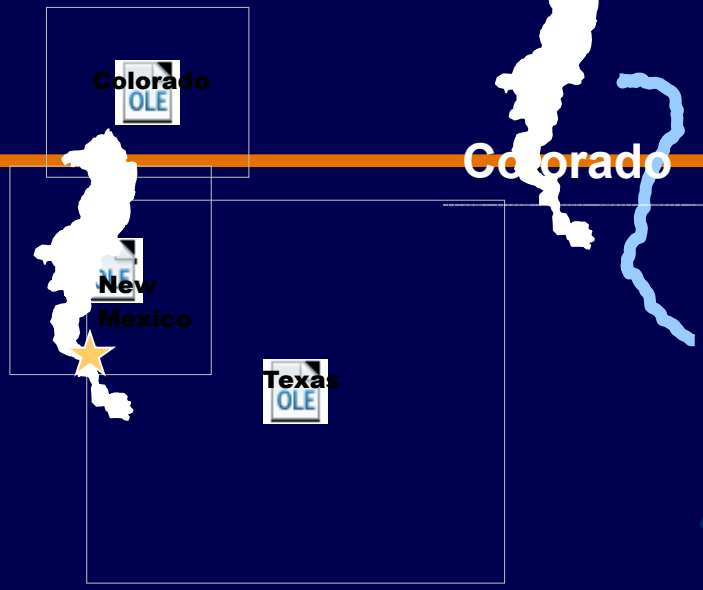
How a Diversified Resource Can Alleviate Water Shortages

Ed Archuleta, P.E. D.E.E. / Director of Water Initiatives

Presented at Central Texas Water Conservation Symposium
San Marcos, Texas February 25, 2014



Colorado

Rio Grande

★ Taos

★ Santa Fe

★ Albuquerque

Socorro ★

New Mexico

United States

★ Las Cruces

★ *El Paso*

Juarez ★

Texas

Mexico

★ Ft. Quitman

Regional Water Resources

Water Management on the US/Mexico Border

	El Paso, TX	Las Cruces, NM	Cd. Juárez, Chihuahua
Ground Water Law	Common Law	Prior Appropriation	Mexican Federal
Surface Water Law	International Treaty Rio Grande Compact	Prior Appropriation International Treaty Rio Grande Compact	Common Law

Foundation for a Successful Utility

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Policy
Guiding the development and implementation of effective programs and practices.

Resources
Managing human, financial and natural resources that ensure excellent service.

Planning
Establishing a course of action that provides a vision for our future.

Technology
Improving performance through hardware, software and web-based resources.

EPWU's success is due to diversification

Diversified Resources

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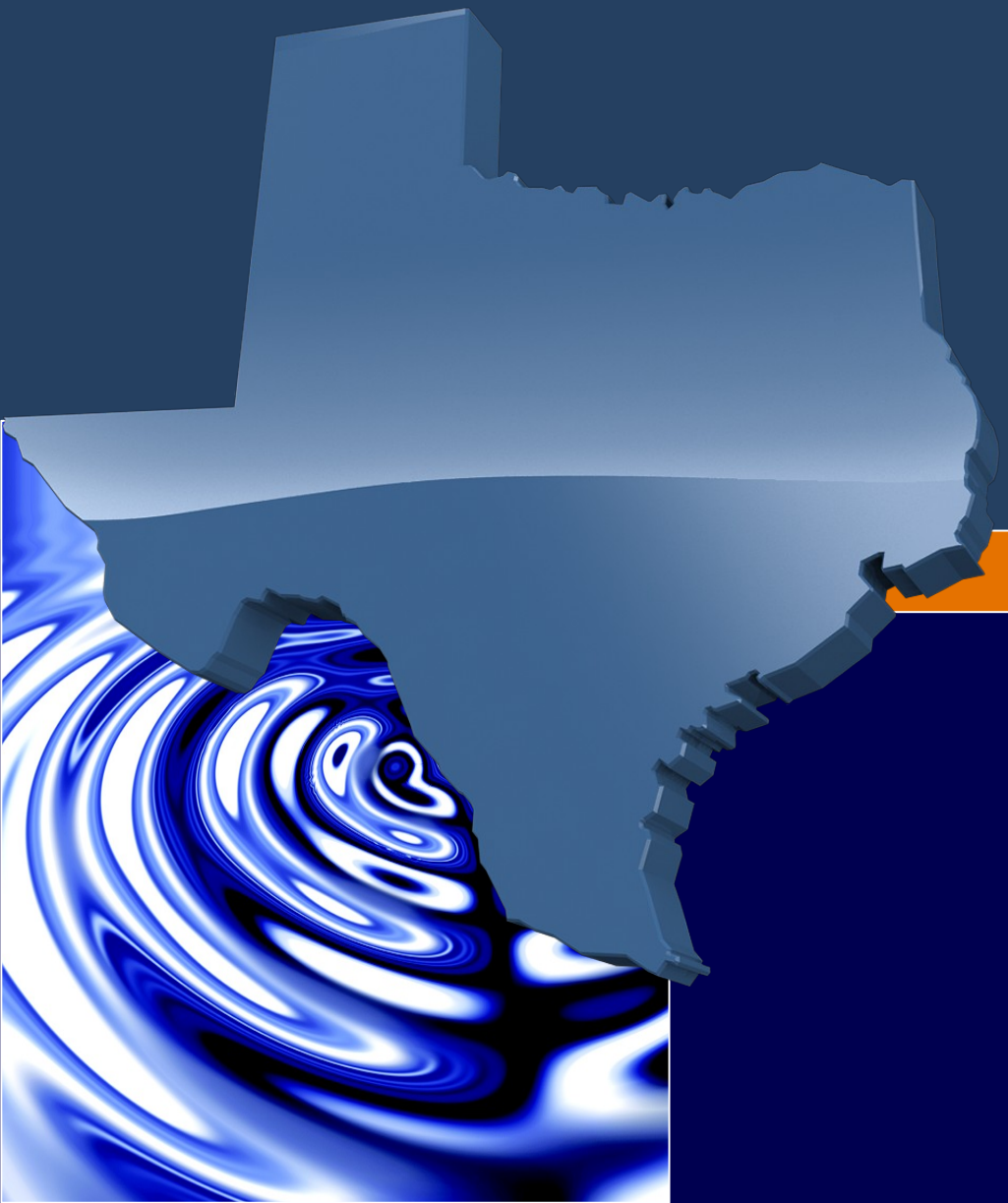
50-Year Water Resource Management Plan adopted in 1991

EL PASO WATER UTILITIES
PUBLIC SERVICE BOARD



Innovation in Desalination

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Kay Bailey Hutchison Desalination Plant

Opened in 2007 to deal with:

- Drought
- Emergency situations
- Growth
- Brackish water intrusion

Desalination Plant Details

- Up to 27.5 MGD capacity
- Utilizes 5 reverse osmosis skids
- Year round usually runs at 1-2 skids
- Operated at full capacity for the first time in May 2012

NEW MEXICO
TEXAS
DEEP WELL
DISPOSAL SITE
CONCENTRATE LINE
BY DEEP WELL DISP.
BLEND WELLS &
COLLECTION LINE
LOOP STS
SOURCE WELLS
RO PLANT SITE
© 2003
© 2003

Remote Concentrate Disposal Area

- Less costly and less environmental impact than evaporation ponds
- 3 injection wells
- Concentrate pipeline (22 mi)

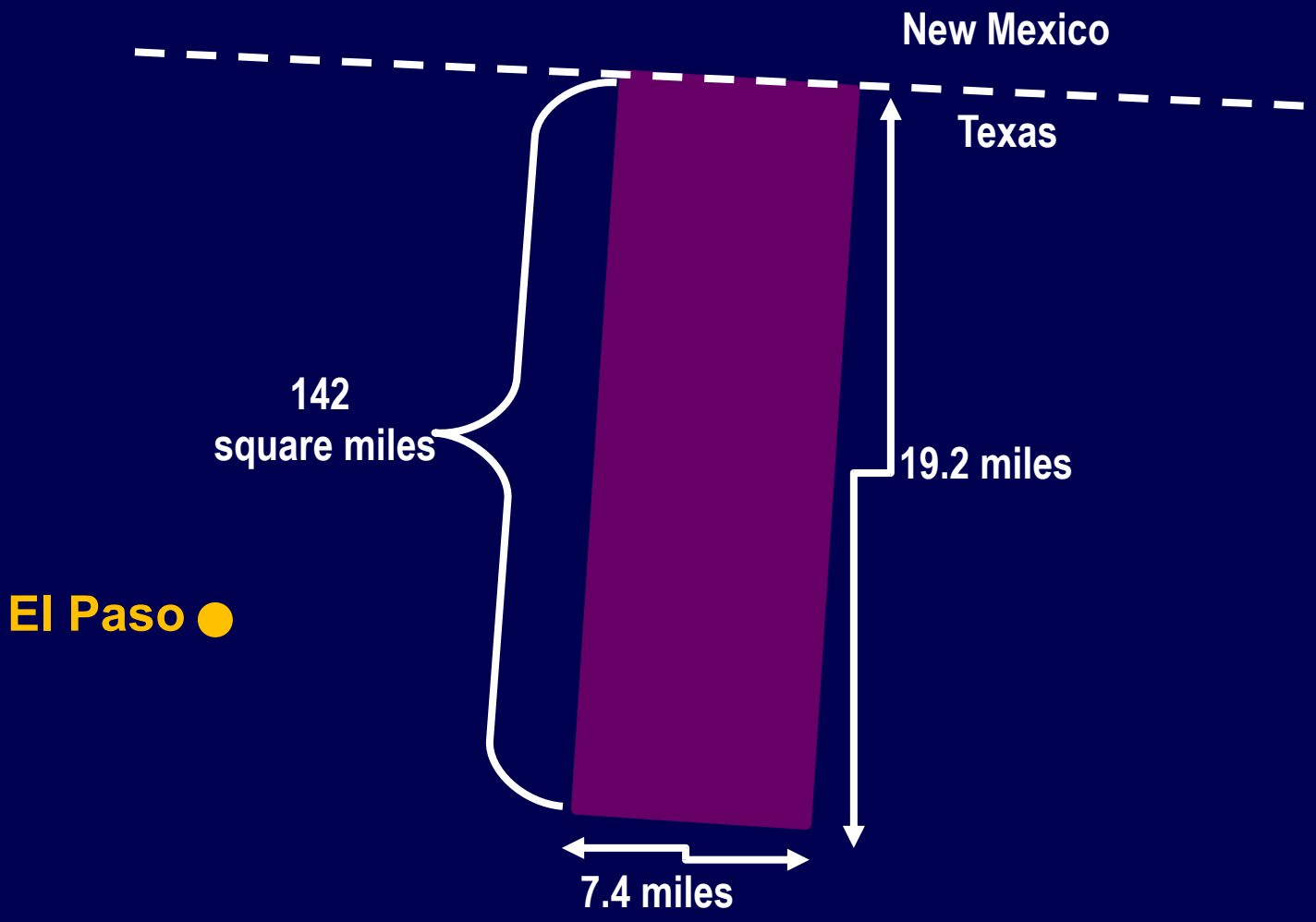
Injection Well Construction

- Well 1 (2004)
  - 3,777 ft deep
- Well 3 (2006)
  - 4,030 ft deep
- Well 2 (2007)
  - 3,720 ft deep

Aquifer Exemption

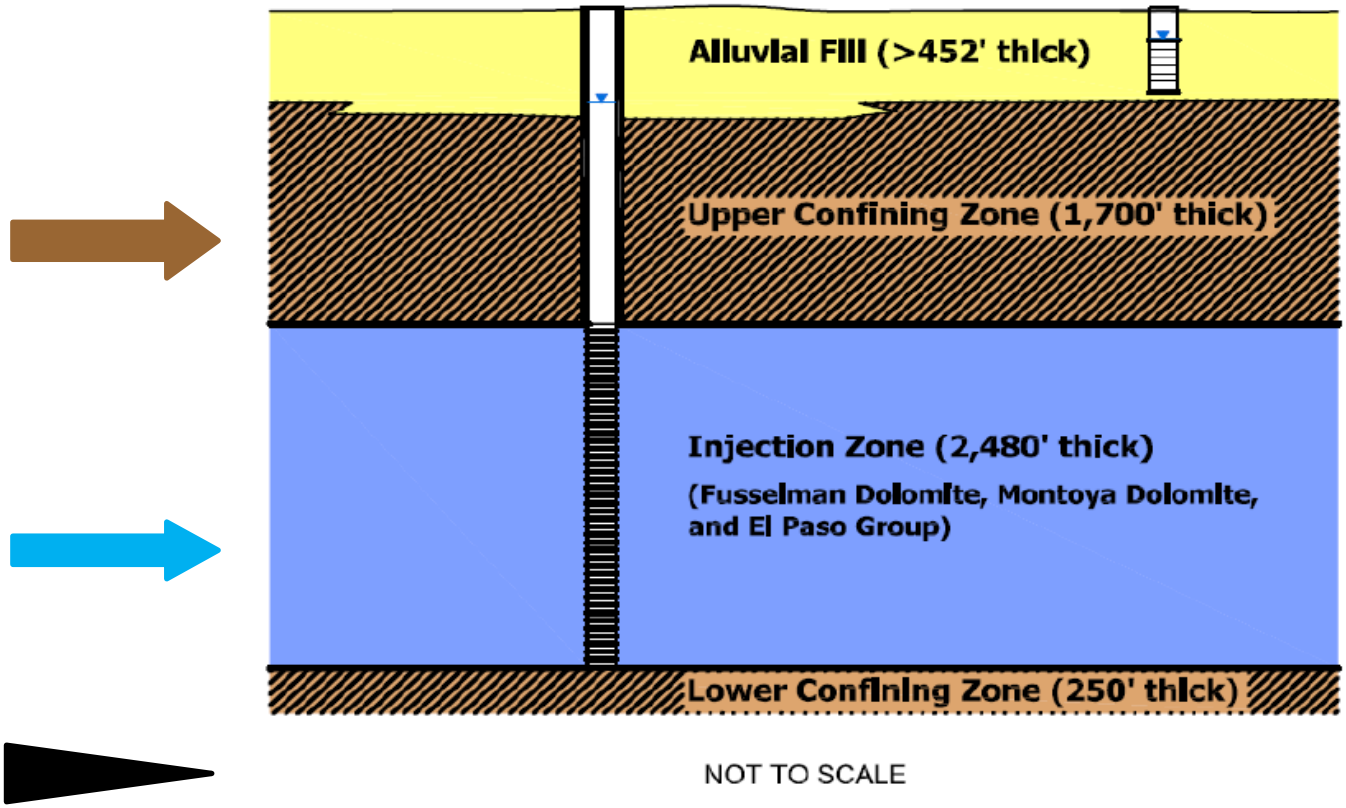
- Injection zone is considered a US Drinking Water source because the Total Dissolved Solids are less than 10,000 mg/L
- Current Class V injection well authorization prohibits injecting water that does not meet primary drinking water standards
- Without aquifer exemption, 30 million gallons/month of freshwater resources is needed to dilute concentrate to meet primary drinking water standards
- However, EPA approved the Aquifer Exemption in 2012

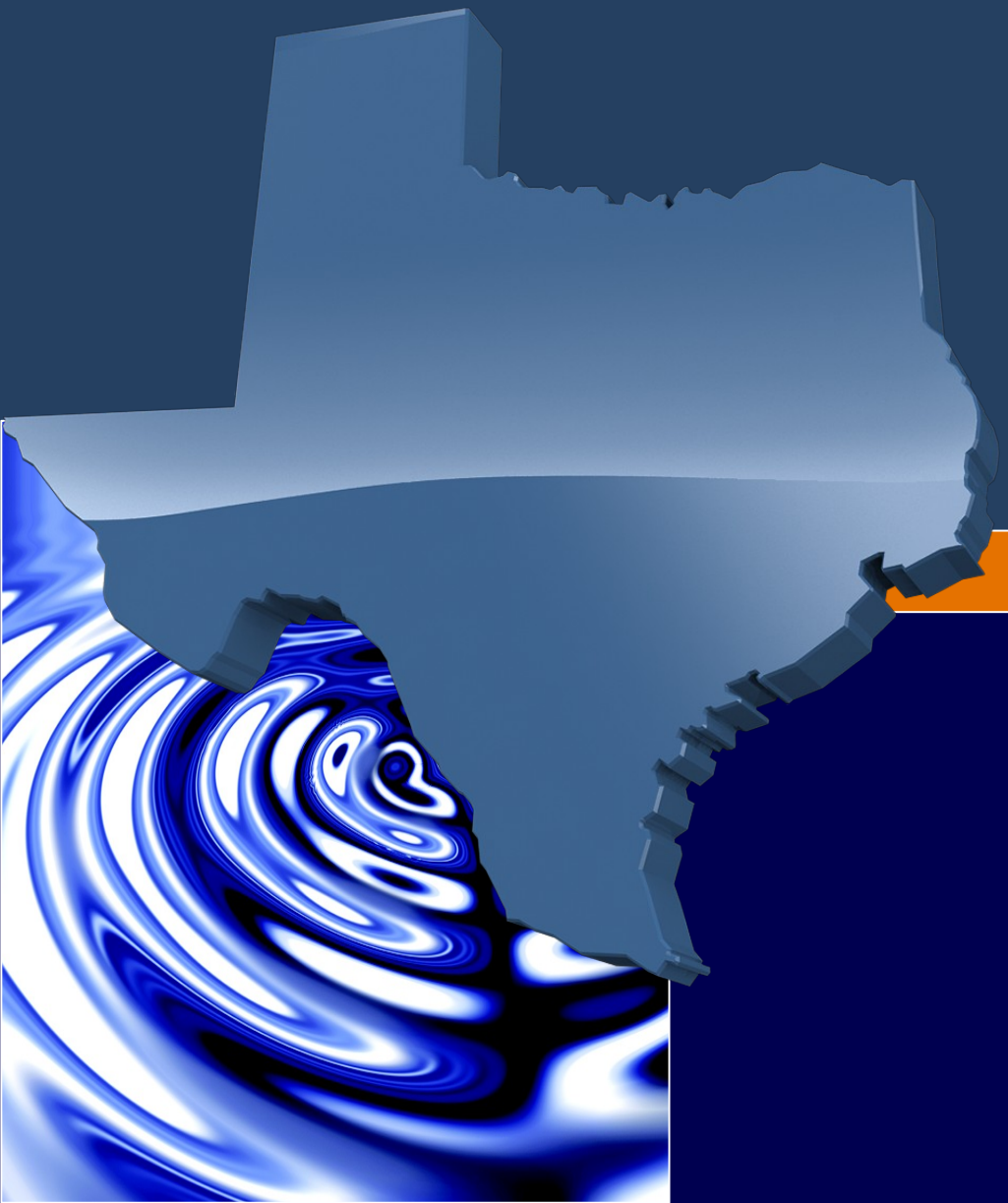
Aquifer Exempted



Schematic Cross-Section of Units Overlying the Injection Zone

Groundwater in the injection zone is under artesian pressure.
Static water level in the injection zone is 500 feet beneath ground surface.





Innovation Using Reclaimed Water

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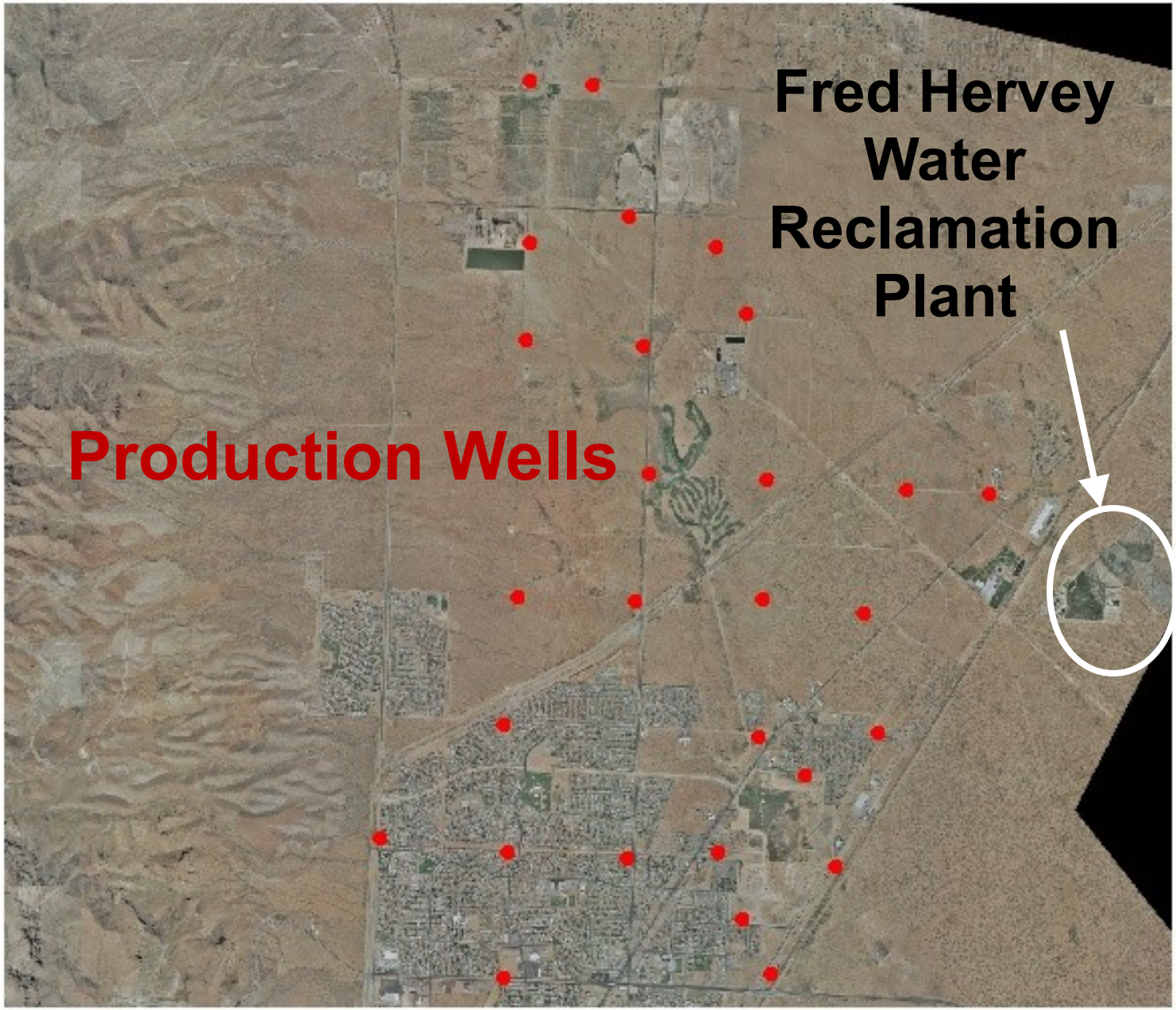
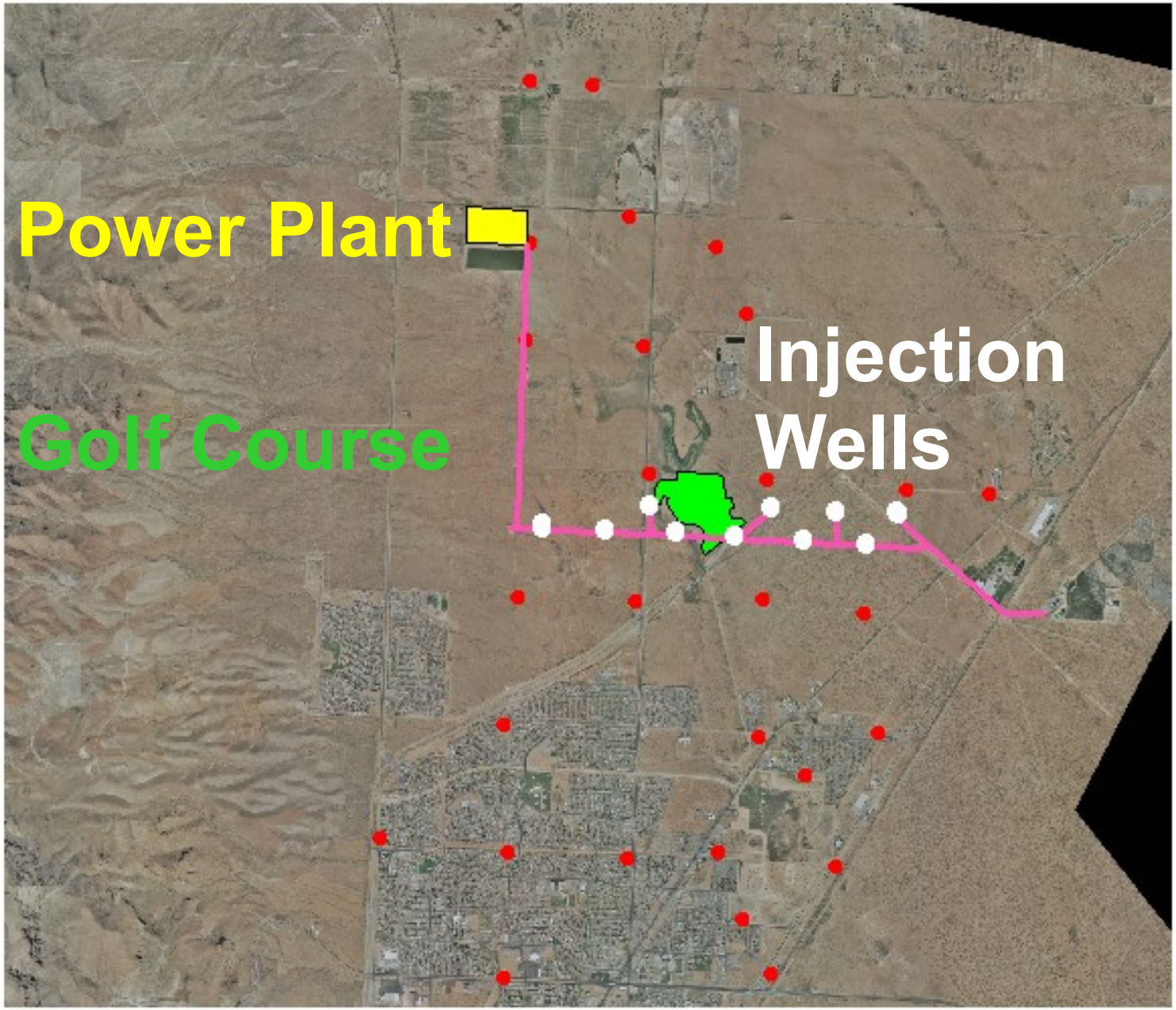
Aquifer Recharge?

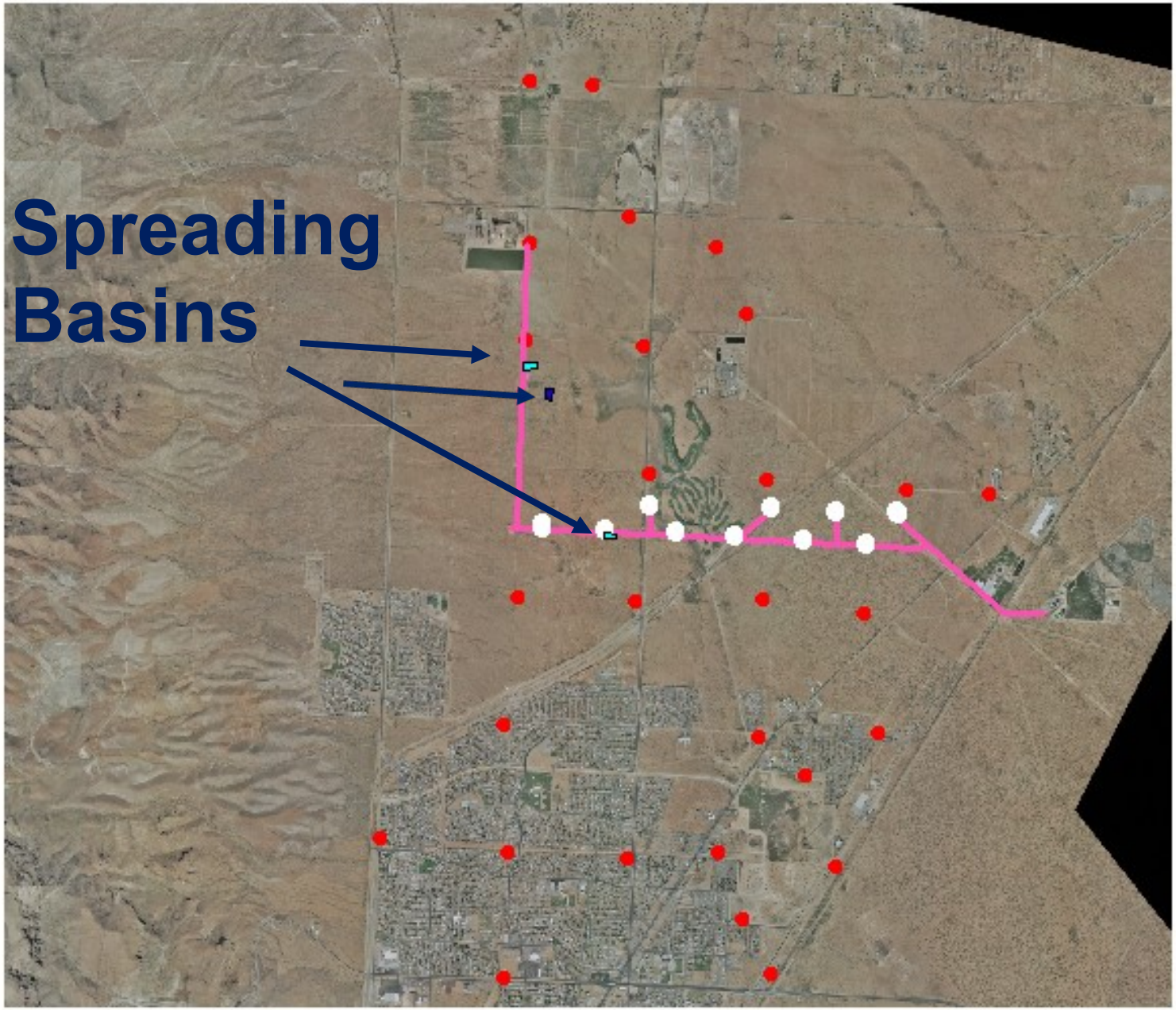
Aquifer Storage and Recovery

- Since 1985, El Paso Water Utilities has been using reclaimed water meeting drinking water standards for aquifer recharge
- Fred Hervey Water Reclamation Plant original capacity was 10 MGD, expanded to 12 MGD
- Plant located 20 miles from the Rio Grande, effluent discharge to the river not economical

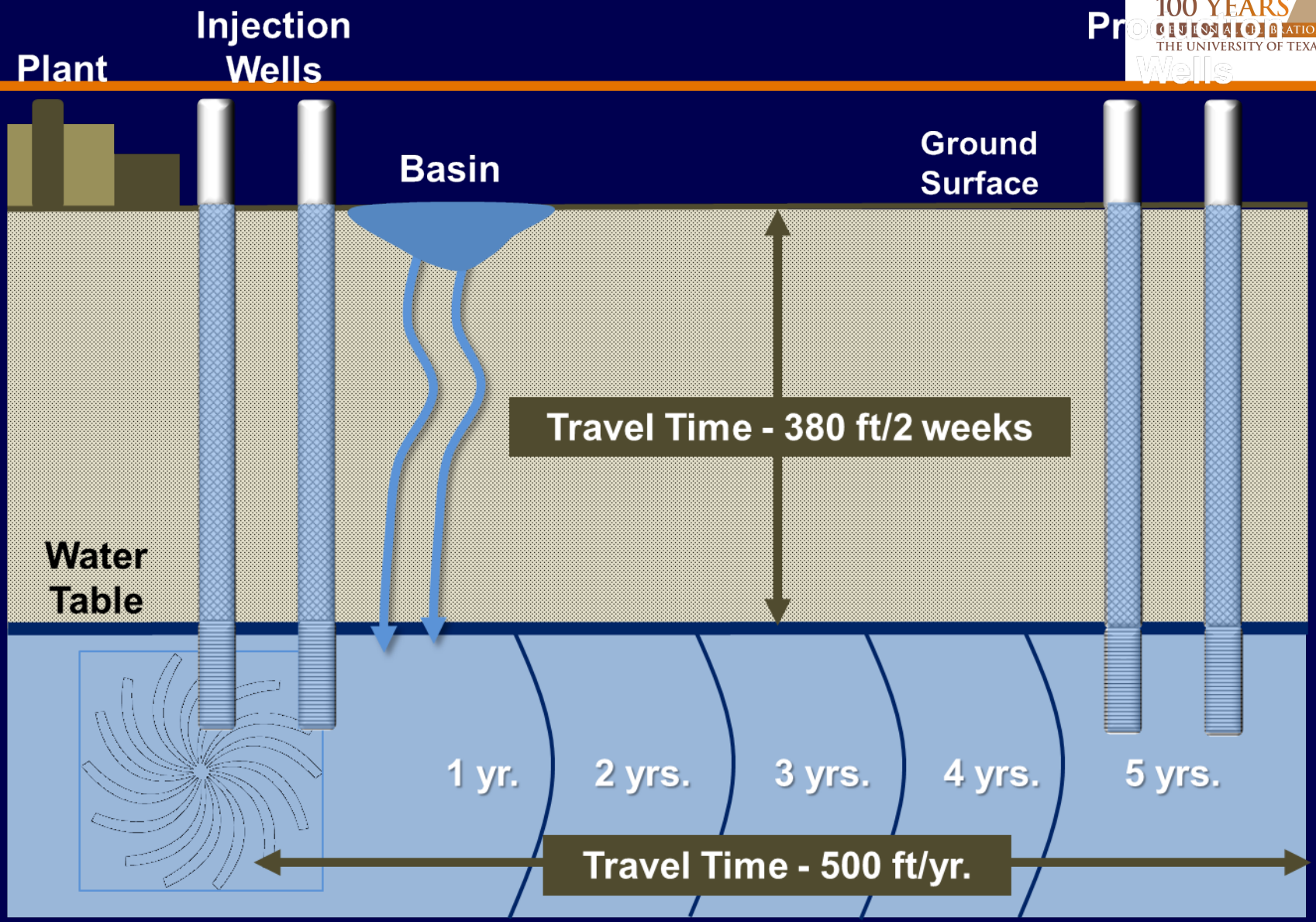
Fred Hervey Expansion


Fred Hervey
Water
Reclamation
Plant
Production Wells
N
0
1
2
3
4
5 Miles

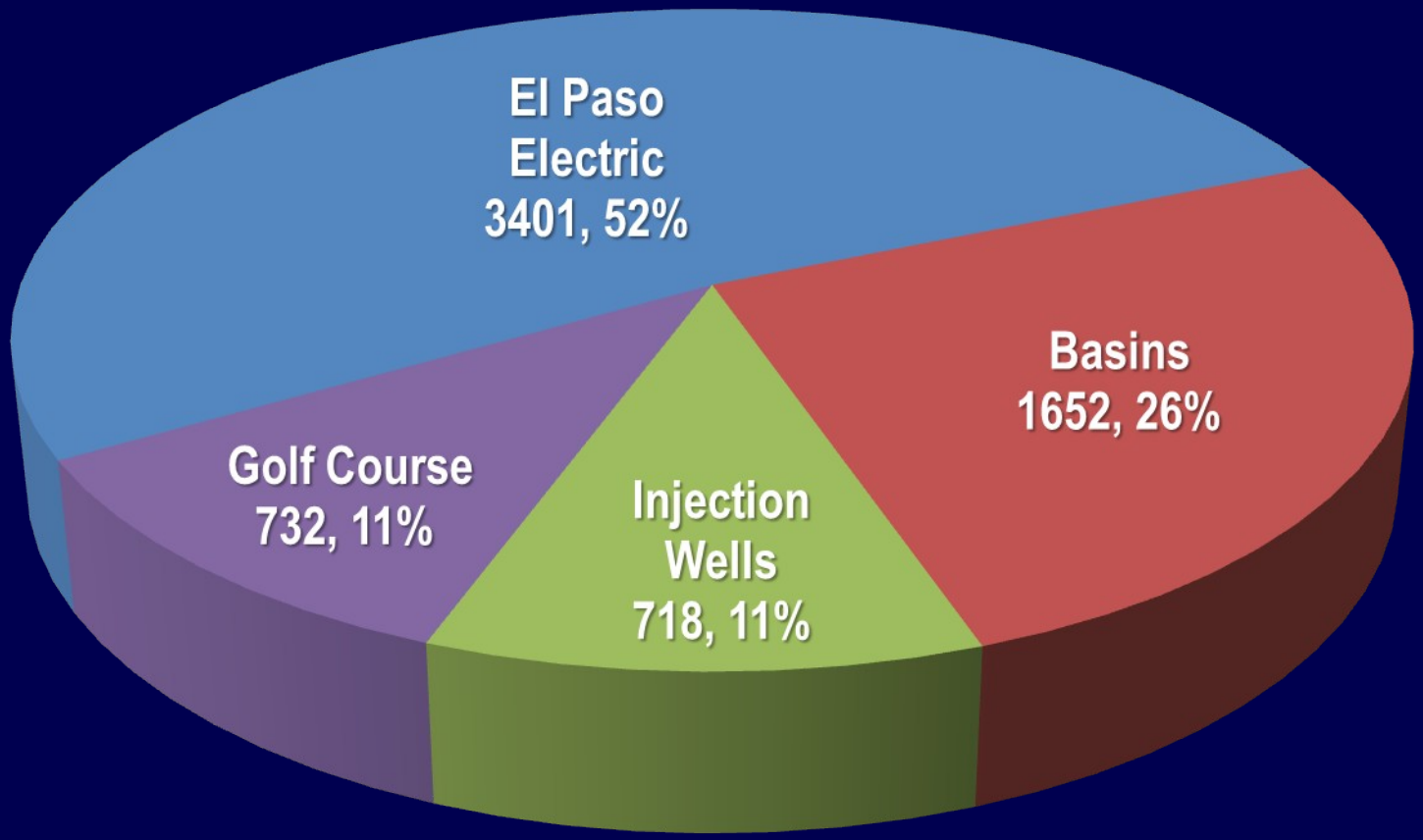

Power Plant
Golf Course
Injection Wells
N
0
1
2
3
4
5 Miles

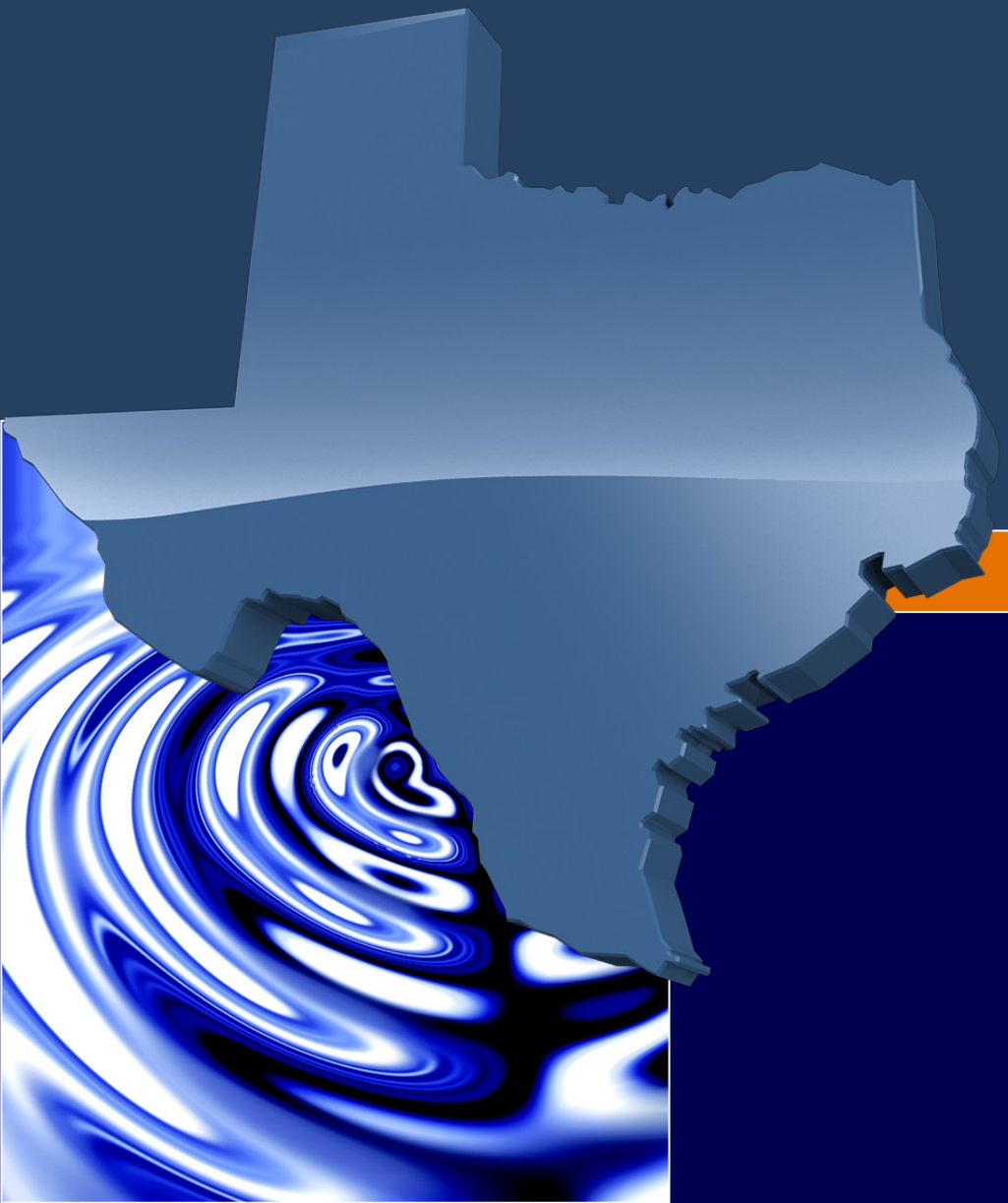

Spreading
Basins
N
0
1
2
3
4
5 Miles

Initial Start-Up of Recharge Basin


Plant
Injection Wells
Basin
Ground Surface
Travel Time - 380 ft/2 weeks
Water Table
1 yr.
2 yrs.
3 yrs.
4 yrs.
5 yrs.
Travel Time - 500 ft/yr.

2012 Fred Hervey Effluent Distribution by Use (ac-ft)





Innovative Rate Structure

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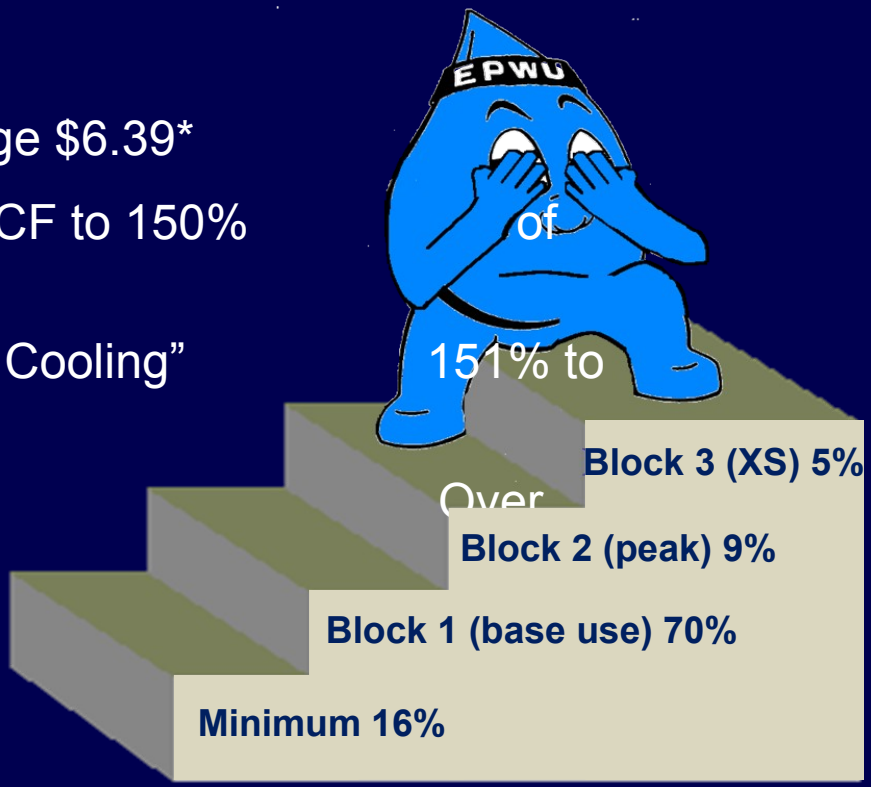
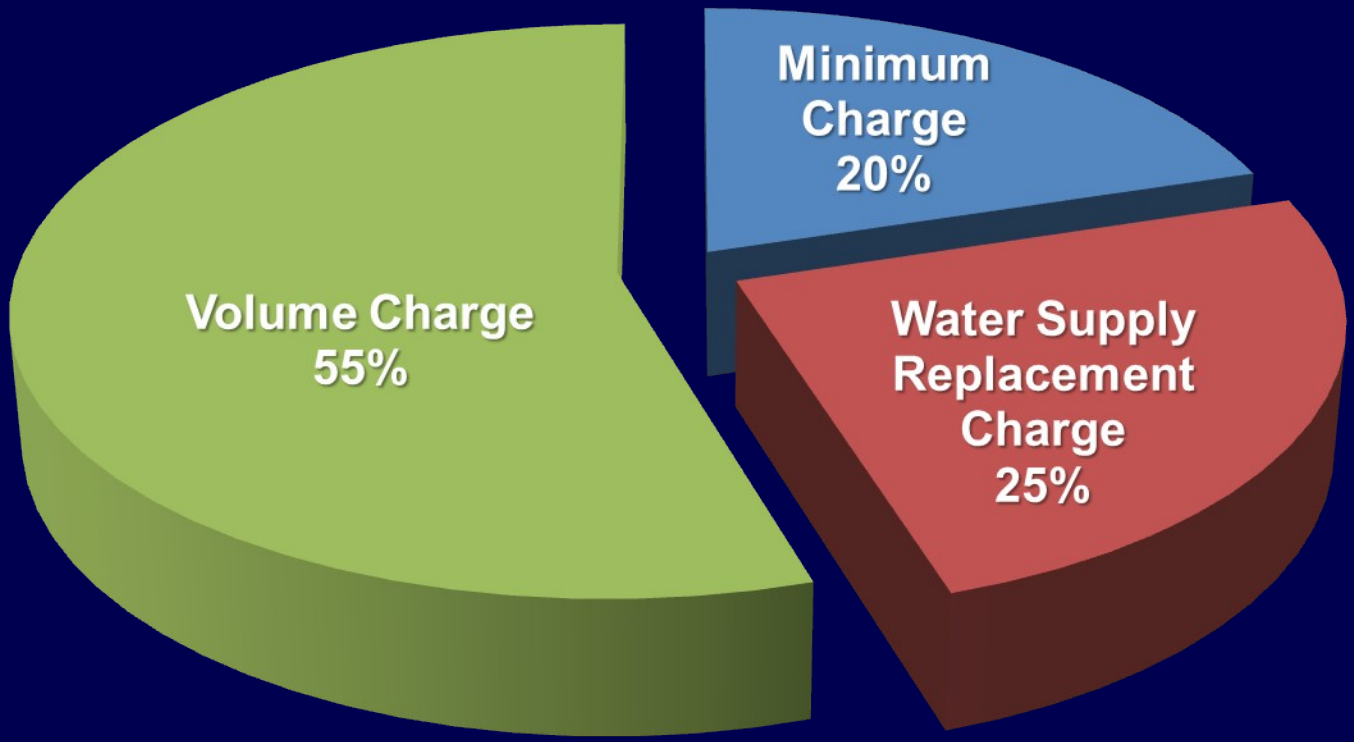
Conservation Rate Structure

- **Average Winter Consumption (AWC)** is the average amount of water used during the most recent Dec., Jan. and Feb. billing period

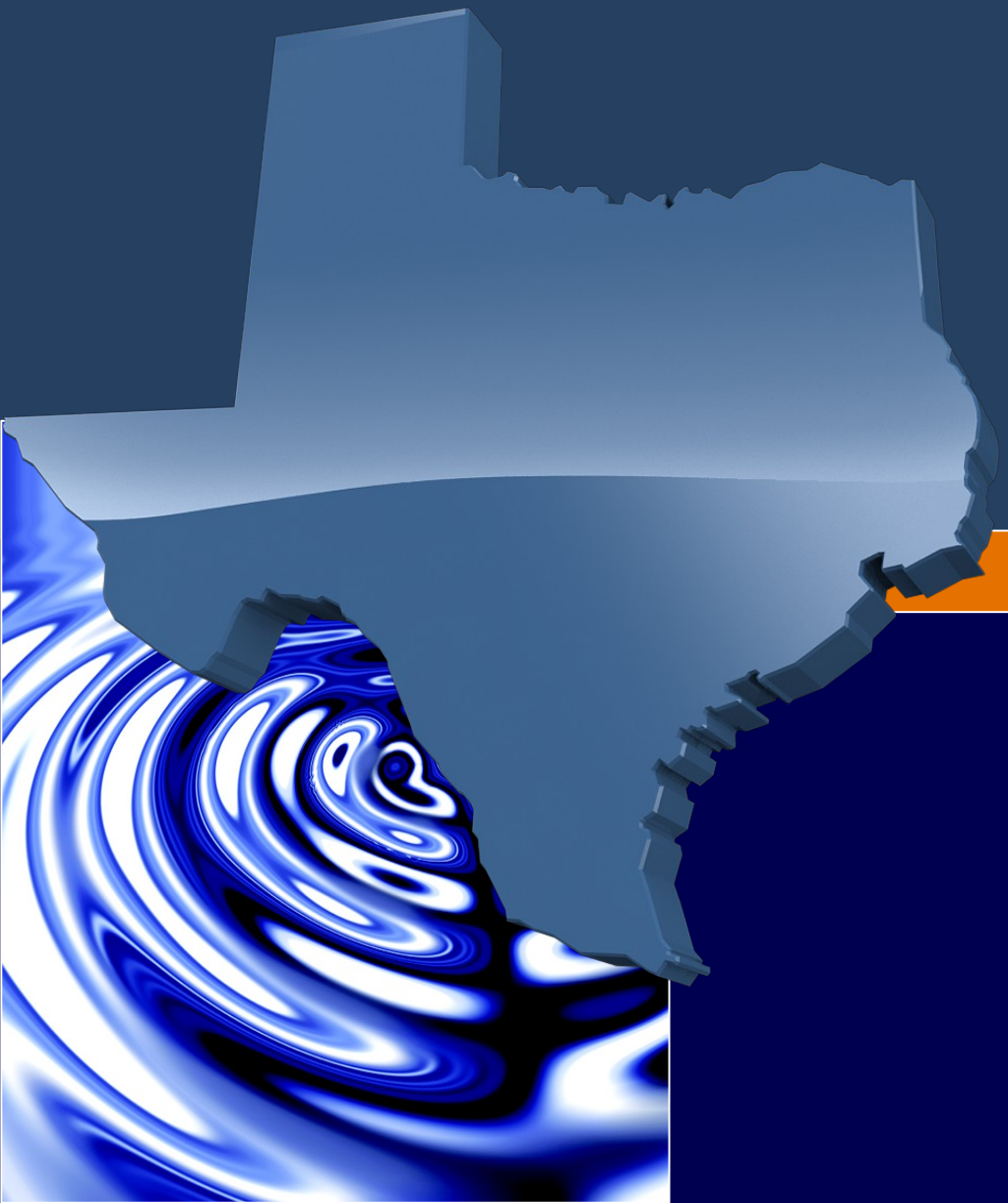
- **Inverted Block Structure**
  - Minimum Charge $5.18*
  - Water Supply Replacement Charge $6.39*
  - Block 1 $1.56* “Indoor Use” >4 CCF to 150% AWC
  - Block 2 $3.68* “Outdoor Use and Cooling” 250% of AWC
  - Block 3 $5.27* “Excessive Use” 250% of AWC



Average Monthly Water Bill



Results



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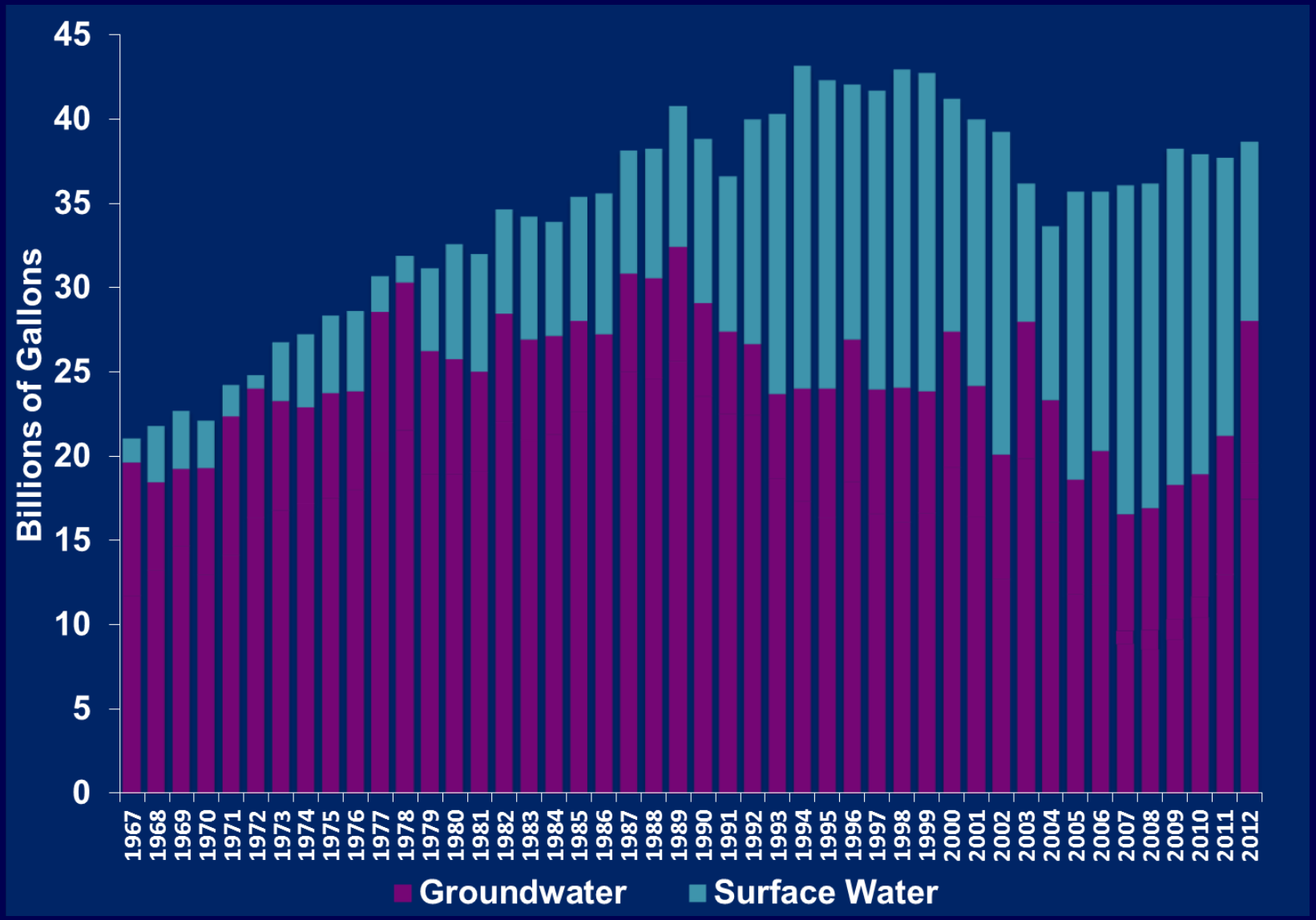
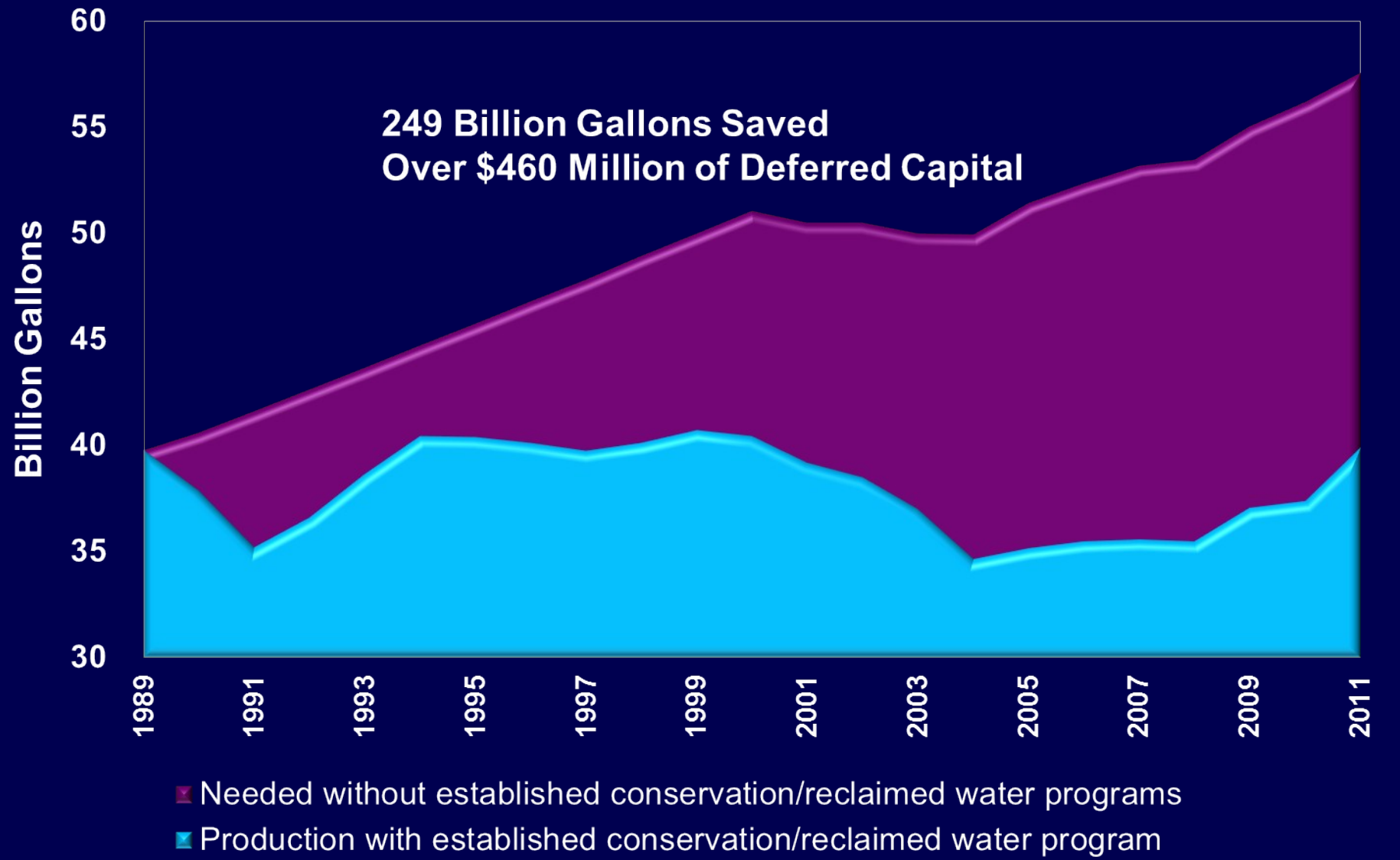
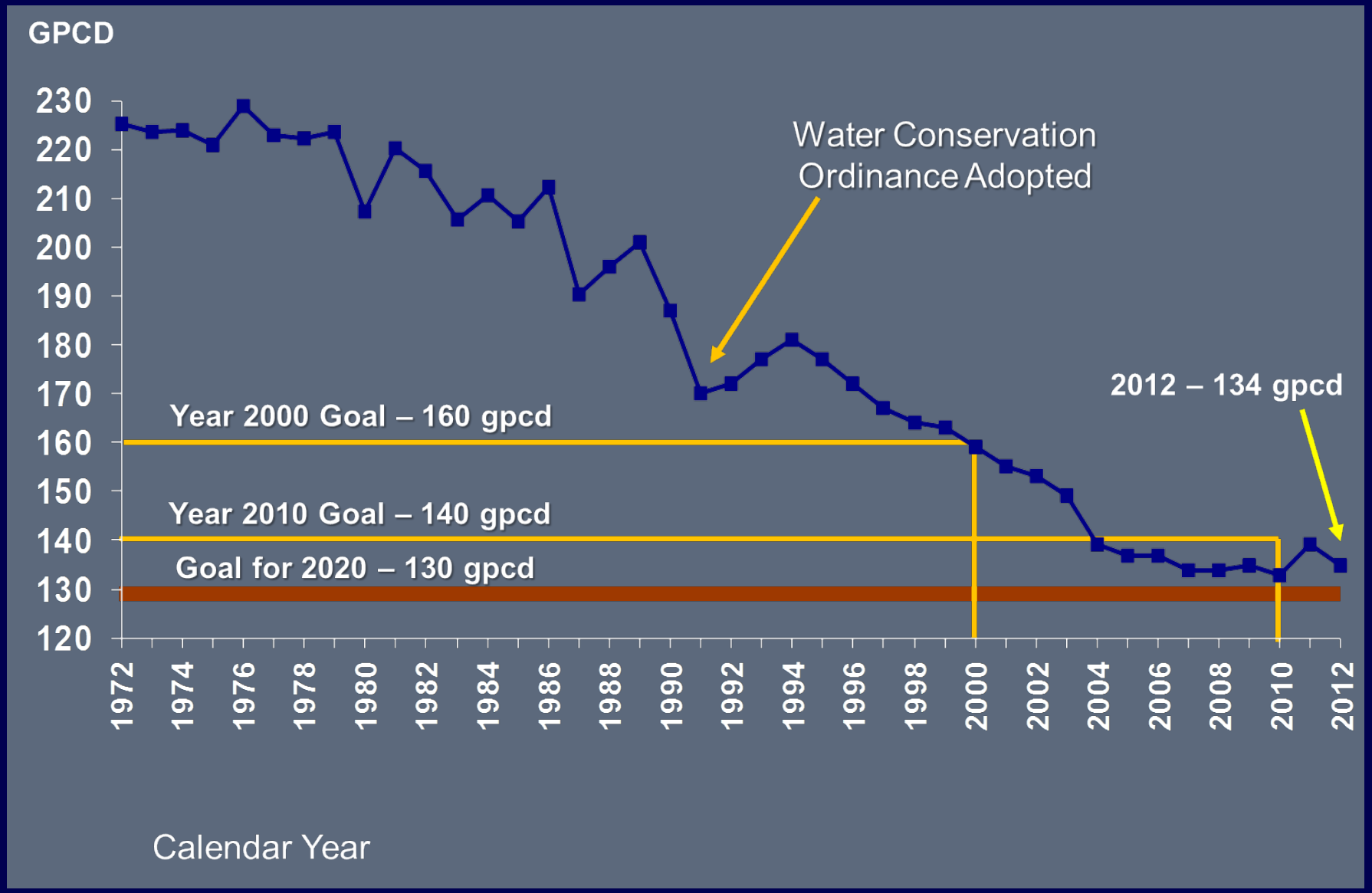
EPWU Water Production



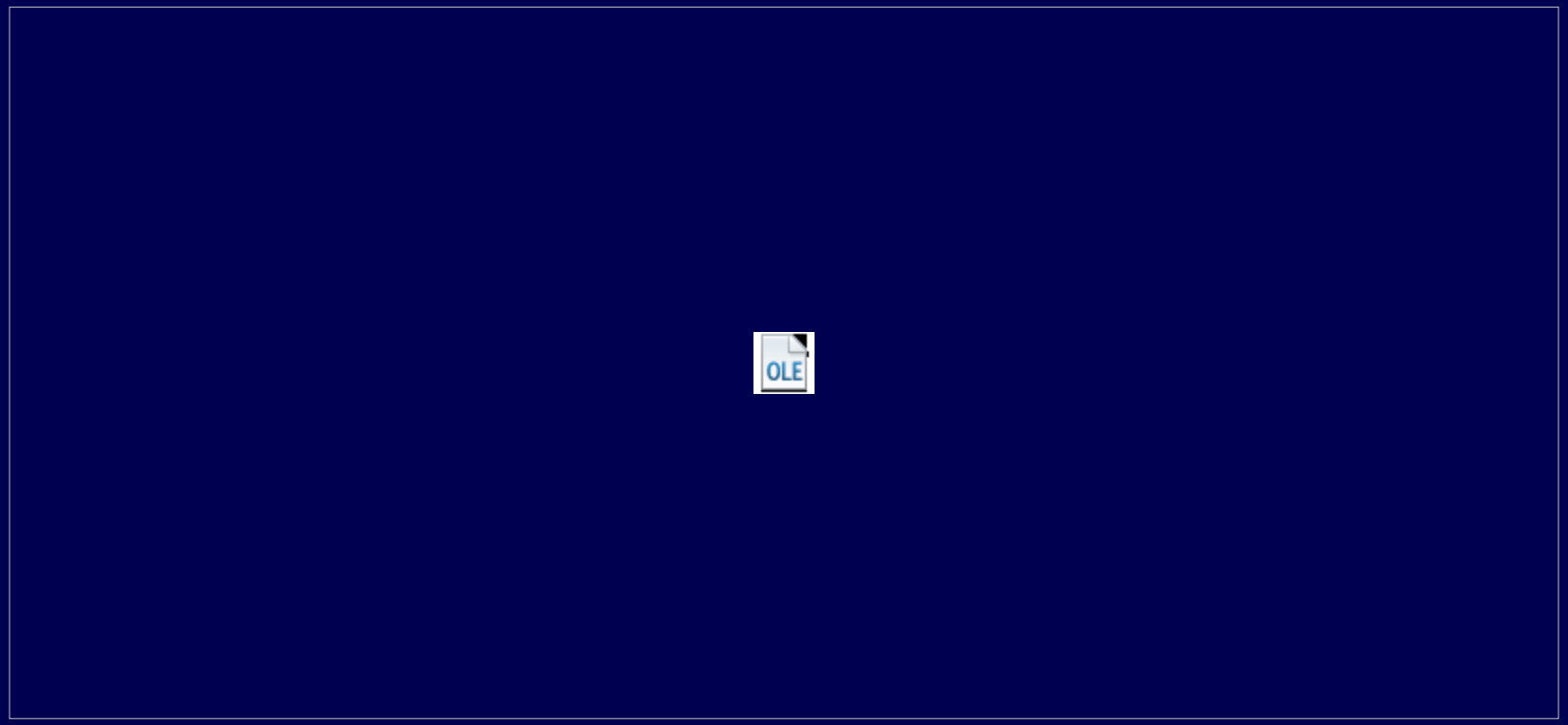
Water Savings Due to Conservation and Reclaimed Water



Per Capita Consumption



Peak Water Demand



Calendar Year

Click to edit Master text styles
Second level
- Third level
- Fourth level
- Fifth level

Water Reuse

POTENTIAL FOR EXPANDING THE NATION'S WATER SUPPLY THROUGH REUSE OF MUCIPAL WASTEWATER

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Summary

El Paso Water Utilities adopted a 50-year water management plan in 1991.

The plan and updates to it have resulted in a forecasted sustainable water supply.

Diversification of water resources is key to sustainability in an arid climate.