El Paso Potable Reuse Program: Historical Development and Current state

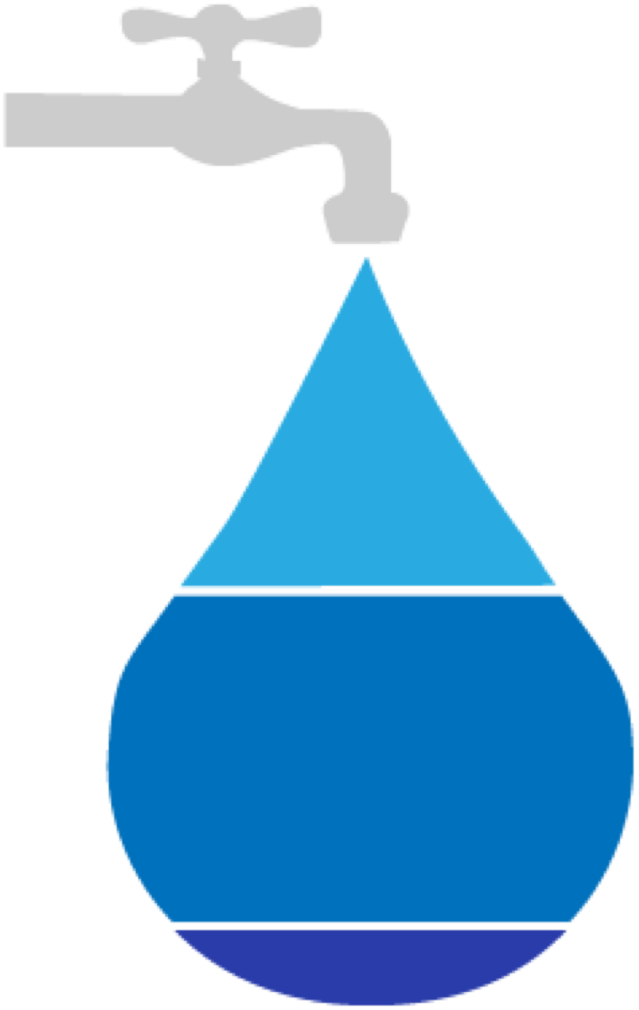
ASERSA
Angel Bustamante PE

May 15, 2024

El Paso and Water Information

- Estimated population in El Paso County is over 860,000
- Average rainfall is 9 to 11 inches per year – 254 mm
- River water allotment is weather dependent
- Two surface water plants
- Two groundwater plants (includes a desalination plant)
- Wastewater system includes 2,400 miles of pipeline and 70 lift stations
- 3 conventional activated sludge plants
- 1 indirect potable reuse plant

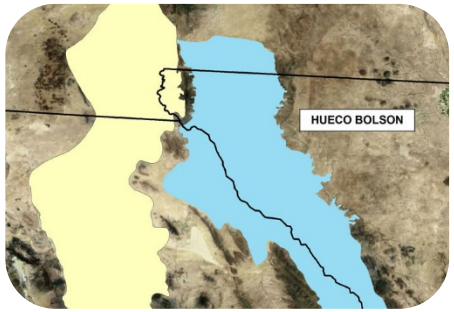
Water Supply



- In 2023, El Paso Water produced approximately 40.5 billion gallons of potable water = 150 cubic hm/year

- Water sources supplying total demand
  - Hueco and Mesilla Bolson 70%
  - Surface water from the Rio Grande 30%
  - Purified water is next

El Paso Water Already has a Diverse Supply Portfolio



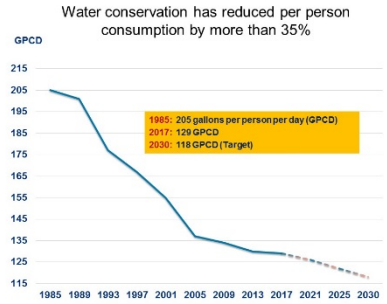
Groundwater

Surface Water

Desalination

Non-Potable Reuse

Indirect Potable Reuse



Conservation

Nonpotable Reuse since 1963

Tertiary Treated Effluent

Fred Hervey Water Reclamation Plant
Indirect Potable Plant – since 1985

Site


3/2024
Fred Hervey Water Reclimation Plant
Image © 2024 Airbus
Google Earth

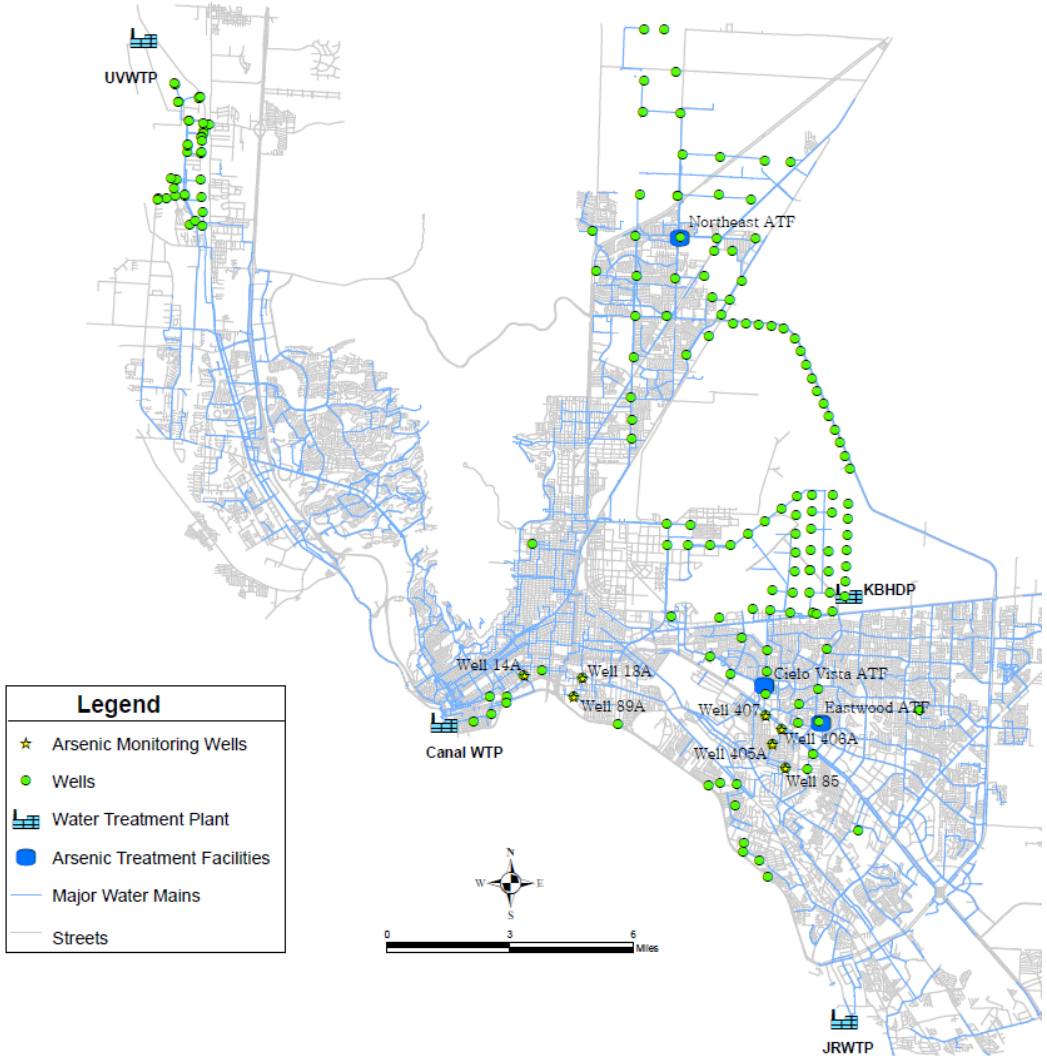
Equalization Ponds

Carbon Based Advanced Treatment

Switched to Infiltration basins

Aquifer Storage and Recovery

Locations of Groundwater Well Facilities



Water Resource Recovery Plants

Opportunities - Drinking Water Treatment Facilities

What are the challenges?

- Wastewater system – don't spill
- Wastewater plant – meet permit

- Water system – how to get water to the right location
- Water distribution – drinking water quality and uninterrupted service
  - Water wells – well capacity
  - Water plants – how to "fit" the water

What do the operators care about?

- Wastewater – meeting discharge permit
- Drinking water – Primary Drinking Water Standards – maximum contaminant level or meeting treatment technique

Source Water Characterization

Raw Surface Water

Turbidity pH TOC Salinity

Primary Clarified Effluent

TSS BOD NH4

Treatment Differences

WW:Biological – no control on Q

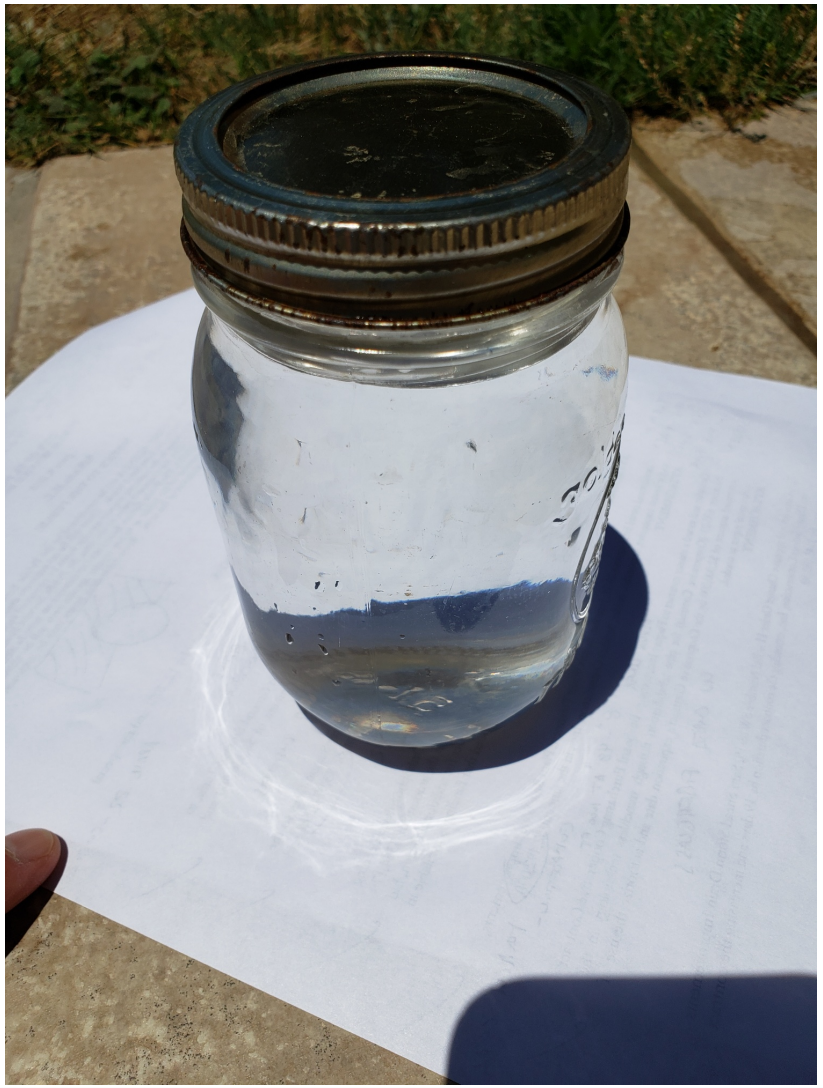
DW:Chemical

Final Effluent

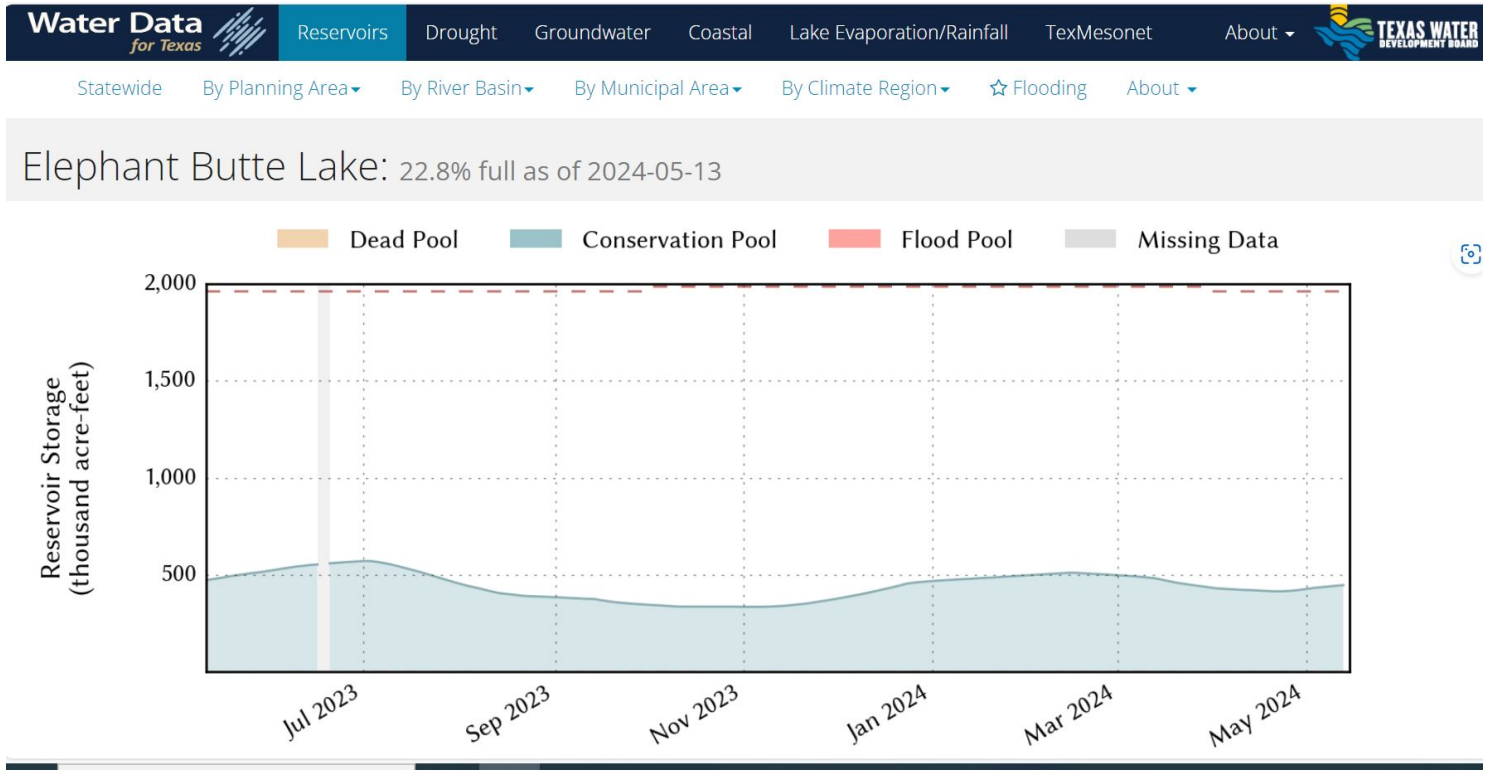
plant washout, plant upset, E Coli

Finished Water

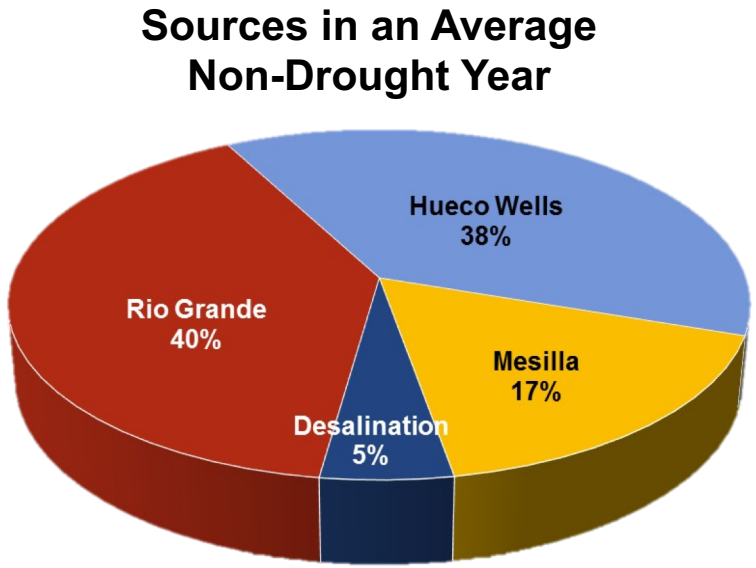
No pathogens, pleasant



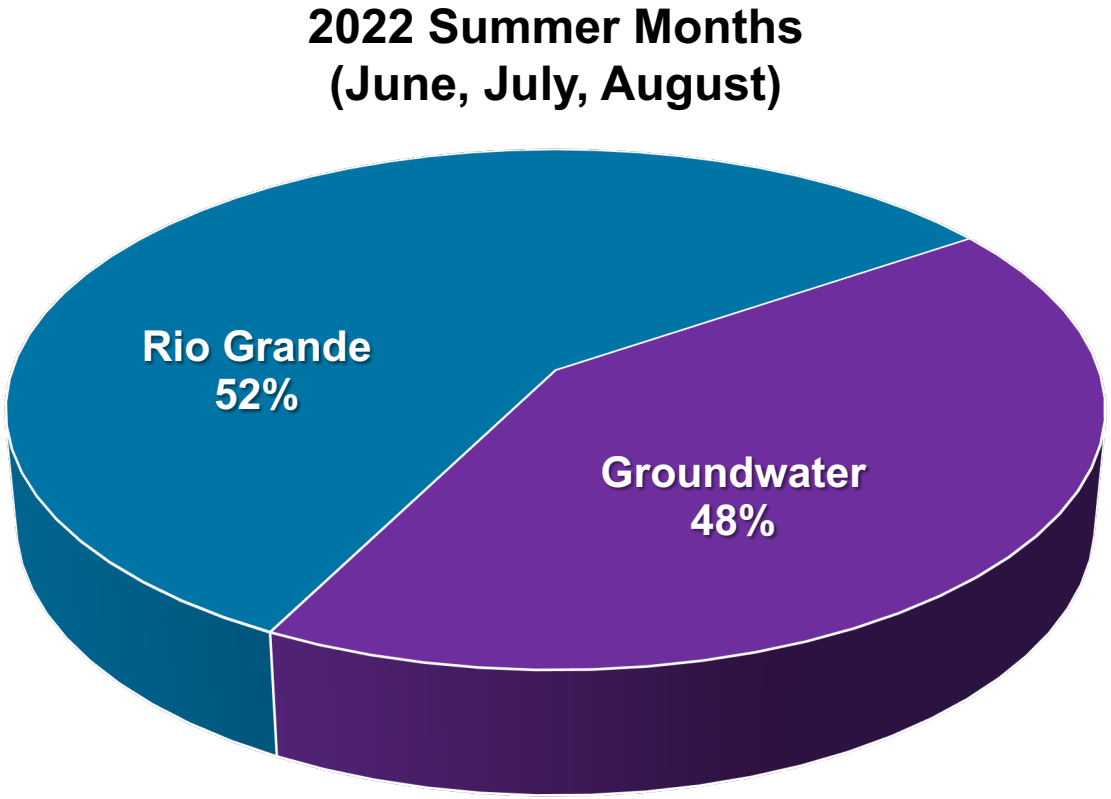
EPWater's surface water supply is variable



22.8% full as of 05/13/24



How much is surface water?



Drought in the West

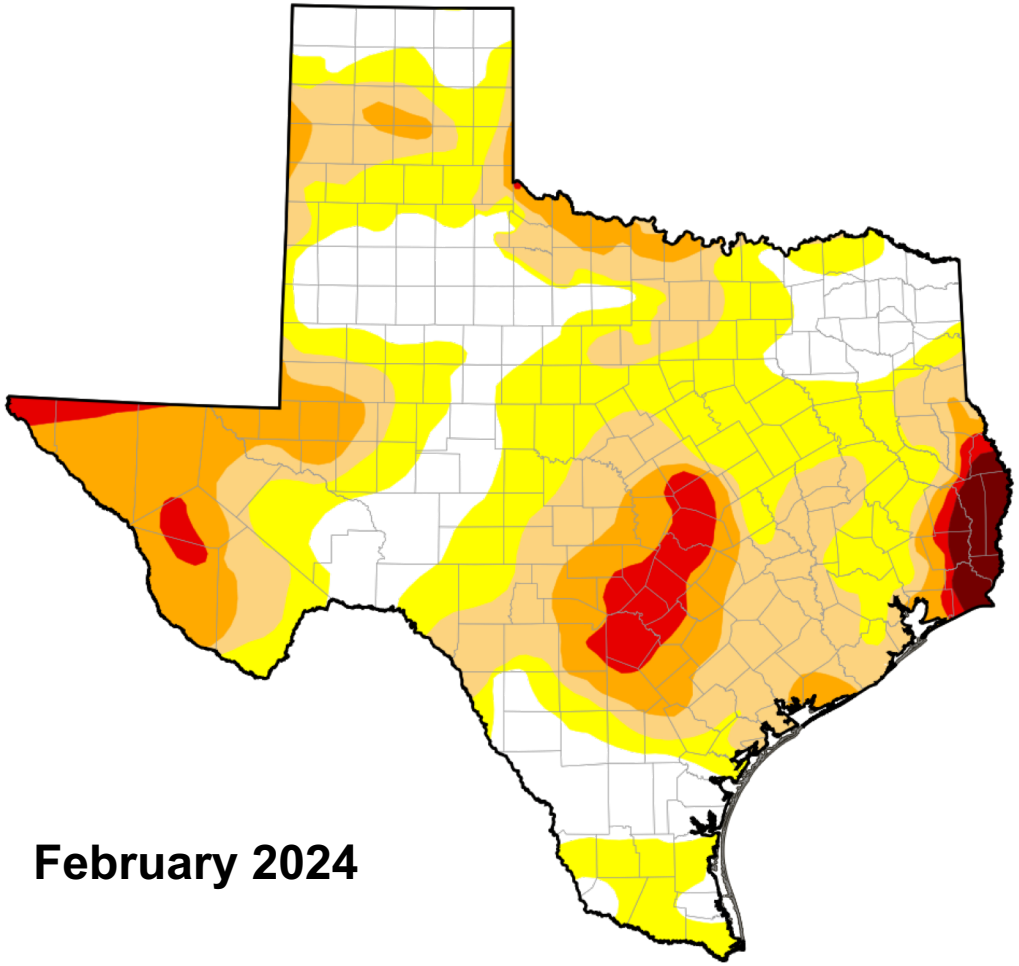
Effects from localized drought in the western US

Houseboats sit in a narrow section of water in a depleted Lake Oroville in Oroville, California on September 5, 2021. Credit: Josh Edelson *Getty Images*

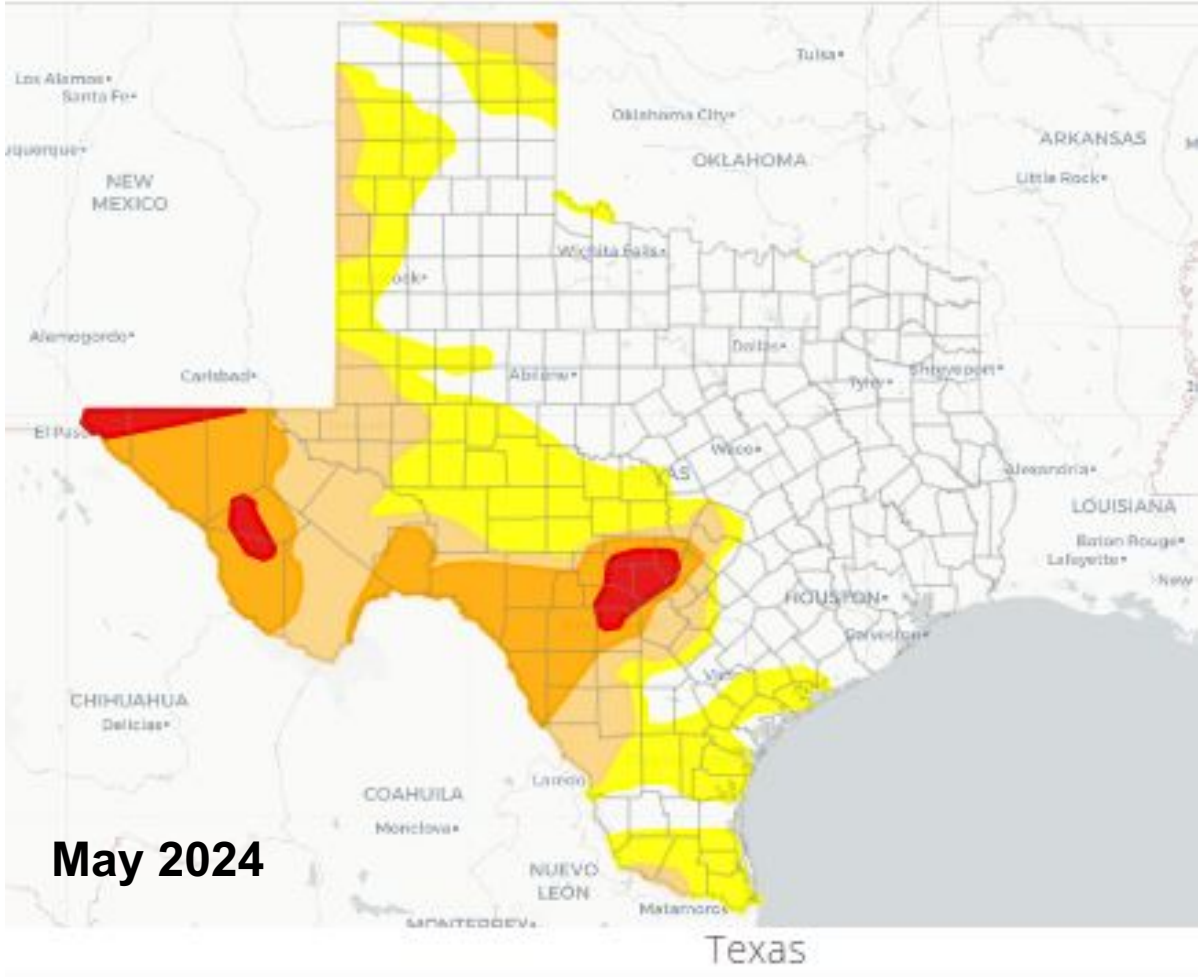
Flooding in Texas

A school bus drives through floodwater to survey the damage as peoples' homes and possessions are submerged in floodwater following significant rainstorms in Coldspring May 4. Callaghan O'Hare for The Texas Tribune

Texas is always changing



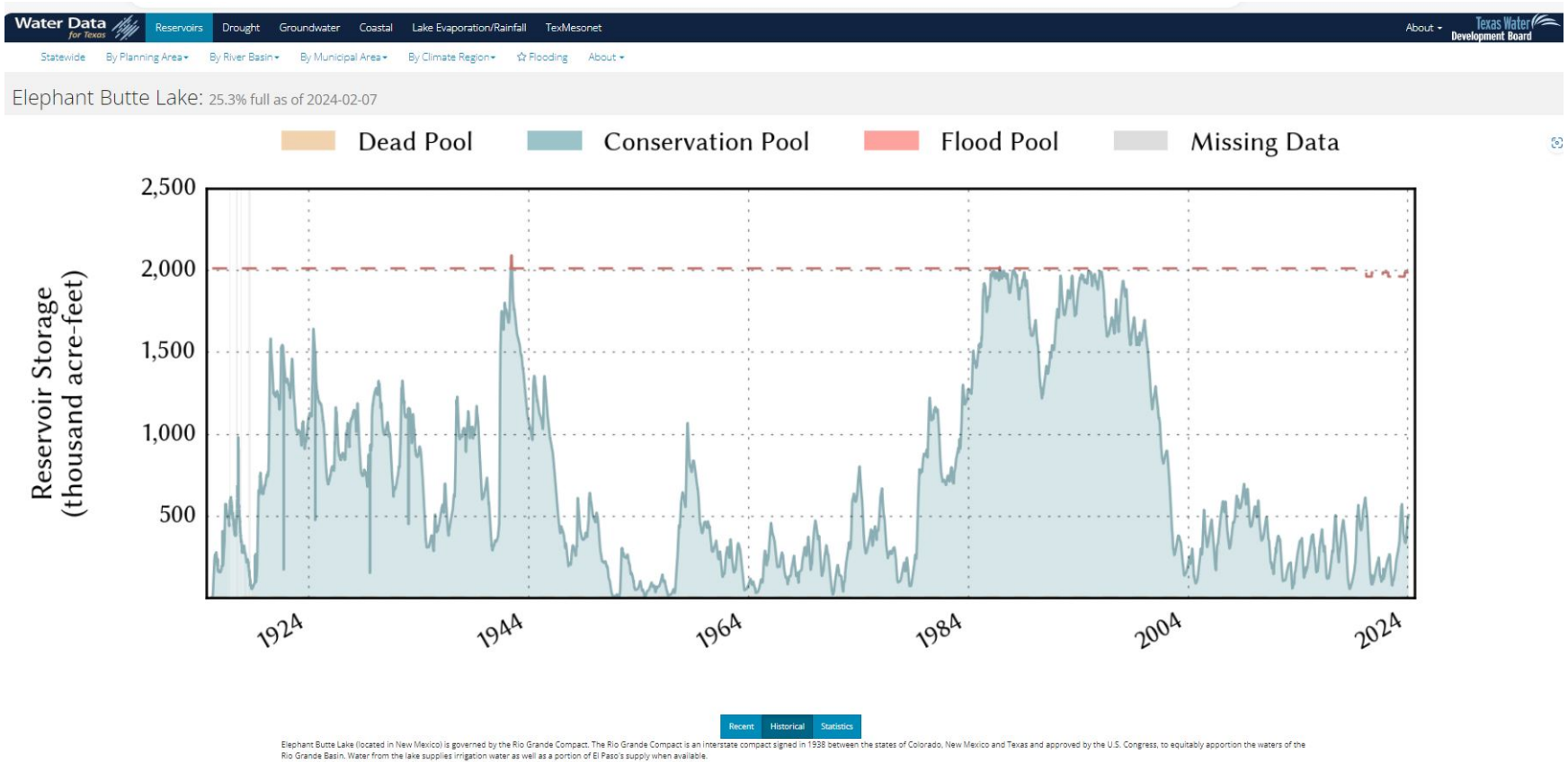
February 2024



May 2024

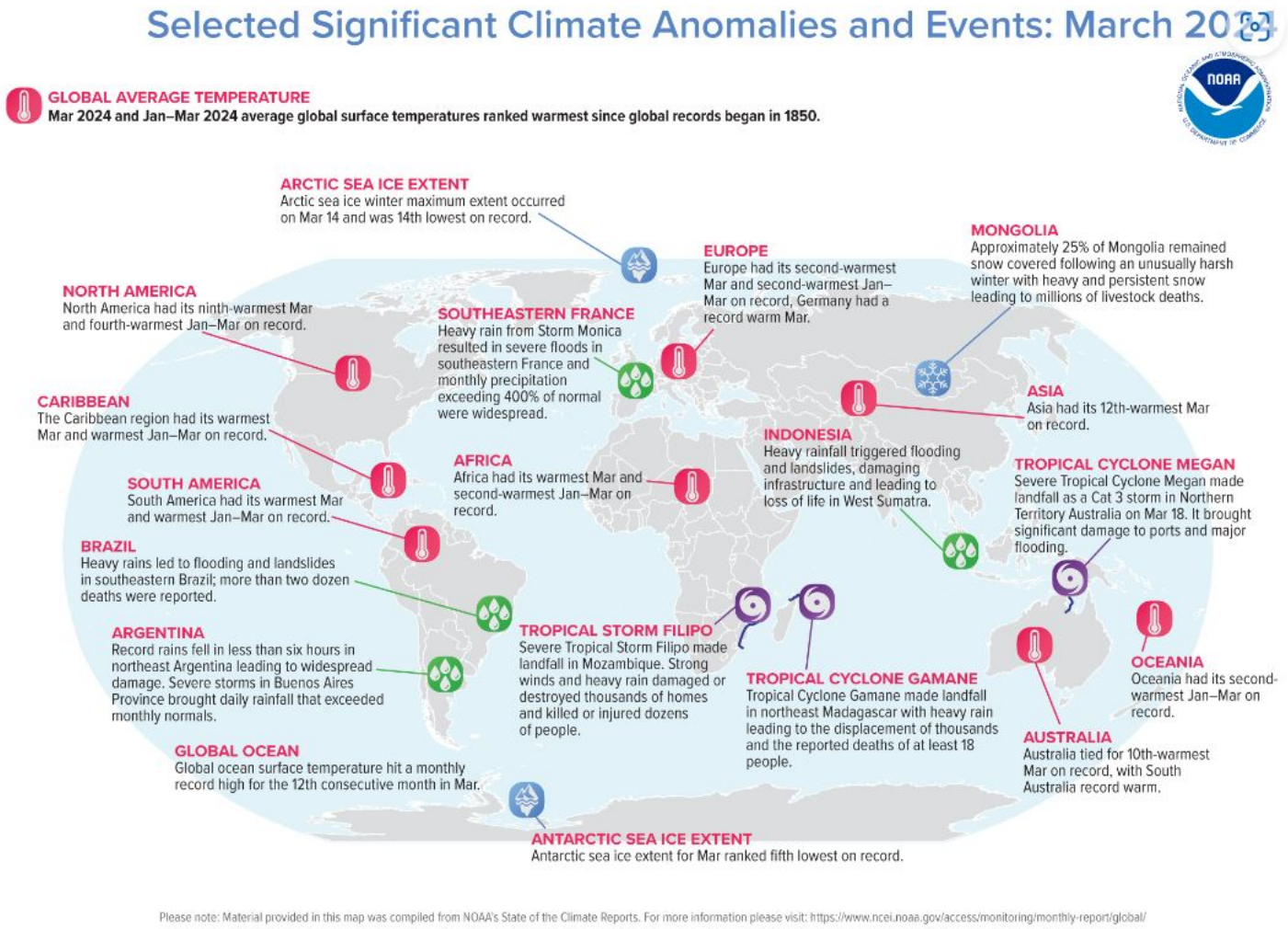
Credit: Texas Water Development Board and Water Data for Texas

Changes all the time



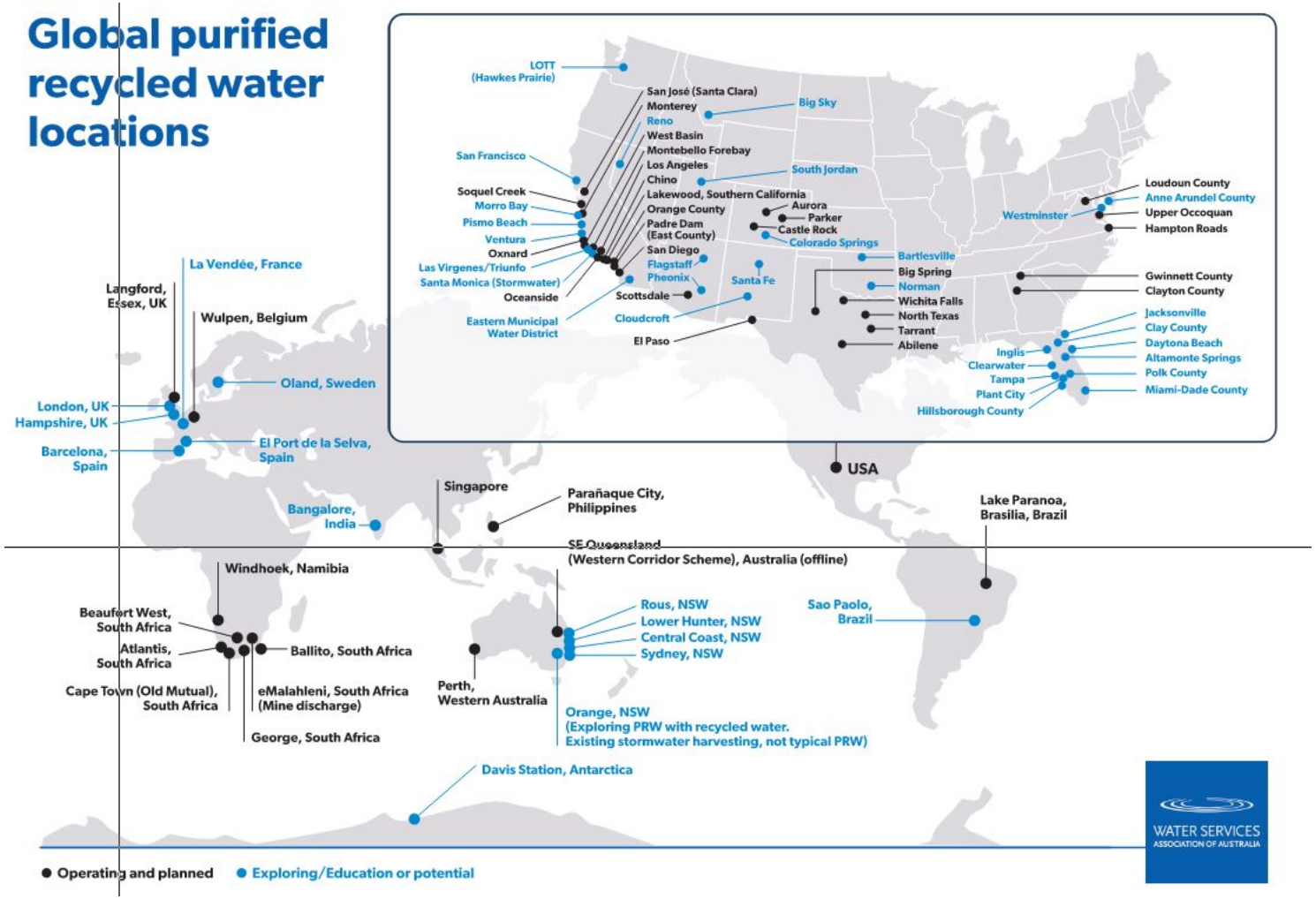
Credit: Water Data for Texas

Global Purified Water Projects



Credit: United States National Oceanic and Atmospheric Administration

Global Purified Water Projects

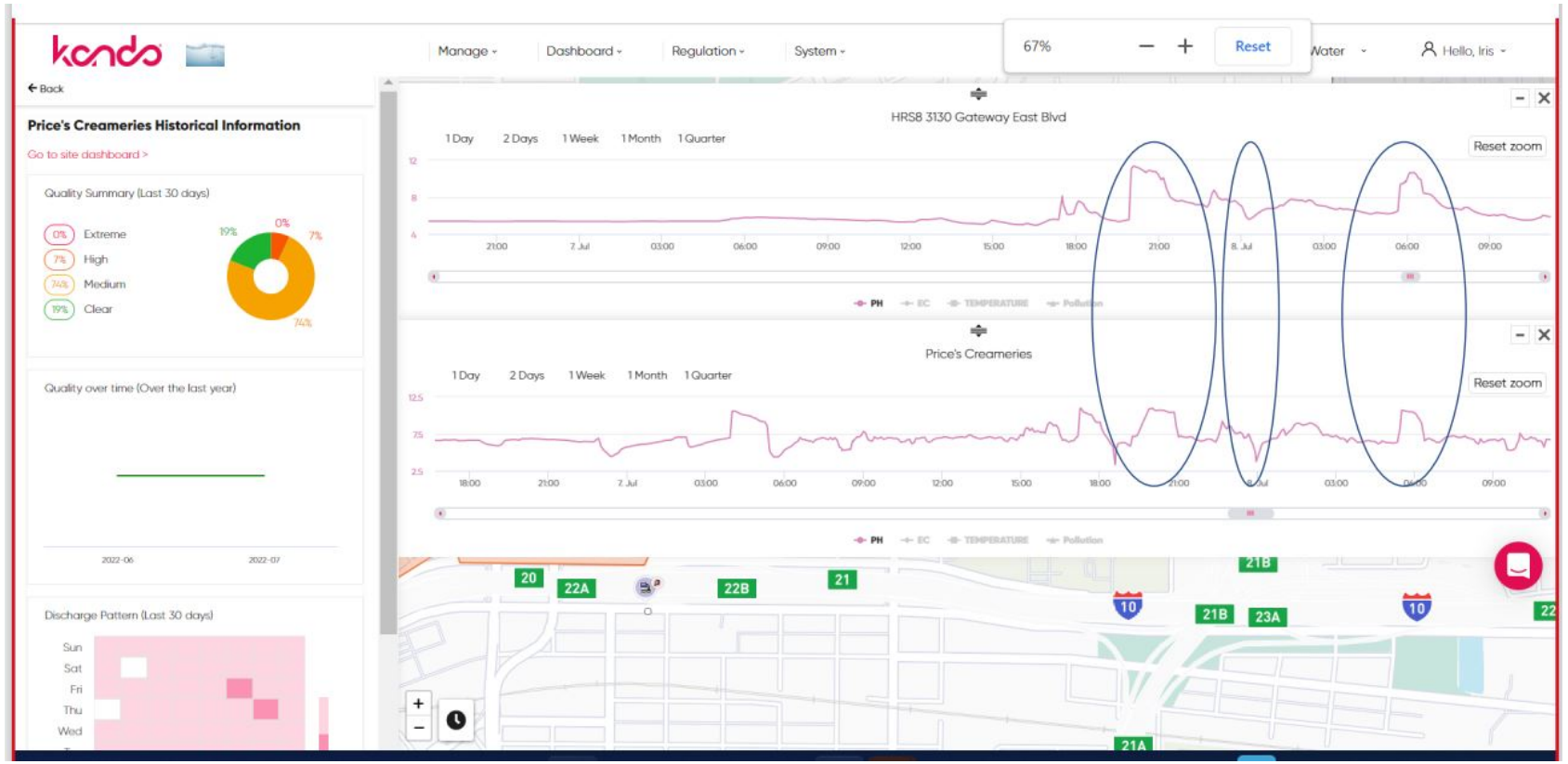


Credit: Water Services Association of Australia

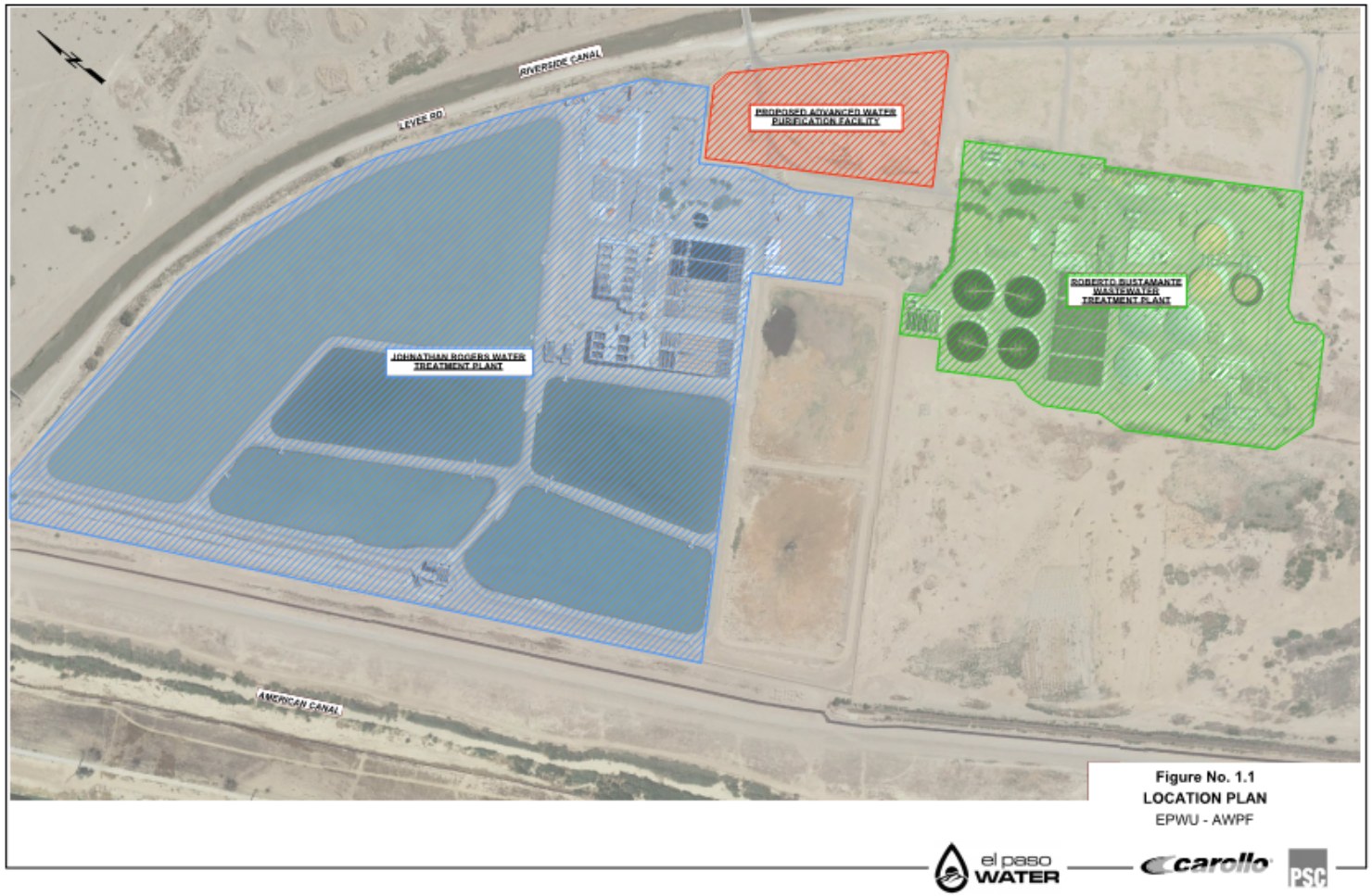
Direct Potable Reuse – what is your source water?

Bustamante Wastewater Treatment Plant secondary effluent
Courtesy of Parkhill

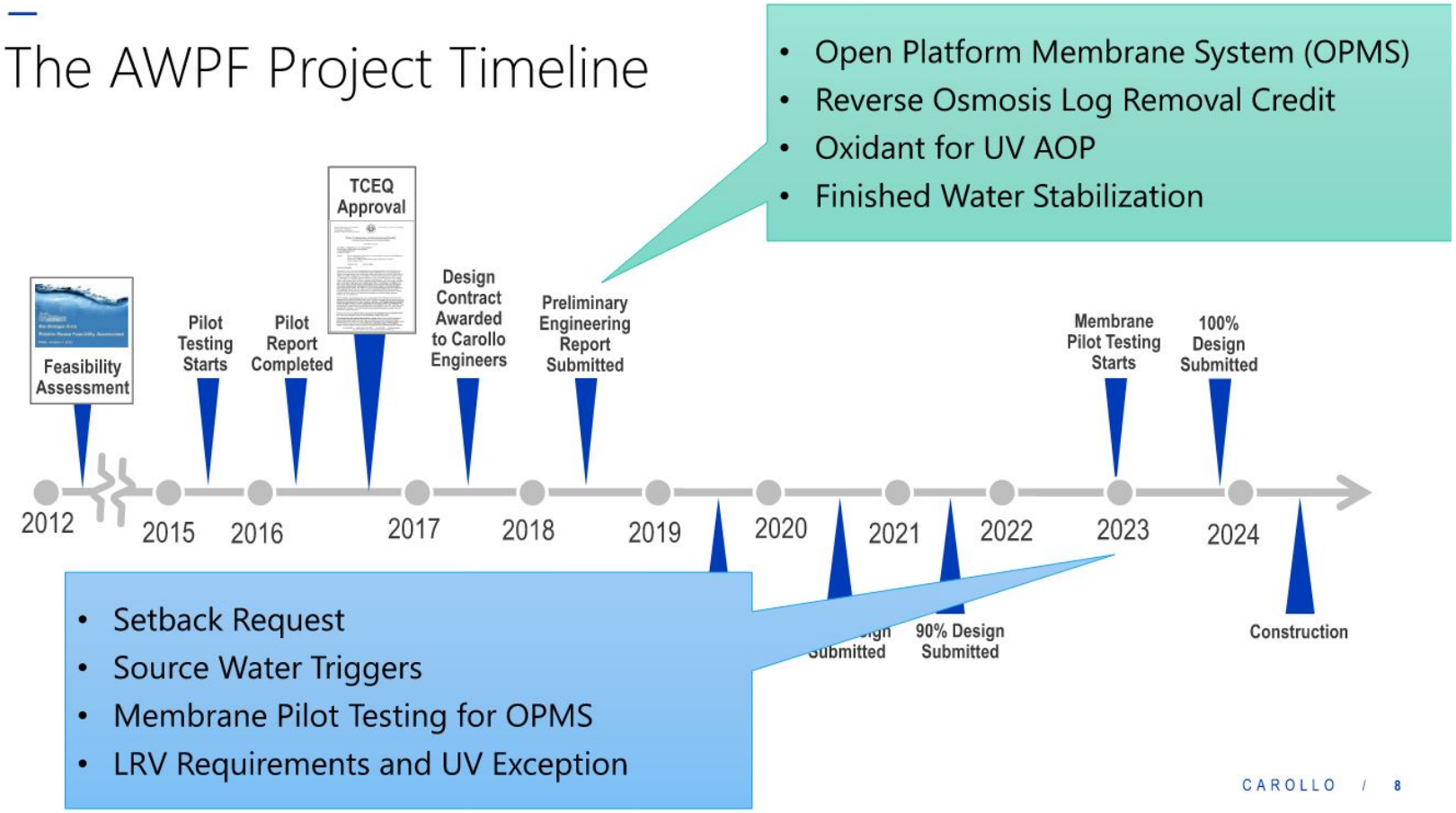
Source water characterization needs to begin with sewershed



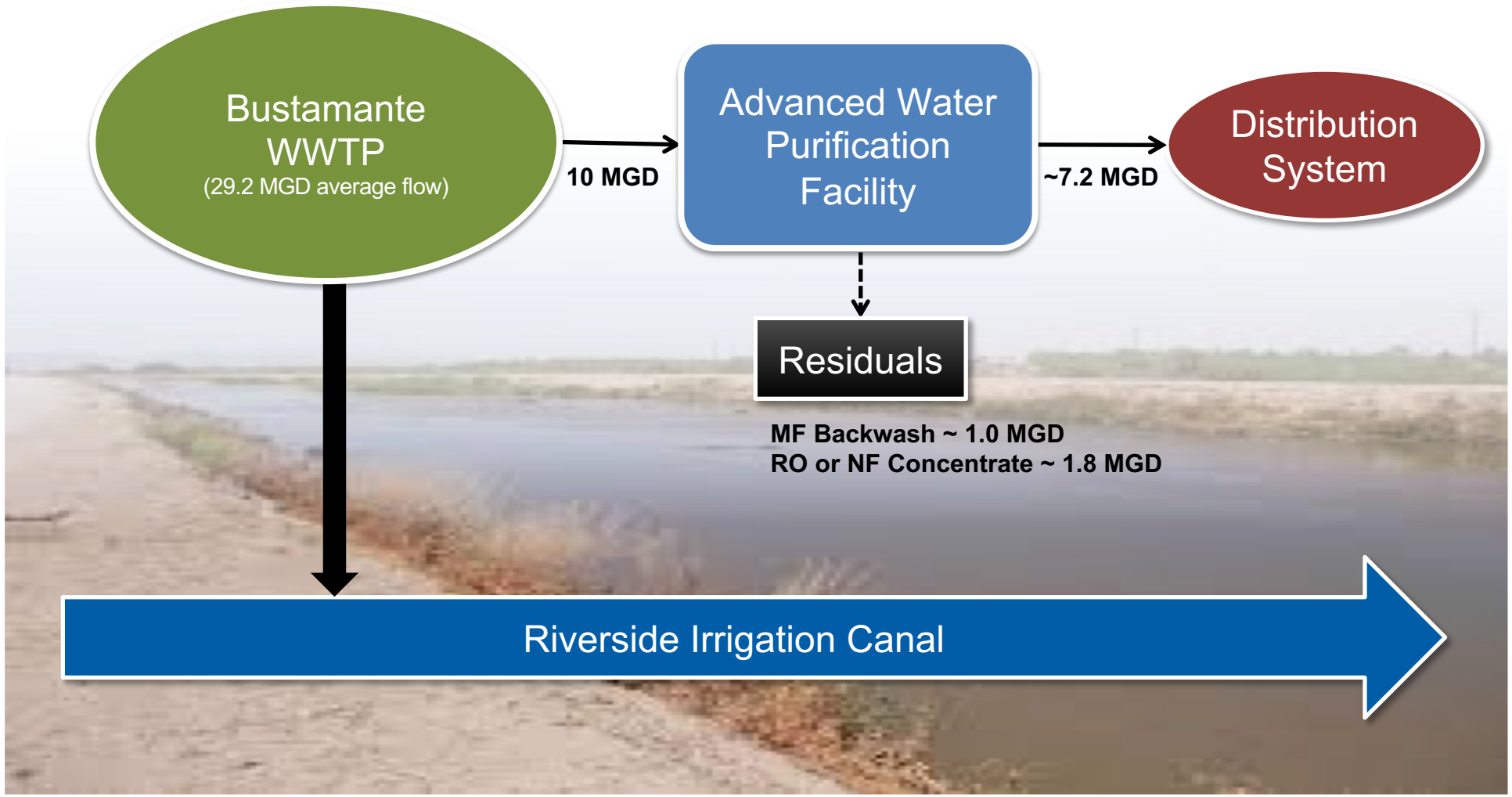
Potable Reuse Concepts using Bustamante Wastewater Plant and Jonathan Rogers Water Plant



El Paso Water Is Taking a Deliberate Approach to Implementing Direct Potable Reuse

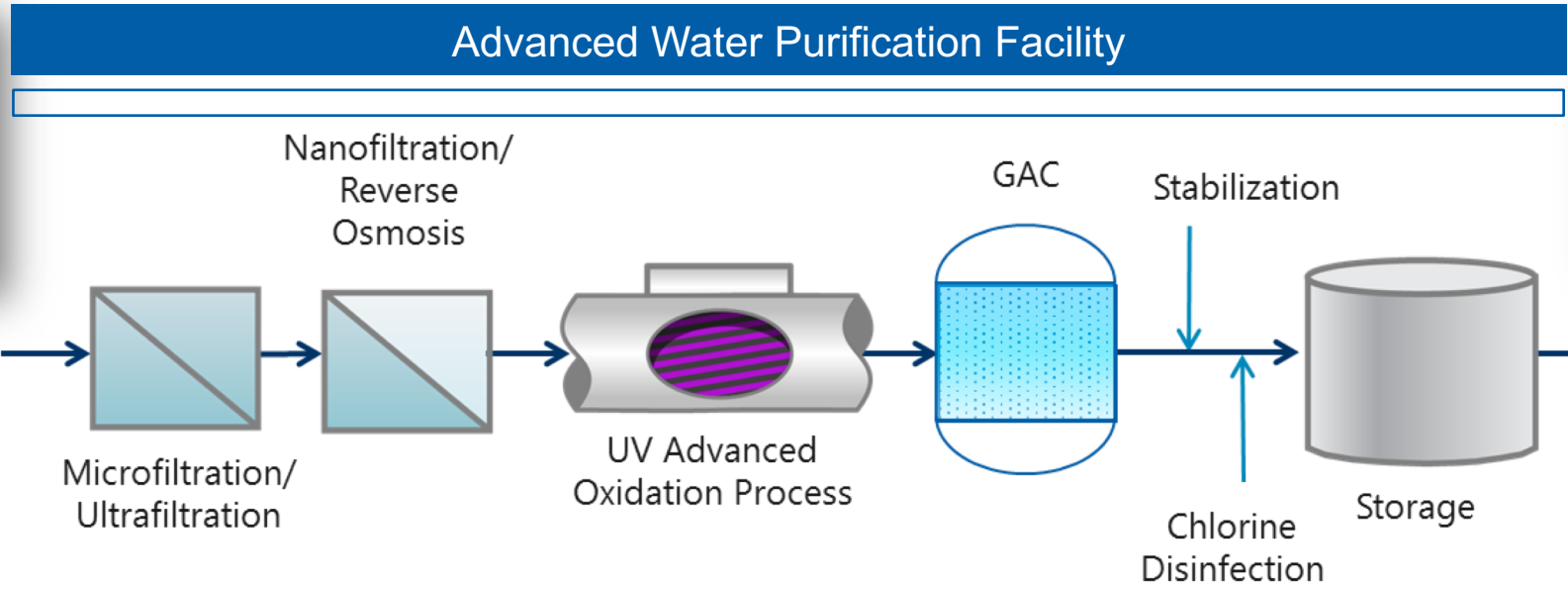


Concept: Advanced Water Purification Facility (AWPF)



Advanced Water Purification Facility (AWPF) Process Schematic

Bustamante WWTP Secondary Effluent (10 mgd)



To Distribution System

Augmentation with Blend

- Used to provide stabilization of AWT
- Need to check Pb and Cu
- No red water
- 50/50 orthophosphate blend

What is the acceptable risk?

TCEQ establishes log removal targets based on source water characteristics and drinking water goals

Wastewater Treatment Plant

24 virus, *Cryptosporidium*, and *Giardia* samples

Advanced Water Treatment Facility

Drinking Water Goals based on 10^{-4} Risk (#/L)	
Virus	2.2 E-07
Crypto	3.0 E-05
Giardia	7.0 E-06

The DPR Operator

Training for Advanced Treatment

Water Environment Federation
the water quality people

ACCESS WATER | CORPORATE ENGAGEMENT | SHOP | NEWS | CAREERS

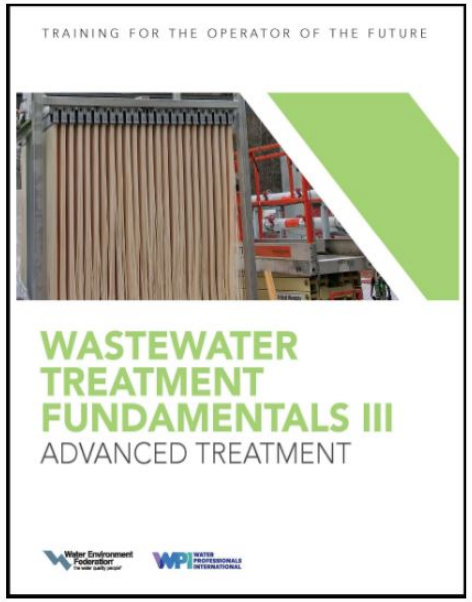
EVENTS & EDUCATION | PUBLICATIONS & NEWS | MEMBERSHIP & COMMUNITY | TOPICS | ABOUT

The latest edition to the Wastewater Treatment Fundamentals series is now available!

Wastewater Treatment Fundamentals III—Advanced Treatment covers advanced wastewater treatment and helps operators prepare for the third and fourth levels of certification examinations. Operators will gain a thorough understanding of critical aspects of membranes, industrial wastewater and pretreatment, physical and chemical treatment, advanced activated sludge, instrumentation, SCADA, leadership and management, sludge sampling, solids management, stabilization, odor control, safety considerations, nontraditional disinfection, and water reuse. After learning from real-life examples, users can apply the material they learn to situations they encounter in their day-to-day work.

*Wastewater Treatment Fundamentals III- Advanced Treatmen*t includes

- Detailed visuals and infographics
- Robust coverage of Wastewater Treatment Operator exam topics and ABC Need-to-Know Criteria
- 1000+ practice questions to test your knowledge at the end of each chapter
- Comprehensive math examples



Angel Bustamante PE
El Paso Water
Wastewater Systems Division Manager
915.594.5401
abustamante@epwater.org