

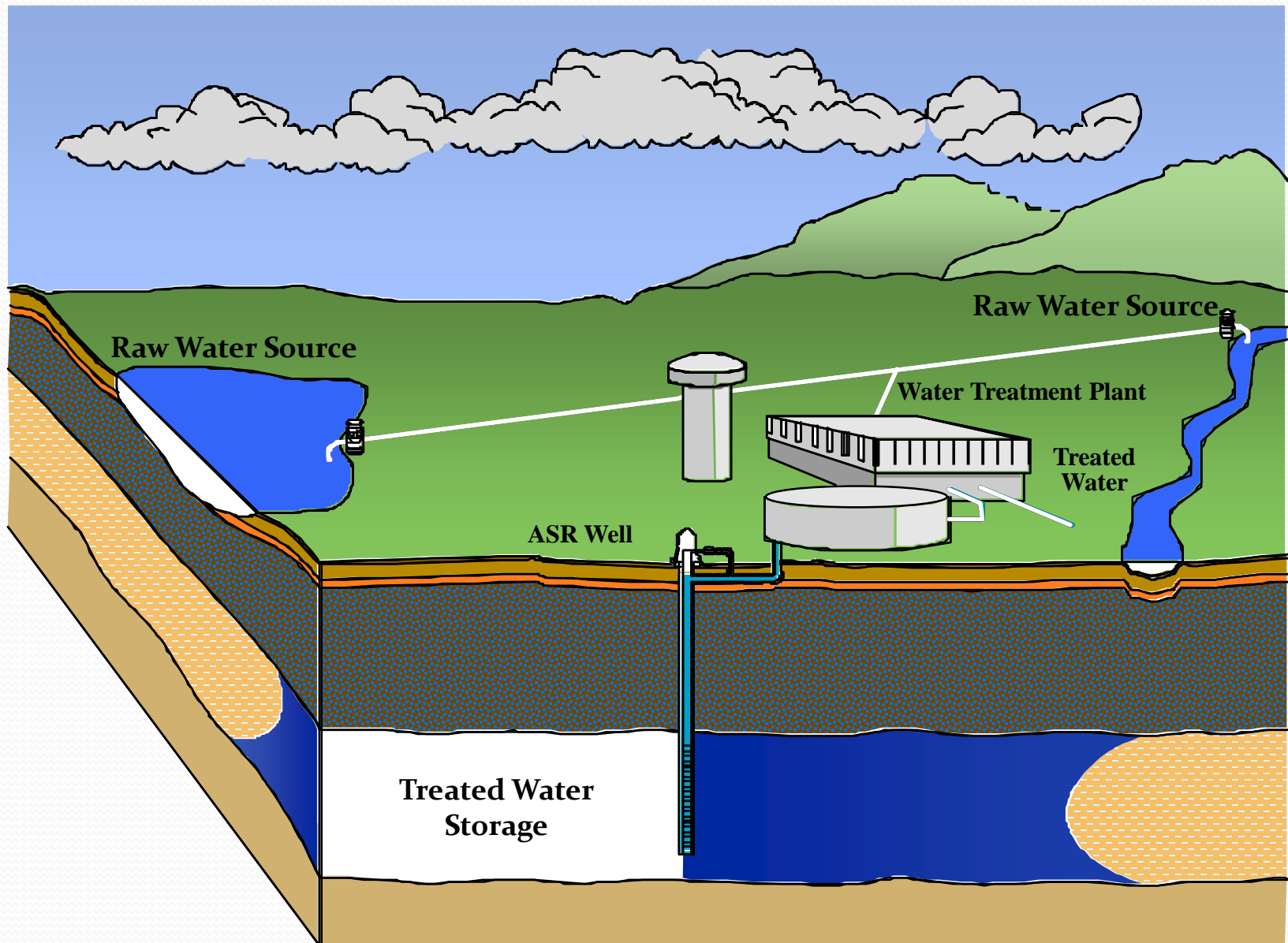
Understanding the Geology of the Aquifers for ASR

James Beach, PG
LBG-Guyton Associates

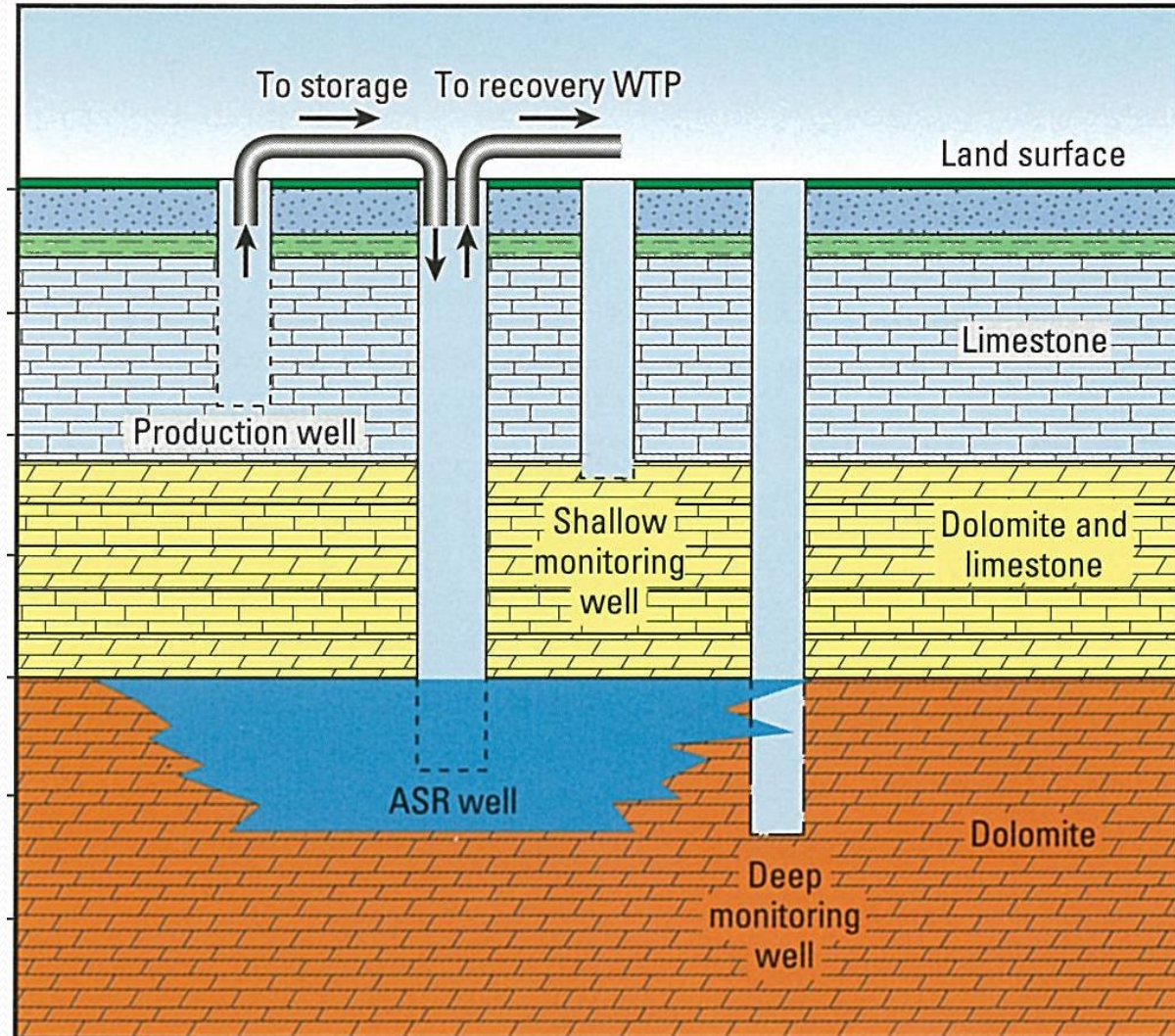
Presented to: Bell County Water Symposium
November 16, 2016



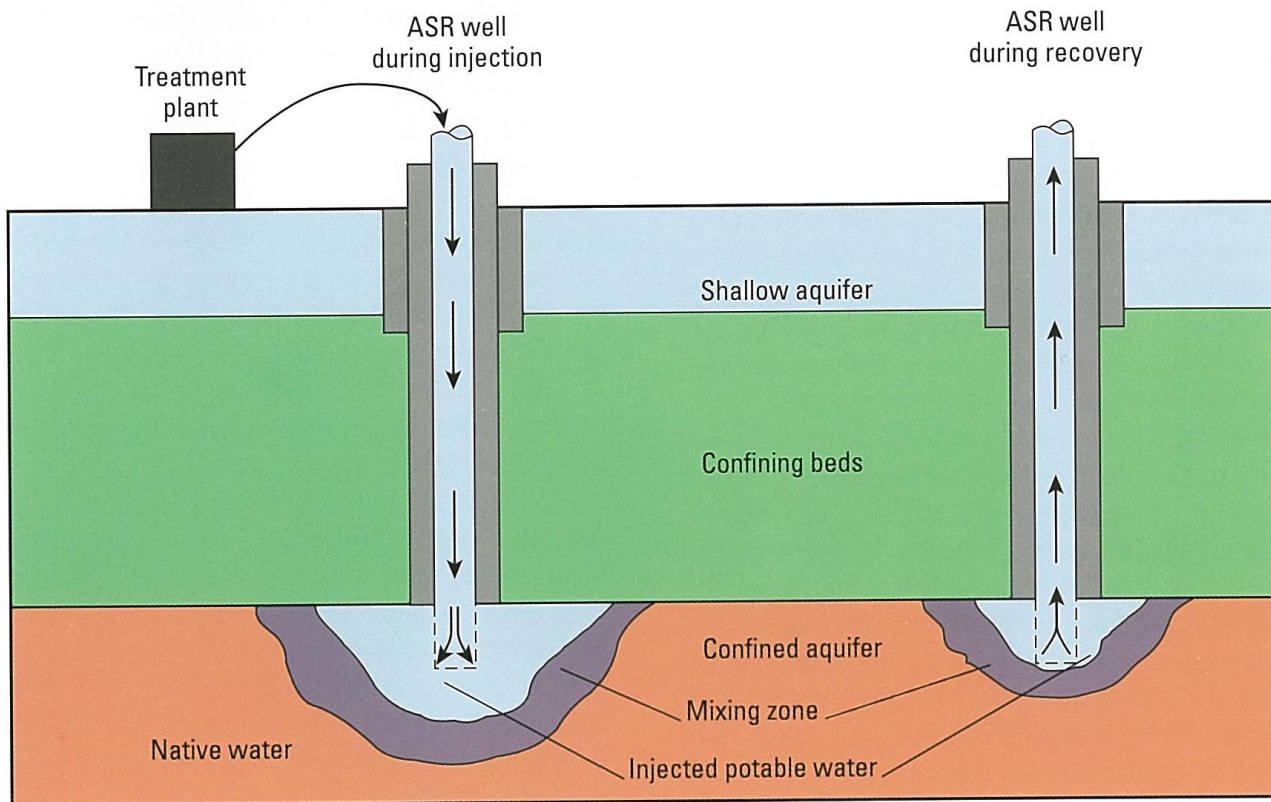
Conceptual ASR



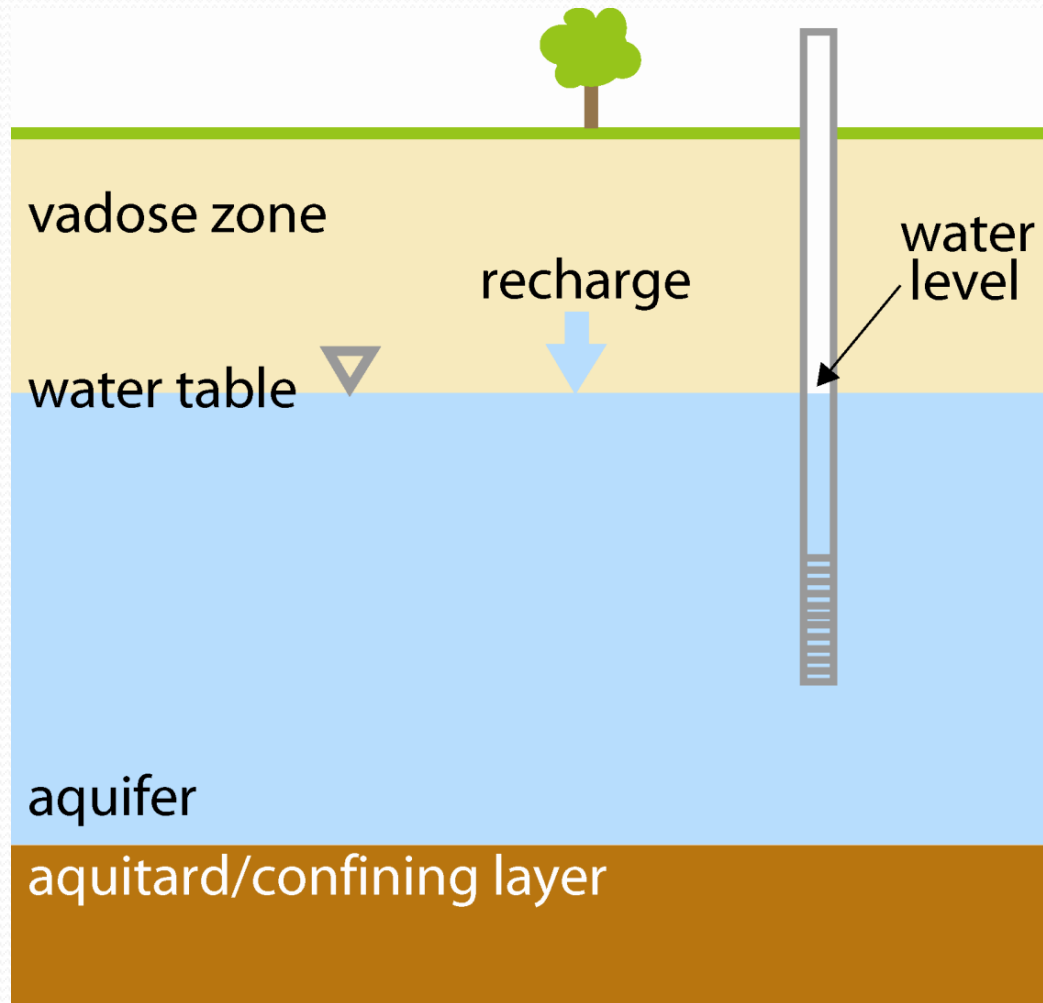
Conceptual ASR



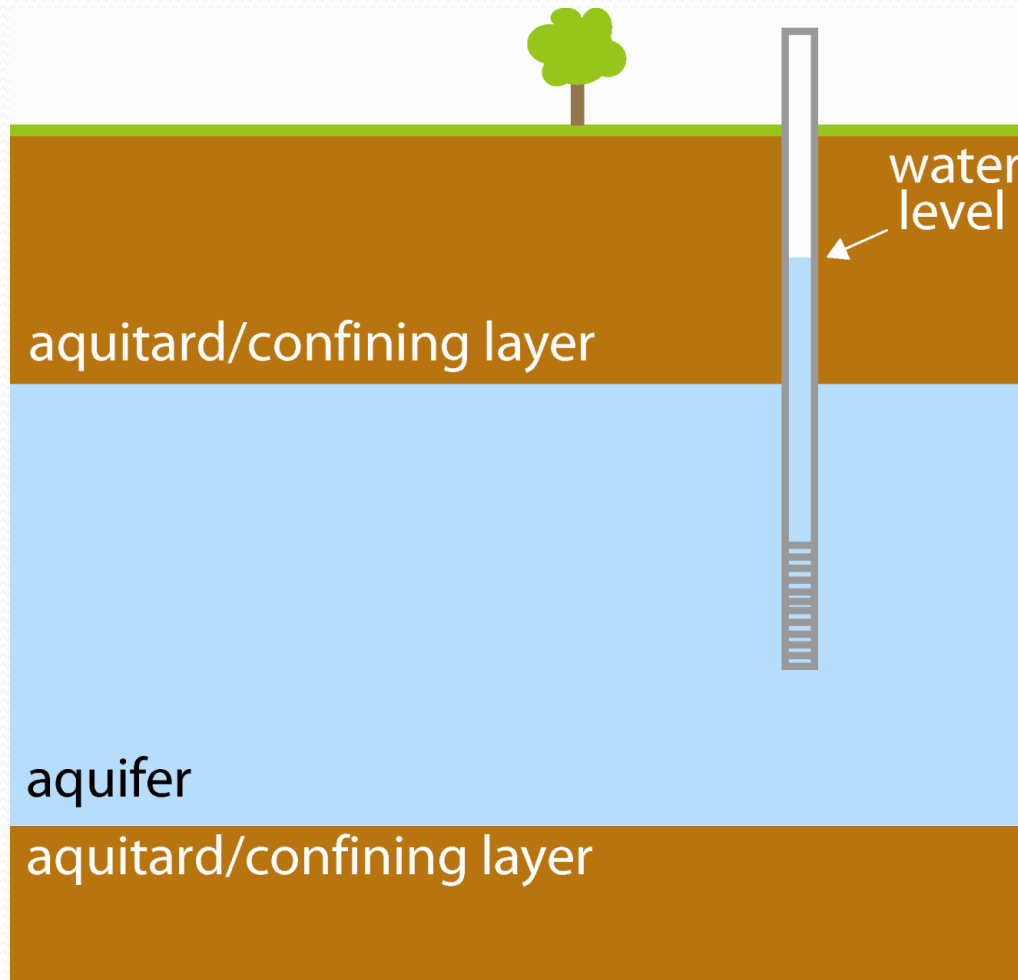
Conceptual ASR



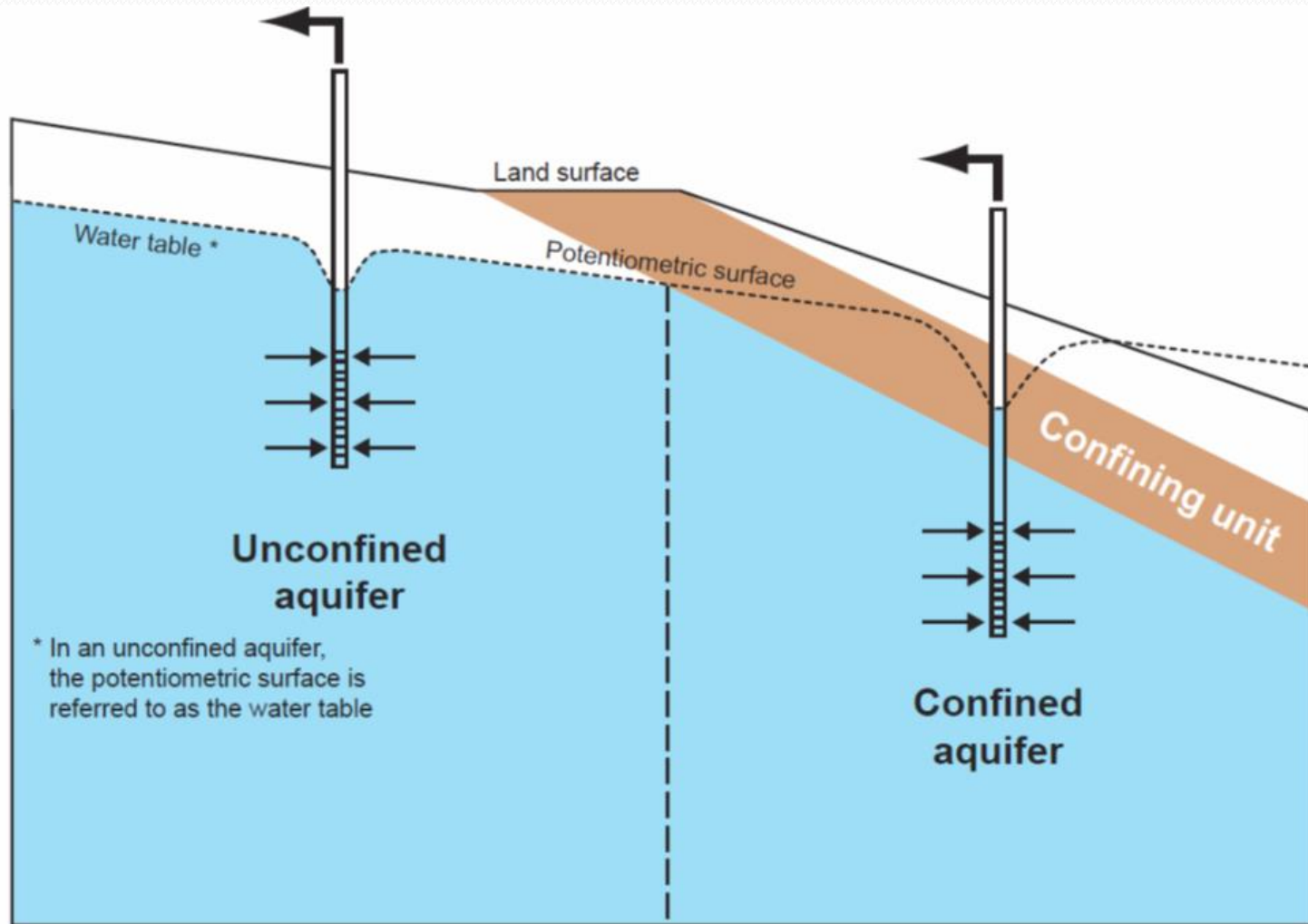
unconfined aquifer



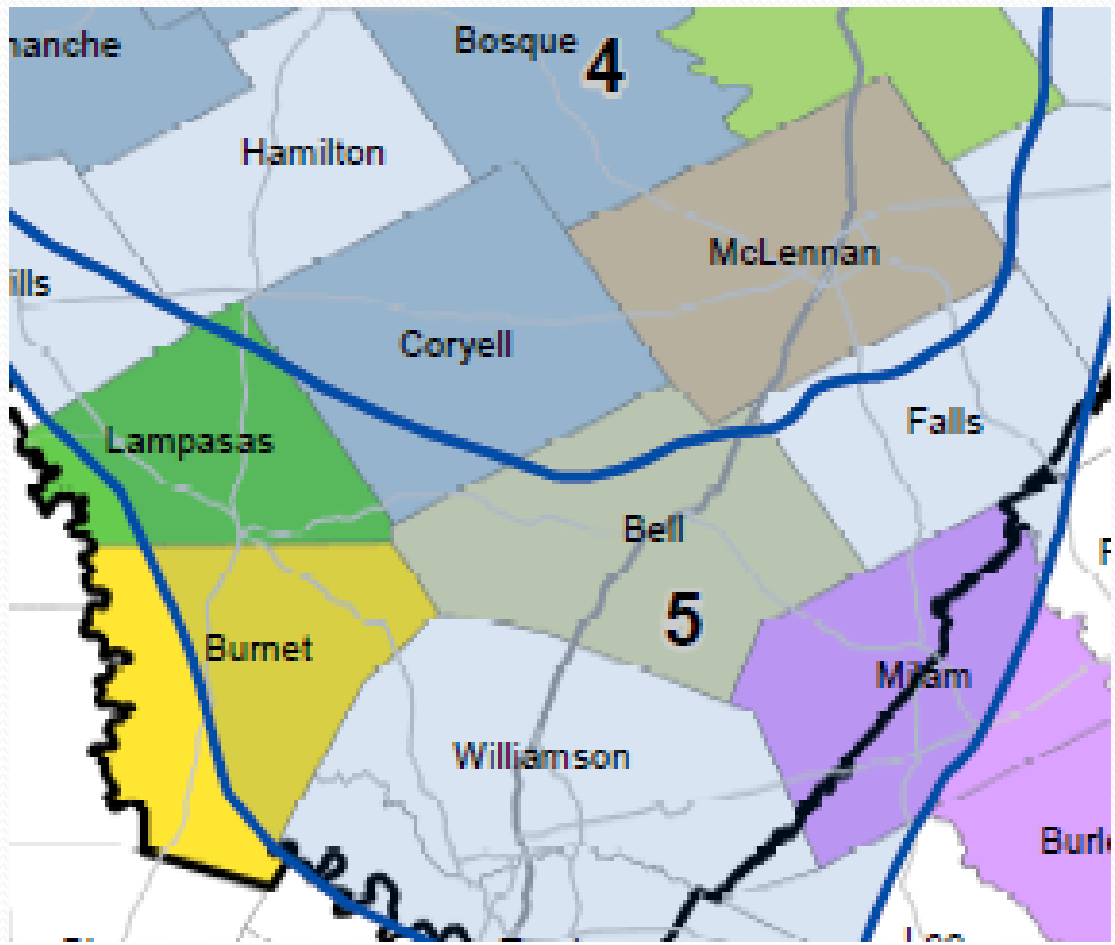
confined (or “artesian”) aquifer



Confined/Dipping Aquifer



Trinity Hydrogeologic Regions



Aquifers in Bell County Area

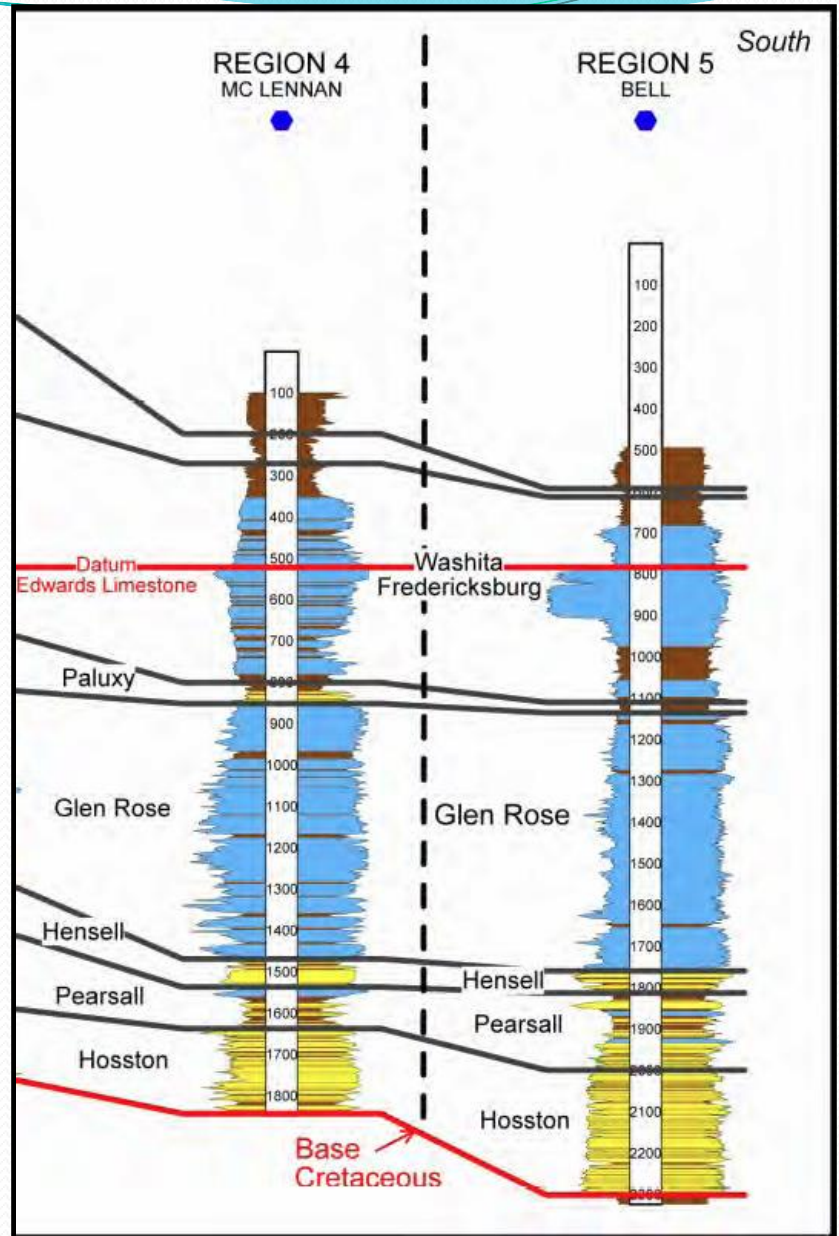
Model Terminology	Region 4	Region 5
Woodbine Aquifer	Woodbine	Woodbine (no sand)
Washita/ Fredericksburg Groups	Washita/ Fredericksburg	Edwards
Paluxy Aquifer	Paluxy	Paluxy (no sand)
Glen Rose Formation	Glen Rose	Glen Rose
Hensell Aquifer	Hensell/ Travis Peak	Hensell/ Travis Peak
Pearsall Formation	Pearsall/ Sligo	Pearsall/ Sligo
Hosston Aquifer	Hosston/ Travis Peak	Hosston/ Travis Peak

yellow = sandstone aquifers

(after Kelley, Nov 18, 2015)

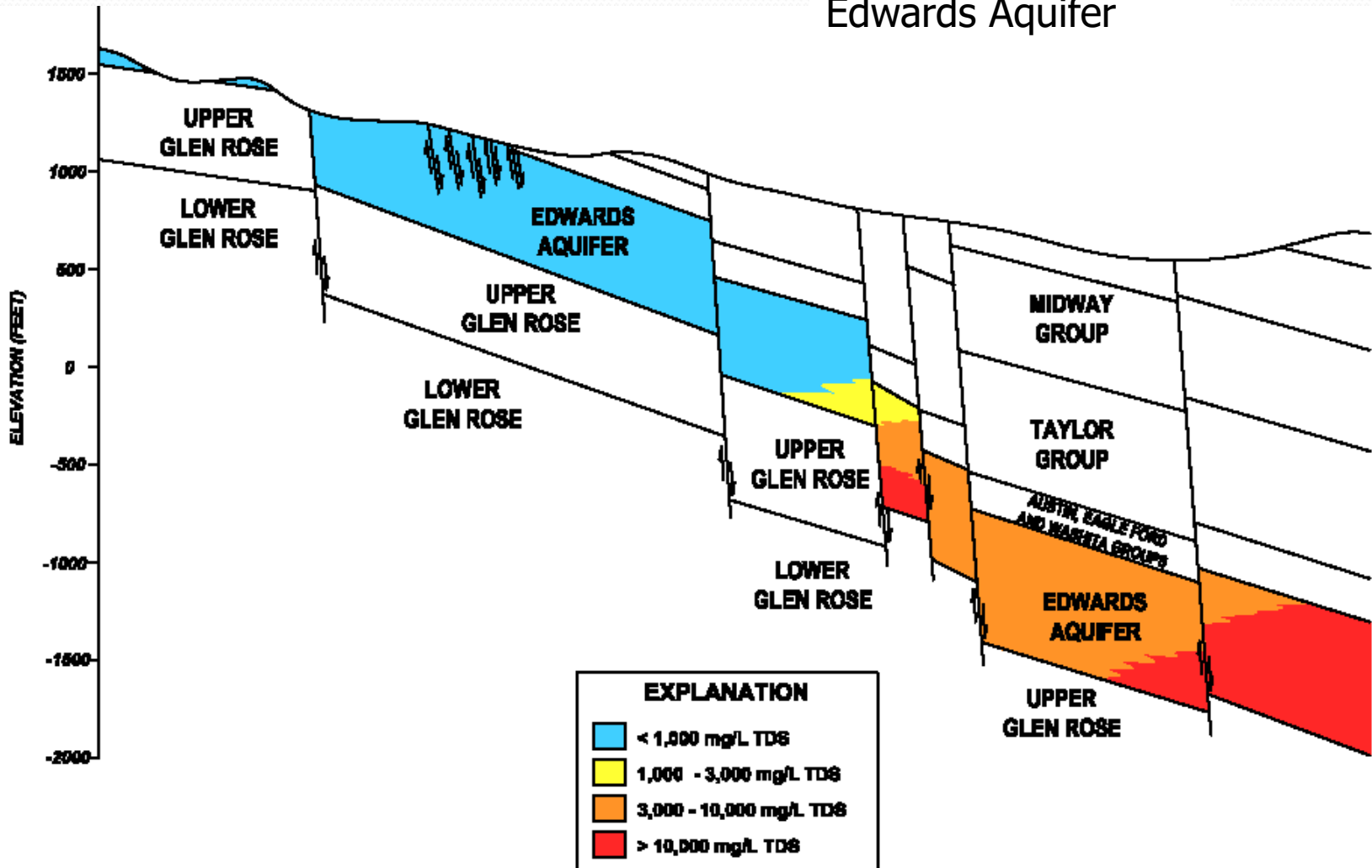


Hydrogeology

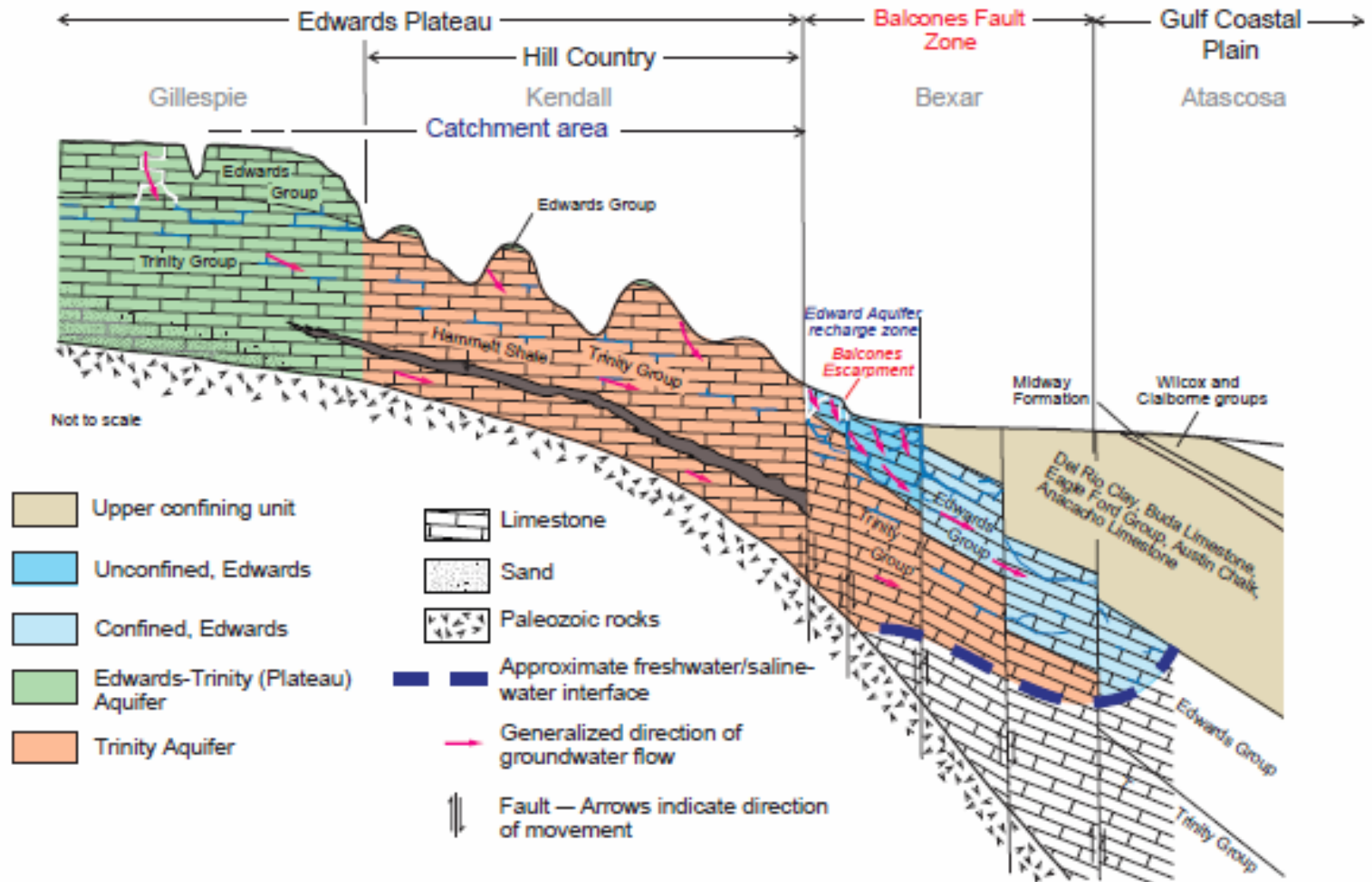


Water Quality

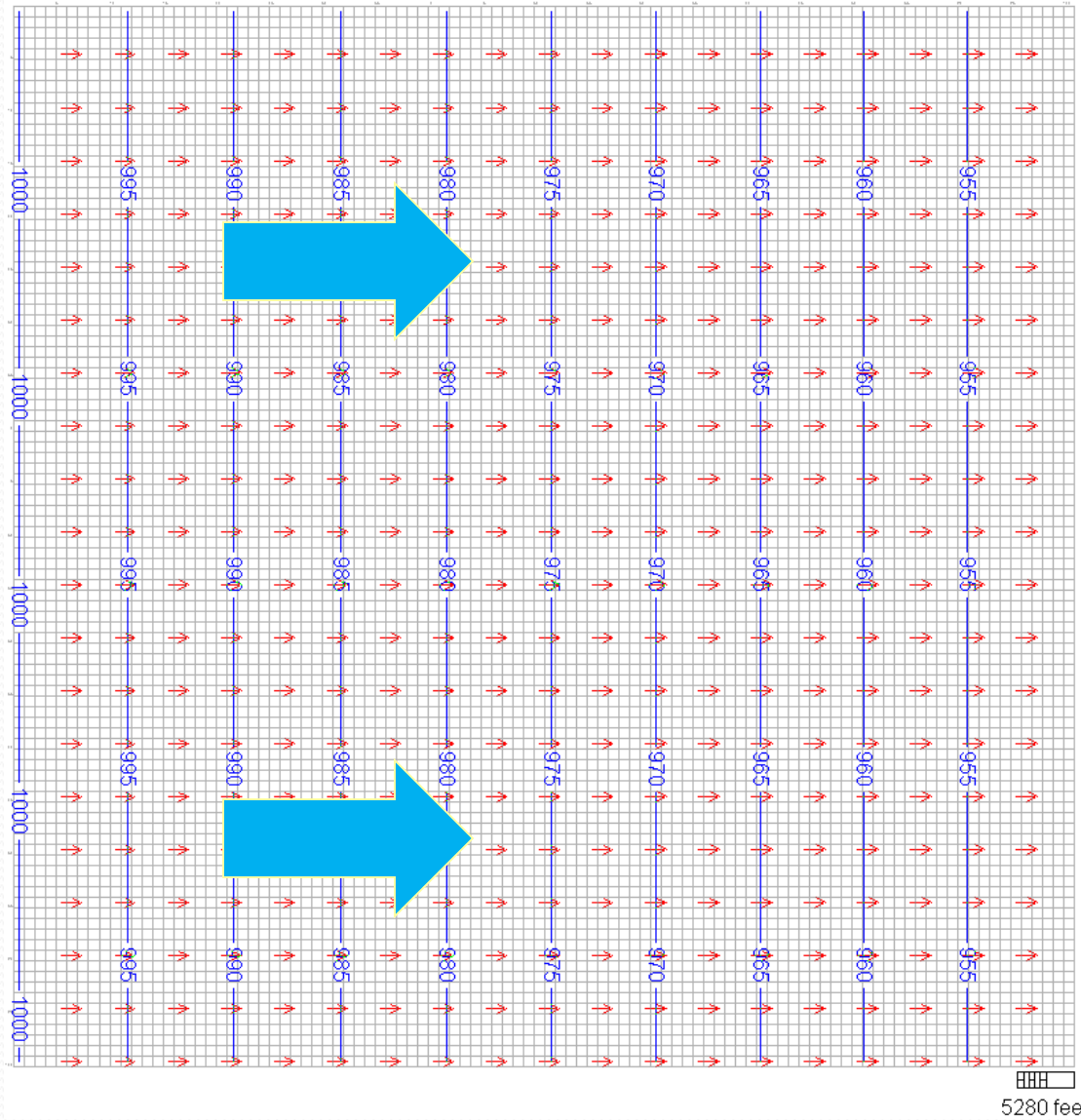
Edwards Aquifer



Edwards

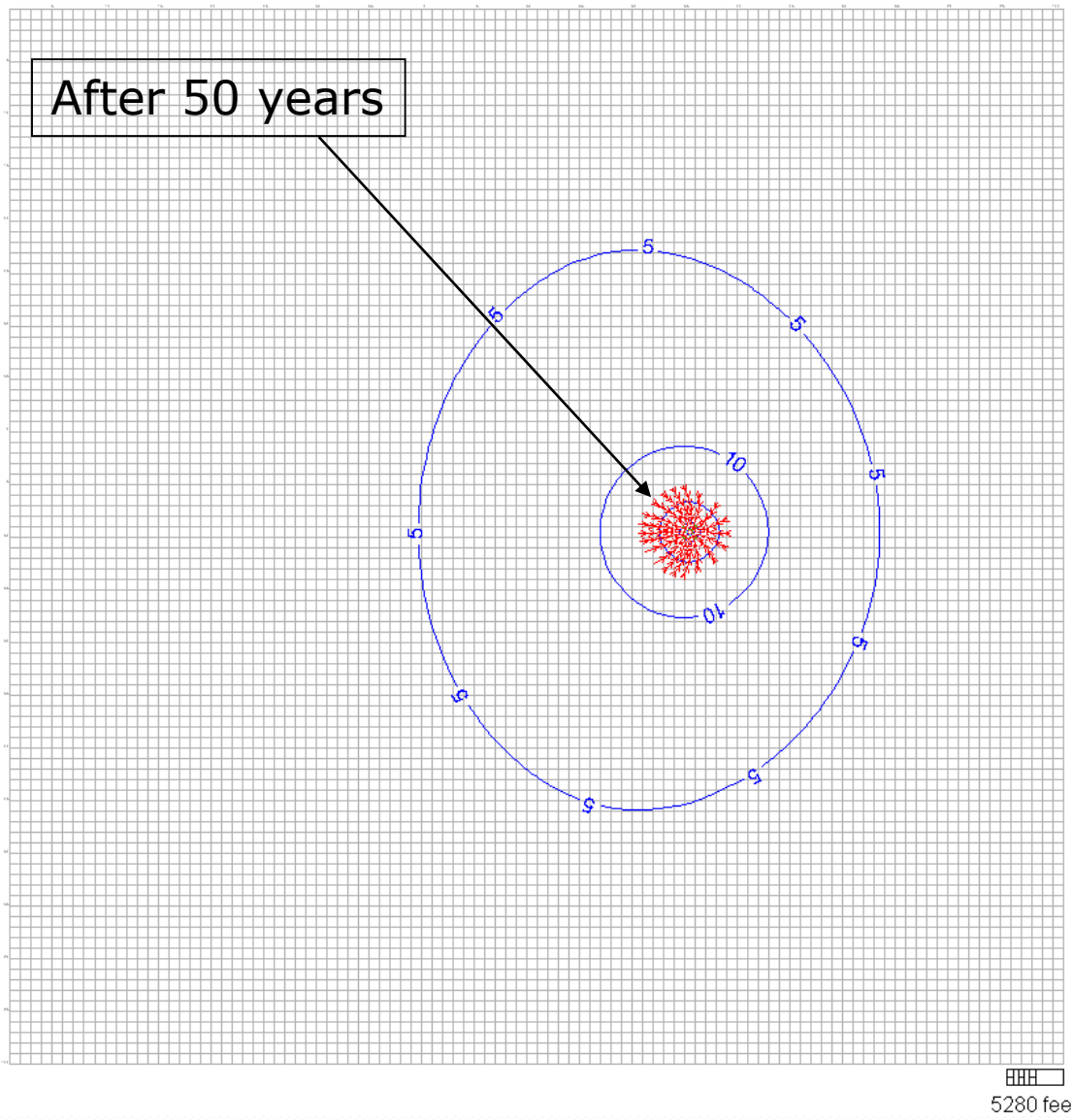


Simple regional flow (sand)

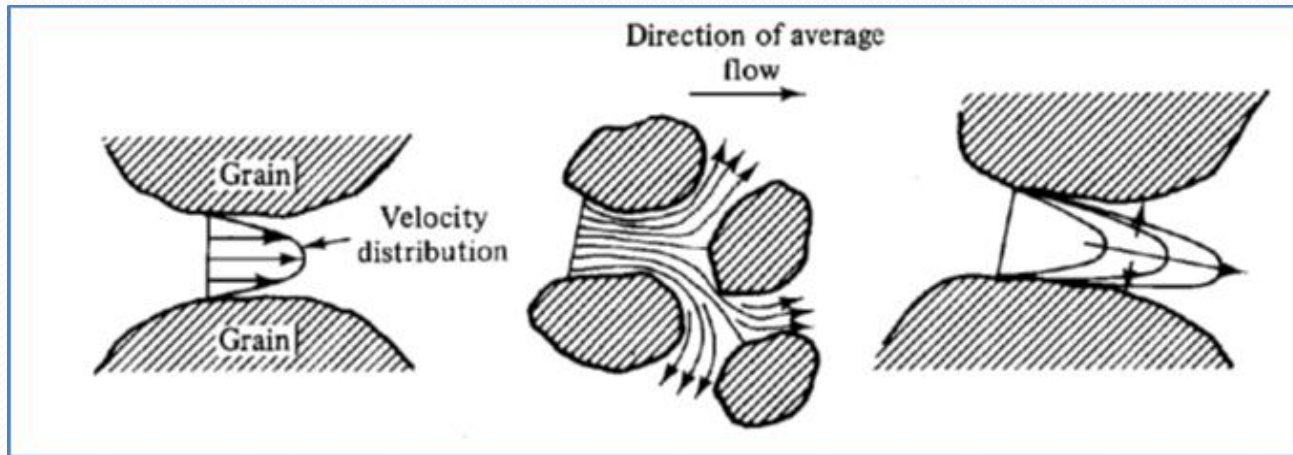


Groundwater movement to well

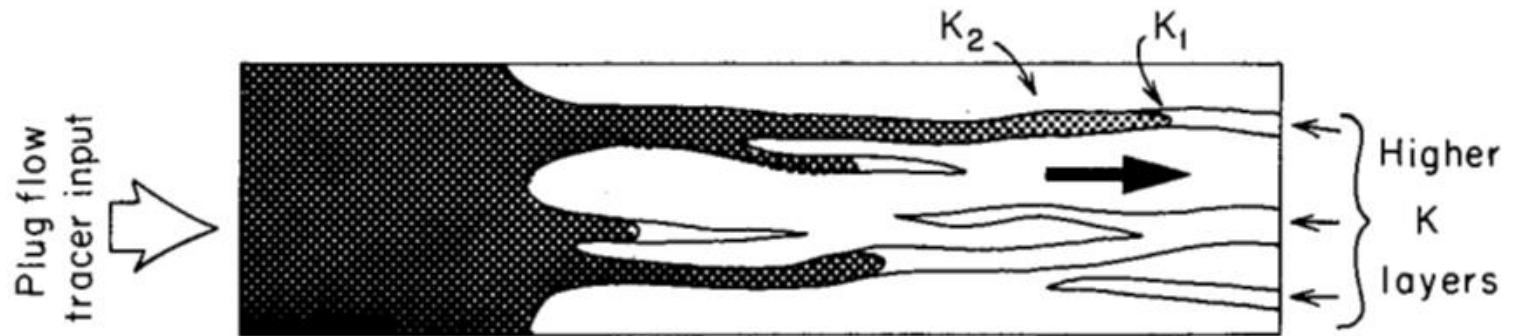
After 50 years



Water mixing in sand matrix

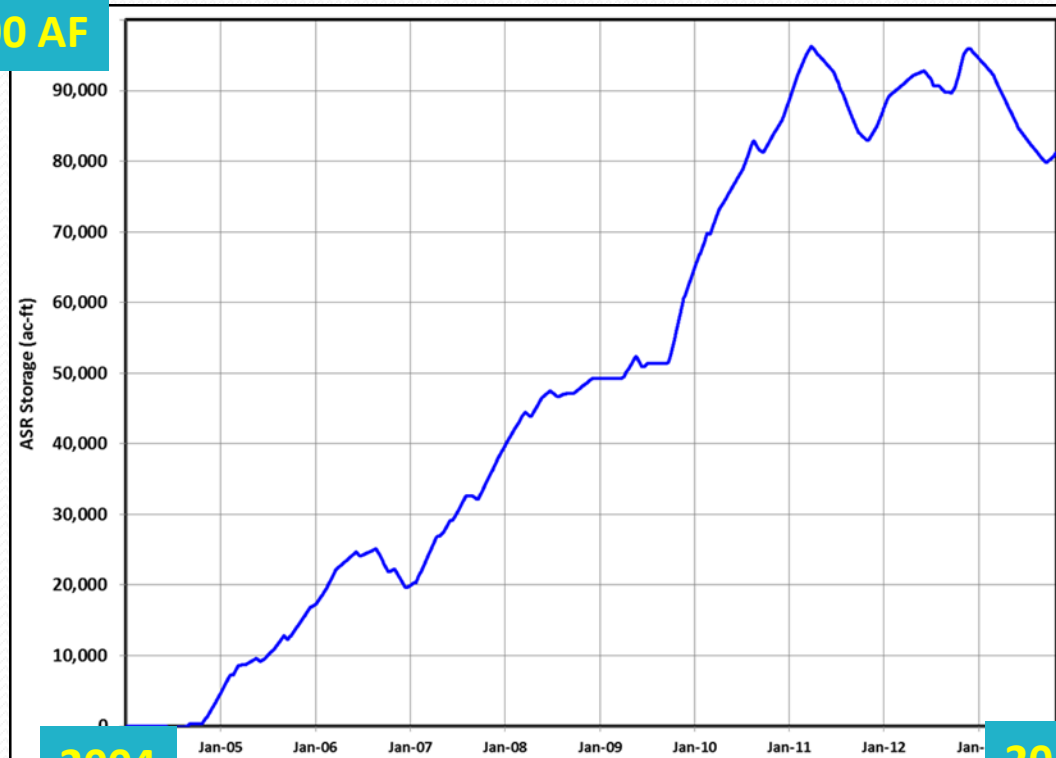


Mixing in an aquifer



Active ASR System

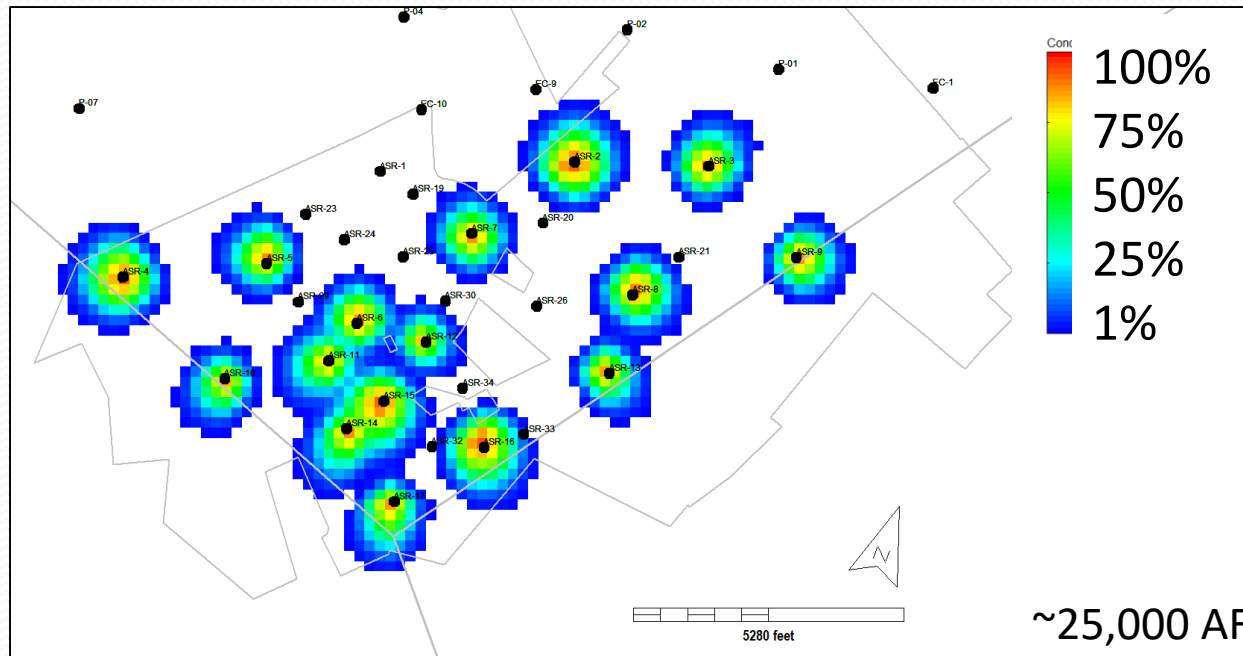
100,000 AF



2004

2014

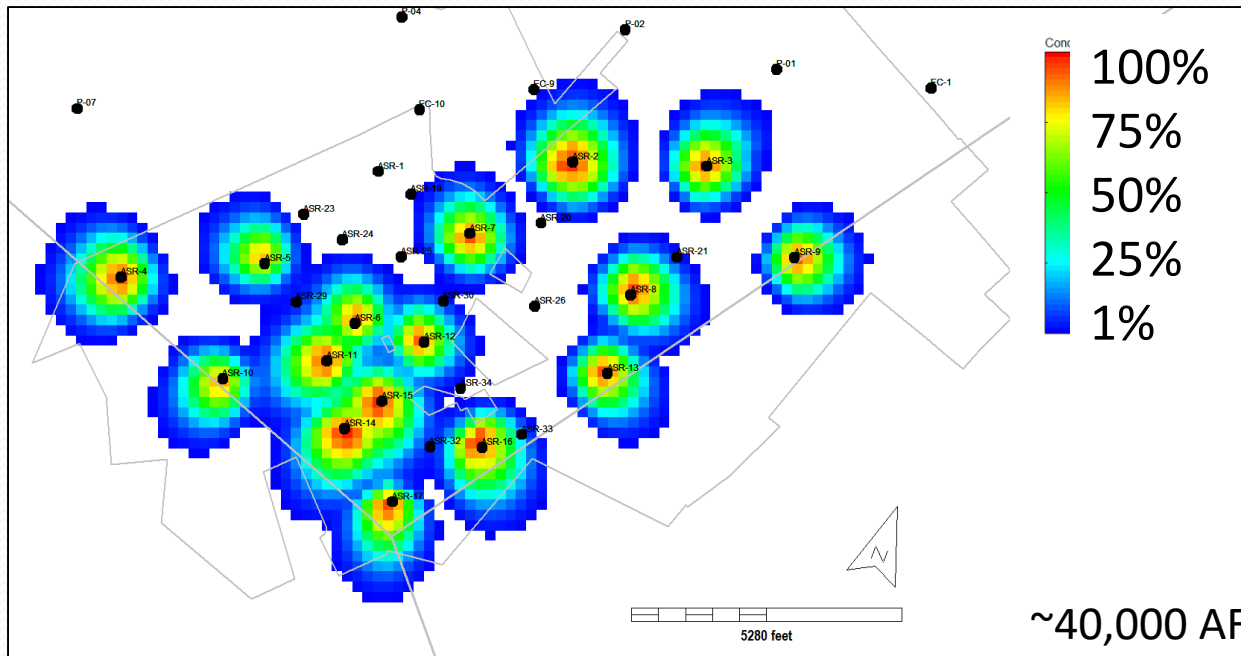
Active ASR System



~25,000 AF

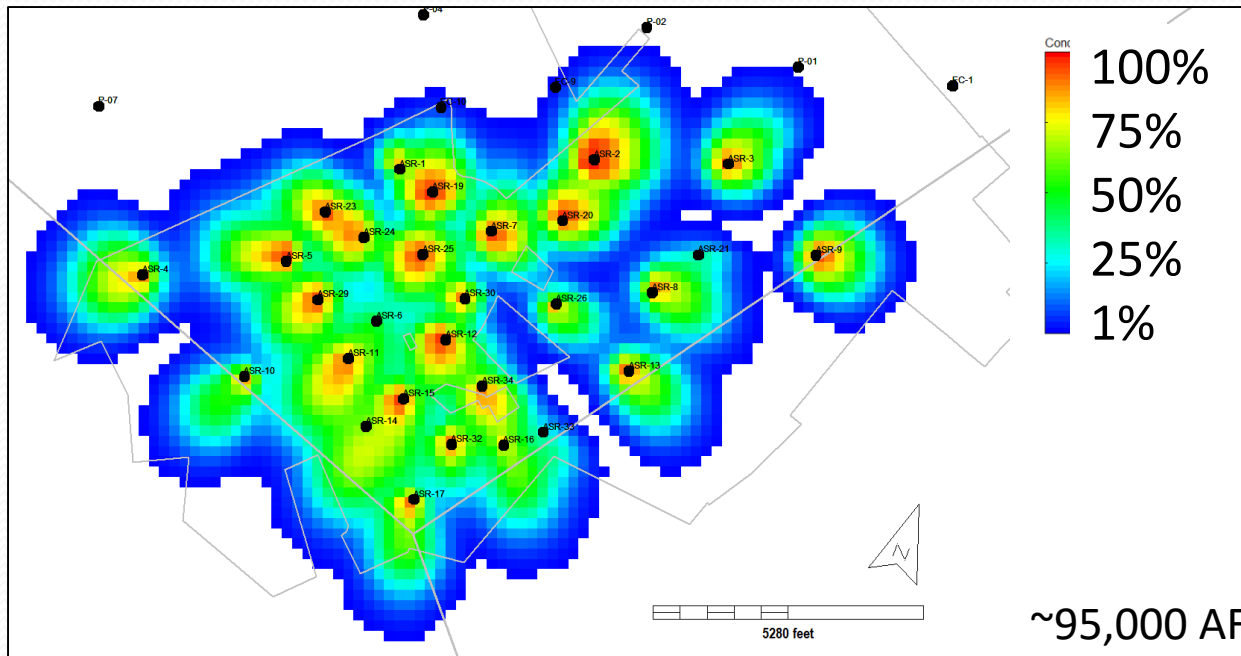
June 2006

Active ASR System

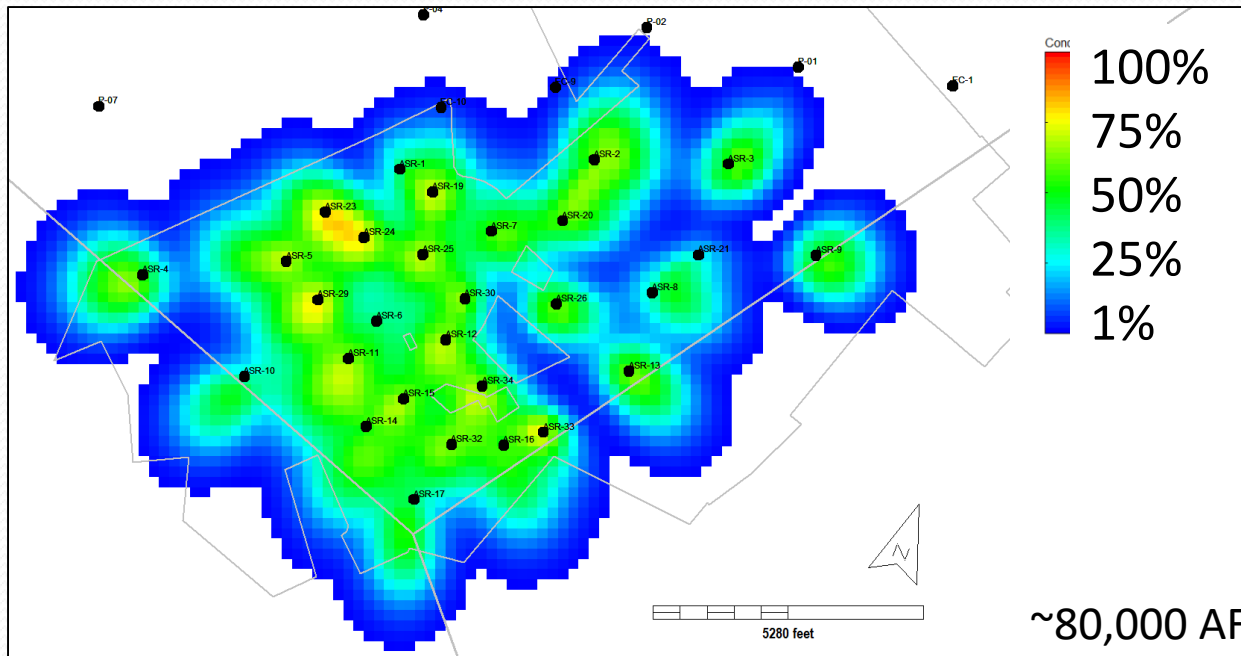


~40,000 AF
January 2008

Active ASR System



Active ASR System



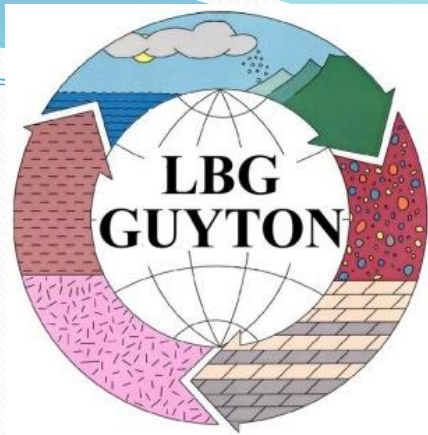
~80,000 AF

Sept 2013



Thanks!
Any Questions?





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