

Reuse in Texas

Basin Clean Rivers Program
Steering Committee Meeting
April 13, 2017
By Erika Mancha

The following presentation is based upon professional research and analysis within the scope of the Texas Water Development Board's statutory responsibilities and priorities but, unless specifically noted, 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.

Water Science & Conservation

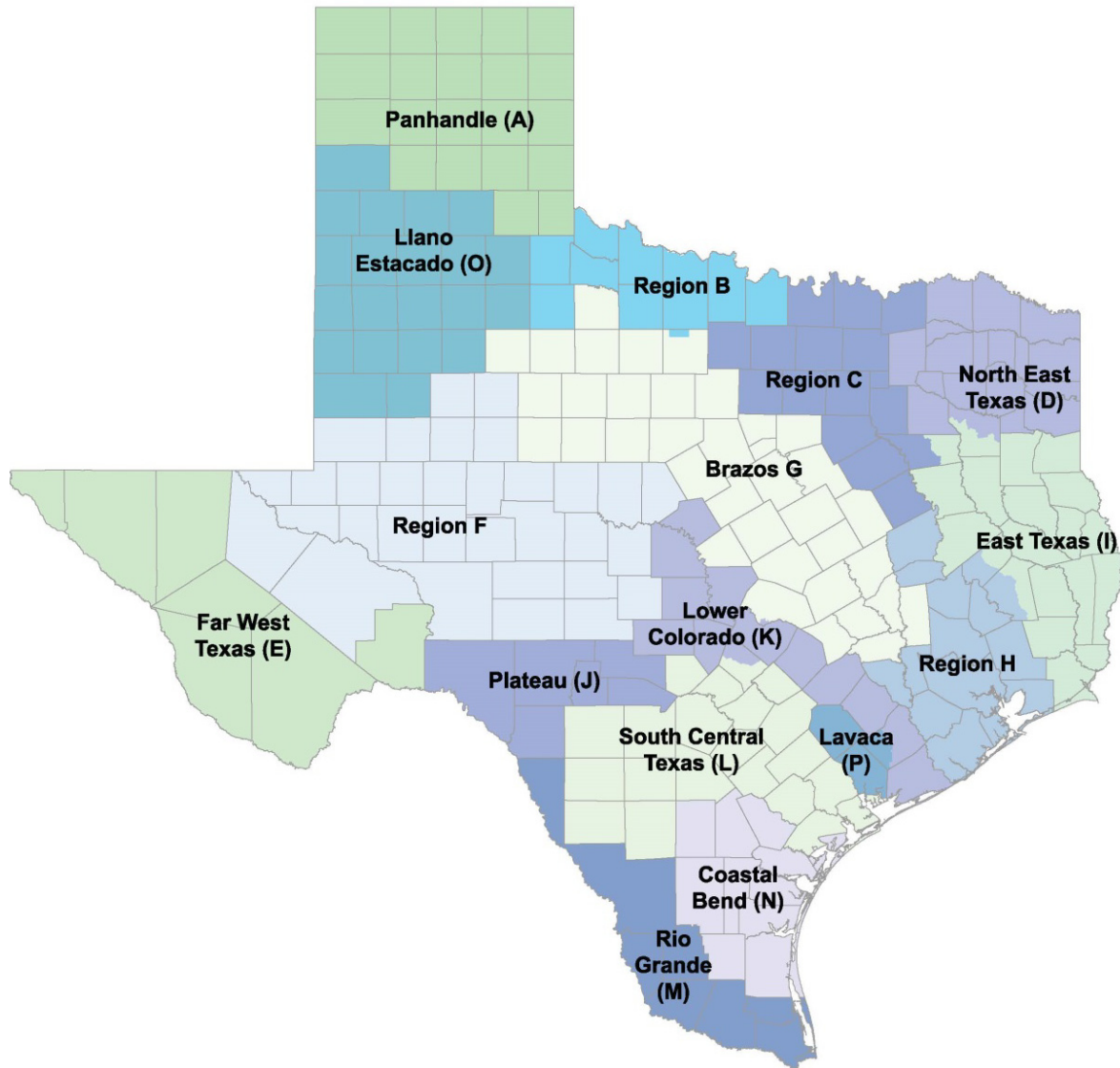
Water Supply & Infrastructure

Texas Natural Resource Information System

Operations & Administration

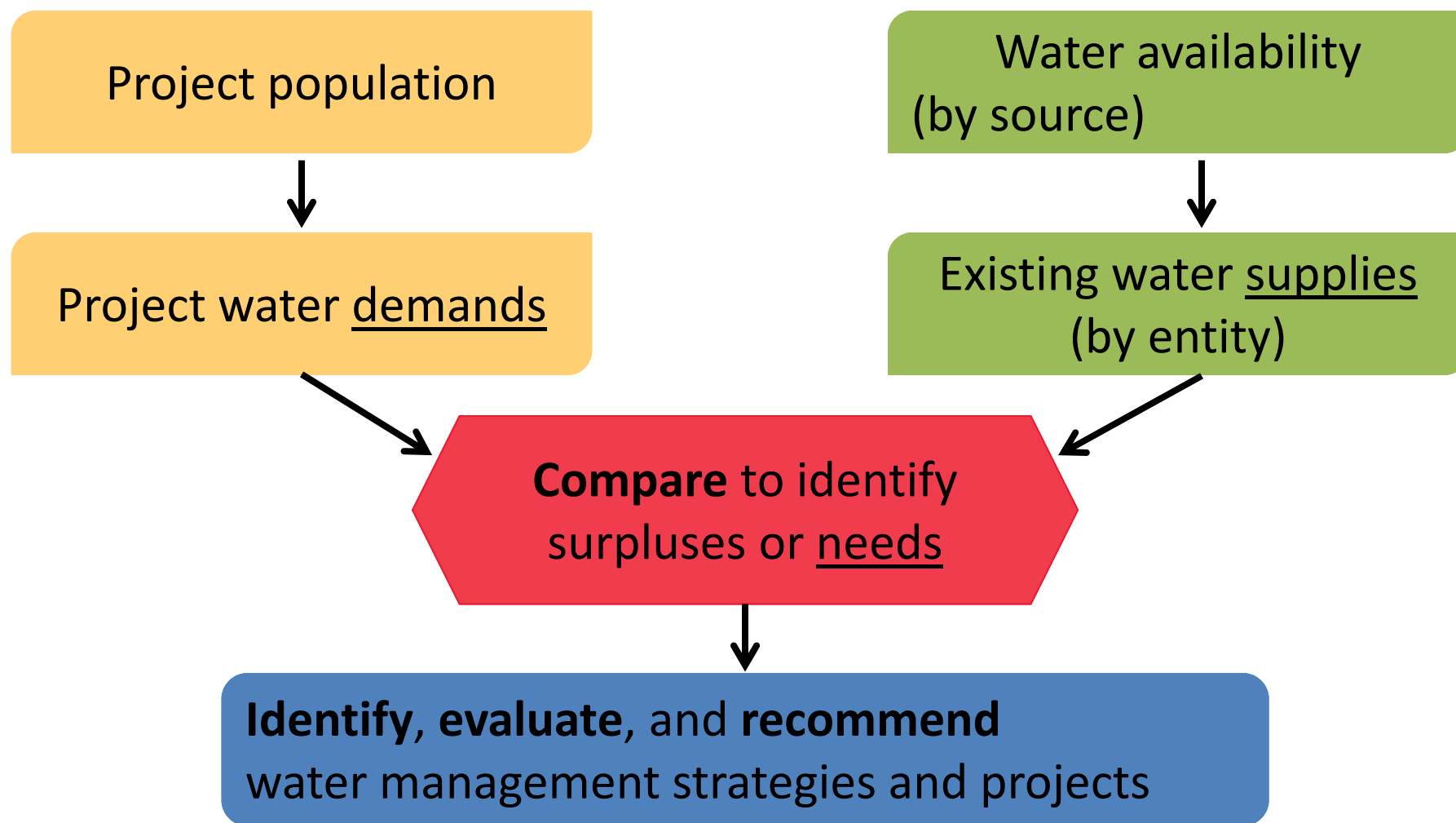
Finance

Regional Water Planning Areas

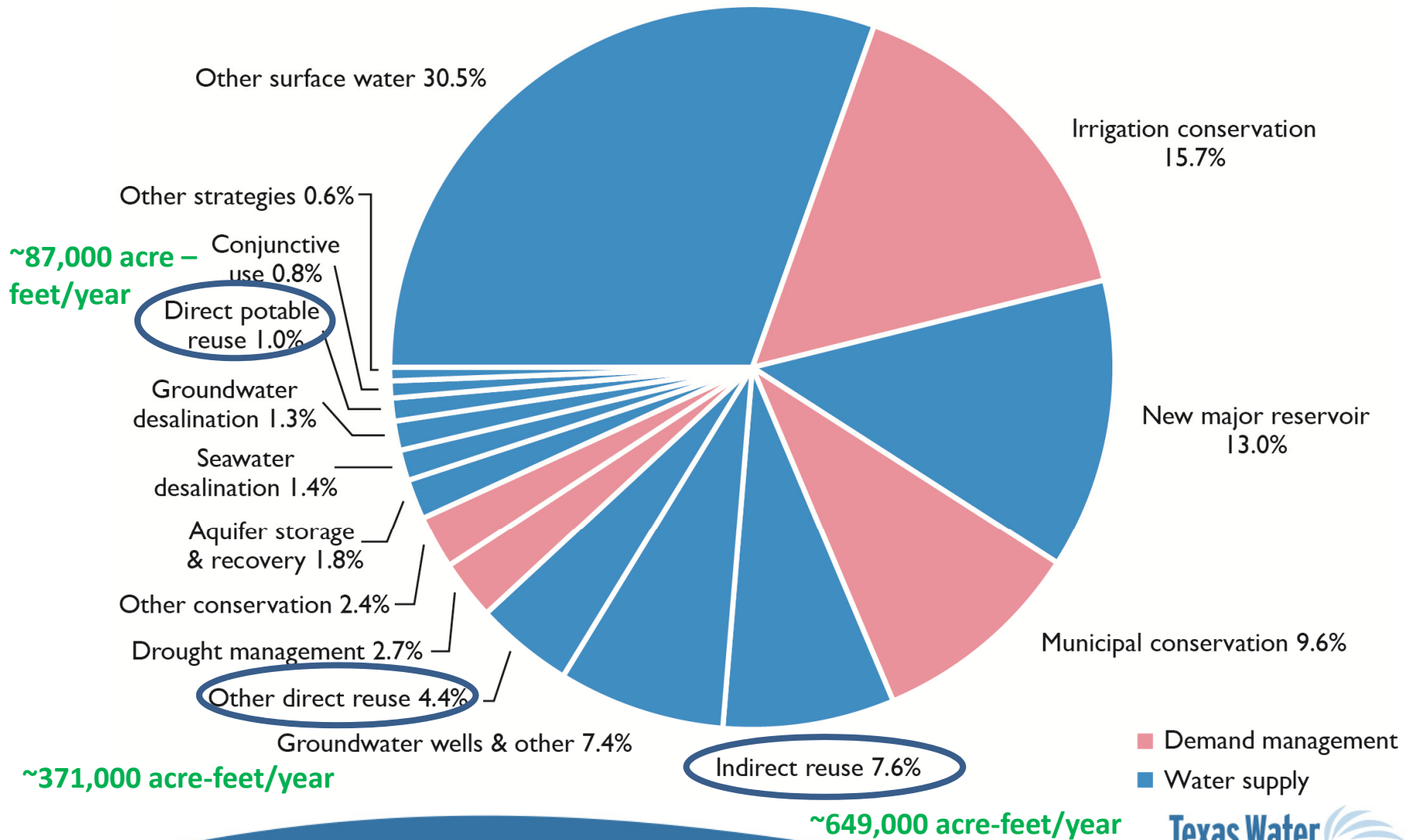


- Bottom-up approach
- State Water Plan every five years
- 2017 State Water Plan

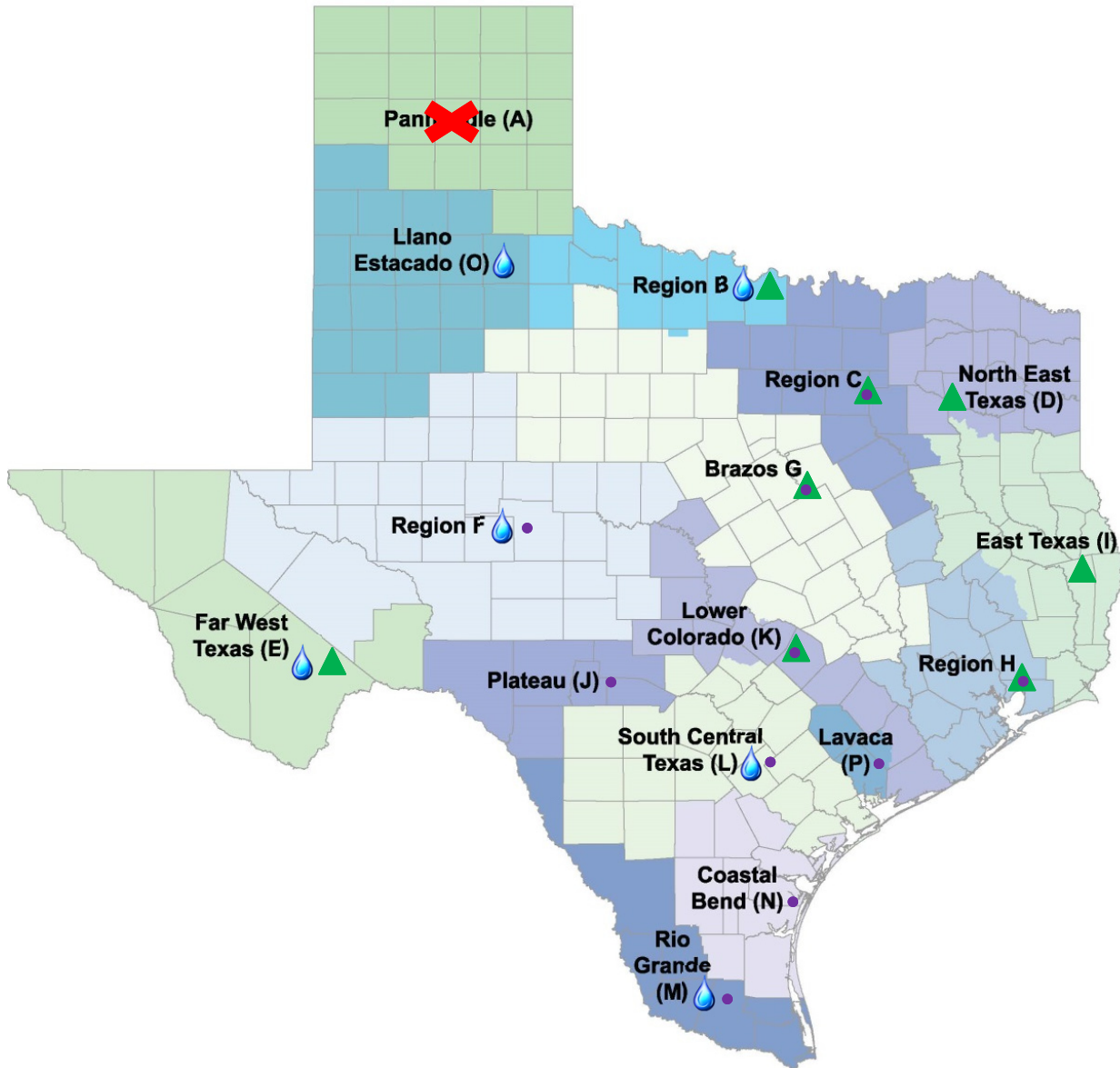
Water Planning Basics



Recommended Water Management Strategies by 2070



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)

Projected reuse existing water supplies

Table 6.1 - Texas' annual existing water supply (acre-feet)

Source	2020	2030	2040	2050	2060	2070	Percent change
Surface water	7,463,000	7,520,000	7,505,000	7,491,000	7,468,000	7,417,000	-1
Groundwater	7,191,000	6,770,000	6,367,000	6,048,000	5,776,000	5,432,000	-24
Reuse	564,000	602,000	631,000	671,000	710,000	723,000	28
Texas*	15,218,000	14,892,000	14,503,000	14,210,000	13,954,000	13,572,000	-11

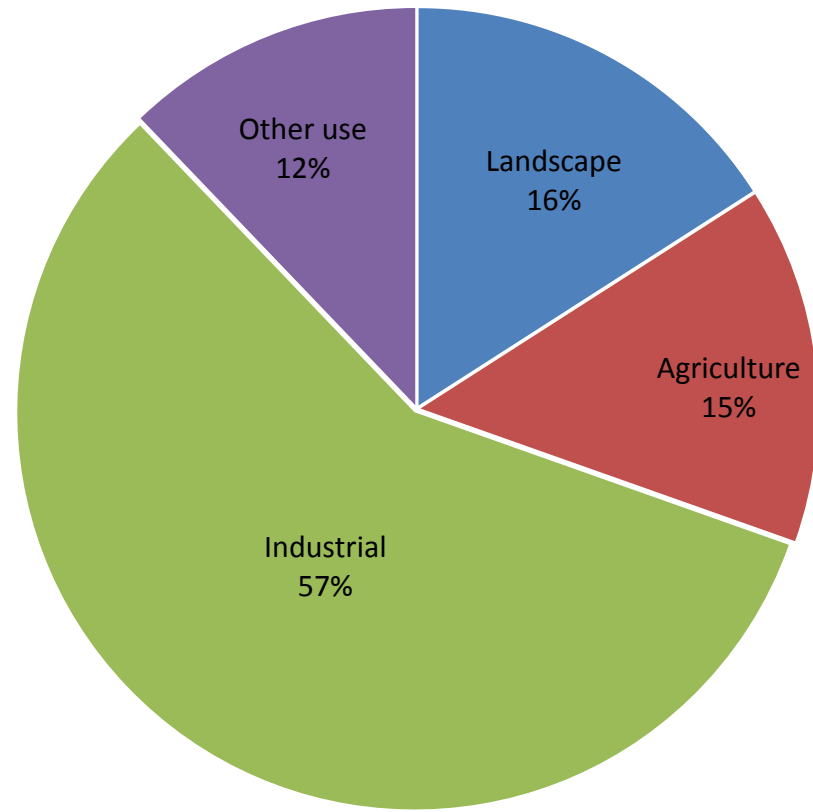
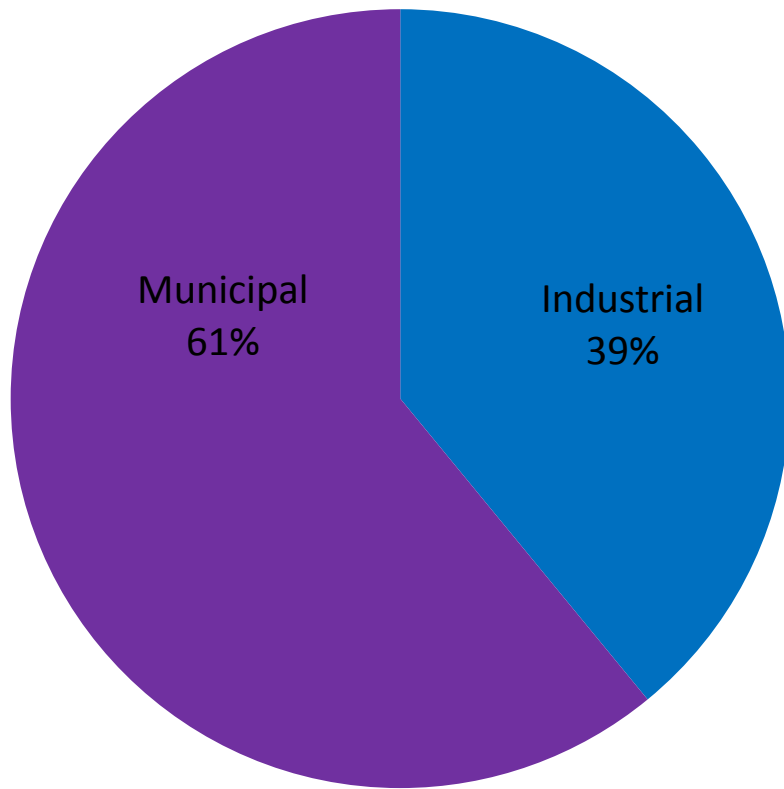
* Does not reflect some portions of existing supplies that are associated with purely saline water sources such as untreated seawater

Source: 2017 State Water Plan

Water Use Survey

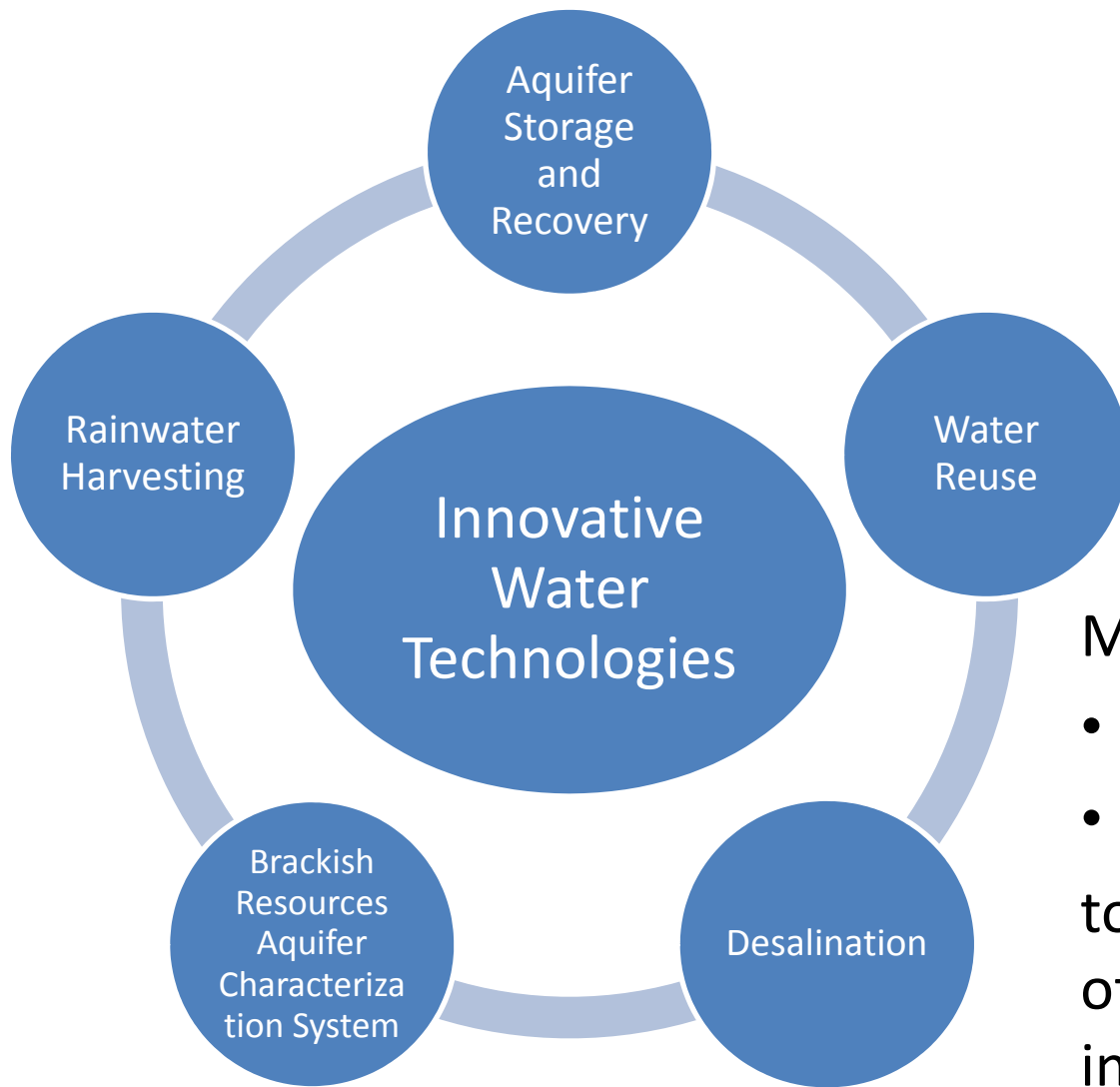
- Conducted annually by water use survey team
- Two surveys types: Municipal and Industrial
- Survey ~4,300 municipal and 2,500 industrial
- <http://www.twdb.texas.gov/waterplanning/waterusesurvey/index.asp>

2015 Water Reuse in Texas



69,352,037,775 gallons
Total Water Reuse

2015 Water Use Survey



Mission is to

- conduct research and
- disseminate information to advance the development of alternative water supplies in Texas.

WATER RECYCLES

-The Complete Story-



Poster created by

www.twdb.org

 Water Quality
 Protection Division
 EPA Region 6

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Types of potable reuse

De facto Water Reuse:

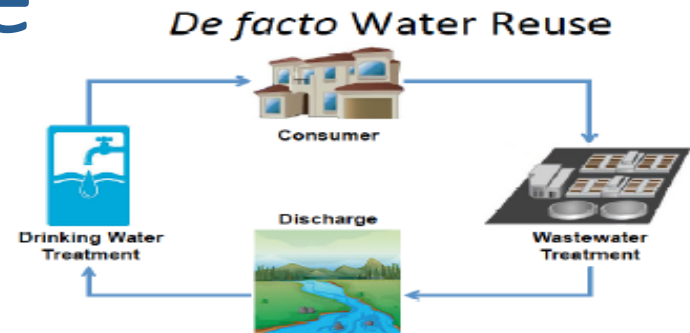
A drinking water supply that contains a significant fraction of treated wastewater, typically from wastewater discharges, although the water supply has not been permitted as a water reuse project.

Indirect Potable Reuse (IPR):

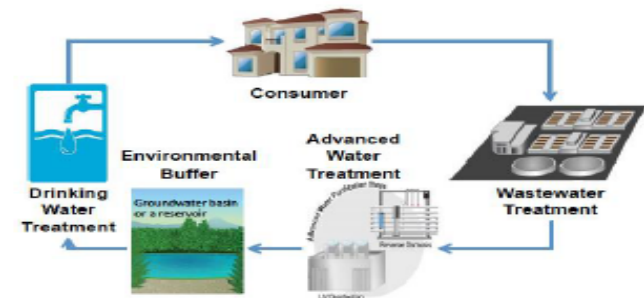
The use of reclaimed water for potable purposes by discharging to a water supply source, such as a surface water or groundwater. The mixed reclaimed and natural waters then receive additional treatment at a water treatment plant before entering the drinking water distribution system.

Direct Potable Reuse (DPR):

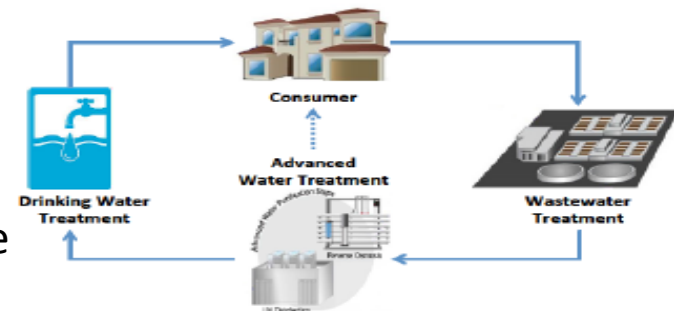
The introduction of advanced-treated reclaimed water either directly into the potable water system or into the raw water supply entering a water treatment plant.



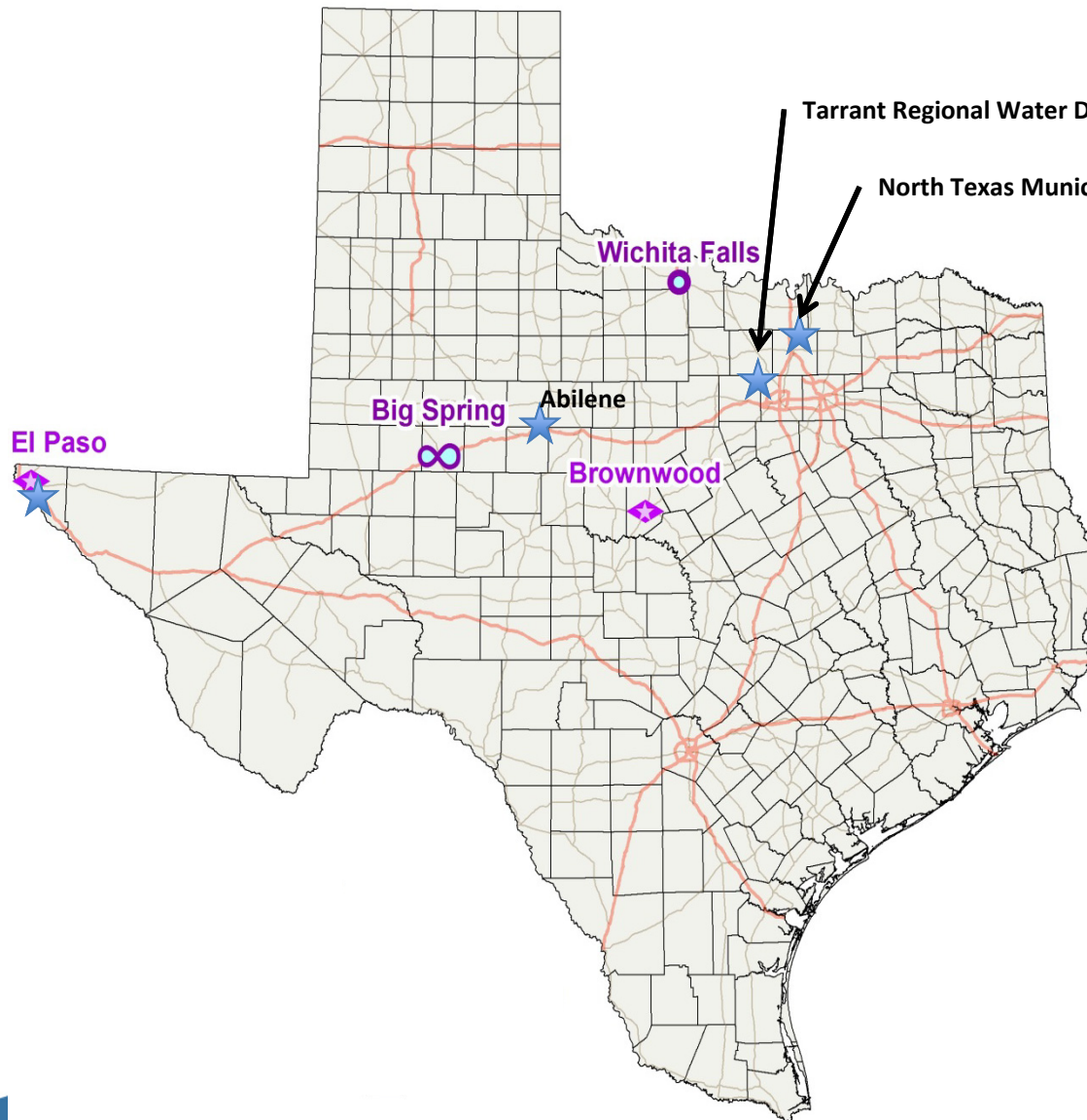
Indirect Potable Reuse



Direct Potable Reuse



Indirect and Direct Potable Reuse Existing and Proposed Facilities

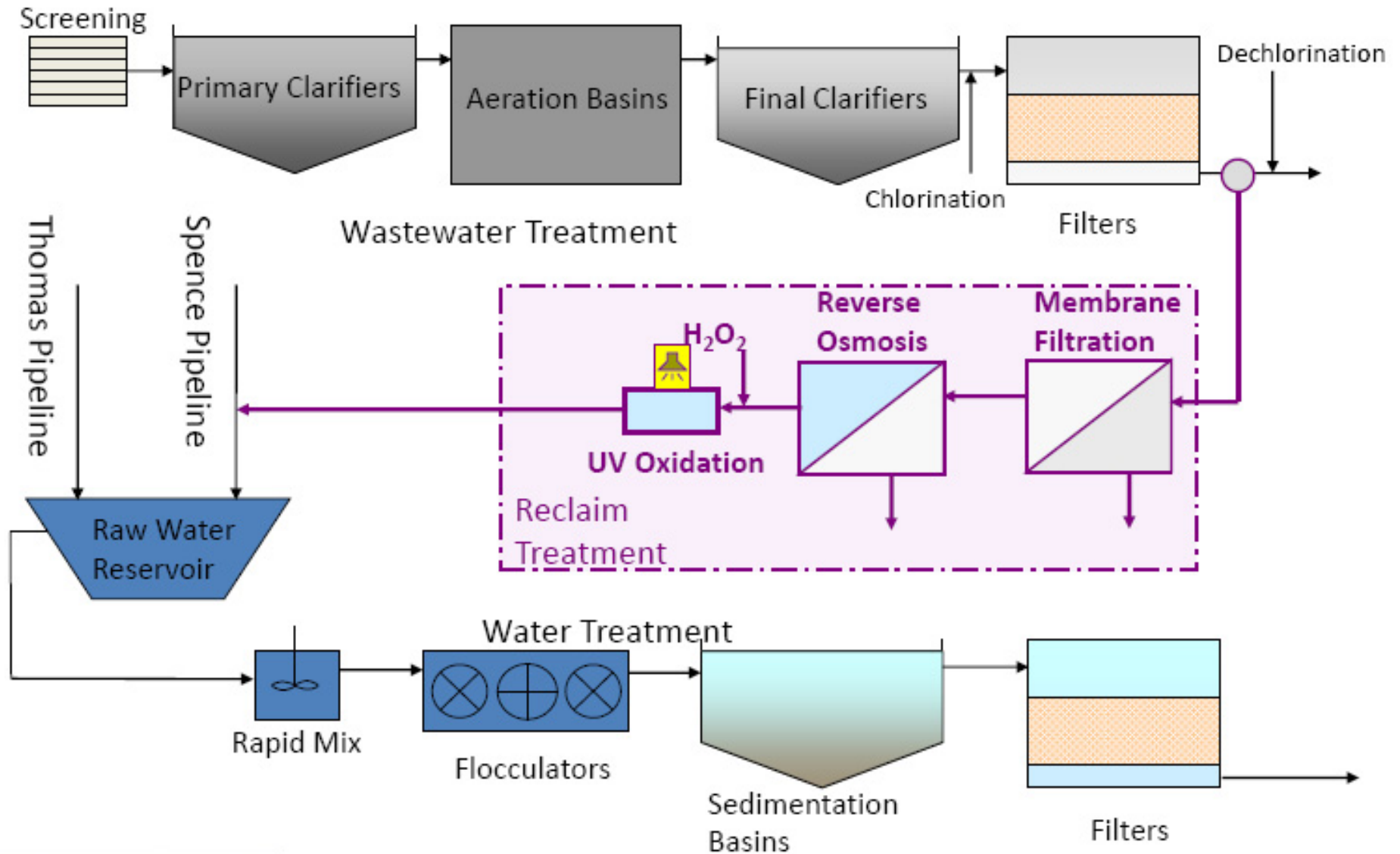


- Raw Water Production Facility
 - Operating since May 2013
- Direct Potable Reuse Project (emergency project)
 - Operating since July 2014
 - Decommissioned July 2015
- Advanced Purified Water Treatment
 - Conducted pilot study
- Direct potable reuse project
 - Awaiting city council approval

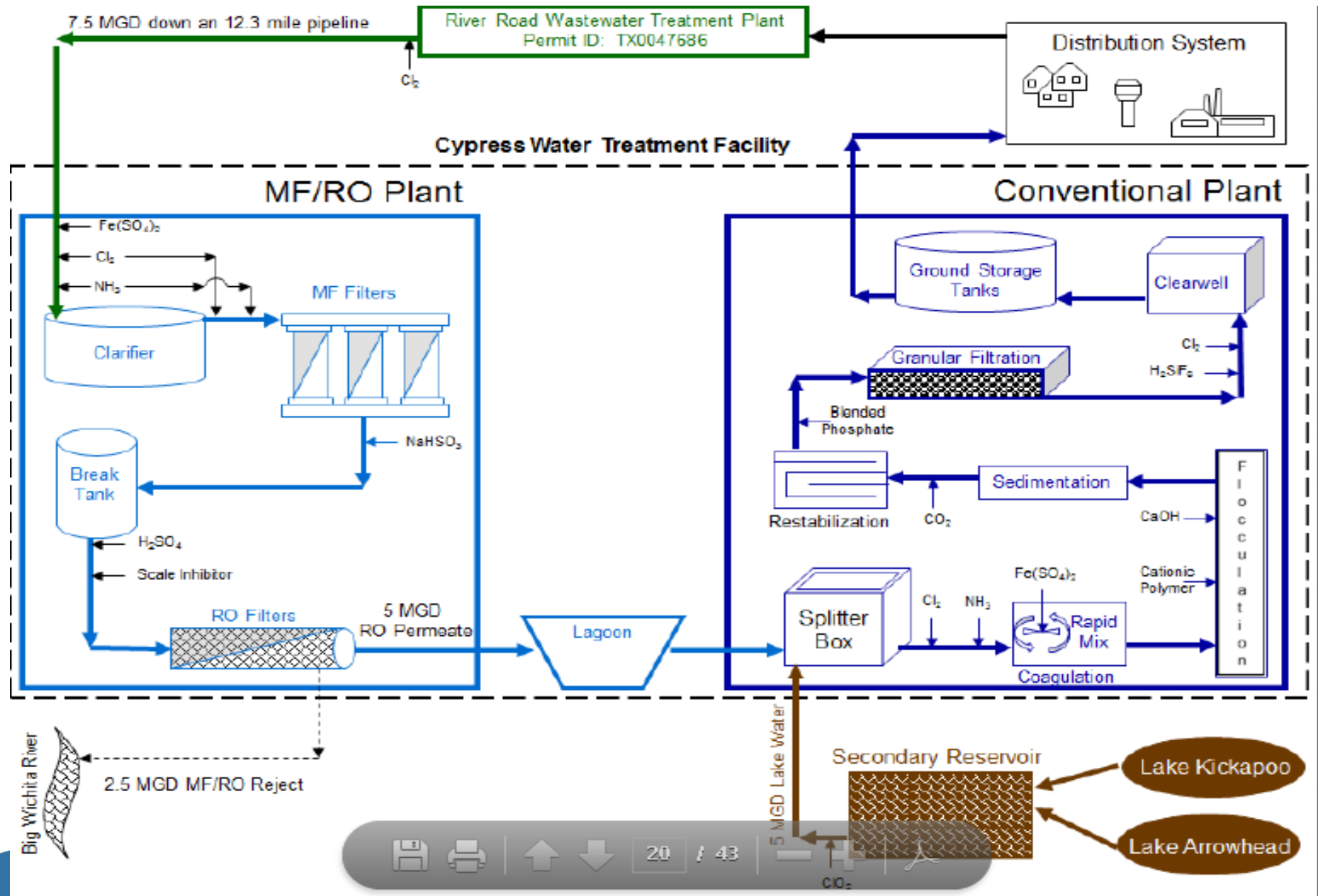
Expected Growth: Water Reuse

- Laguna Madre Water District
 - Completed feasibility study for direct potable
- San Angelo
 - Completed feasibility study and pilot for direct potable
- Wichita Falls
 - Obtained permits for Lake Arrowhead indirect potable
- Lake Fort Phantom Hill
 - Implemented indirect potable reuse on January 2015

Raw Water Production Facility in Big Spring

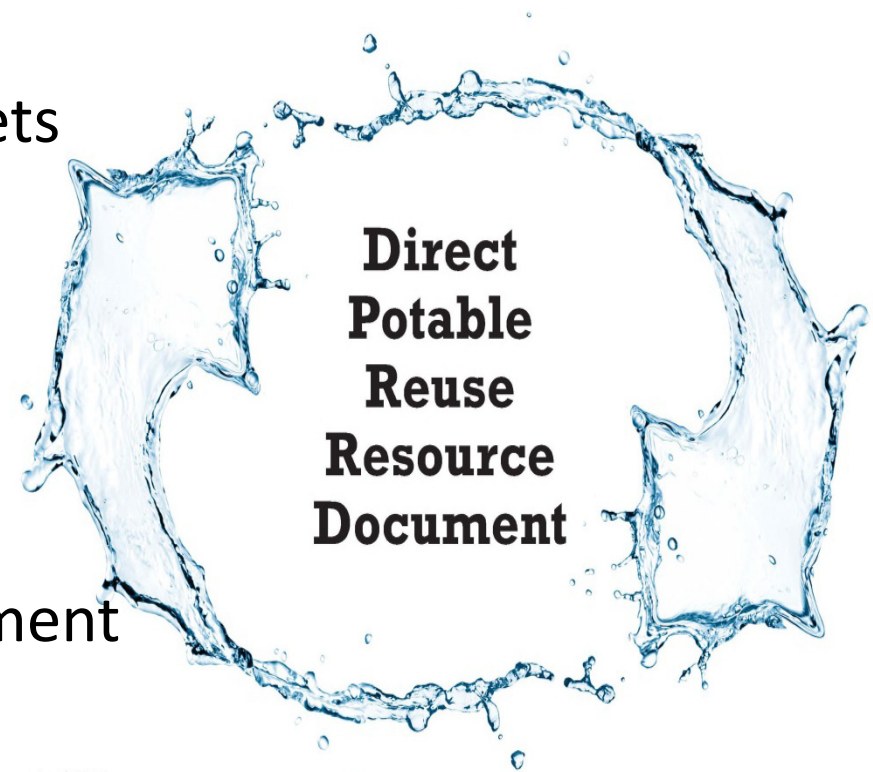


Direct Potable Reuse Project in Wichita

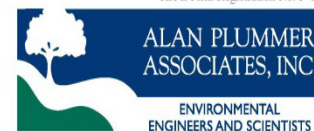


Evaluating the Potential for Direct Potable Reuse

- 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



TBPE Firm Registration No. F-13

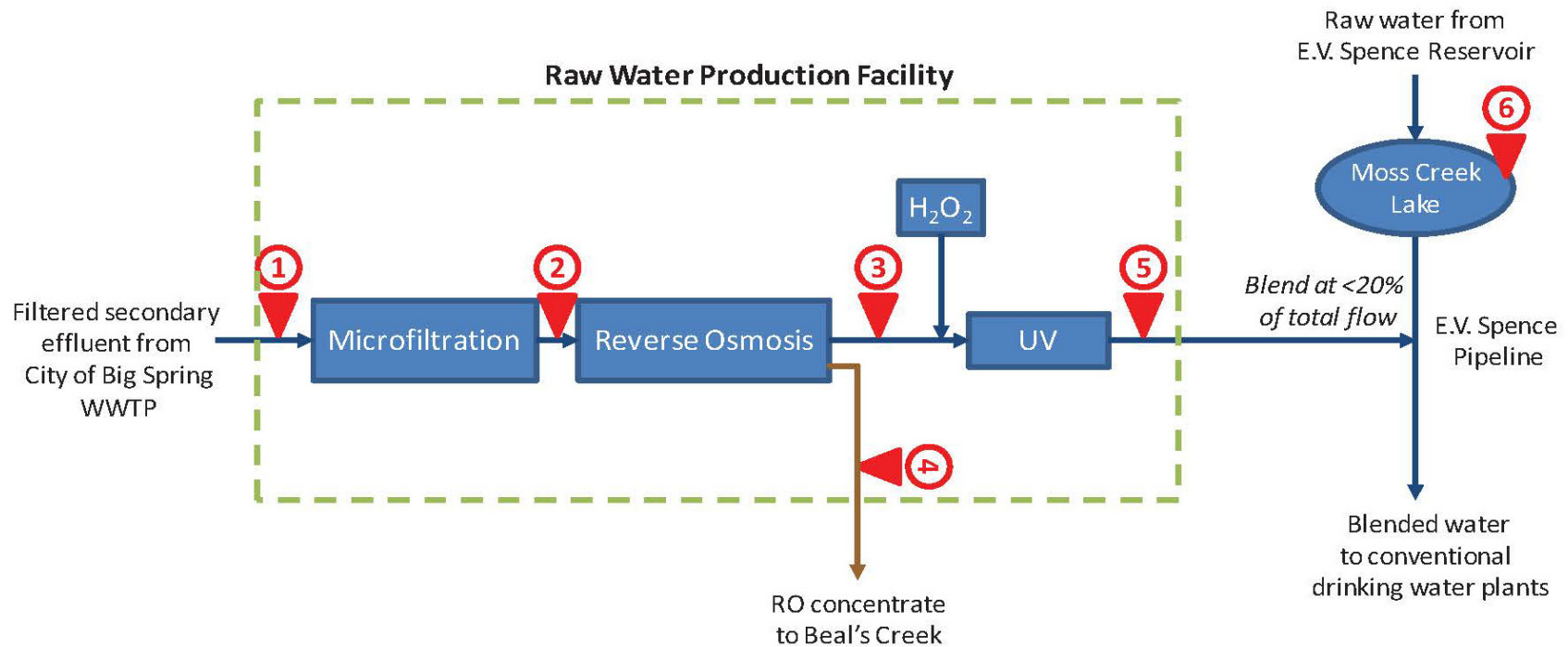
TWDB Contract No. 1248321508
Volume 1 of 2

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



Sample Locations



Proposed Sample Location



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.

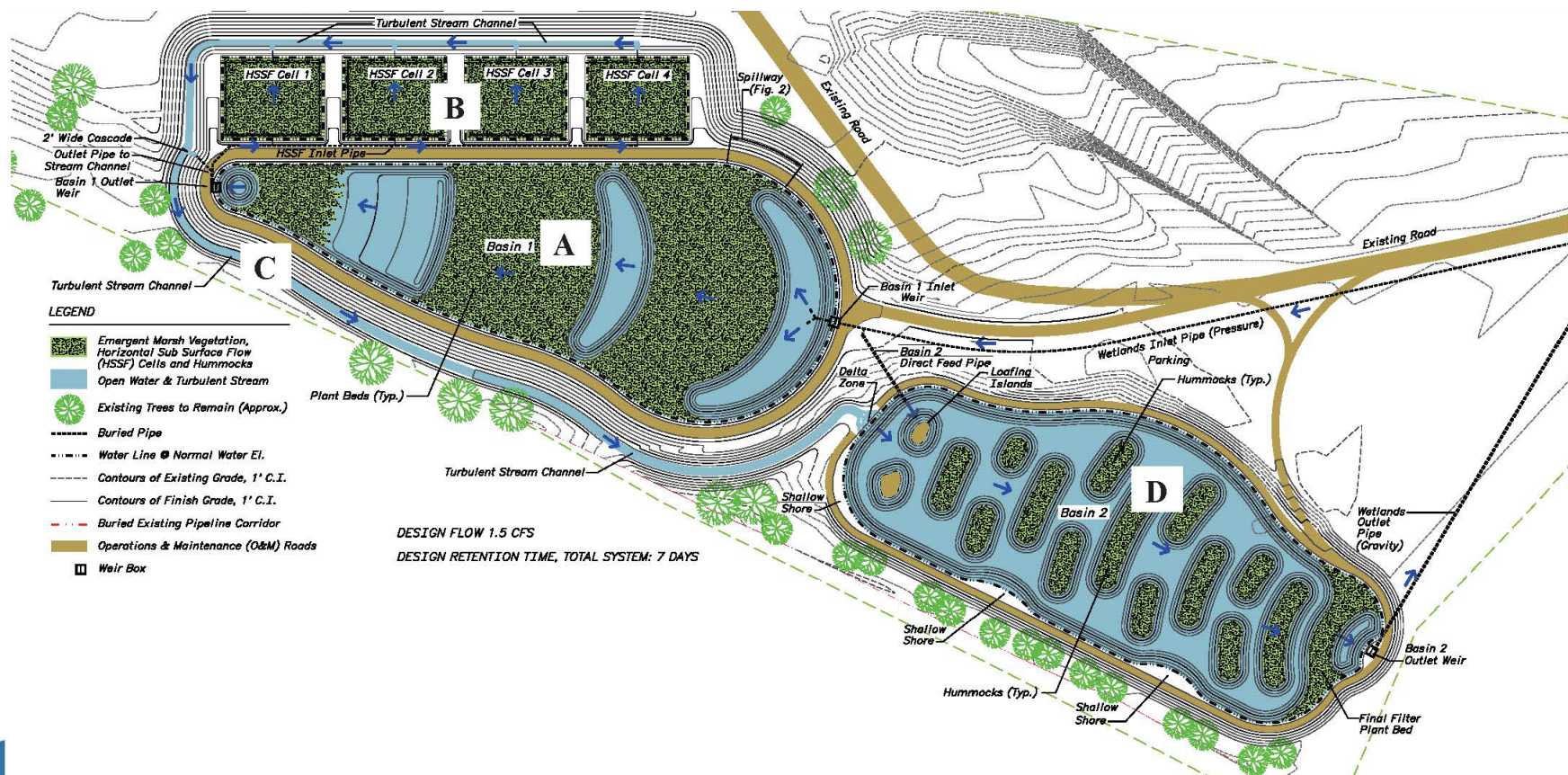


Field-Filtering for Virus

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.

Brazos River Wetland

- Engineered wetland constructed in Waco, Texas to evaluate how endocrine disrupting compounds can be reduced from treated wastewater effluent.



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Innovative Water Technologies

<http://www.twdb.texas.gov/innovativewater/reuse/index.asp>