



City of Boerne Water Resources Plan

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September 22, 2015

DISCUSSION

Background and Objective

Population and Demands

Water Supply Alternatives

Recommendations



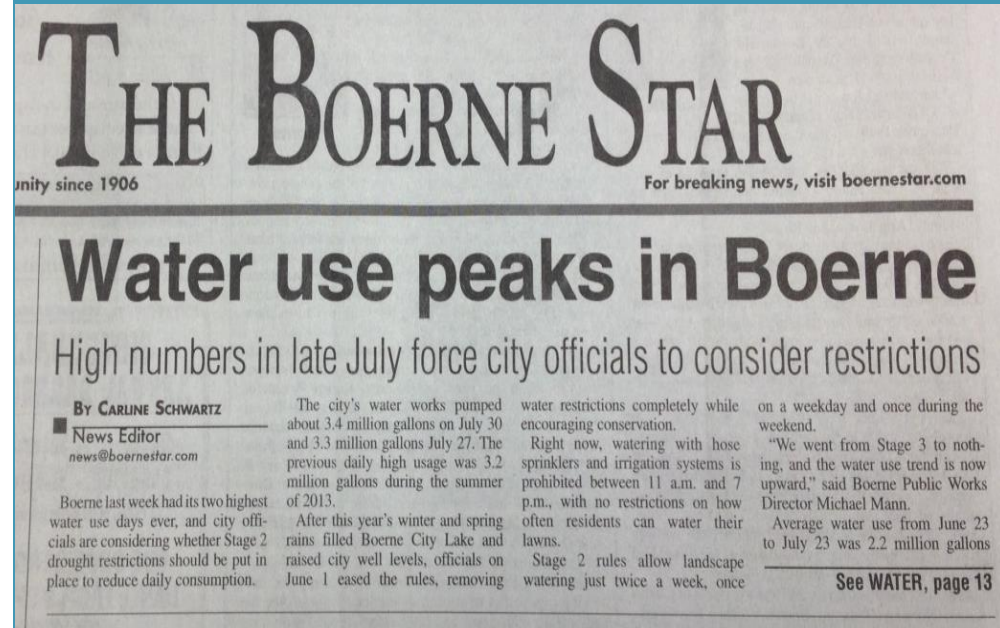
Background

- Boerne experiencing rapid population growth
- Water Resources Plan intended to be guide and updated
- City has long realized that adequate water supply is necessary



Objective

- Task 1 – Compile and Analyze Population, Water Demands, and Existing Supplies
- Task 2 – Identify and Evaluate Water Supply Alternatives
- Task 3 – Prepare Report on Water Resources Plan



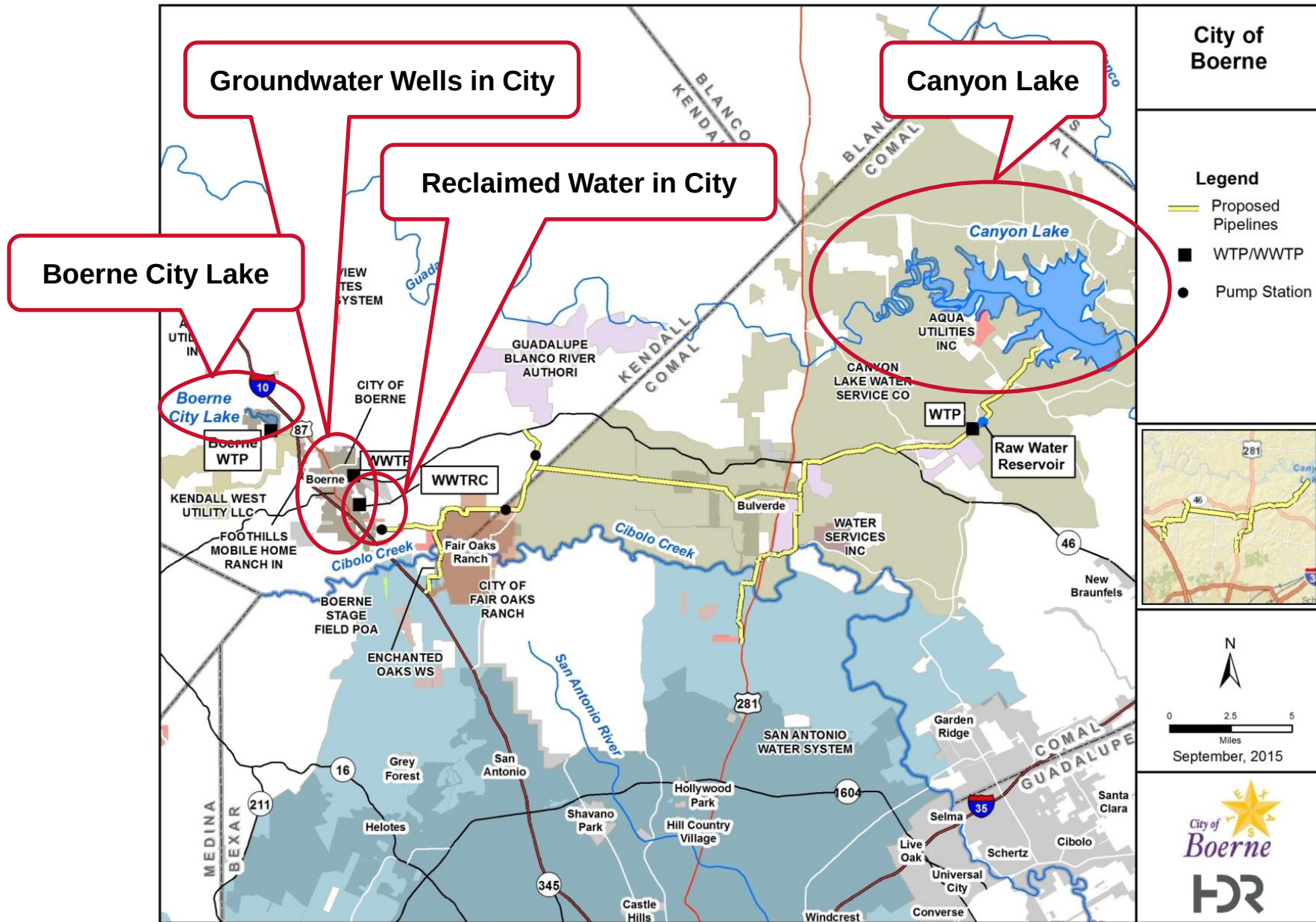
August 4, 2015

Objective

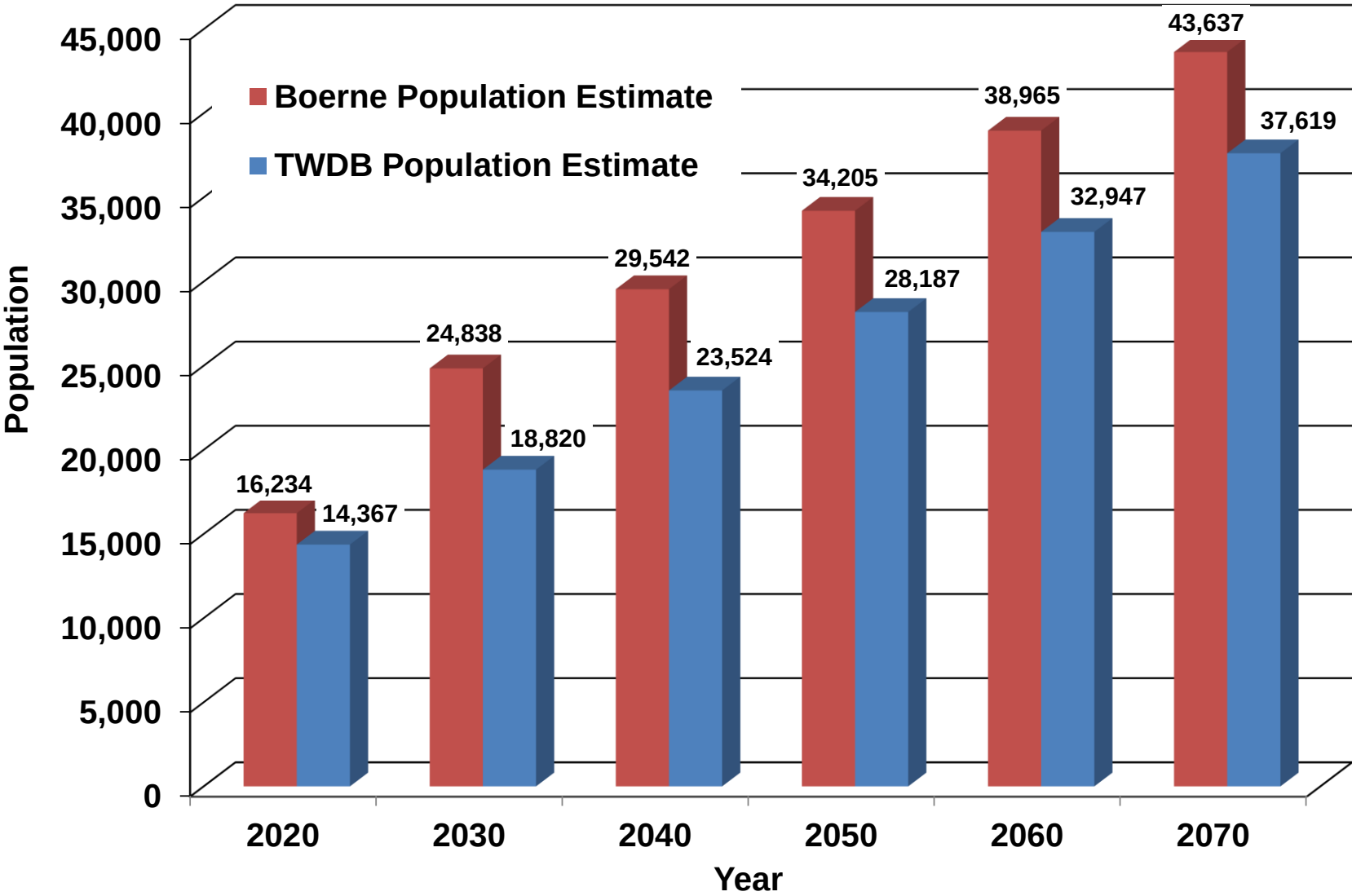
- **Allow Boerne to meet its water supply demands and future needs of customers through 2070**
 - Determine approximate year in which current supply capacity is reached
- **Identify feasible plan of action**
- **Improve reliability of existing supplies**



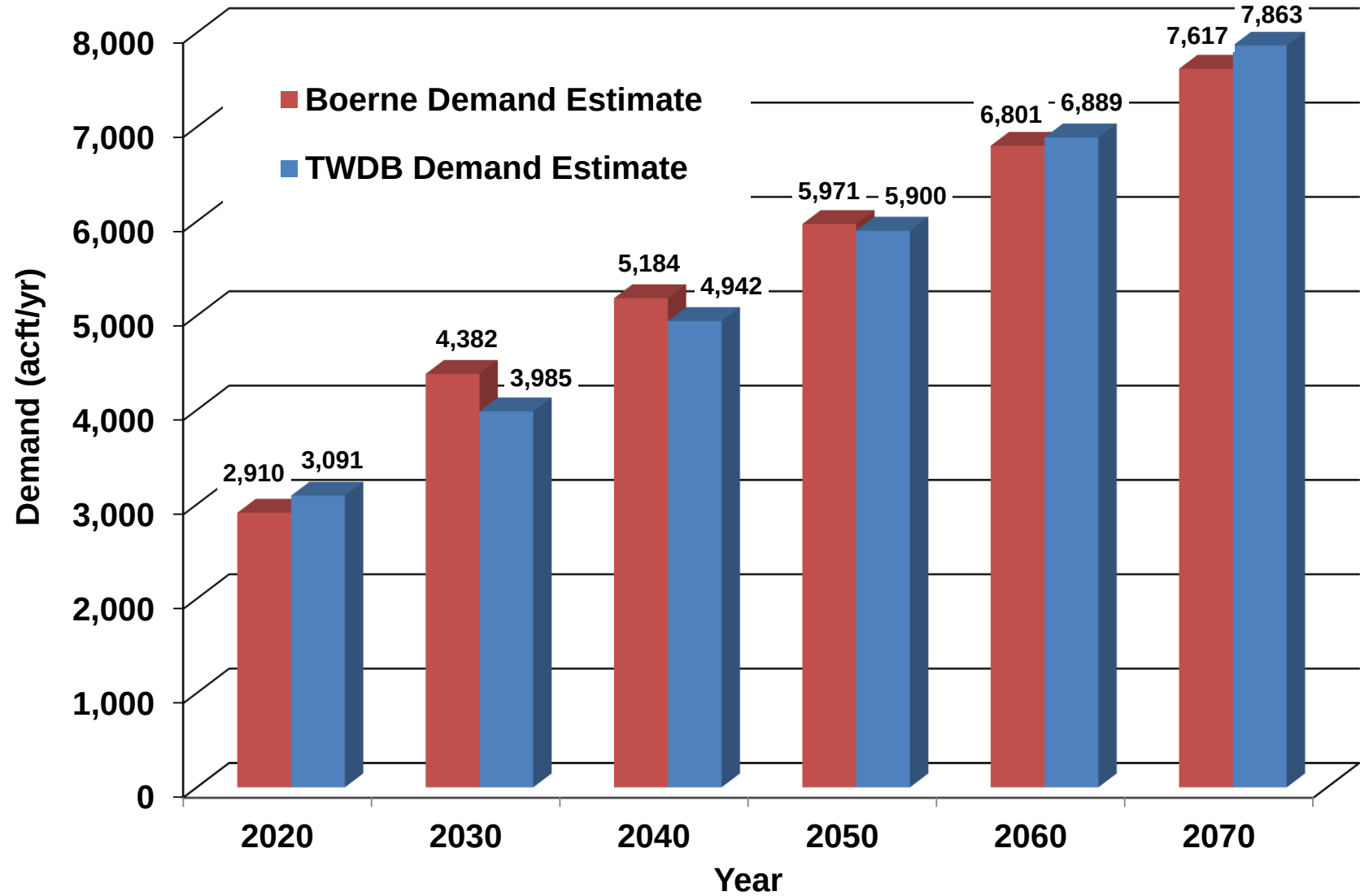
Current water supply



Population



Demand



Water Supply Alternatives

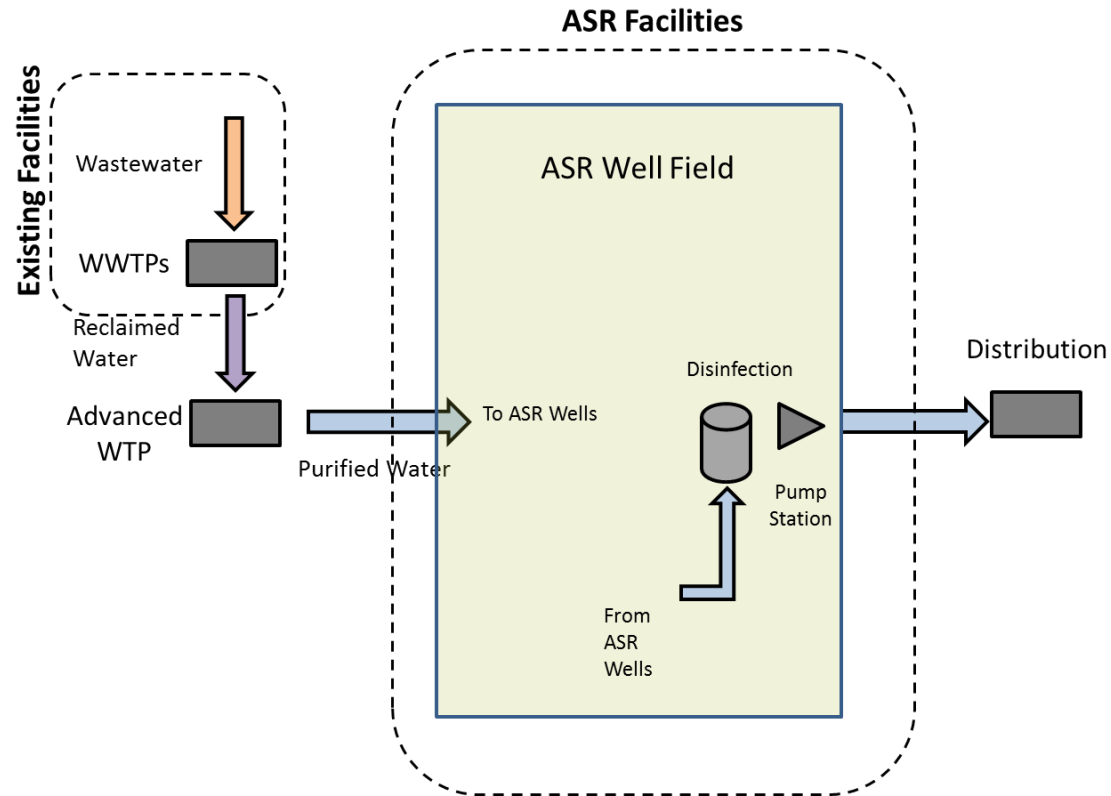
Reclaimed water
Direct non-potable reuse
Indirect Potable Reuse to supplement Boerne Lake
Indirect Potable Reuse with ASR
Direct Potable Reuse
Groundwater
Brackish groundwater desalination
Fresh groundwater supplies
Surface Water
New surface water right with ASR
Increased firm yield of Boerne City Lake
GBRA Canyon Lake water contract increase with ASR
Regional
GBRA Canyon Lake water contract increase

Alternatives Selected for Cost Analysis

- Indirect potable reuse with ASR
- Direct potable reuse
- Brackish groundwater desalination
- New surface water right with ASR
- GBRA Canyon Lake water contract increase

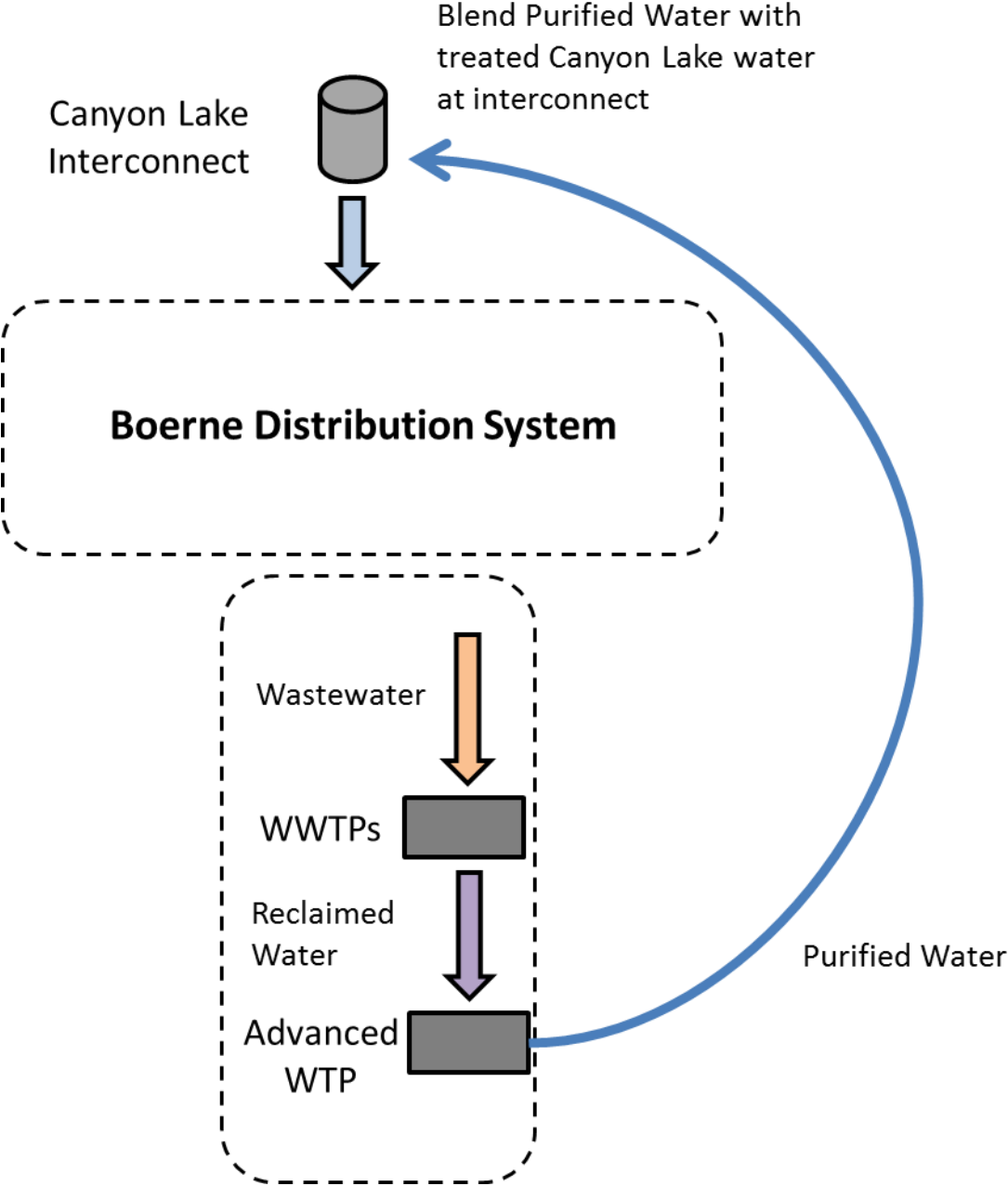
Indirect Potable Reuse with ASR

- Yield (acft/yr): 500
- Peaking Factor: 2
- Annual \$ per acft: \$7,020
- Annual \$ per 1,000 gal: \$21.54



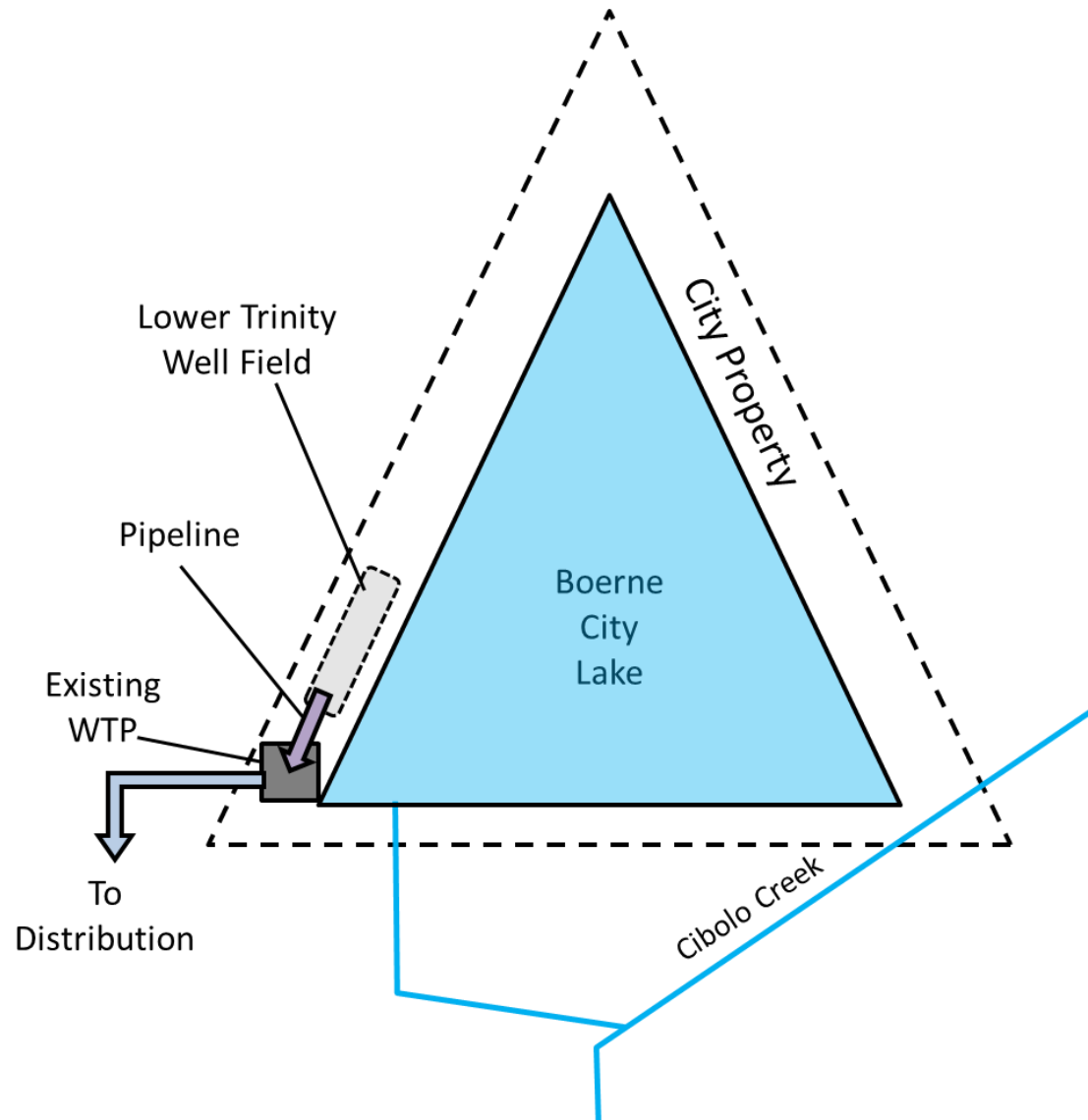
Direct Potable Reuse

- Yield (acft/yr): 3,186
- Peaking Factor: 1
- Annual \$ per acft: \$1,834
- Annual \$ per 1,000 gal: \$5.63



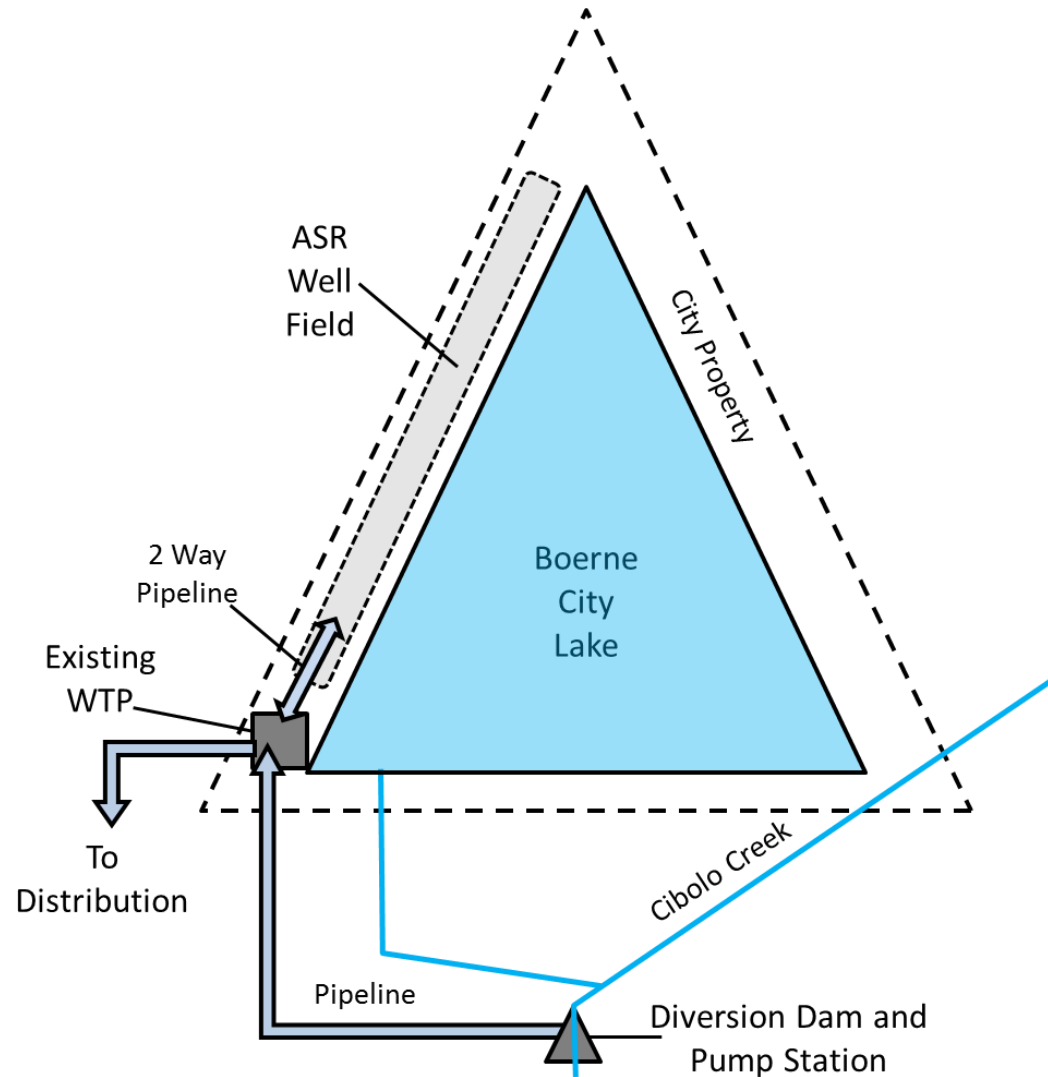
Brackish Groundwater

- Yield (acft/yr): 224
- Peaking Factor 1
- Annual \$ per acft: \$580
- Annual \$ per 1,000 gal: \$1.78



ASR with New Surface Water Right

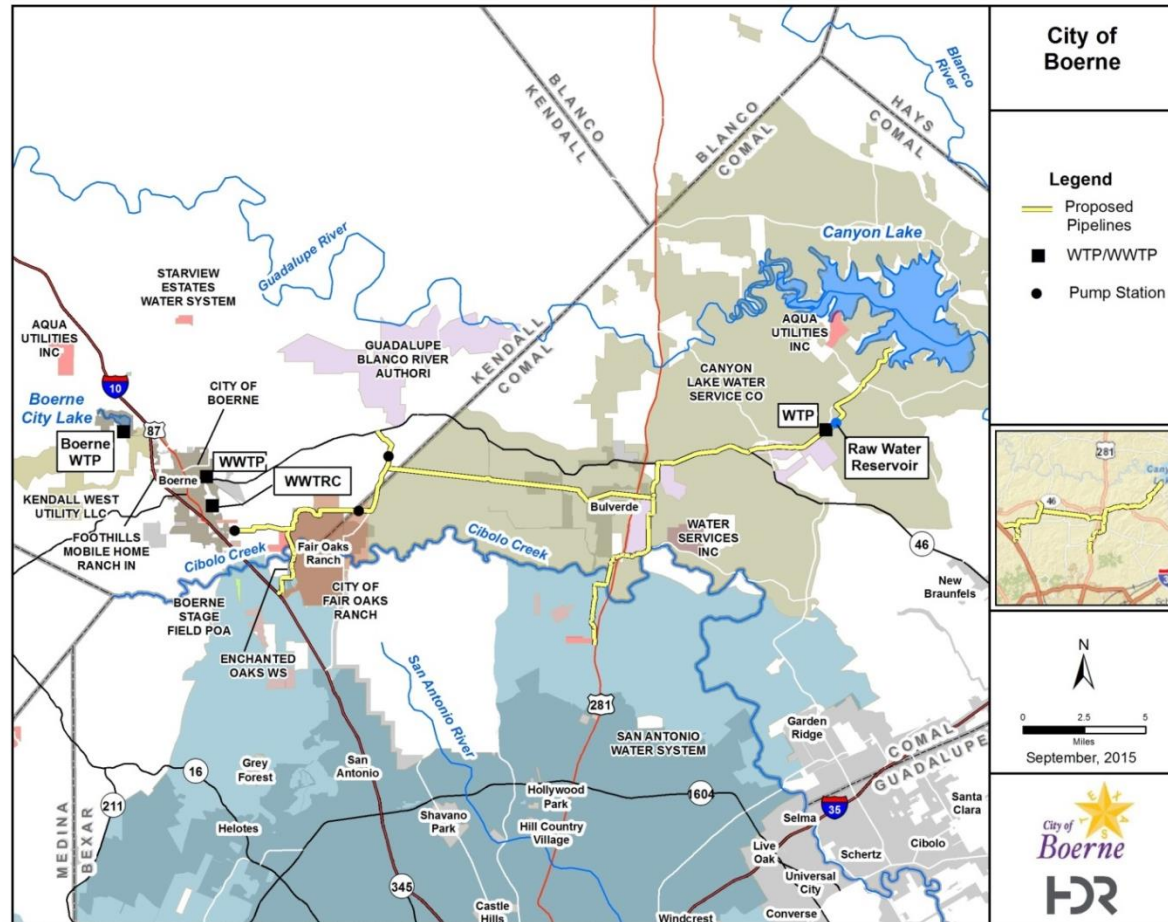
- Long-term Yield (acft/yr): 500
 - Peaking Factor: 3
 - Annual \$ per acft: \$1,762
 - Annual \$ per 1,000 gal: \$5.41
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- Yield of project is not firm and depends on availability of water right.
 - In wet years, 880 acft would be available.
 - In dry years, no water would be available.



GBRA Canyon Lake water contract increase

- Yield (acft/yr): 5,000
- Peaking Factor: 1
- Annual \$ per acft: \$344
- Annual \$ per 1,000 gal: \$1.06 / \$3.00

- City could acquire part or all of additional 5 MGD (~5,000 acft/yr) of treated water from GBRA beginning in 2050.
- Water not intended for peaking.



Fresh Groundwater Well

- 175-gpm, 300-ft well: \$240,000
 - 175-gpm, 500-ft well: \$300,000
 - Peaking factor: 2
 - 175-gpm well would produce 141 acft/yr per well
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- **Alternative not selected by City for full development of cost estimate**
 - **For comparison purposes to other alternatives, costs associated with developing new well estimated from TWDB Regional Water Planning costing tool for well construction only.**



Planning Level Cost Estimates

Alternative	Planned Yield (acft/yr)	Peaking Factor	Suitable for Peaking	Cost / acft	Cost / 1,000 gal
Indirect Potable Reuse with ASR	500	2	Yes	\$7,020	\$21.54
Direct Potable Reuse	3,186	1	No	\$1,834	\$5.63
Brackish Groundwater	224	1	No	\$580	\$1.78
ASR with New Surface Water Right	500	3	Yes	\$1,762	\$5.41
GBRA Canyon Lake water contract increase	5,000	1	No	\$344	\$1.06 / \$3

- For comparison, fresh groundwater well ~ \$300,000

Recommendations

1. Evaluation of integrating selected alternatives into distribution system
2. Evaluation of integrating the alternatives to accommodate future demands in high growth areas
3. Update yield of Boerne City Lake
4. Evaluation of reliability of existing supplies from Boerne City Lake and fresh groundwater
5. Test drilling to determine quality and potential well yield from Lower Trinity wells
6. Test drilling and technical analyses with possibility of local scale groundwater modeling for potential ASR projects
7. Evaluation of alternatives for disposal of reject water from advanced water treatment plant and/or desalination projects

Regulatory and Regional Considerations

1. Comprehensive analysis of TCEQ and CCGCD permitting and regulatory requirements
2. Coordination with CCGCD on reliability of local, fresh groundwater supplies, availability of brackish groundwater, and permitting and operation of ASR
3. Coordination with Region L Water Planning Group

Questions?

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