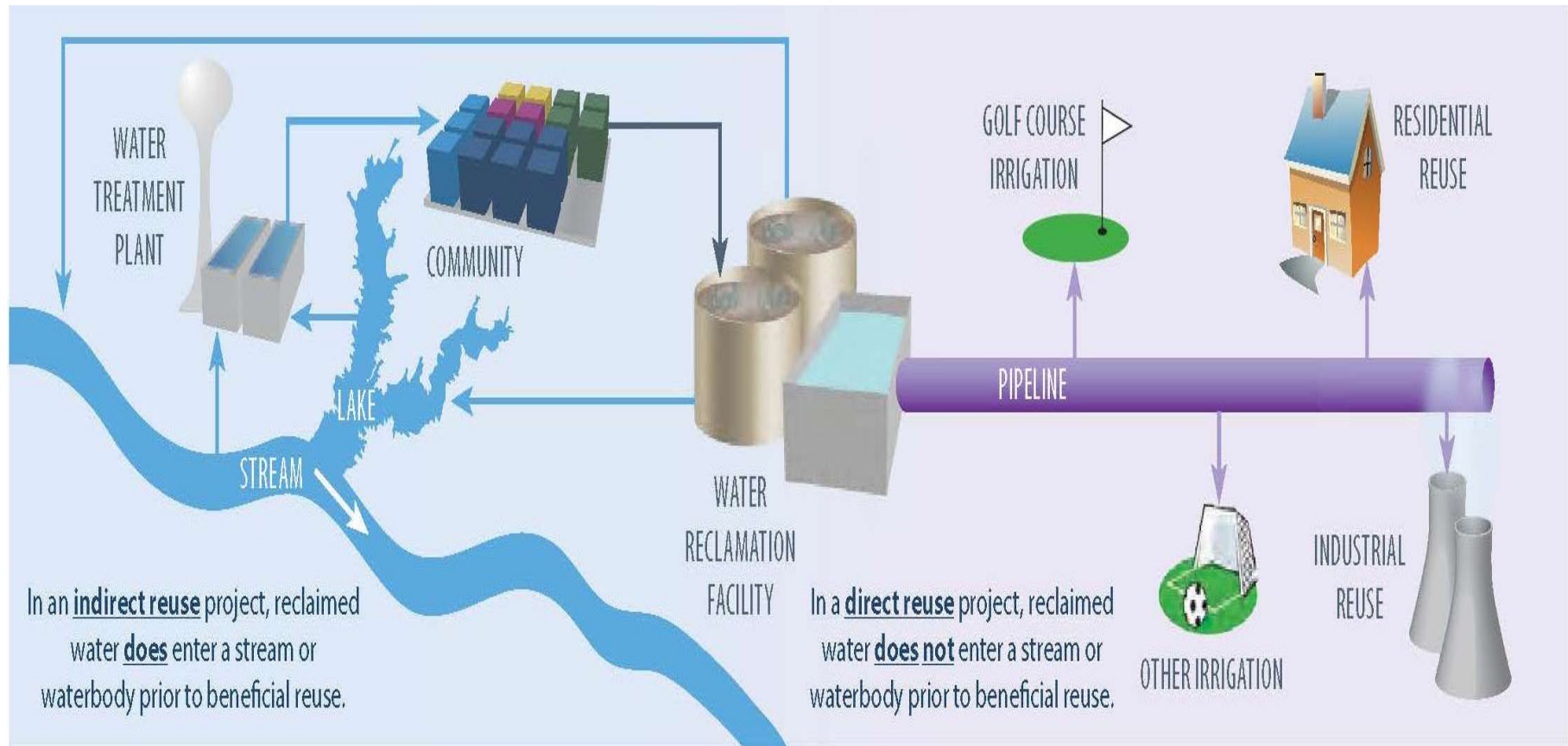
- 15 regional water planning groups (except A)

- Direct Potable Reuse (blue water drop)
- Other direct reuse (purple dot)
- Indirect reuse (green triangle)



# Water Reuse

Two types: Indirect and Direct Reuse



# Types of potable reuse

## De facto Water Reuse:

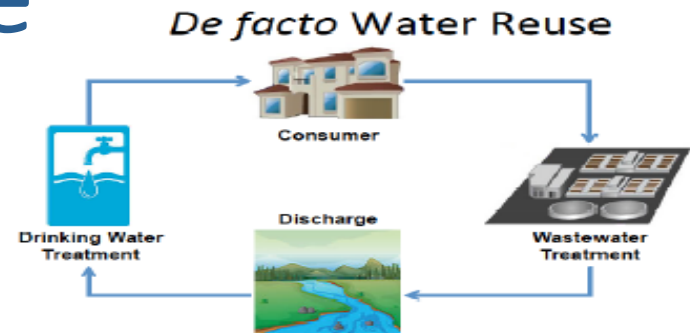
A drinking water supply that contains a significant fraction of treated wastewater, typically from wastewater discharges, although the water supply has not been permitted as a water reuse project.

## Indirect Potable Reuse (IPR):

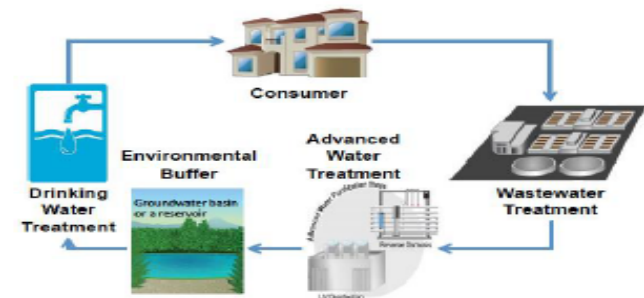
The use of reclaimed water for potable purposes by discharging to a water supply source, such as a surface water or groundwater. The mixed reclaimed and natural waters then receive additional treatment at a water treatment plant before entering the drinking water distribution system.

## Direct Potable Reuse (DPR):

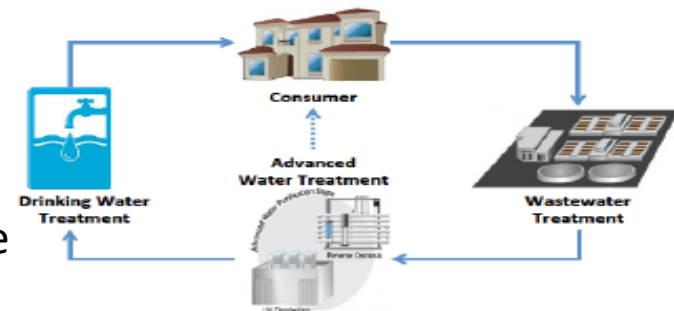
The introduction of advanced-treated reclaimed water either directly into the potable water system or into the raw water supply entering a water treatment plant.



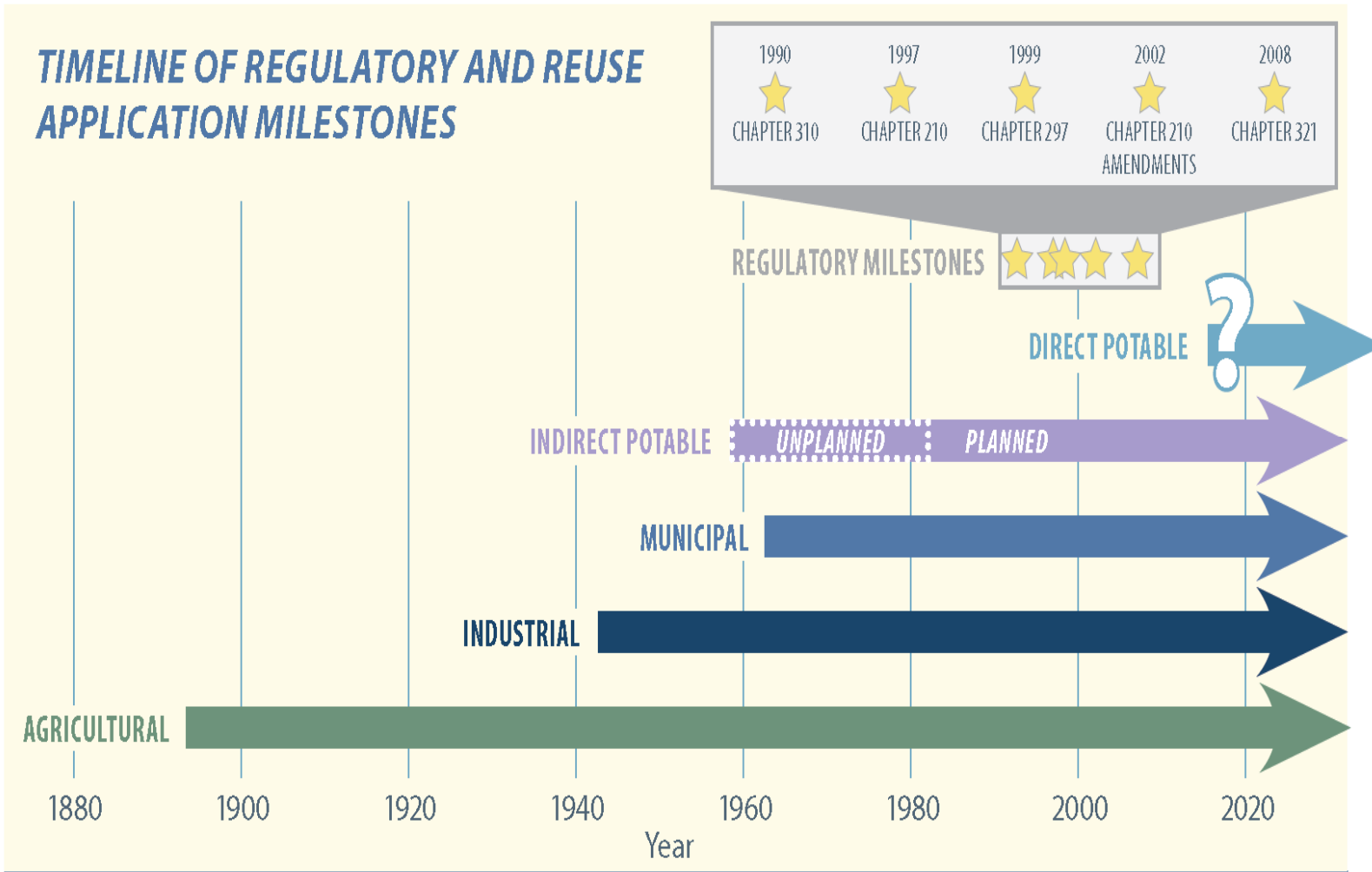
## Indirect Potable Reuse



## Direct Potable Reuse



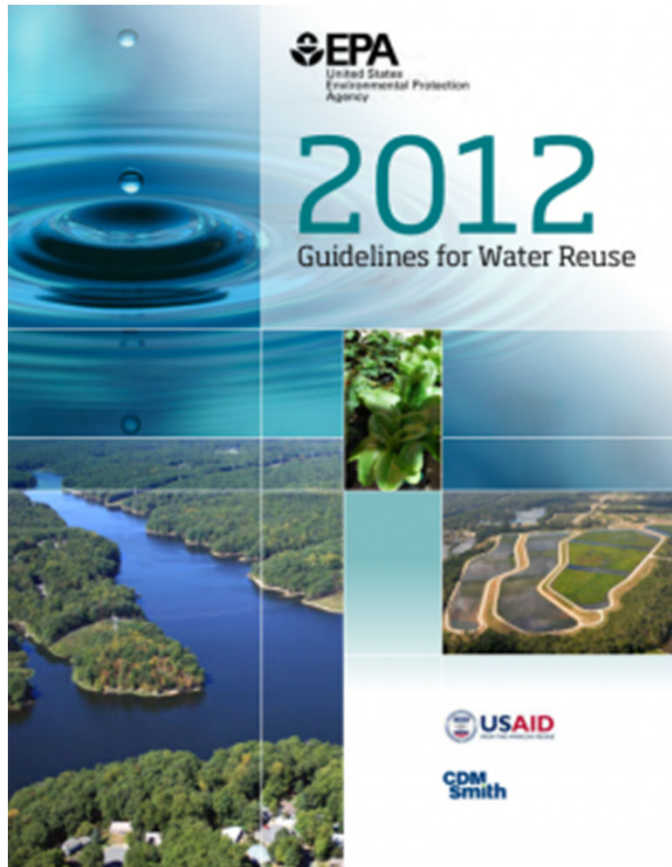
# TIMELINE OF REGULATORY AND REUSE APPLICATION MILESTONES



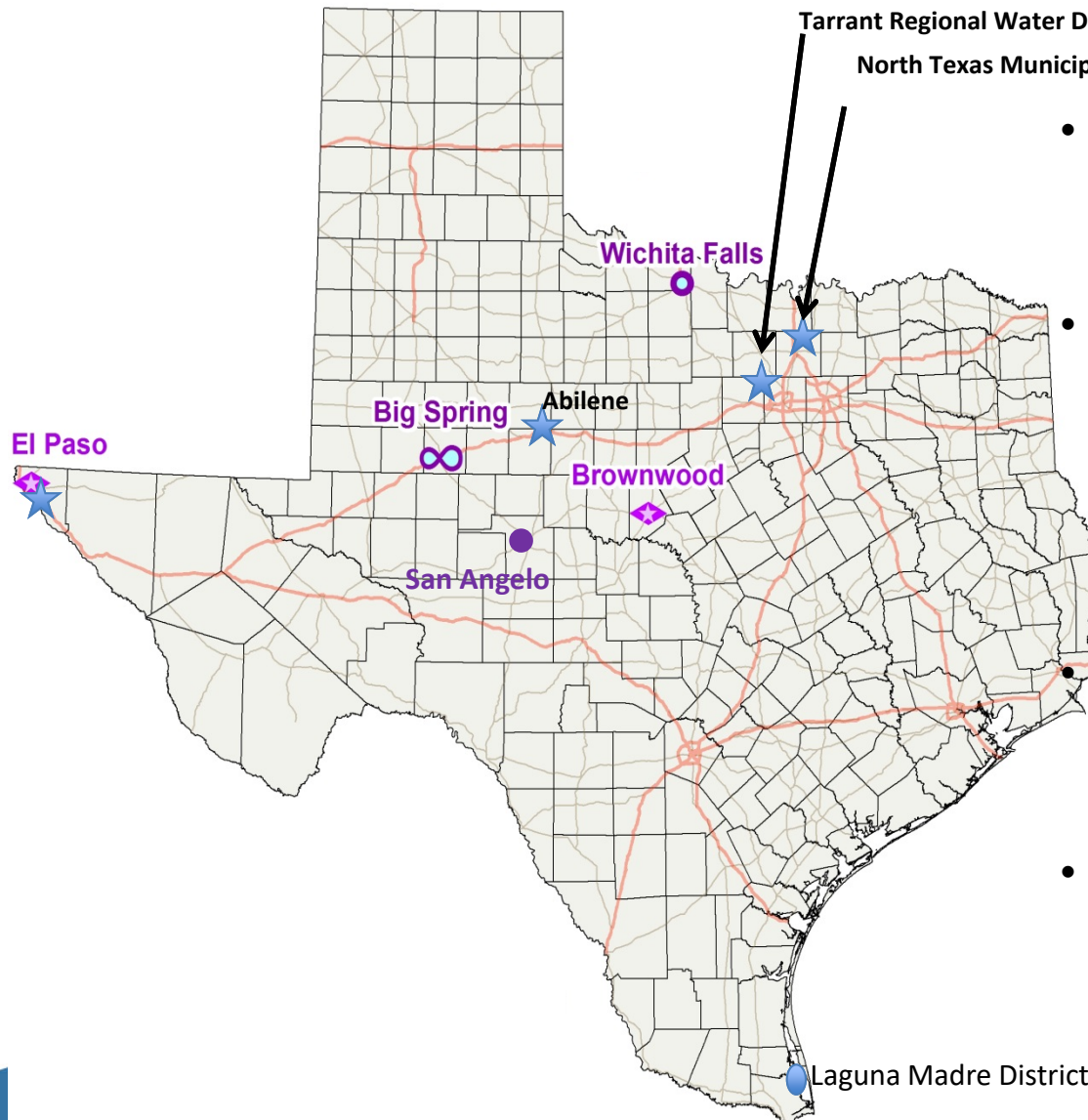
## REGULATORY MILESTONES

1990	Adoption of Texas Administrative Code Chapter 310—The first state regulations specifically addressing the use of reclaimed water.
1997	Adoption of Texas Administrative Code Chapter 210—Establishes rules and the authorization process for direct nonpotable water reuse projects. Replaces Chapter 310.
1999	Adoption of Texas Administrative Code Chapter 297.49—Grants the right to reuse treated wastewater as long as the water is not discharged to a waters belonging to the state of Texas.
2002	Adoption of amendments to Texas Administrative Code Chapter 210 to include rules for use of industrial reclaimed water.
2008	Adoption of Texas Administrative Code Chapter 321, Subchapter P – Reclaimed Water Production Facilities—Establishes streamlined permitting requirements for reclaimed water treatment (production) facilities at remote sites.

# National EPA guidelines



# Indirect and Direct Potable Reuse projects



- Raw Water Production Facility
  - Operating since May 2013
- Direct Potable Reuse Project (emergency project)
  - Operating since July 2014
  - Decommissioned July 2015
- Advanced Purified Water Treatment
  - Engineering design phase
- Direct potable reuse project
  - Stalled for city council approval

# Water Reuse TWDB Reports

**HISTORY OF WATER REUSE  
IN TEXAS**

**FEBRUARY 2011**

ALAN PLUMMER  
ASSOCIATES, INC.  
ENVIRONMENTAL  
ENGINEERS AND SCIENTISTS

**Final Report**

**STATE OF TECHNOLOGY  
OF WATER REUSE**

Prepared For:  
Texas Water Development Board  
P.O. Box 13231, Capitol Station  
Austin, Texas 78711-3231

August 2010

Prepared by:  
ALAN PLUMMER  
ASSOCIATES, INC.  
ENVIRONMENTAL  
ENGINEERS AND SCIENTISTS  
TDFE Firm Registration No. F-13

In conjunction with:  
Bryan W. Brooks, Ph.D.  
James Crook, Ph.D., P.E.  
Jörg E. Drewes, Ph.D.  
Katz and Associates, Inc.  
Margaret H. Nellor, P.E.  
David L. Sedlak, Ph.D.  
Shane A. Snyder, Ph.D.

... because water is precious

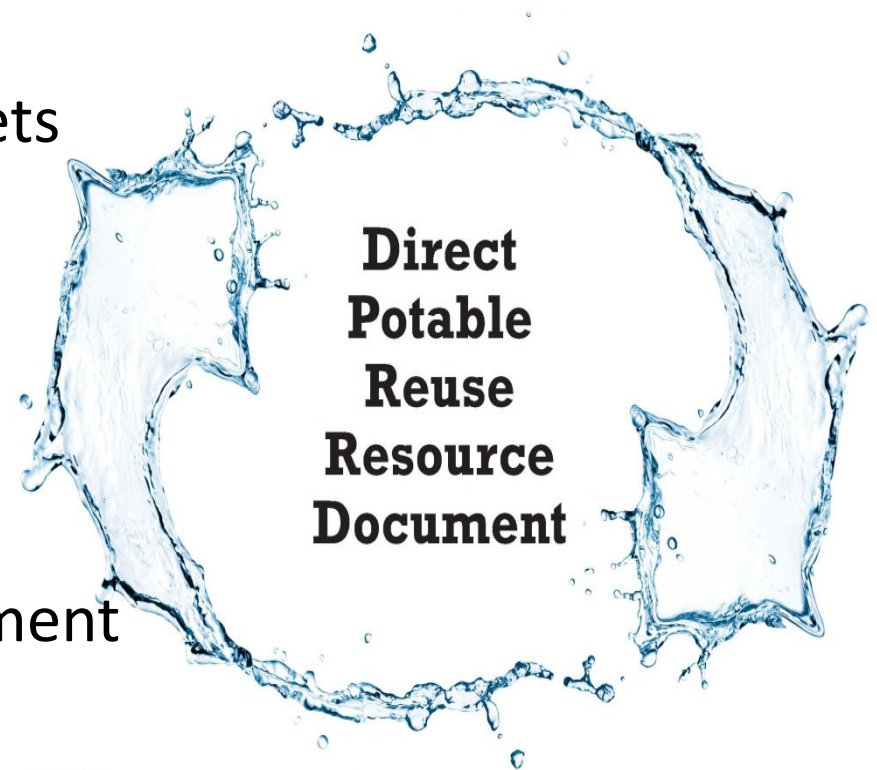
**WATER REUSE  
RESEARCH AGENDA**

**FEBRUARY 2011**

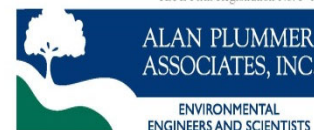
ALAN PLUMMER  
ASSOCIATES, INC.  
ENVIRONMENTAL  
ENGINEERS AND SCIENTISTS

# Evaluating the Potential for Direct Potable Reuse

- Contaminants of Concern
- Water quality performance targets
- Water quality characterization
- Source control
- Treatment technologies
- Environmental buffers
- Quantitative relative risk assessment
- Pilot protocols
- Regulatory summary
- Public awareness and outreach



April 2015



**TWDB Contract No. 1248321508**  
**Volume 1 of 2**

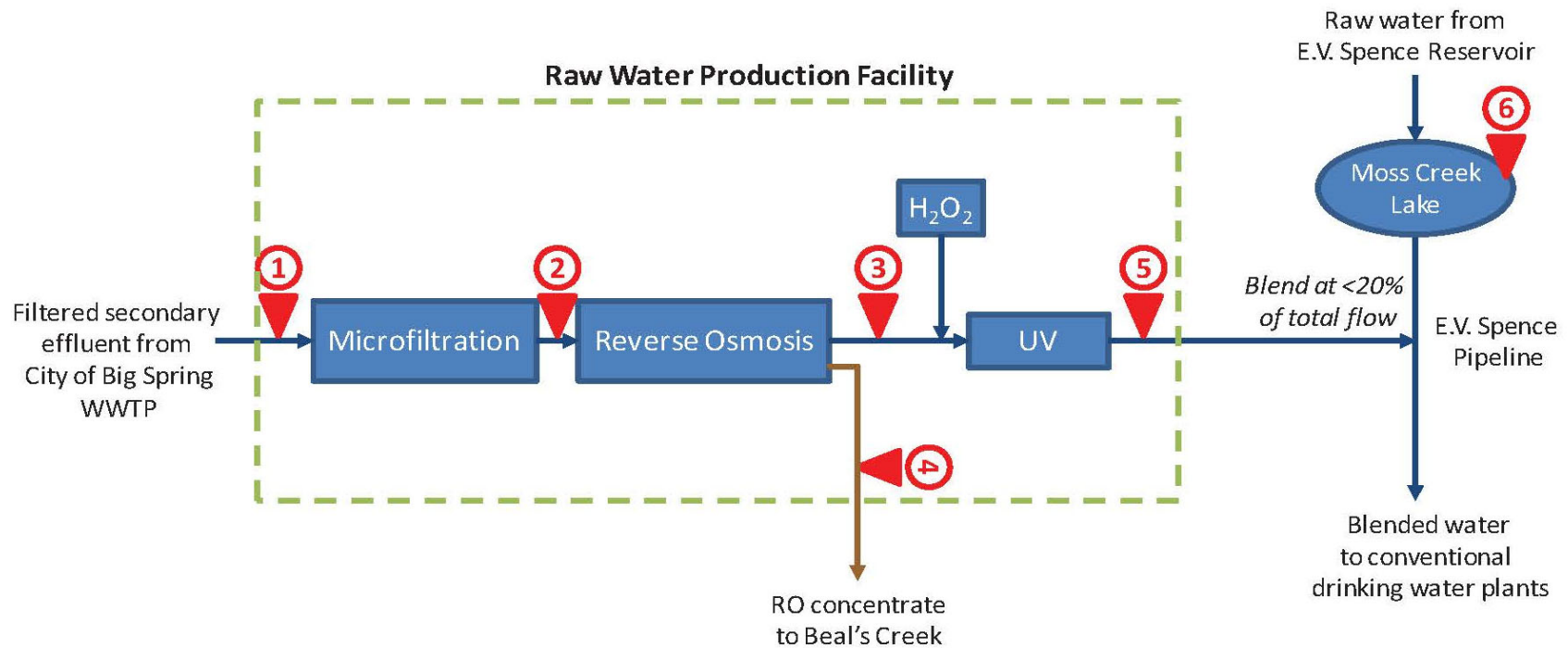


# Testing Water Quality in a Municipal Wastewater Effluent Treated to Drinking Water Standards

- Quarterly sampling
  - Chemicals of Emerging Concern
  - Microbial pathogens
- Develop correlations for surrogates compounds
- Guidance document for monitoring at direct potable reuse facilities



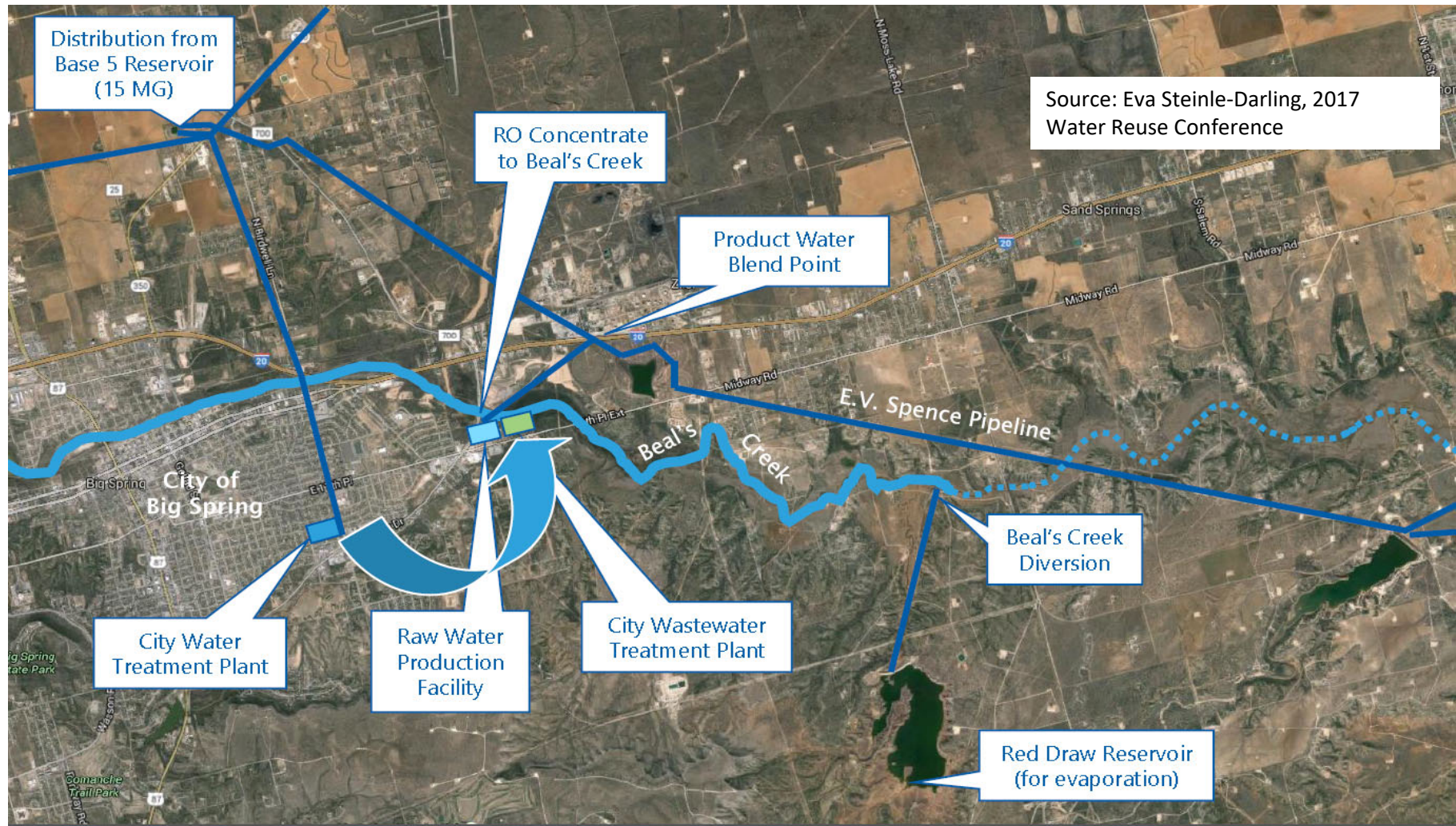
# Water sample locations



Proposed Sample Location



# Raw Water Production Facility in Big Spring



## EXECUTIVE SUMMARY

In May 2013, the Colorado River Municipal Water District (CRMWD or District) began augmenting raw water supplies with advanced treated reclaimed water from its Raw Water Production Facility (RWPF) in Big Spring, Texas. Since the implementation of direct potable reuse projects at Big Spring and Wichita Falls, many view direct potable reuse (DPR) as a viable option for increasing a community's water supply.

### Study Goals

Because this newfound acceptance may lead to more DPR projects across the state, the Texas Water Development Board commissioned this study to increase confidence in the safety and effectiveness of the RWPF's DPR applications through a detailed sampling campaign. In addition, this study includes guidance focused on indicators and surrogates for improved DPR process monitoring at a reasonable cost. Both of the aforementioned goals support further developing DPR projects as a viable water supply alternative across Texas and the United States.

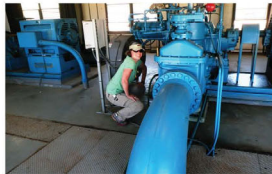
### Sample Results

Testing was conducted in accordance with a detailed Test Protocol, and data were compiled into summary tables and graphics. Samples collected unequivocally showed that the RWPF produces water of very high quality. In fact, the water is more than sufficient to serve as a raw water source that is blended with other, conventional raw water sources before being retreated in conventional water treatment plants served by the District. This conclusion is supported by a number of facts:



Plant Operators Collecting Compliance Samples

**1** RWPF compliance testing already addresses parameters with regulatory limits. Based on the data provided to the project team (see Appendix C), no regulated parameters have been exceeded.



Sampling at Moss Creek Lake Pump Station

**2** Study sampling for constituents of emerging concern (CECs) indicate that concentrations of CECs in the RWPF influent are below health-based benchmarks, and concentrations in the product water are correspondingly lower. In fact, unregulated CECs in the RWPF product water were generally lower than concentrations measured in samples from Moss Creek Lake. Water from Moss Creek Lake is blended with RWPF product water. This means that the RWPF product water is actually improving the quality of the blended water provided to downstream conventional water treatment plants for final drinking water treatment and distribution to customers.



Field-Filtering for Virus

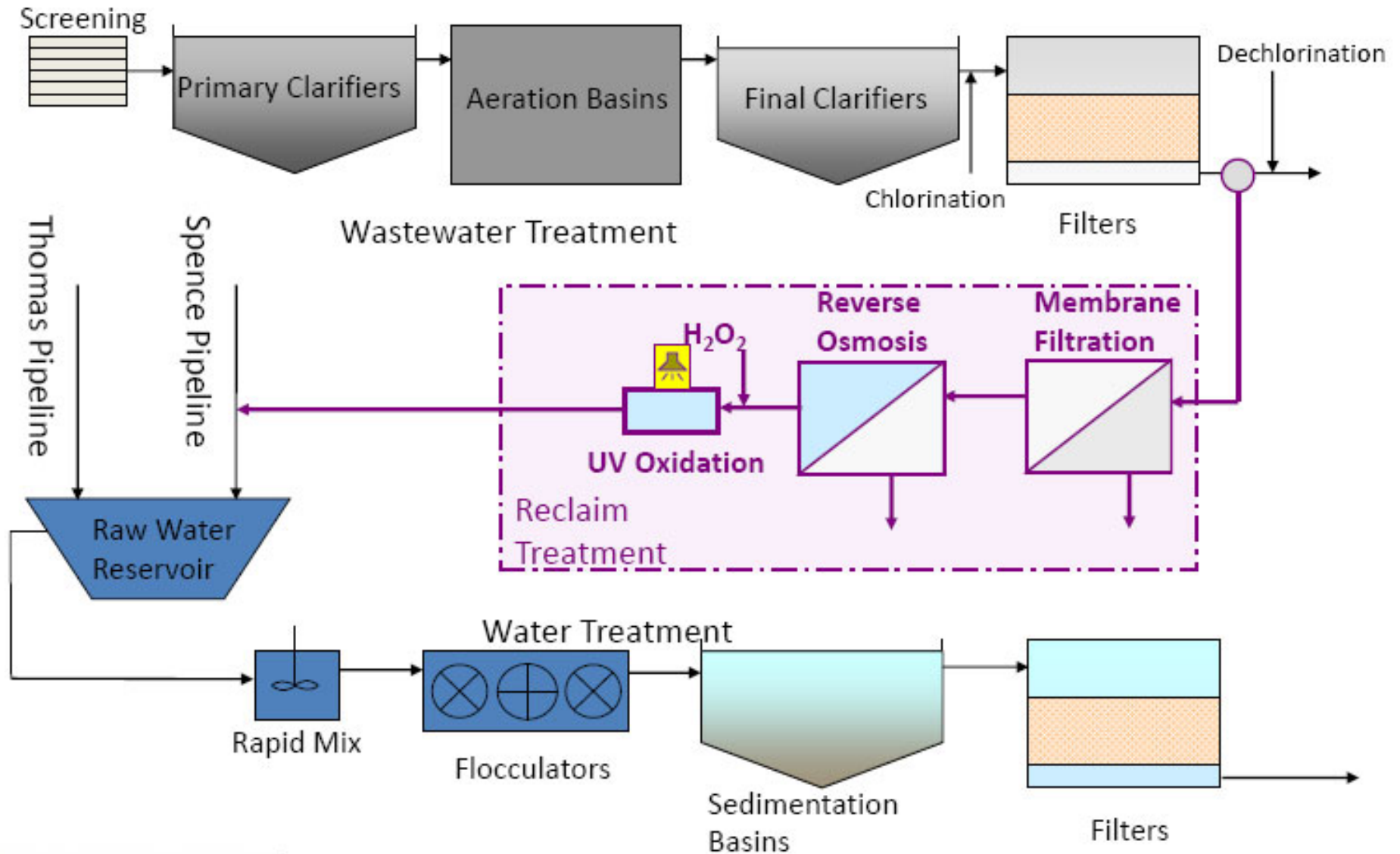
**3** Pathogen testing yielded equally clear results: Protozoa (Giardia and Cryptosporidium) and bacteria (Escherichia coli) were not detected past the first treatment process in the RWPF (microfiltration). Not a single sample collected at the RWPF tested positive for enteric virus.



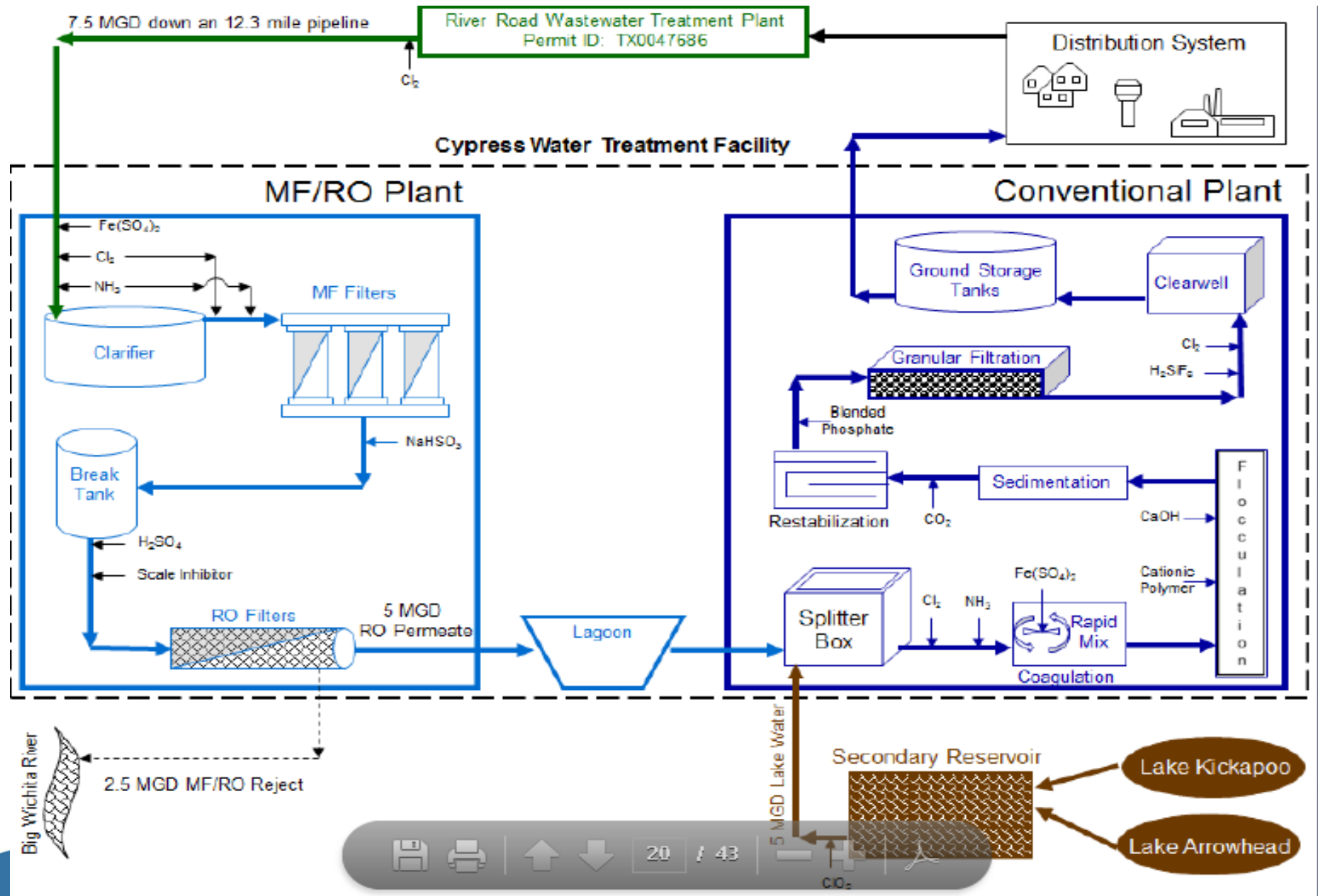
Erika Mancha  
Innovative Water Technologies  
(512) 463-7932  
erika.mancha@twdb.texas.gov

**Innovative Water Technologies**  
**[www.twdb.texas.gov/innovativewater/index.asp](http://www.twdb.texas.gov/innovativewater/index.asp)**

# Raw Water Production Facility in Big Spring



# Direct Potable Reuse Project in Wichita

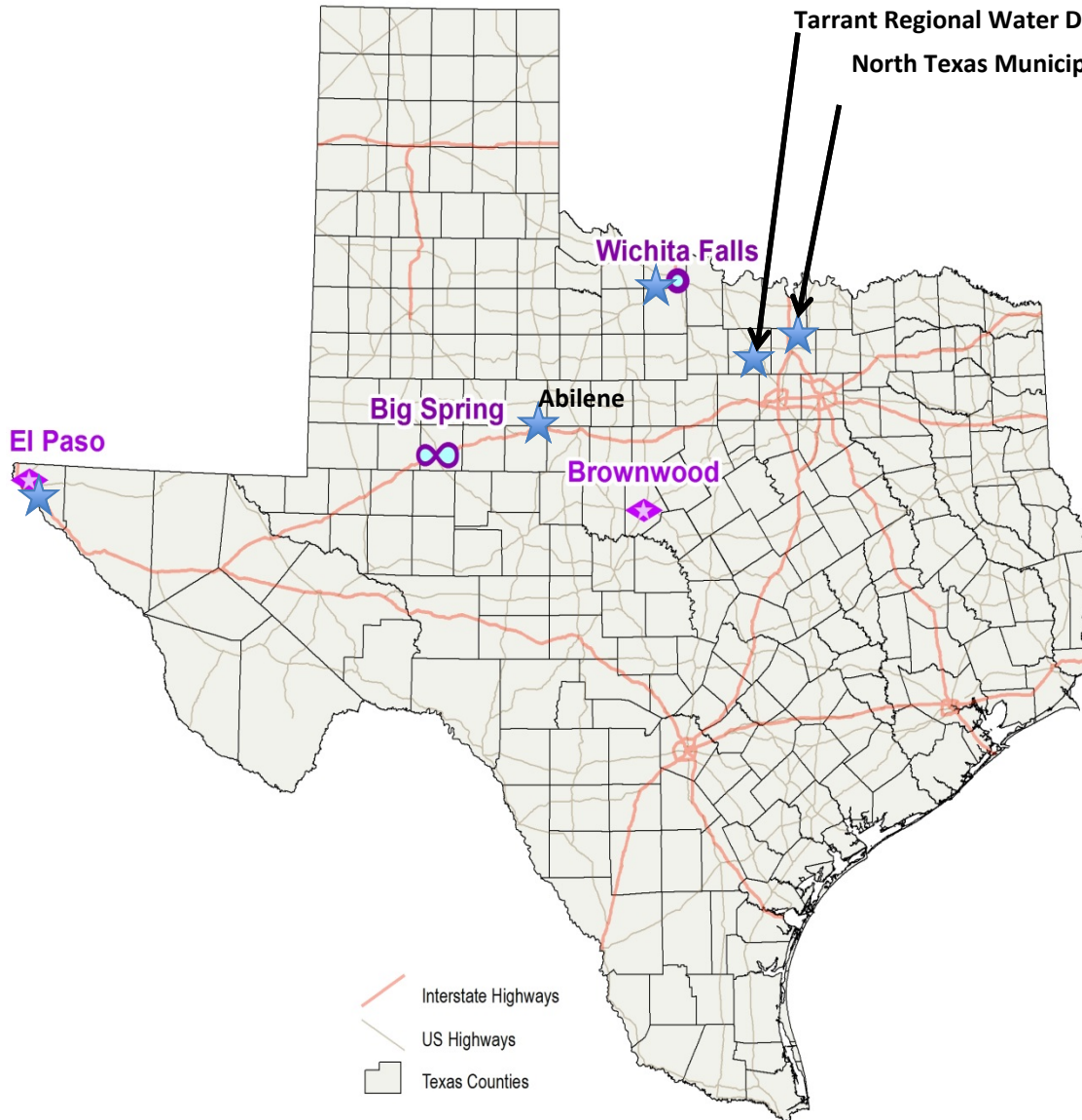


20 / 43



$\text{CO}_2$

# Potable Reuse Facilities in Texas



## Direct potable reuse (purple symbol)

- Raw Water Production Facility in Big Spring
  - Operating since May 2013
- Direct Potable Reuse Project in Wichita Falls (emergency project)
  - Operating since July 2014
  - Decommissioned July 2015
- Advanced Purified Water Treatment in El Paso
  - Engineering design phase
- Direct potable reuse project in Brownwood
  - Canceled due to city council disapproval

## Indirect potable reuse (blue star)

- Fred Hervey Reclamation Plant in El Paso
  - Operating since 1985
- Tarrant Regional Water District
- North Texas Municipal Water District
- City of Abilene
  - Operating since January 2015
- City of Wichita Falls
  - Operating since January 2017