

Brackish Groundwater Desalination

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Multi-State Salinity Coalition
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Brackish Groundwater Desalination

- In December 2005, SAWS commenced feasibility assessment to determine the feasibility of utilizing the brackish portions of the Wilcox and Edwards Aquifers for the development of a 20 MGD treatment facility
- Much of this multi-year review has focused on characterizing the source of supply and determining appropriate pre-treatment and treatment processes

Why Brackish Groundwater?

- Few entities have developed brackish groundwater supplies, despite the vast supply confirmed by the Texas Water Development Board
- Reduces regional competition for fresh groundwater supplies
- Requires state agencies, municipalities, and local communities to partner on research and project development

Feasibility Assessment Components

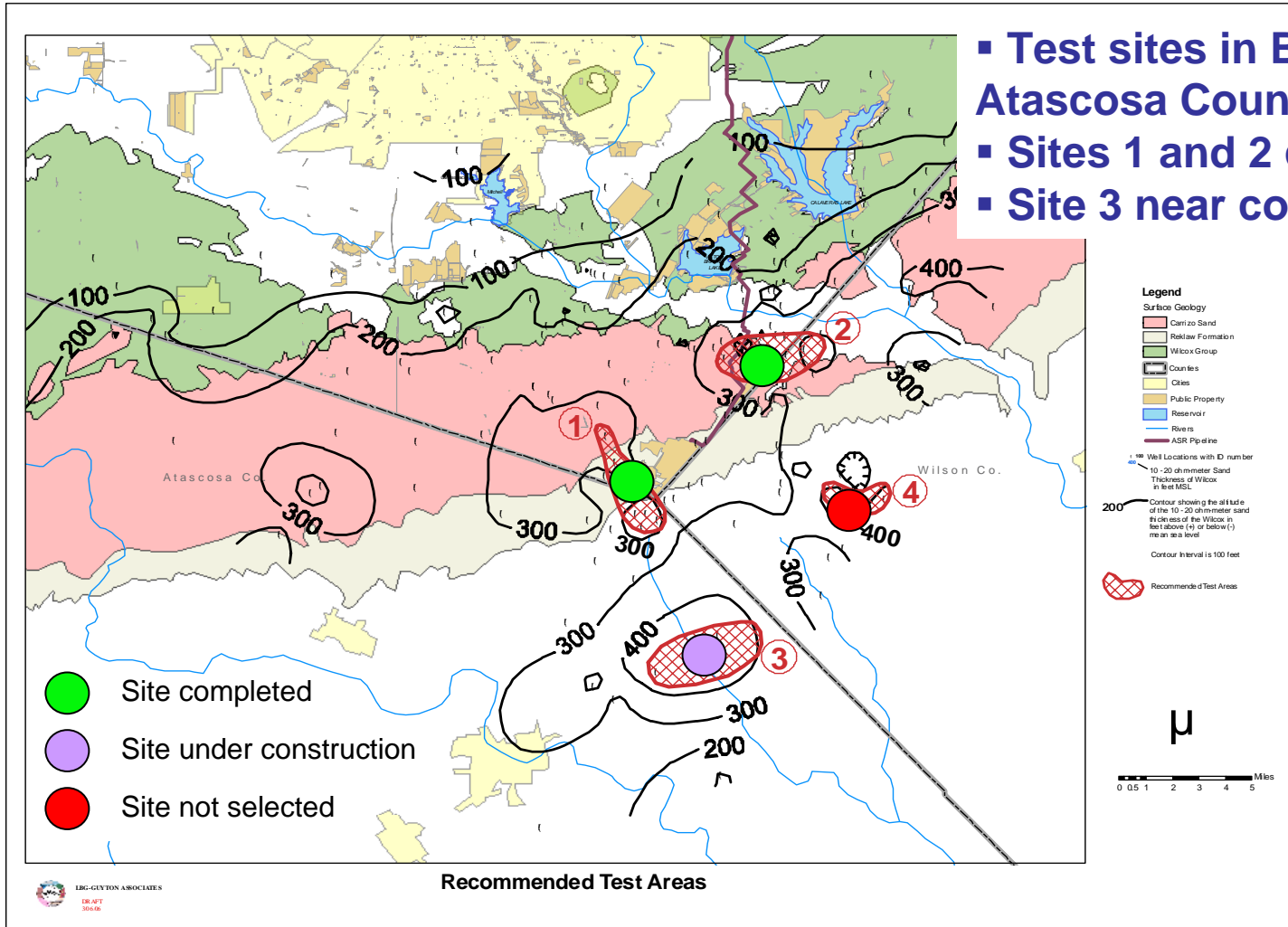
1. Hydrogeologic Assessment and Source Water Quality Evaluation
2. Membrane Pilot Test and Treatment Options Evaluation
3. Conceptual Design, Finished Water Compatibility Analysis, and Integration Assessment
4. Concentrate Disposal Assessment
5. Permitting
6. Financial and Procurement Evaluation

Hydrogeologic Assessment

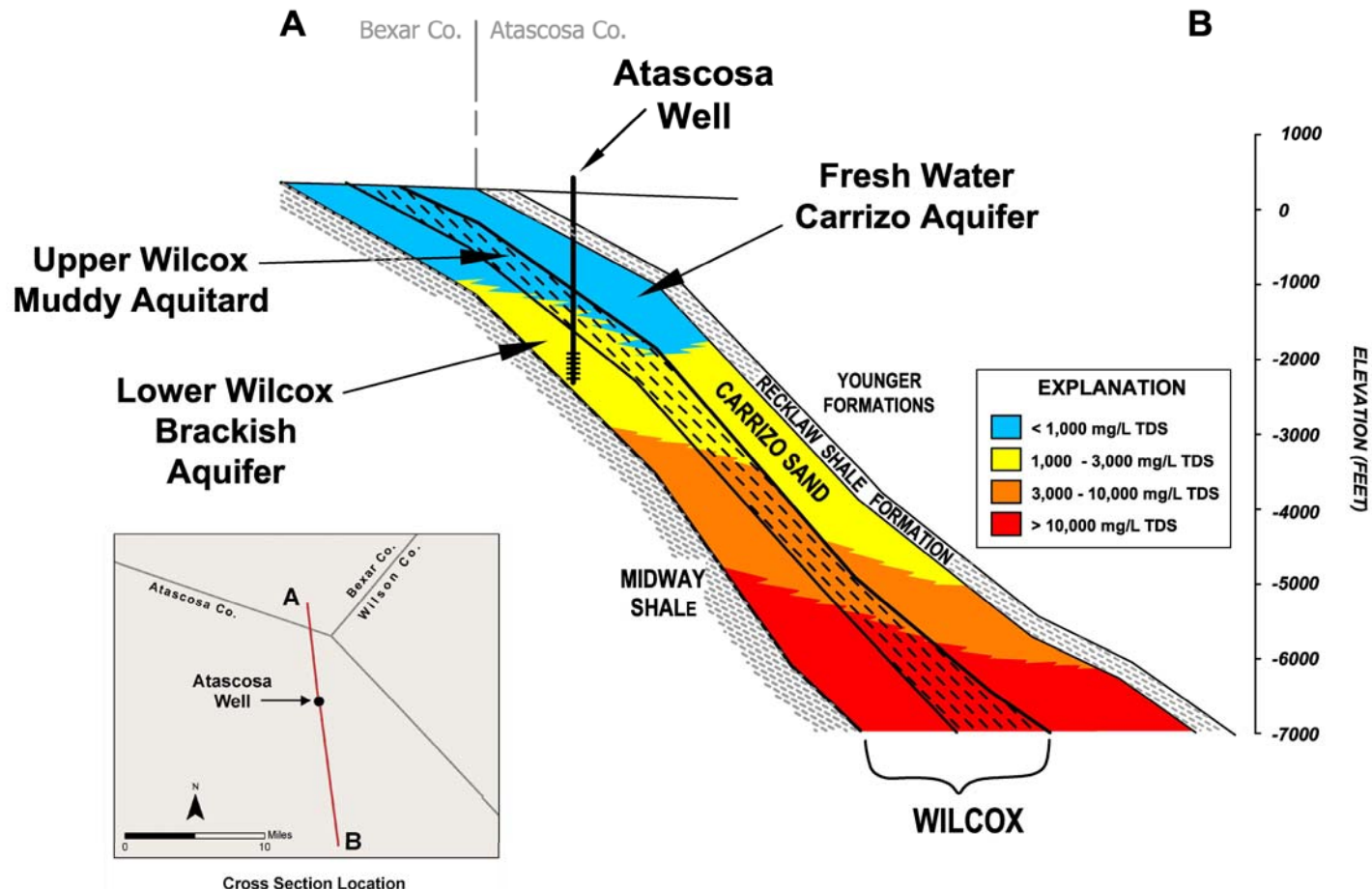
- Evaluated saline zones of Wilcox and Edwards Aquifers to identify up to four test sites
- Site location determined by reviewing geophysical logs to ascertain thickness of brackish sand beds (Wilcox) or evaluating contour maps to determine areas with higher salinity (Edwards)

Hydrogeologic Assessment - Wilcox

- Test sites in Bexar and Atascosa Counties
- Sites 1 and 2 completed
- Site 3 near completion



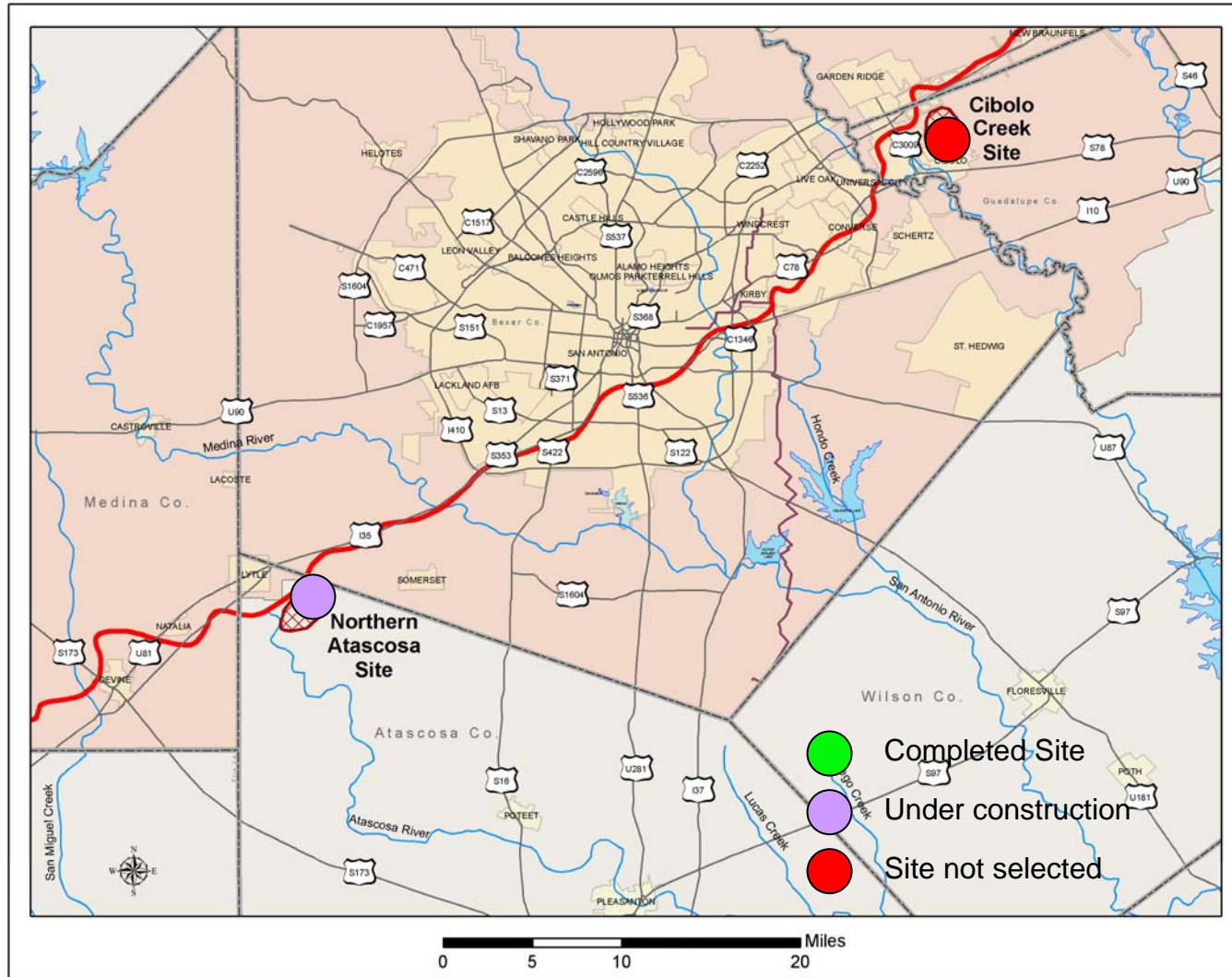
Cross Section of the Carrizo and Wilcox Aquifers



Hydrogeologic Assessment - Wilcox

- Aerially extensive (long-term raw water source)
- Upper Wilcox - (shale) - acts as an aquitard that will isolate brackish production from overlying freshwater sands
- Very fine grained sand that may have impacts on pre-treatment for the plant (Silt density index)
- Well productivity between 800 – 1,500 gpm possible
- Well spacing – approximately 4,000 feet apart
- Preliminary modeling suggests approximately 350 ft. water level decline after 50 years of pumping at 25 MGD
- Water quality consistent: 1,300 – 1,700 mg/L TDS

Hydrogeologic Assessment - Edwards



Hydrogeologic Assessment - Edwards

- Encountered high levels of H₂S gas
- Flow test conducted
 - Well produced 400 gpm
 - Shut-in Pressure: 16 psi (35-38 ft of head)
 - All flow test water captured in retaining pond
- Although encountering H₂S gas is not uncommon in deep well drilling, detection sensors indicated very high levels
 - Test well plugged on November 20, 2007

Next Steps

First Quarter 2008

- Completion of Site 3 (Wilcox) construction
- Commence 90-day pilot test at Site 1 (Wilcox)
- Groundwater availability modeling
- Complete well field configuration
- Distribution system modeling

Second Quarter 2008

- Present findings to public
- Prepare procurement documents

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