Understanding the Aquifers of Bell County for ASR

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Conceptual ASR



Conceptual ASR



From Maliva/Missimer 2010

Conceptual ASR



From Maliva/Missimer 2010

Per Capita Surface Water Supply



Reality Shifted... (and Still Shifting)



Good Aquifer Characteristics for ASR

Desire for ASR System	Aquifer Characteristic
Should be easy to put water in and take it out	Reasonable transmissivity productive wells
Want the aquifer to store sufficient volume in smallest area possible	Reasonable thickness and porosity
Want stored water to be there when you are ready to recover	Low hydraulic gradient, low mixing
Want the water quality to be satisfactory	Understand and account for geochemical and biological changes
Do all this at reasonable cost	All the above

Trinity Hydrogeologic Regions



(after Kelley, Nov 18, 2015)

Hydrogeology



Glenrose Thickness



Glenrose Transmissivity



Hensell Thickness



Hensell Transmissivity



Hosston Thickness



Hosston Transmissivity

TWDB GAM



Hosston Transmissivity

Clearwater Modified GAM



Specific Capacity in Public Supply Wells



Hosston ASR Model Run

- ASR model run was performed using Hosston parameters
- Model run used a 5 well system over a 5 year period
- Injected initially from center well first for 2.5 years followed by injection/pumping cycle every 6 months



Injection Example in Hosston



Injection Example in Hosston



Relative Concentration in Center Well



Barton Springs Middle Trinity Pilot Study

- Inject Edwards water into Middle Trinity Aquifer
- 2-Phase pilot test has been successful
 - Hydraulically
 - Geochemically
- Well yield 220 gpm
- Specific capacity -1.3 gpd/ft
- Transmissivity 4,600 gpd/ft

ASR Development Phasing

- 1. Desktop feasibility studies
- 2. Exploratory well program (or use existing wells)
- 3. Design of Pilot ASR system/permitting
- 4. Pilot construction
- 5. Operational testing of Pilot ASR
- 6. Expansion of ASR system
 - a. Design
 - b. Permitting
 - c. Construction
- 7. Operational optimization





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