CITY OF PHOENIX
Colorado River Status & Advanced Purified Water

PURE WATER PHOENIX

Max Wilson
Water Resource Advisor

Brandy Kelso
Water Services Director

PHOENIX WATER

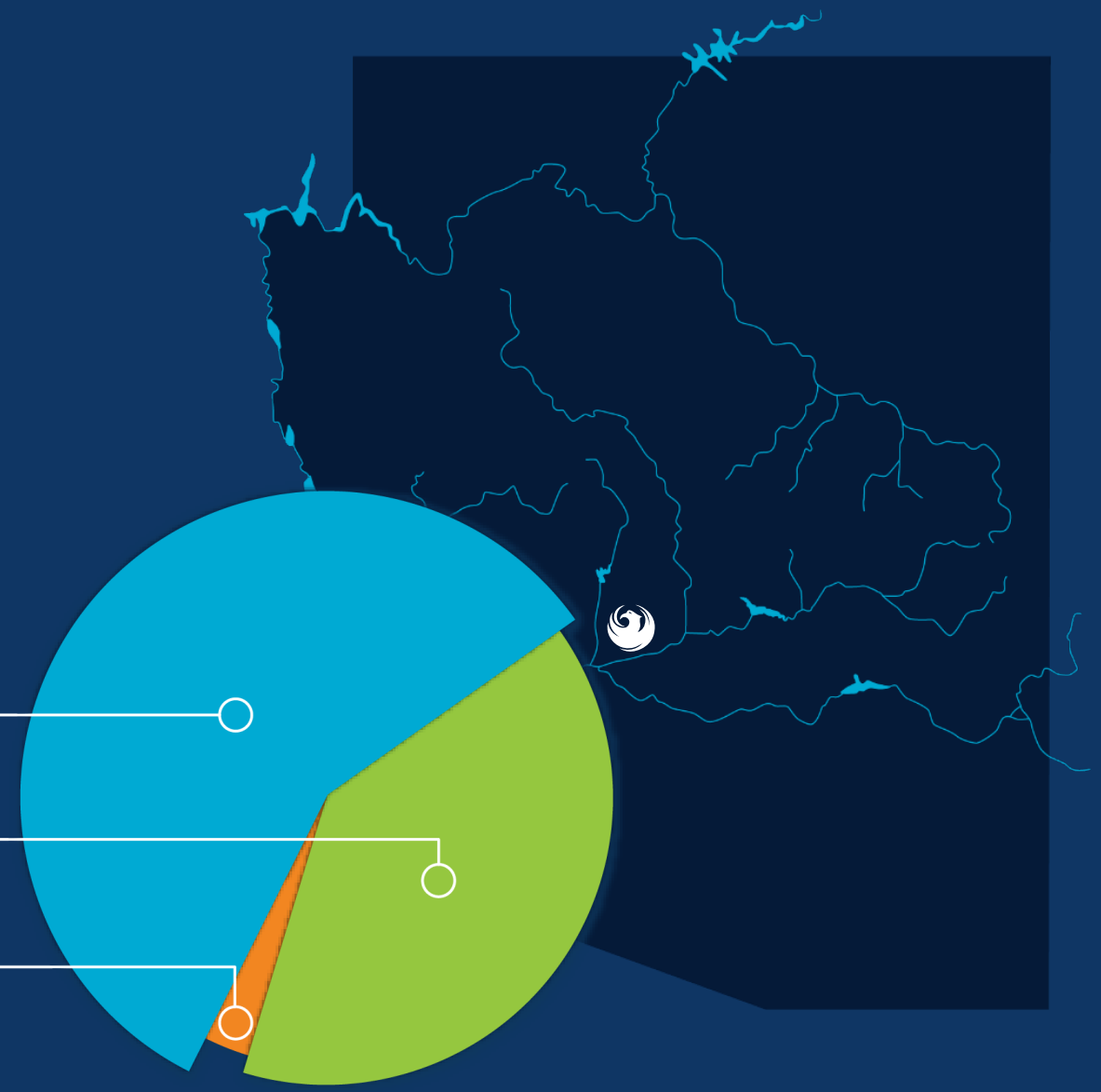
ONE OF THE NATION'S LEADING UTILITIES

- Largest potable water provider in Arizona
- 5 water treatment plants
- 7,000 miles of pipelines
- 5,000 miles of sewer mains
- 3 wastewater treatment plants
- 70 billion gallons per year of recycled water put to beneficial use
- Produce more than 110 billion gallons per year of clean water



WHERE DOES PHOENIX'S WATER COME FROM?

Phoenix Water Supply



58% SALT & VERDE RIVER WATER

40% COLORADO RIVER WATER

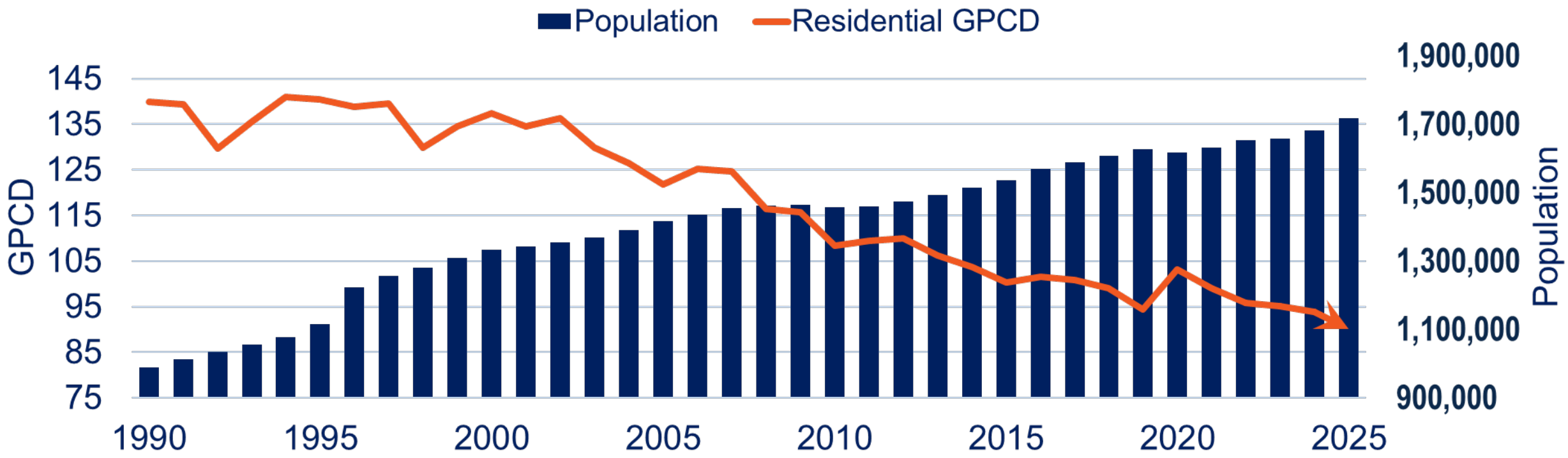
2% GROUNDWATER

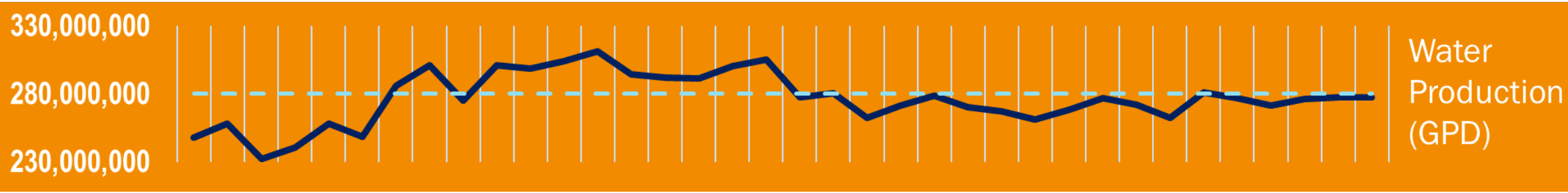
WHERE DOES PHOENIX'S WATER GO?

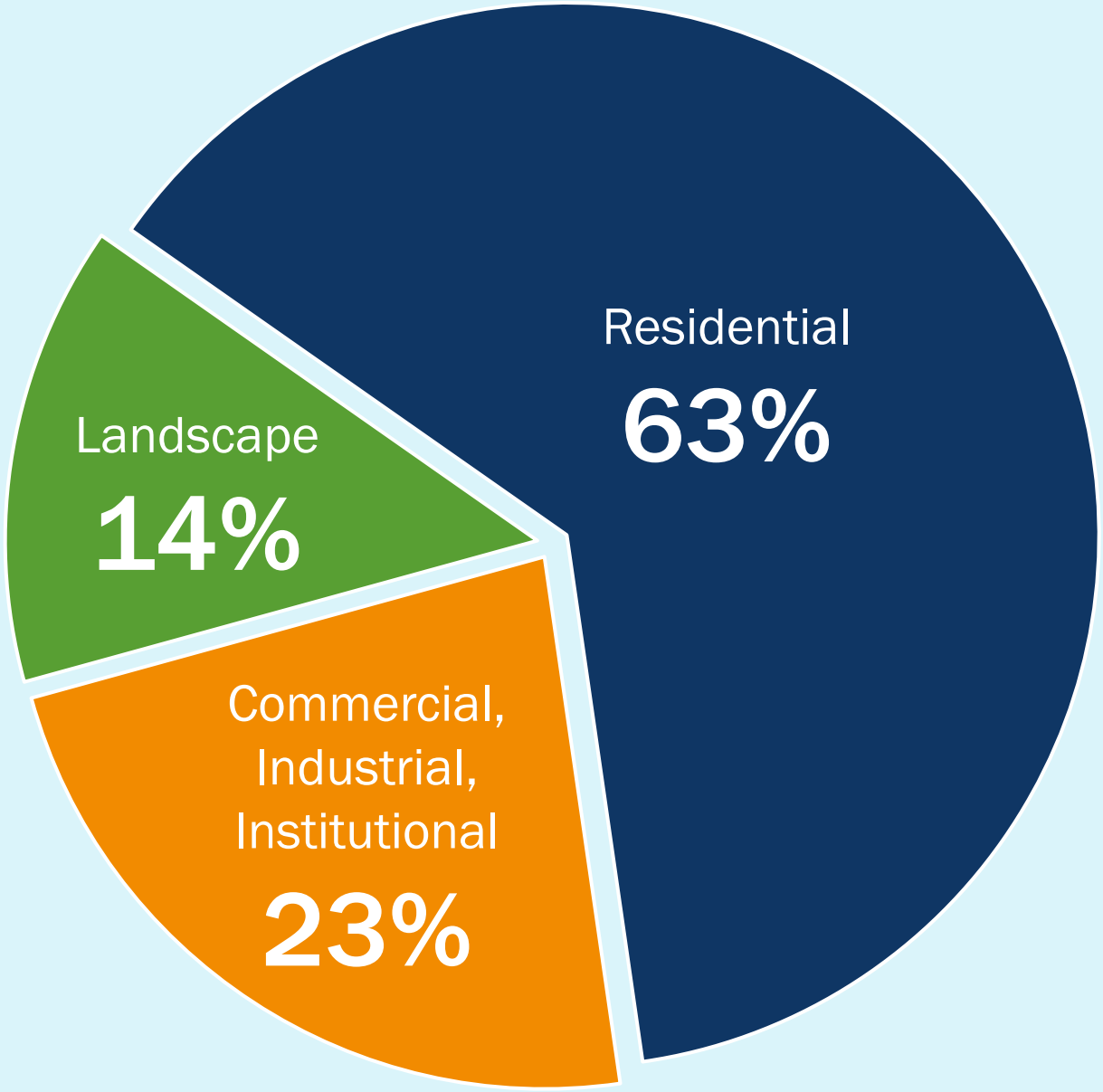
PHOENIX WATER DEMAND

PHX WATER SMART

Population and Residential Water Use in Gallons Per Capita Per Day (GPCD)

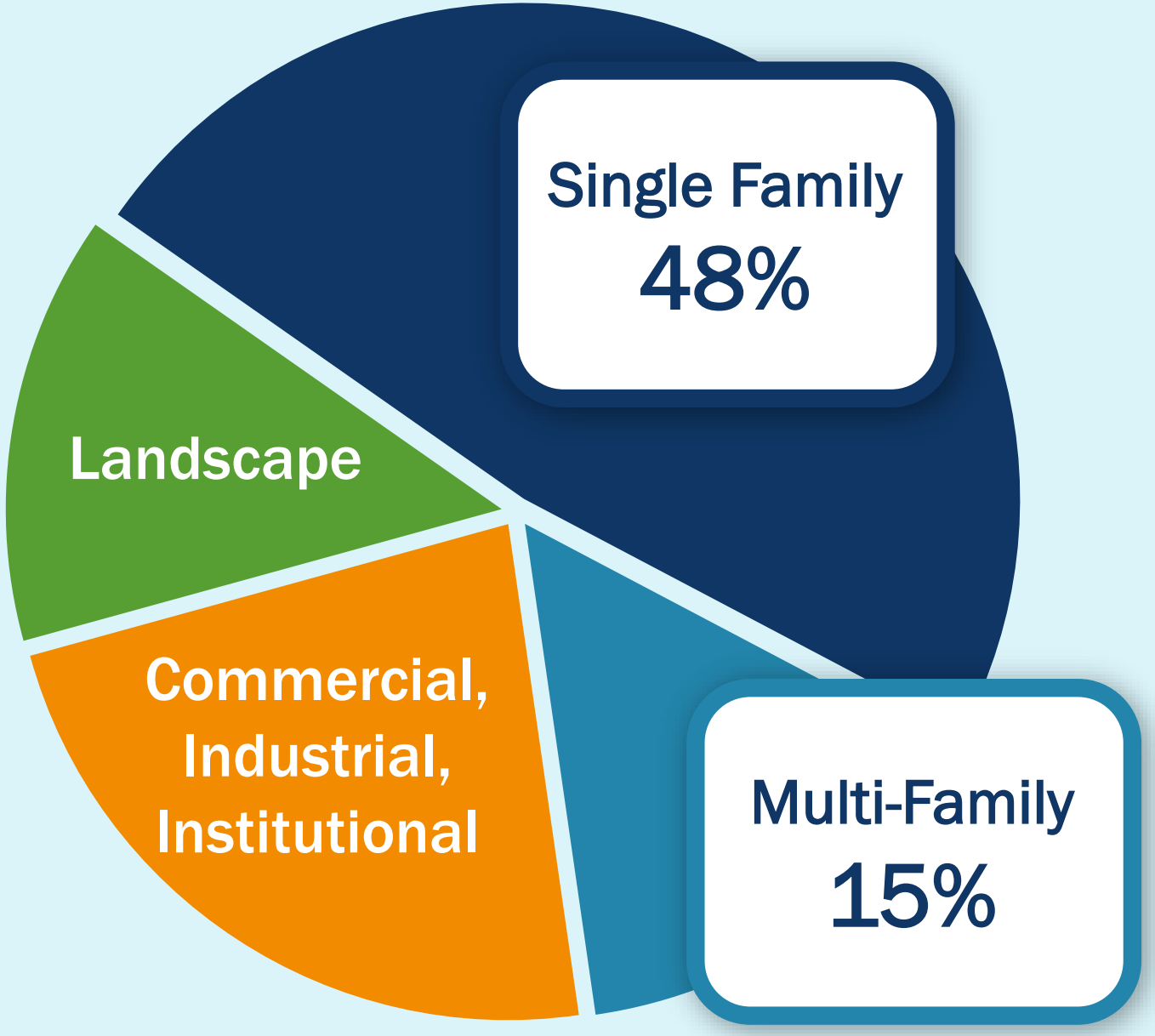


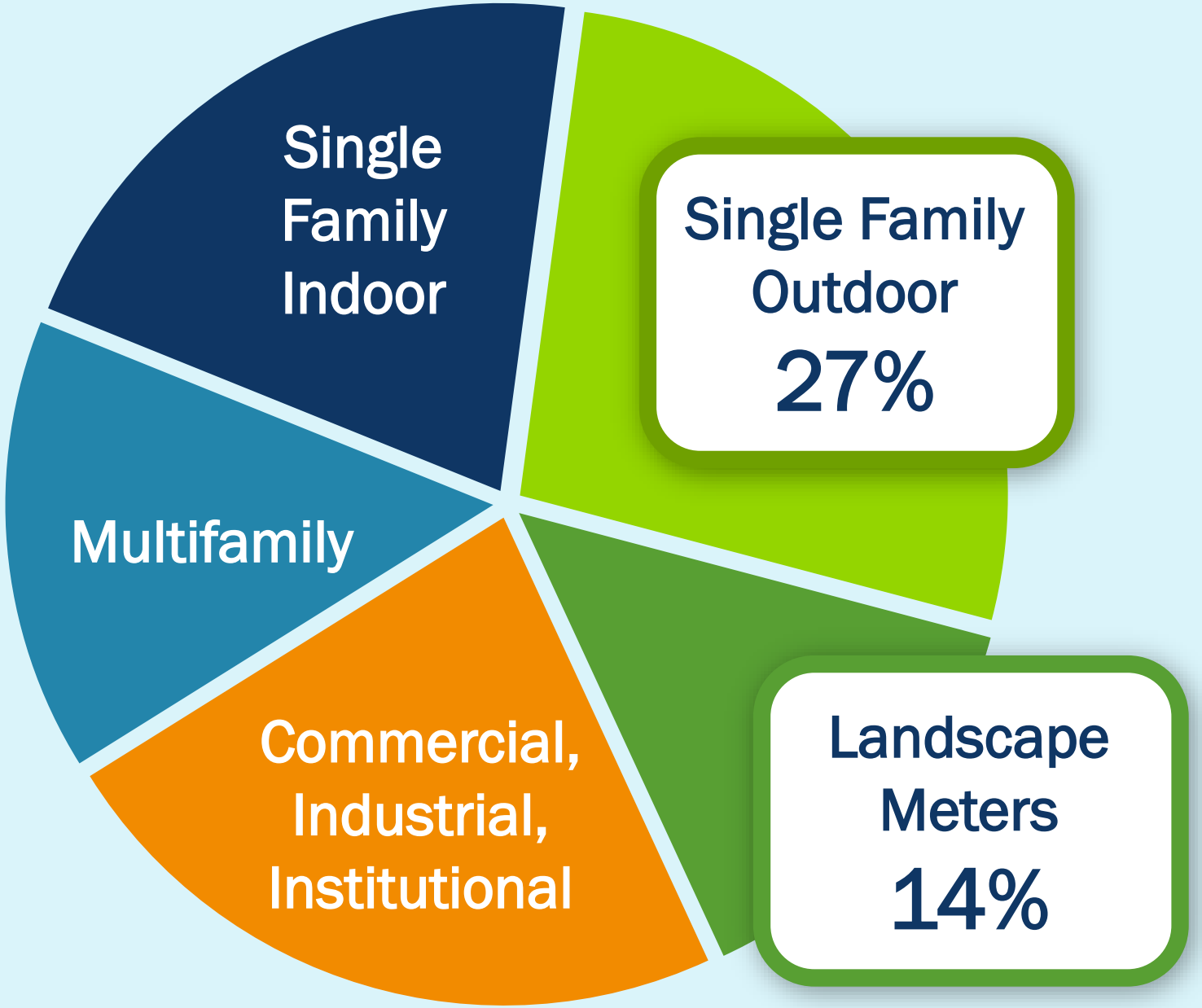




This pie chart represents water delivery in the City of Phoenix

Total Residential Usage 63%





Total Outdoor Usage 41%



WHAT ABOUT THE COLORADO RIVER?

A Bad Climate

- Lowest flow conditions in over 1,200 years.
- Major reservoirs are at low levels.
- Bureau of Reclamation declared shortage in 2022, 2023, 2024, 2025, and 2026.

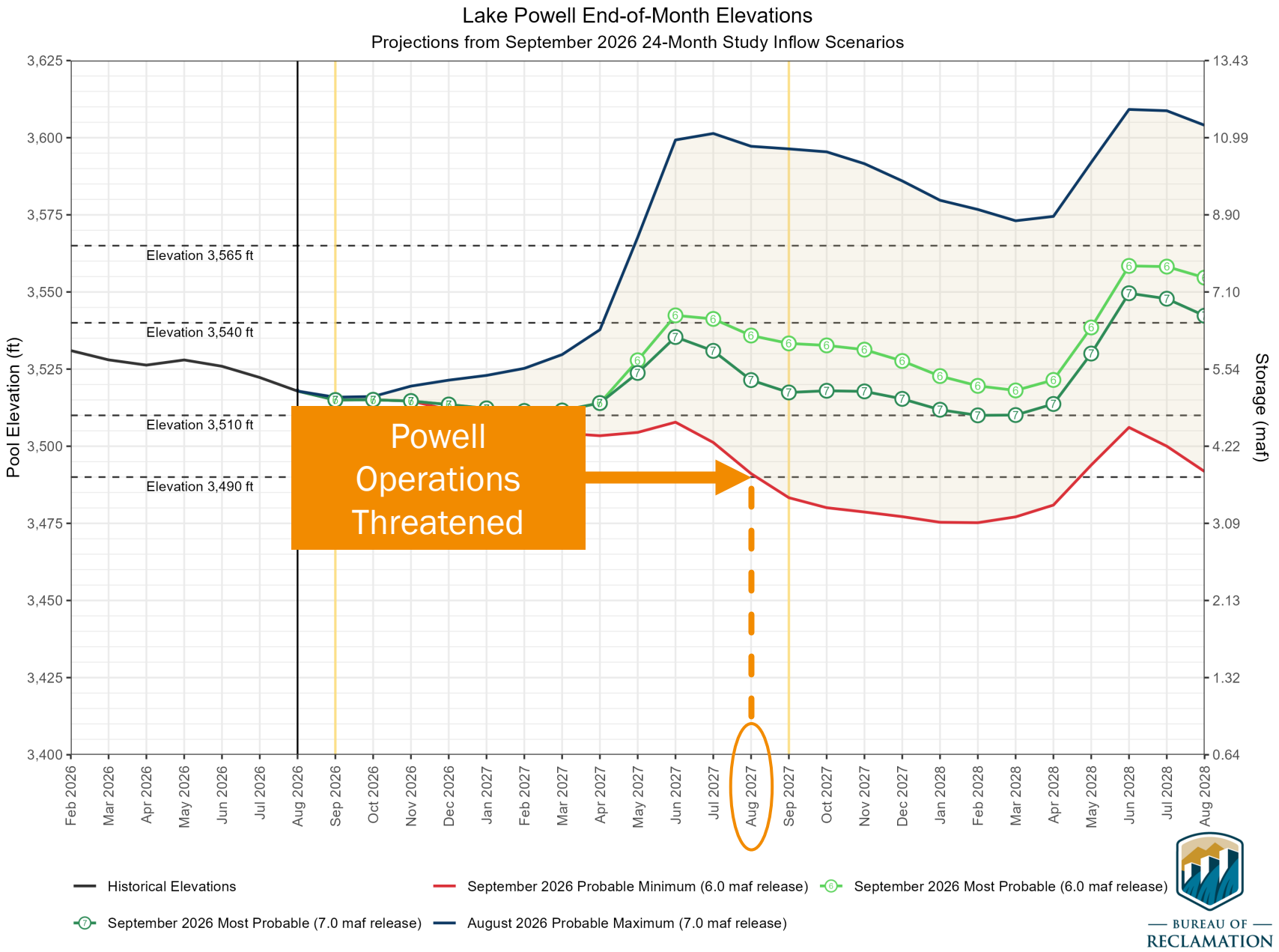




A Bad Climate at a Bad Time

- Rules determining who loses water in shortage expire at the end of this year.
- Seven Basin States unable to come to consensus.
- Three Lower Basin states still developing a shortage sharing agreement for 2027 and 2028.

In The Meantime Conditions Have Gotten Worse



BUREAU OF RECLAMATION

WHAT ARE WE GOING TO DO ABOUT IT?

1

Step One

DEPLOY WATER BANK

- State of Arizona stored millions of acre-feet underground for times of shortage.
- Not a forever supply, a first line of defense against drought.
- A defense for all, not just those who haven't prepared.

2

Step Two

UTILIZE CITY BACKUPS

- Includes both surface water stored in SRP system and long-term storage credits stored under ground.
- Having supplies to dip into is a sign we planned, not a sign we failed.

3

Step Three

PUMP GROUNDWATER

- Wise groundwater management has ensured that the groundwater we had in 1980 is still here.
- Not a forever supply, but a bridge to what comes next.

4

Step Four

DEPLOY DROUGHT PLANS

- “Drought management” is not a dirty word – Drought management means the City is doing what is necessary to protect reliable water service.
- Reliable water service is the core of economic and community vitality.
- We all have a role to play in maintaining reliable water service for our community.

Drought Management Plan



1 **STAGE 1 - *WATER ALERT***
Insufficient Supply situation appears likely → **Declared in June 2022**

2 **STAGE 2 - *WATER WARNING***
Insufficient Supply situation occurs → **Possible 2027**

3 **STAGE 3 - *WATER EMERGENCY***
Additional restrictions in water supplies occur beyond Stage 2

4 **STAGE 4 - *WATER CRISIS***
WSD Director determines additional measures must be implemented to protect human health and safety



5

Step Five

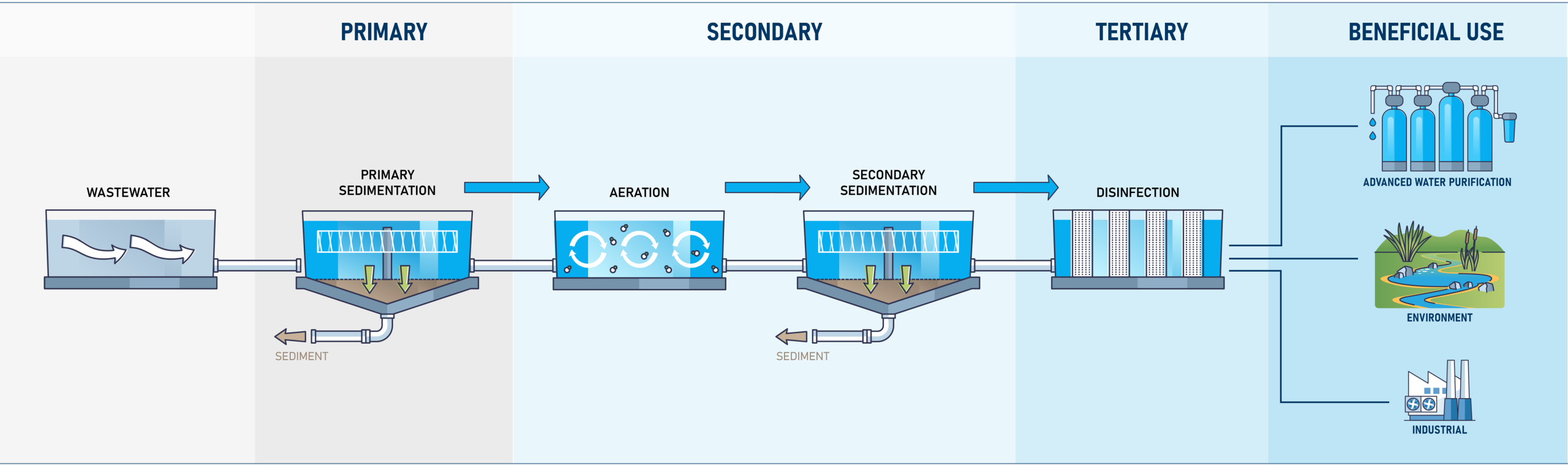
DEVELOP NEXT-GEN SUPPLIES

- Bartlett Dam.
- Additional Groundwater Wells.
- Secure Water Arizona Program.
- Advanced Purified Water.



PURE WATER PHOENIX

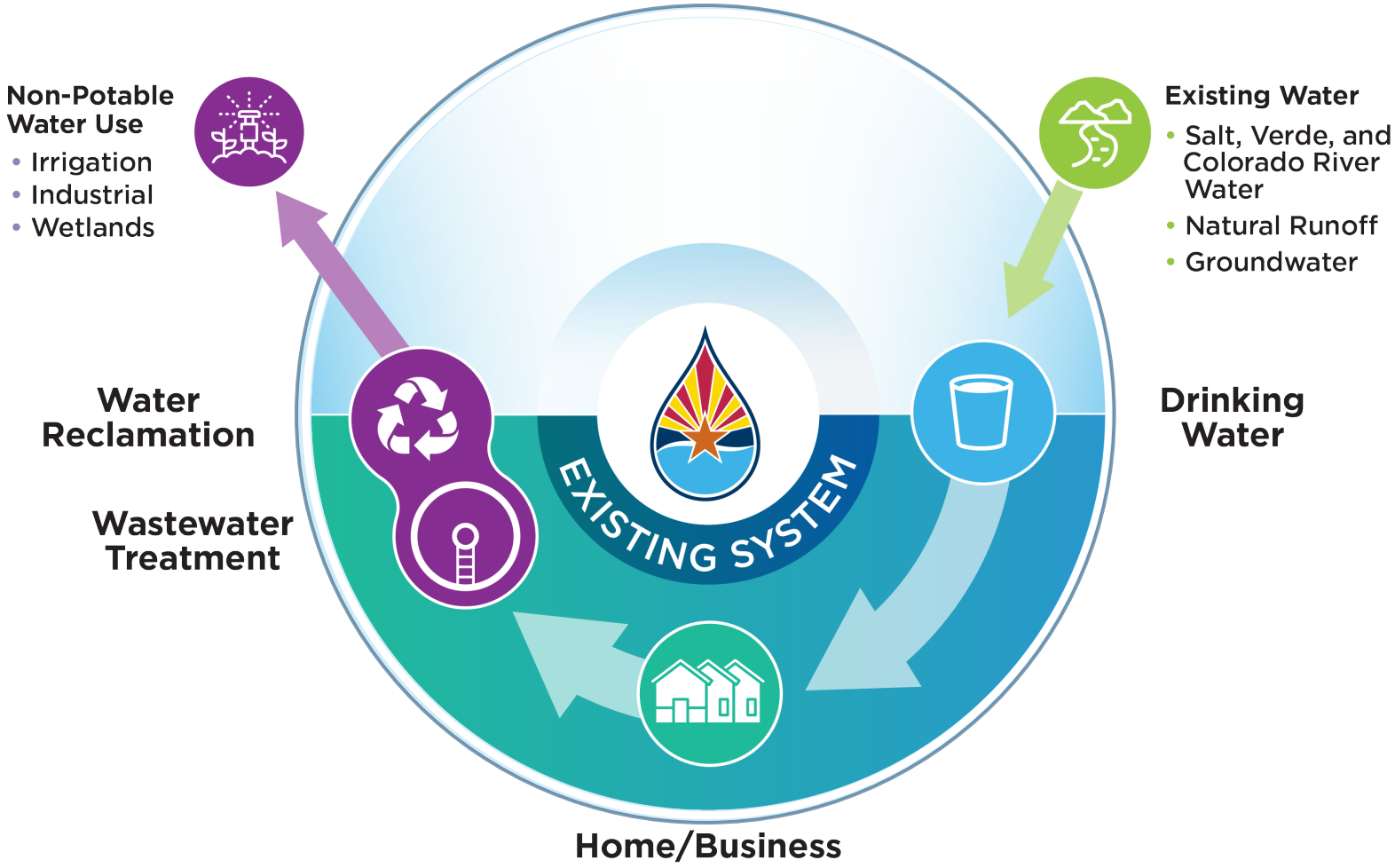
WASTEWATER RECLAMATION



Wastewater Treatment and Water Reclamation (Recycled Water):

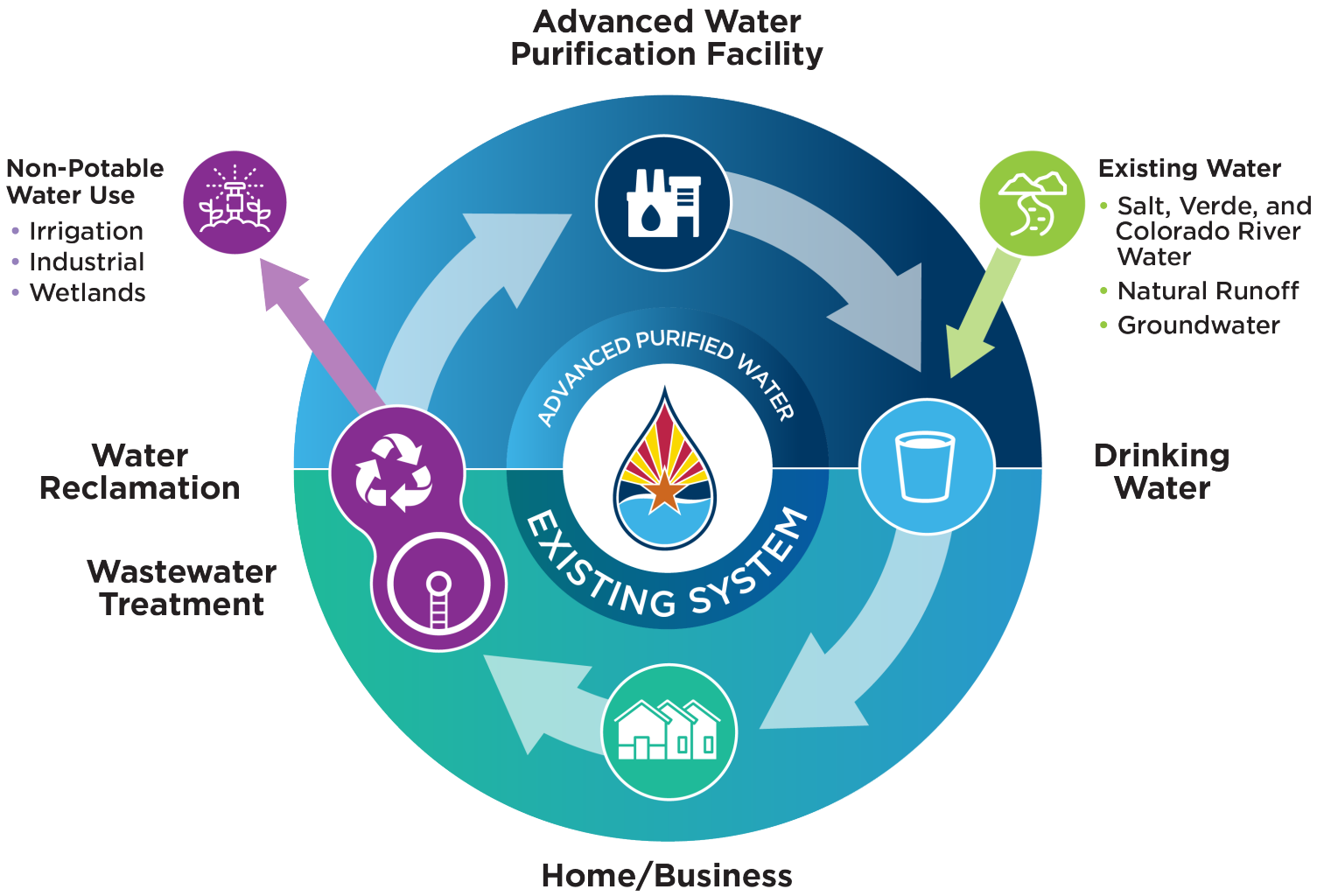
Three step treatment process to clean wastewater to non-potable beneficial reuse standards

- Primary: Remove solids
- Secondary: Biological process to break down remaining organic material
- Tertiary: Disinfection



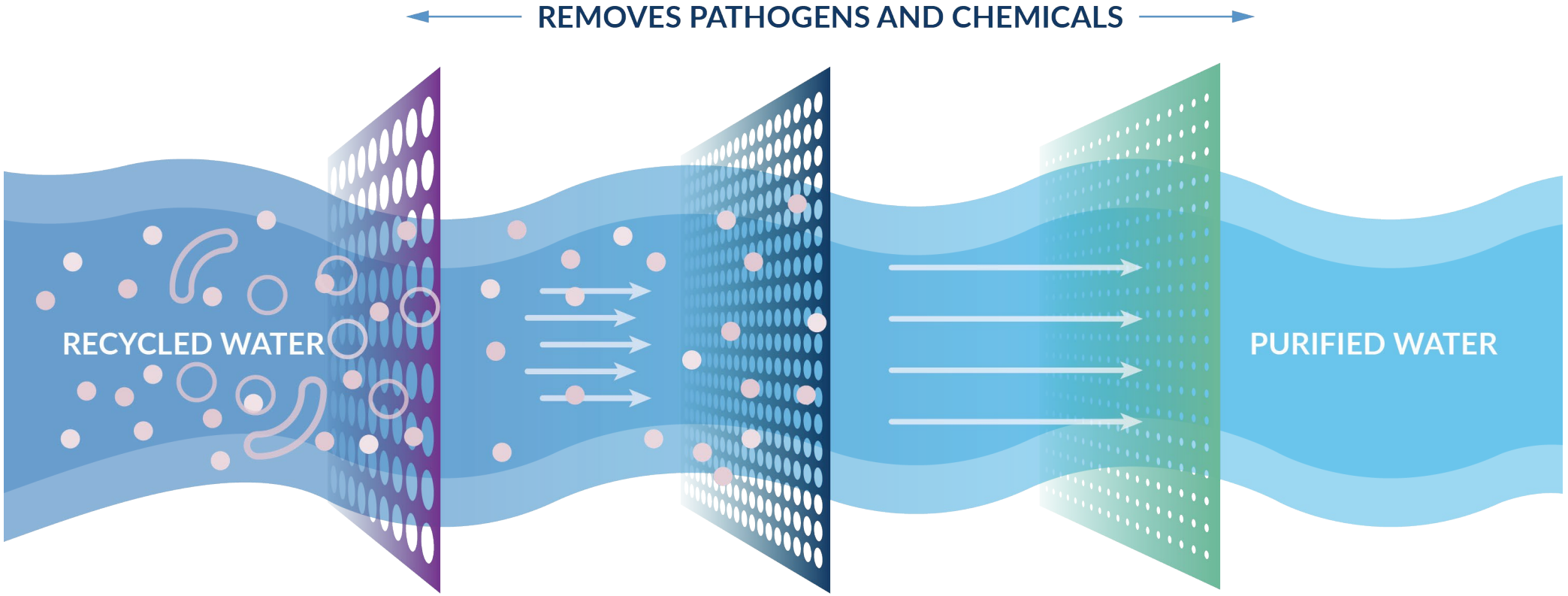
PHOENIX'S EXISTING REUSE SYSTEM

DELIVERS NON-POTABLE REUSE



ADVANCED TECHNOLOGY COMPLETES THE WATER CYCLE

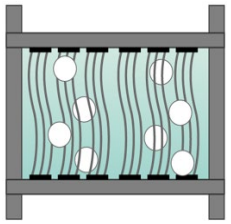
WHAT IS ADVANCED WATER PURIFICATION?



MULTI-STEP BARRIER SYSTEM TO:

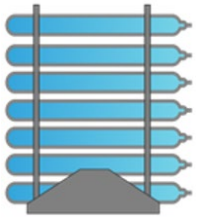
- Remove pathogens and organics in the water
- Remove chemicals and byproducts from the water
- Reduce water salinity

ADVANCED WATER PURIFICATION TECHNOLOGY



MEMBRANE BIOREACTOR (MBR) →

First step, uses **micro-organisms** to **biologically** break down organic matter and reduce nitrogen-based chemicals. Second step, uses **membrane filters** (0.04 microns) to **physically** remove small particles, micro-plastics, large pharmaceuticals, and large viruses.



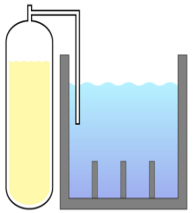
REVERSE OSMOSIS (RO) →

Uses a **semi-permeable membrane** to **physically** remove chemicals based on their size (~0.0005 microns) and weight (~150 Daltons). RO is highly effective at removing harmful pathogens (like cryptosporidium and giardia) as well as viruses. It is also highly effective at removing PFAS, micro and nano-plastics, pharmaceuticals and personal care products; and significantly reduces salinity.



UV AOP →

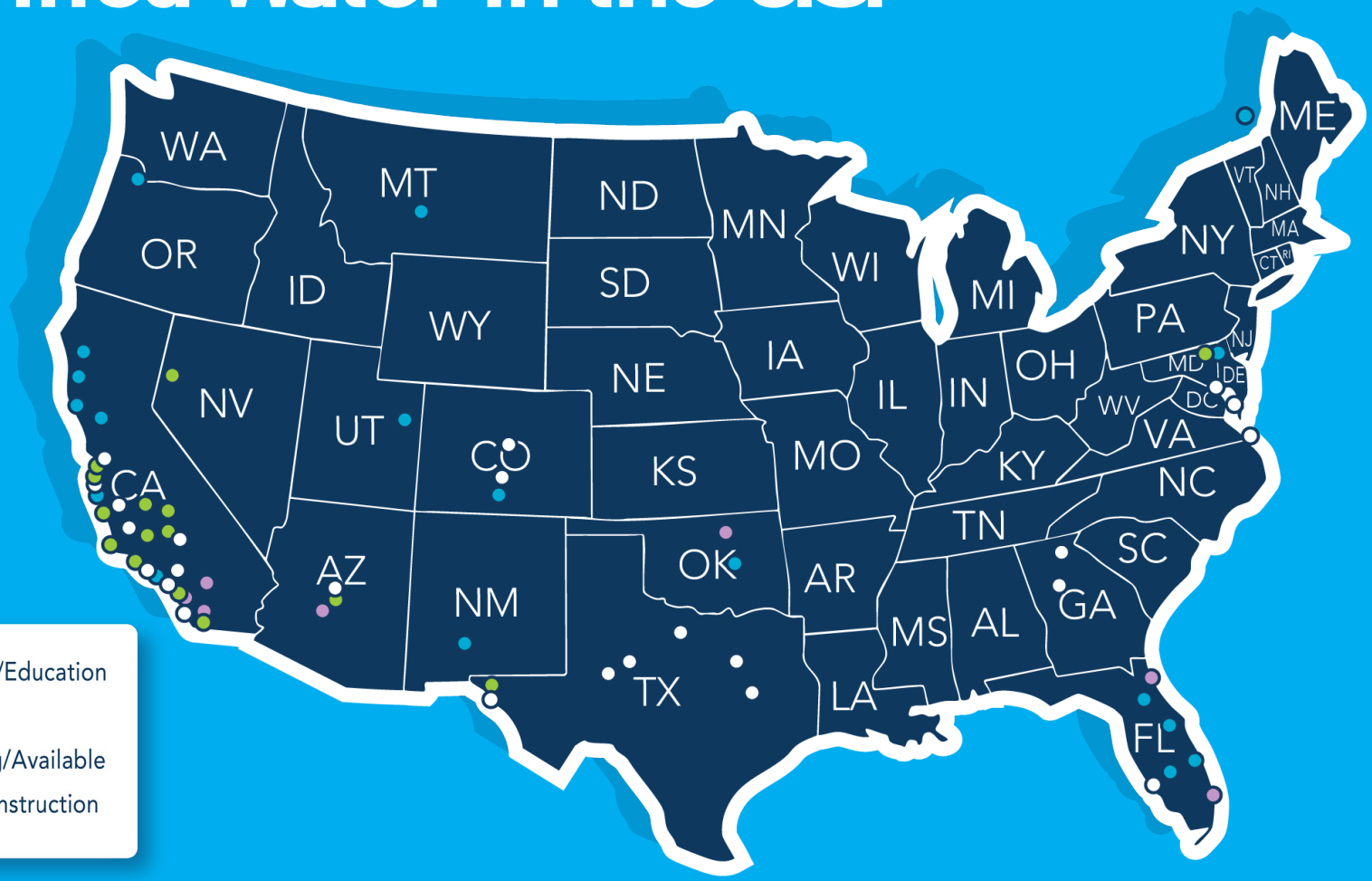
Uses **ultraviolet light and chlorine** to create a powerful **chemical oxidant** which is highly effective at inactivating harmful pathogens and effective for viruses. It is also effective at breaking down complex organic chemicals, such as, pharmaceuticals and personal care products.



DISINFECTION →

Uses **chlorine** as a **chemical disinfectant** which is highly effective at inactivating viruses and is used in the water distribution system to provide ongoing protection against pathogens and viruses.

Who Else is Using Advanced Purified Water in the U.S.



- Exploring/Education
- Planned
- Operating/Available
- Under Construction

Data for the map courtesy of Water Services Association of Australia in collaboration with WateReuse Association.

ARIZONA
- Phoenix
- Scottsdale

CALIFORNIA
- Alameda County
- Antelope Valley
- Burbank
- Cambria
- Camp Pendleton
- Carpinteria
- Central Coast
- Conejo Valley
- East San Diego County
- El Segundo
- Highland
- Inland Empire
- Laguna County
- Long Beach
- Los Angeles
- Monterey
- Morro Bay
- Oceanside
- Orange County
- Pico Rivera
- Pure Water Southern CA
- Rancho California
- San Diego
- San Franciso
- San Jacinto
- Santa Clara County
- Santa Monica
- South Orange County
- Santa Cruz County
- Tri-Valley
- Ventura
- Yucaipa

CANADA
- Québec City

COLORADO
- Aurora
- Castle Rock
- Colorado Springs

FLORIDA
- Altamonte Springs
- Clay County
- Clearwater
- Hillsborough County
- Jacksonville
- Palm Beach County
- Plant City
- Polk County

GEORGIA
- Clayton County
- Gwinnett County

MARYLAND
- Anne Arundel County
- Westminster

MONTANA
- Big Sky

NEVADA
- Reno

NEW MEXICO
- Cloudcroft

OKLAHOMA
- Bartlesville
- Norman

OREGON
- Washington County

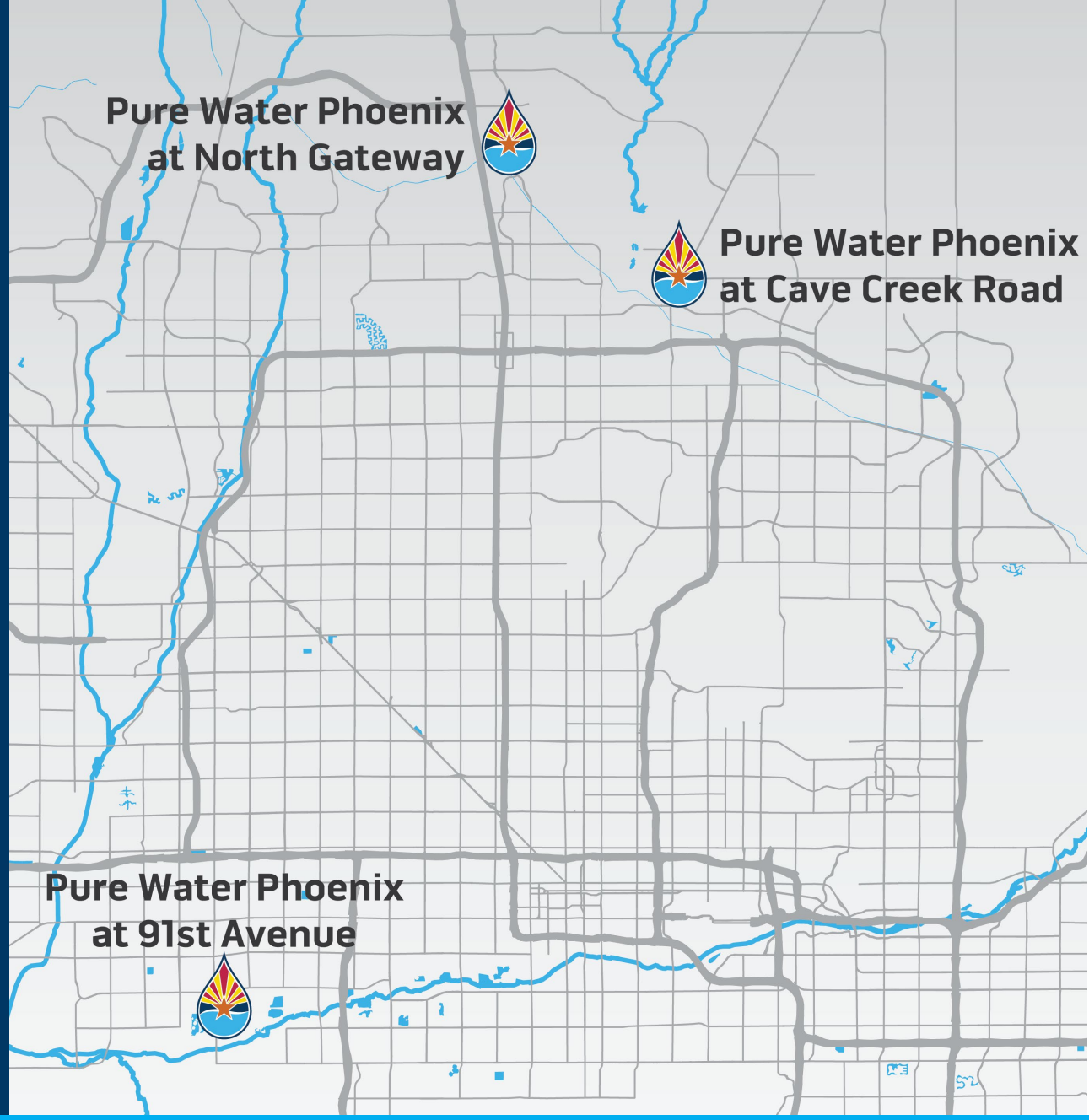
TEXAS
- El Paso
- Big Spring
- Abilene
- Wichita Falls
- North Texas
- Tarrant

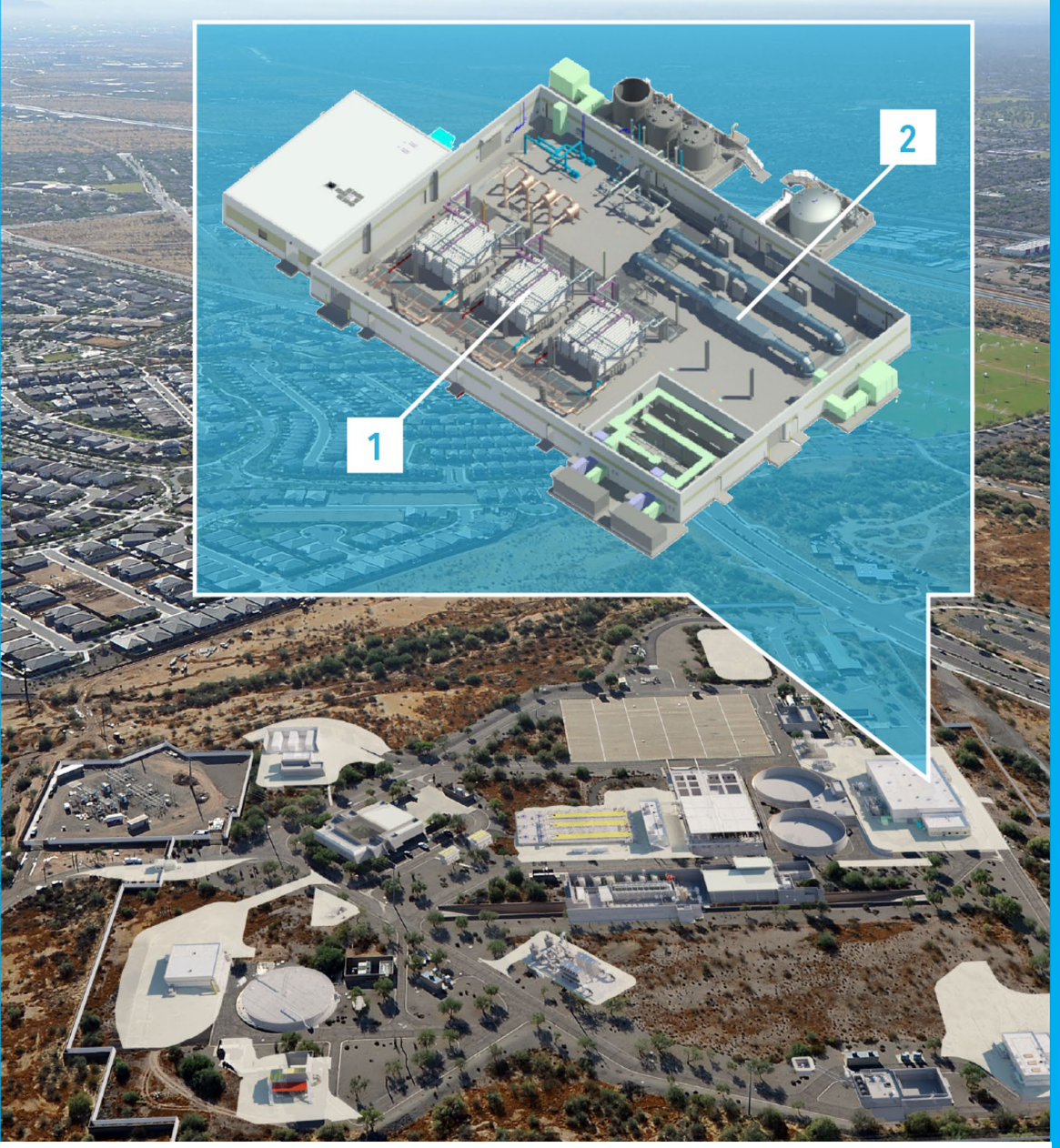
UTAH
- South Jordan

VIRGINIA
- Hampton Roads
- Loudoun County
- Upper Occoquan

POTENTIAL LOCATIONS

- Cave Creek Road Advanced Water Purification Facility
- North Gateway Advanced Water Purification Facility
- 91st Avenue Advanced Water Purification Facility



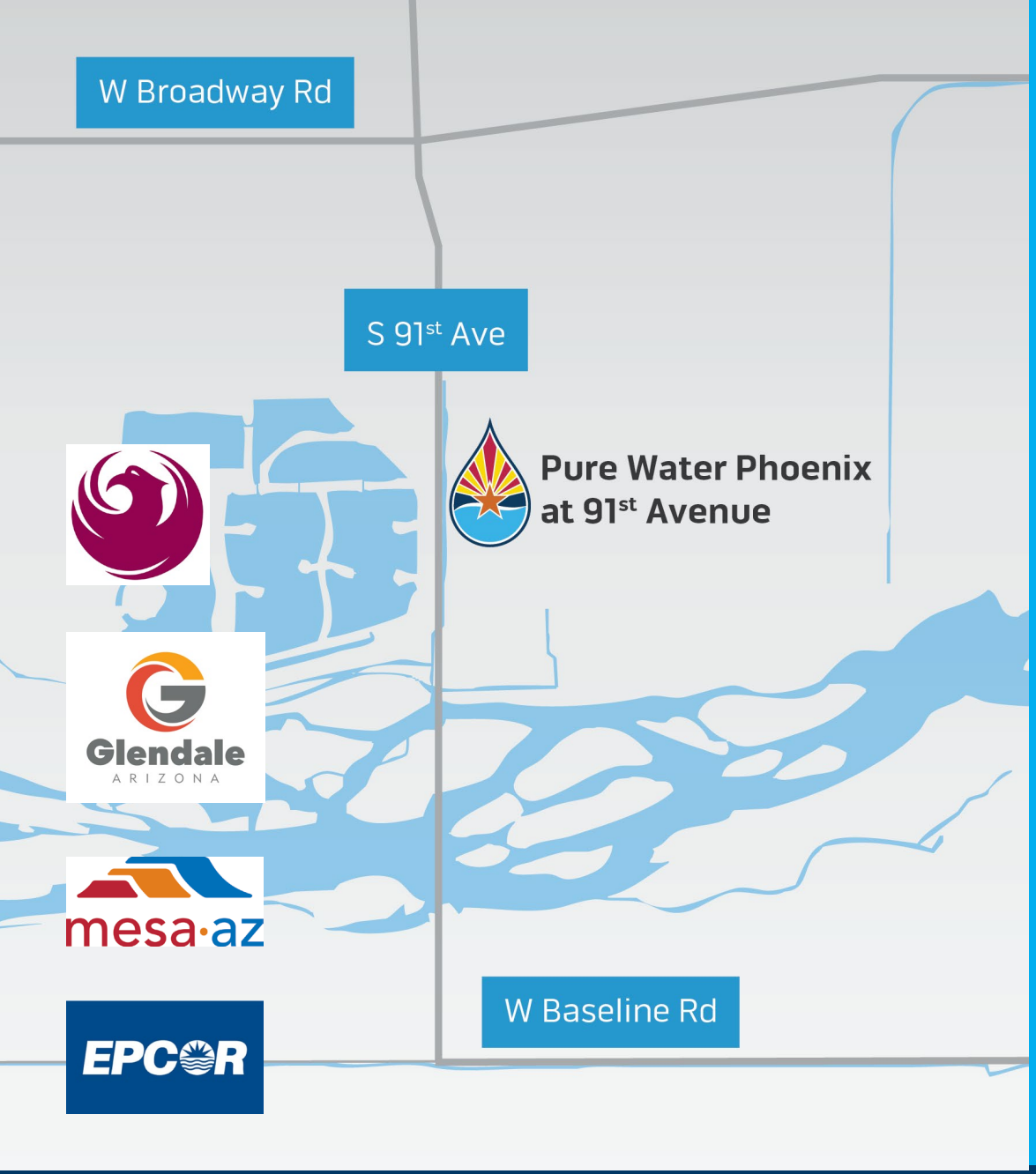


(1) Reverse Osmosis and (2) UV Advanced Oxidation technologies.

PURE WATER PHOENIX AT CAVE CREEK ROAD

ADDING AN ADVANCED WATER PURIFICATION FACILITY TO THE CCWRP SITE

- Purified water initially added to groundwater supplies
- In the future, the purified water may be conveyed to the drinking water system
- Production:
  - Initial – 6.75 MGD capacity
  - Build-out – 13.5 MGD capacity



PURE WATER PHOENIX AT 91ST AVENUE

- Advanced Water Purification Facility located adjacent to the 91st Ave WWTP.
- Regional facility could produce advanced purified water from other Valley cities' flows.
- Purified water conveyed to the drinking water system(s).

Up to 64 MGD

Purified water production capacity (approximately 235,000 homes

PHOENIX ADVANCED WATER PURIFICATION FACILITIES TIMELINE



- Cave Creek full-scale pilot testing anticipated to begin in 2027
- Cave Creek Road to begin delivering drinking water in 2029
- North Gateway construction expected 2028 - 2032
- 91st Avenue construction expected 2030 - 2033

ADVANCED PURIFIED WATER

Federal Safe Drinking Water Act + **Arizona Advanced Water Purification Rules** = PURE WATER PHOENIX

"Water should not be judged by its history, but by its quality." *Lucas van Vuuren, National Institute of Water Research*

LEARN MORE ABOUT ADVANCED PURIFIED WATER

PURE WATER
PHOENIX

To learn about advanced purified water in your community, visit the City of Phoenix's Water Services Department website:

phoenix.gov/purewater

watersmart@phoenix.gov

WATEREUSE

The WateReuse Association focuses on advancing laws, policy and funding to increase water reuse and provides educational information about water reuse.

watereuse.org/educate