Desalination and Aquifer Storage and Recovery Potential of the Saline Edwards Aquifer, Central Texas

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30 years 1987-2017
Barton Springs Edwards Aquifer CONSERVATION DISTRICT

South Central GSA
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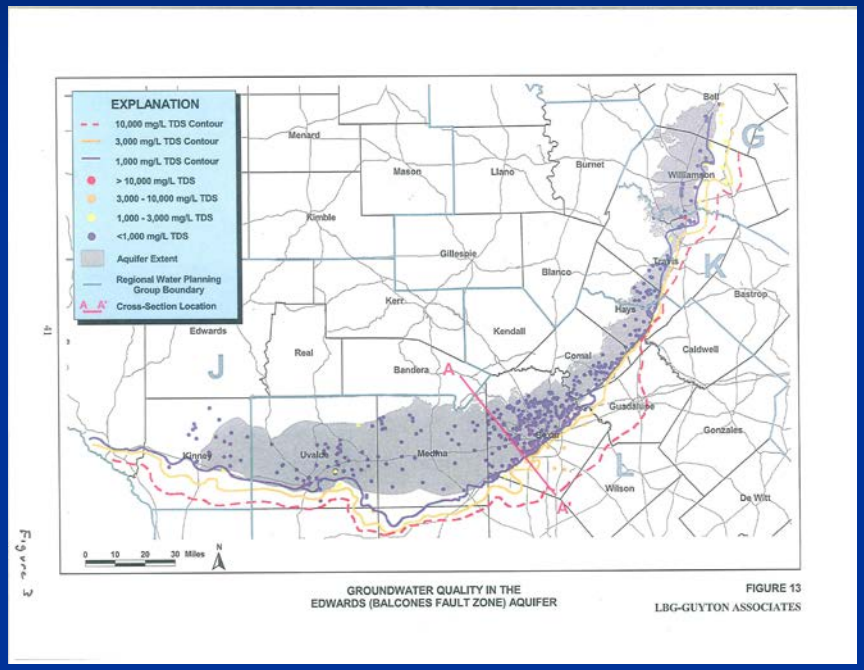
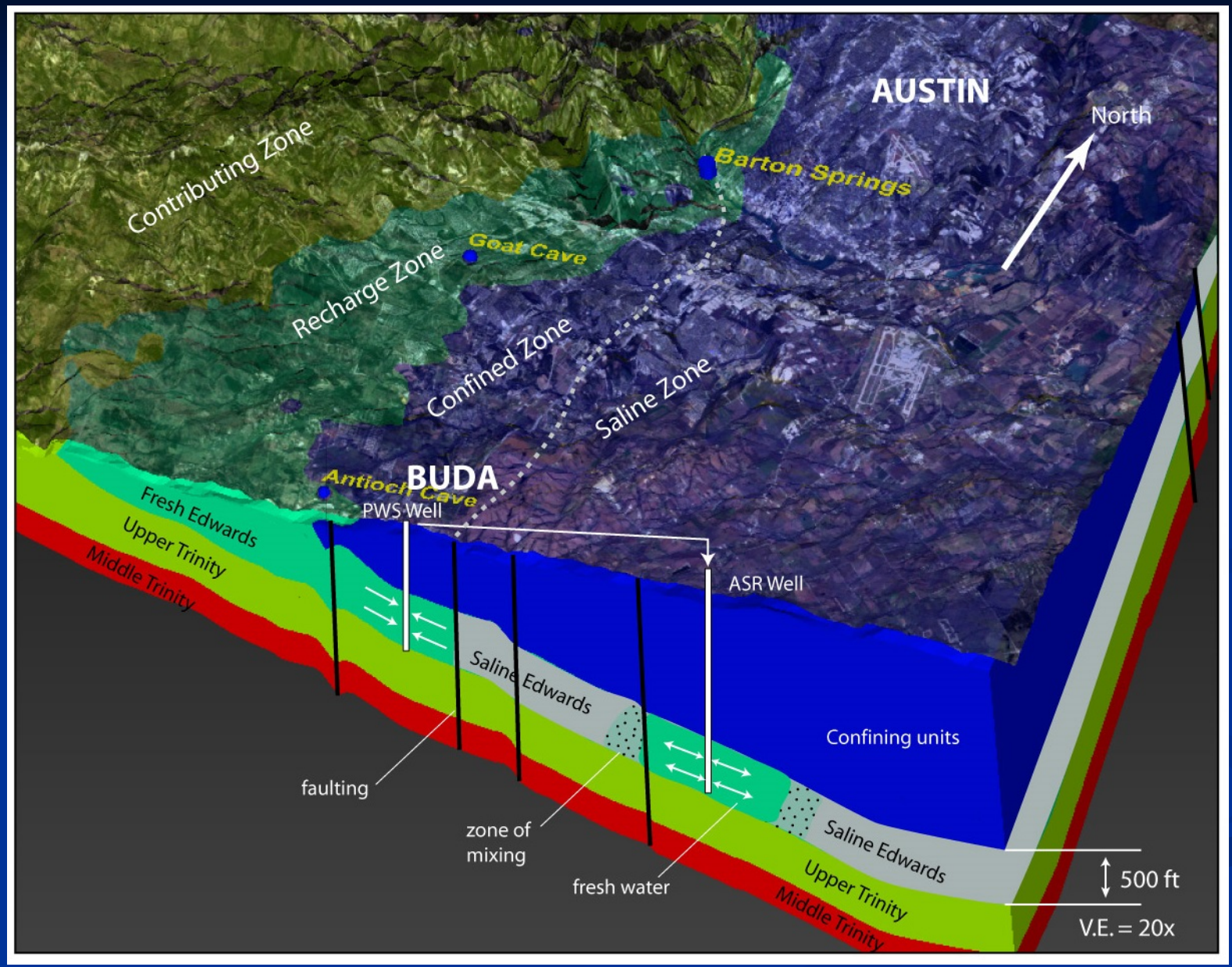
Edwards Aquifer

Previous Saline-Interface Studies



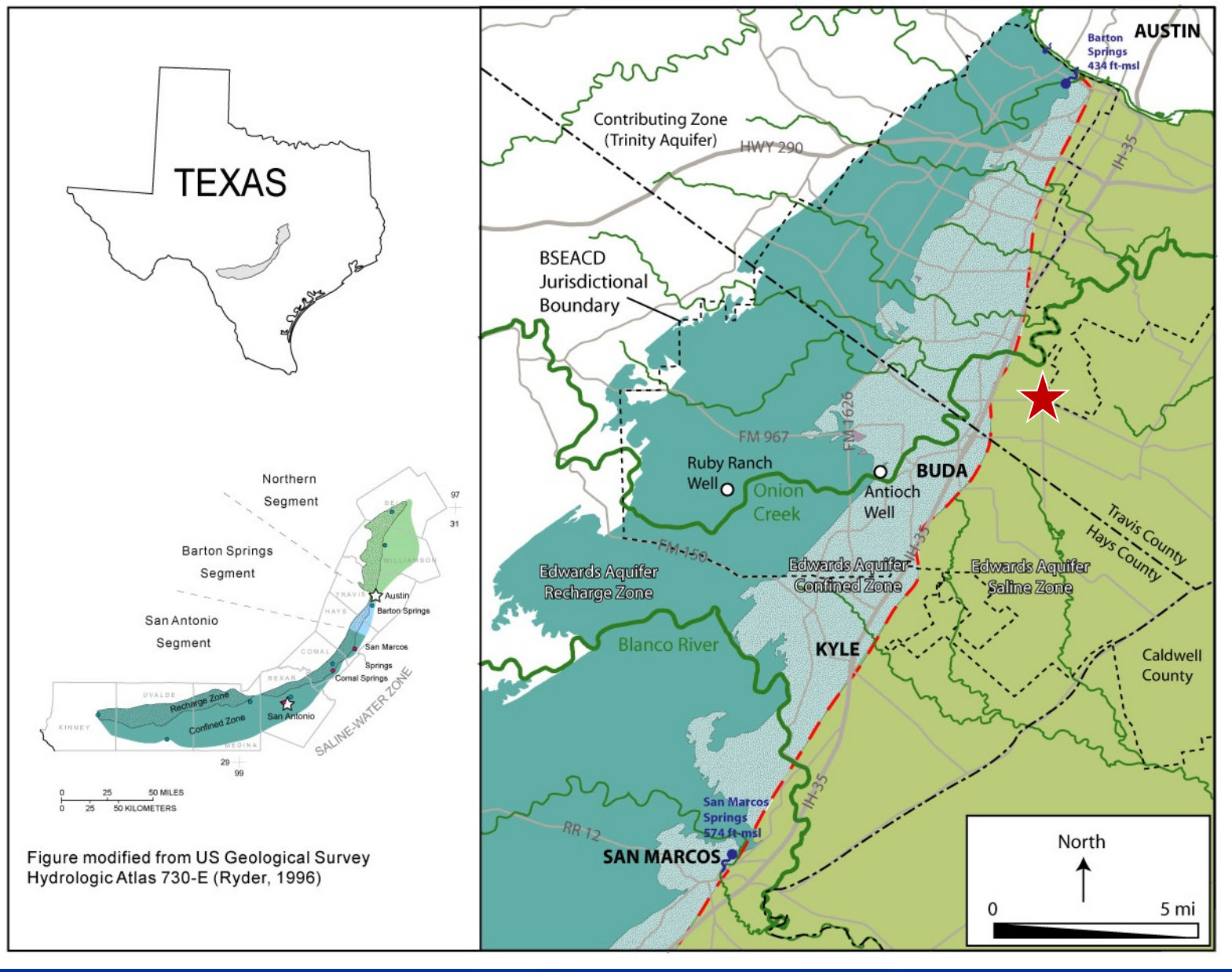
- TWDB (Flores 1990)
- EUWD (Poteet 1992; Schultz)
- SAWS
- USGS (Thomas/Lambert etc.)
- EAA
- UT Austin (Oetting, Banner and Sharp, 1995)


AUSTIN
North
Contributing Zone
Barton Springs
Goat Cave
Recharge Zone
Confined Zone
Saline Zone
BUDA
Antioch Cave
PWS Well
ASR Well
Fresh Edwards
Upper Trinity
Middle Trinity
Saline Edwards
Confining units
faulting
zone of
mixing
fresh water
Saline Edwards
Upper Trinity
Middle Trinity
500 ft
V.E. = 20x

TWDB Regional Facilities Planning Grant

- Feasibility study for desalination and ASR
  - Carollo Engineers
  - ASR Systems (David Pyne)
  - New Gen (financial analysis)

- BSEACD contribution- hydrogeologic characterization with the installation of multiport monitor well



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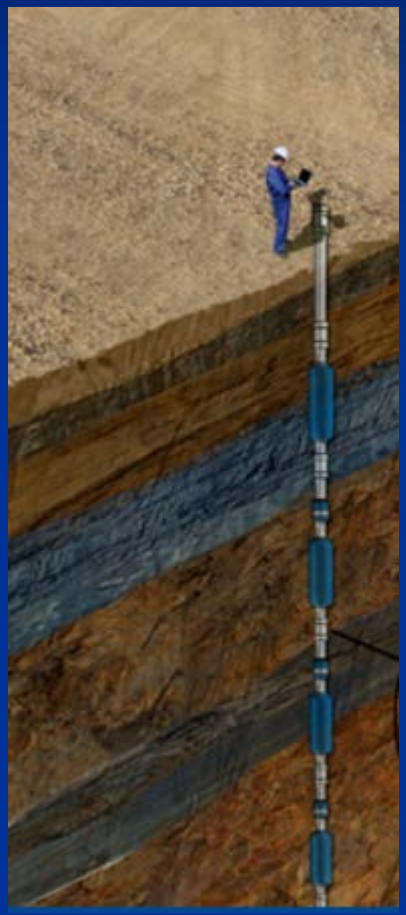
Multiport Monitor Well



Long-term data collection:

- Fluid pressure (water levels)
- Hydraulic conductivity (slug testing)
- Sampling (geochemistry)

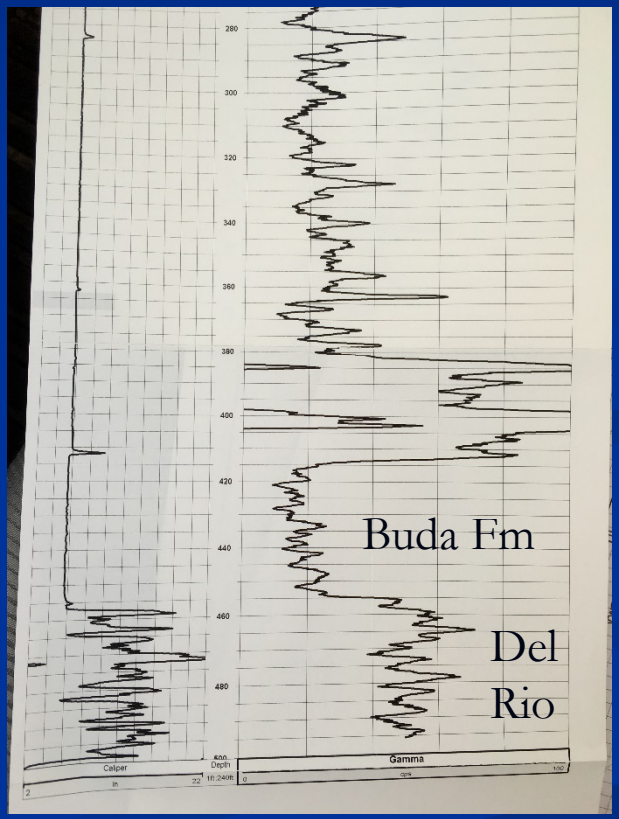
Westbay Instruments

Drilling

- August 2016
- Depth 1,100 ft
- Entire Edwards Group penetrated

Geophysical Logging

Gamma



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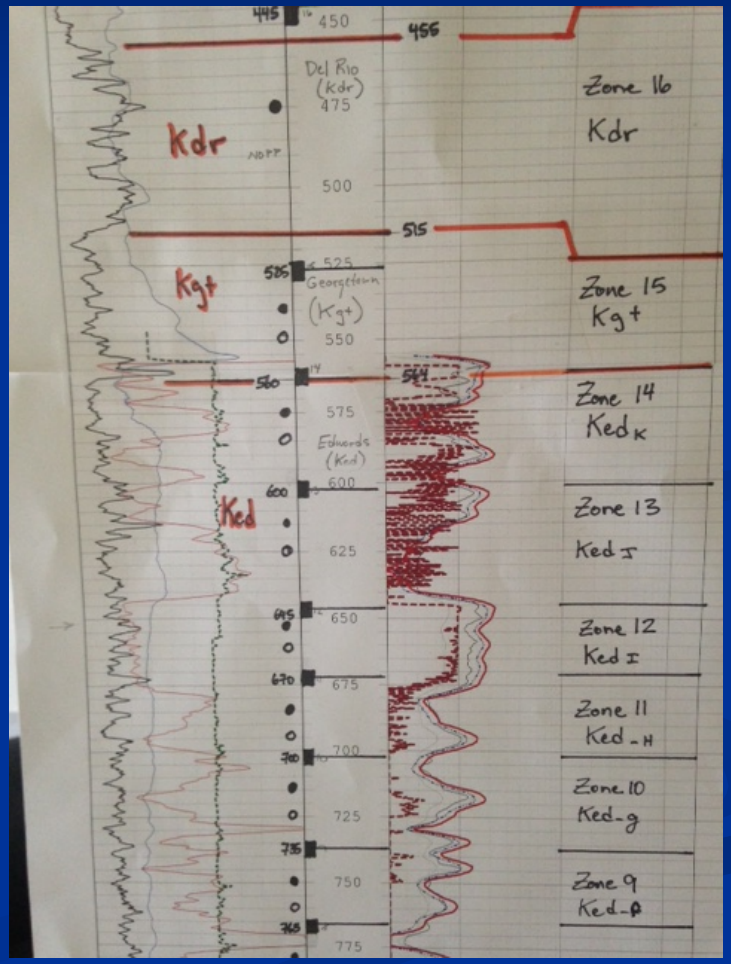
Multiport Well Design



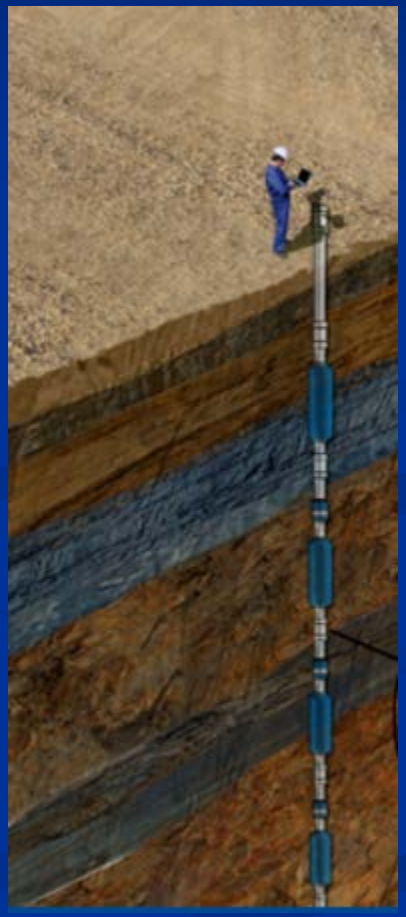
18 total zones

- 4 confining units
- 12 Edwards
- 2 Upper Glen Rose

Multiport Installation

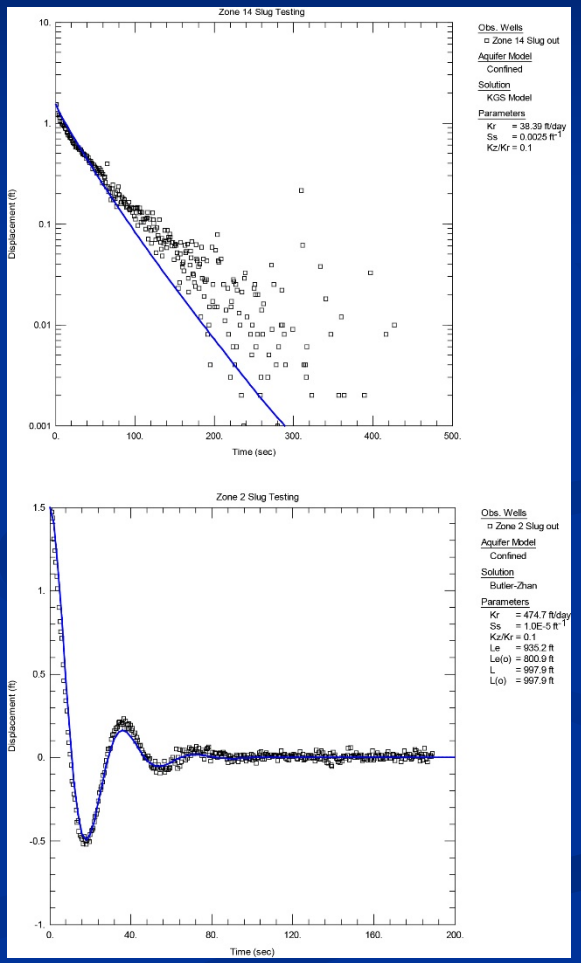
Multiport Installation

Packers



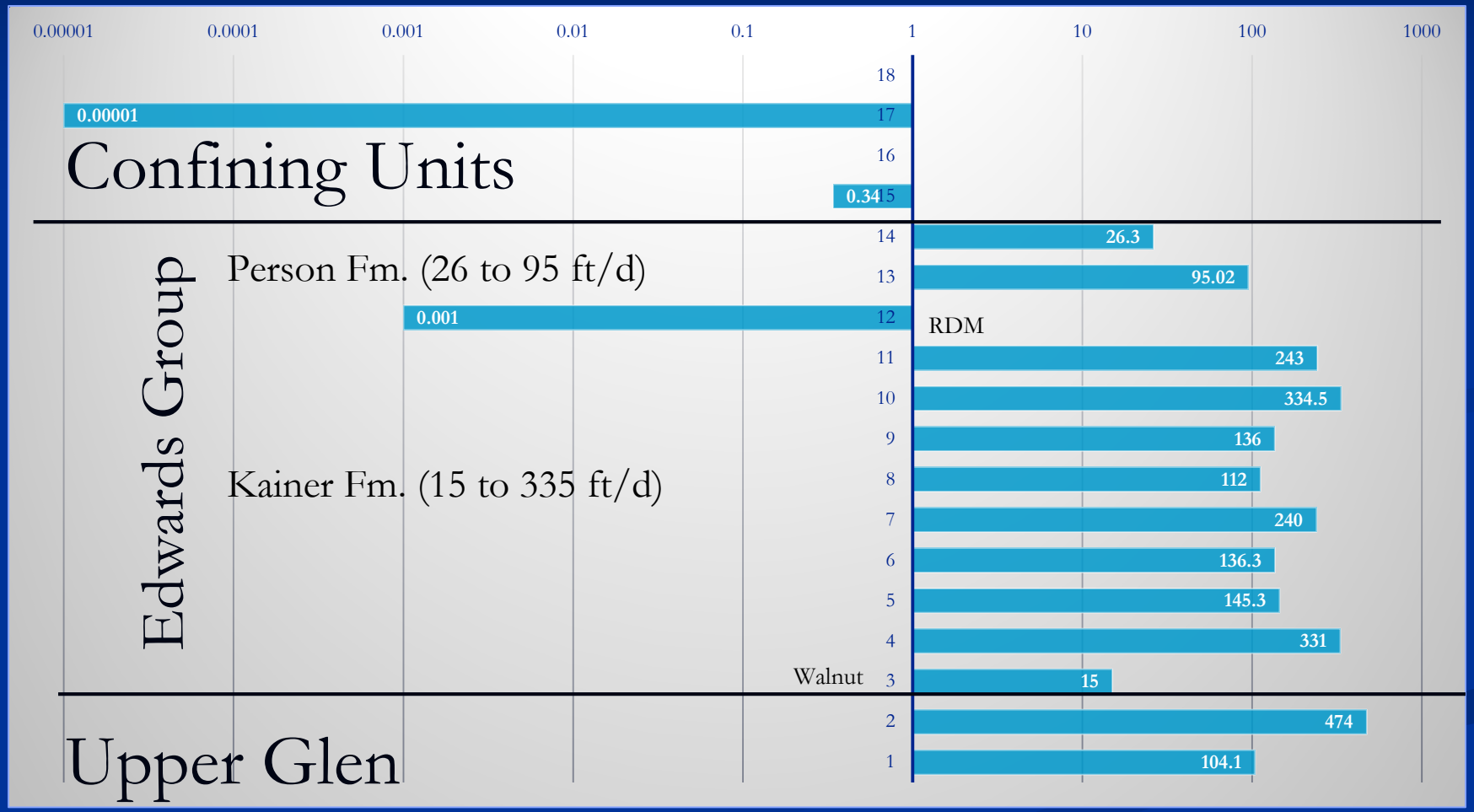
Purging and Slug Testing

Inertial pump



Aqtesolv

Results: Hydraulic Conductivity (ft/d)



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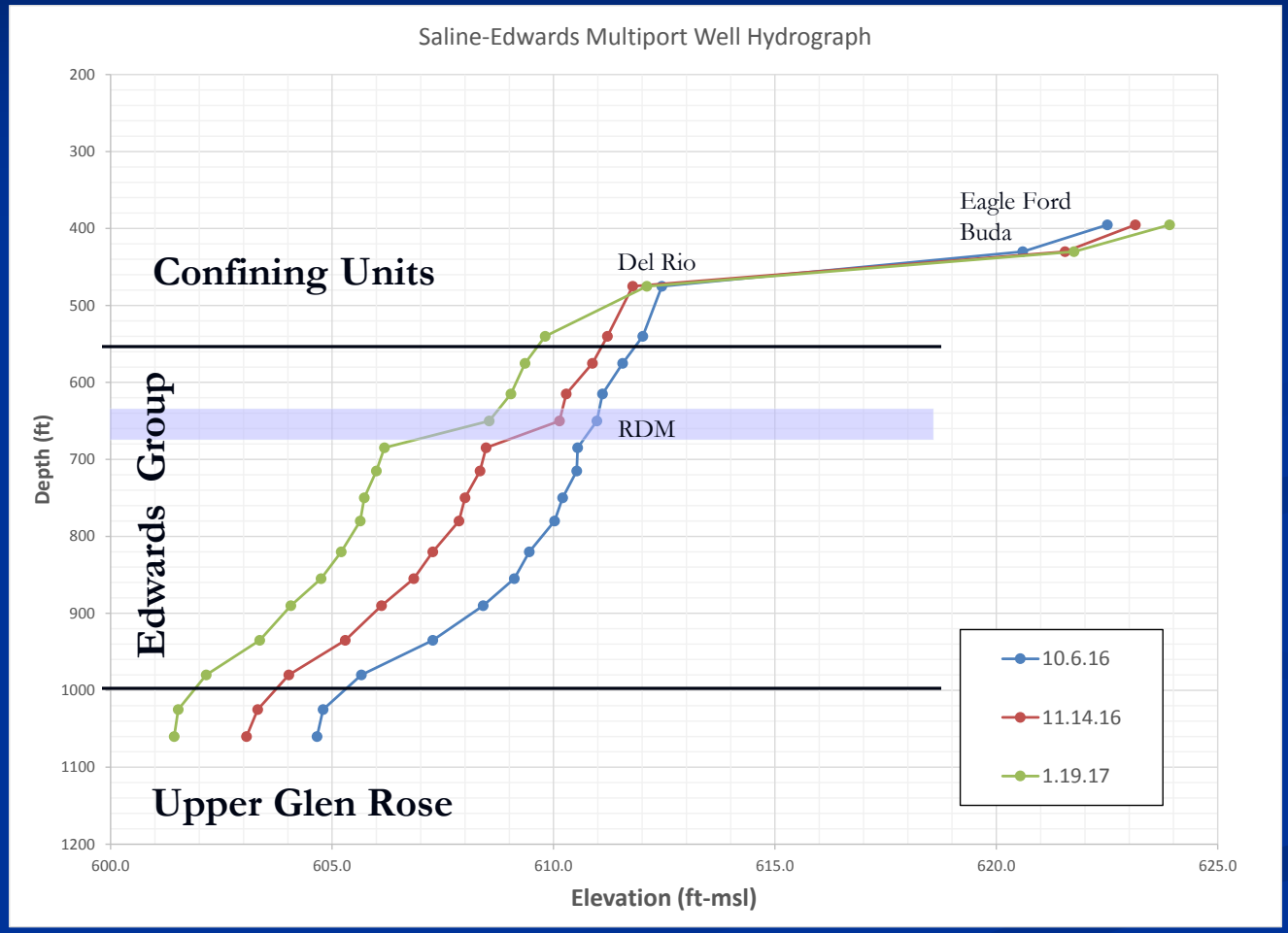
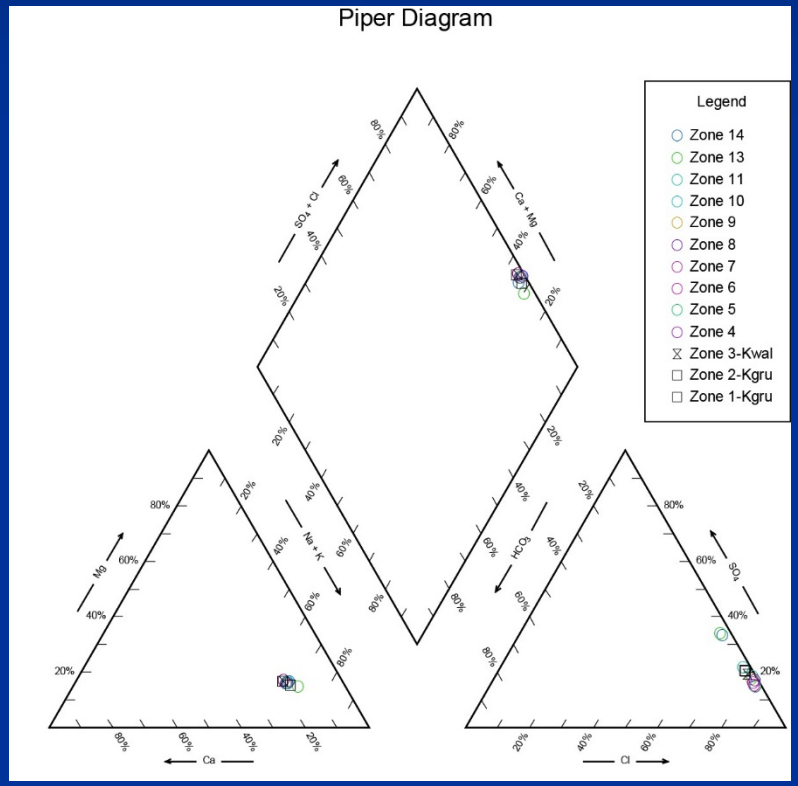
Results: Heads



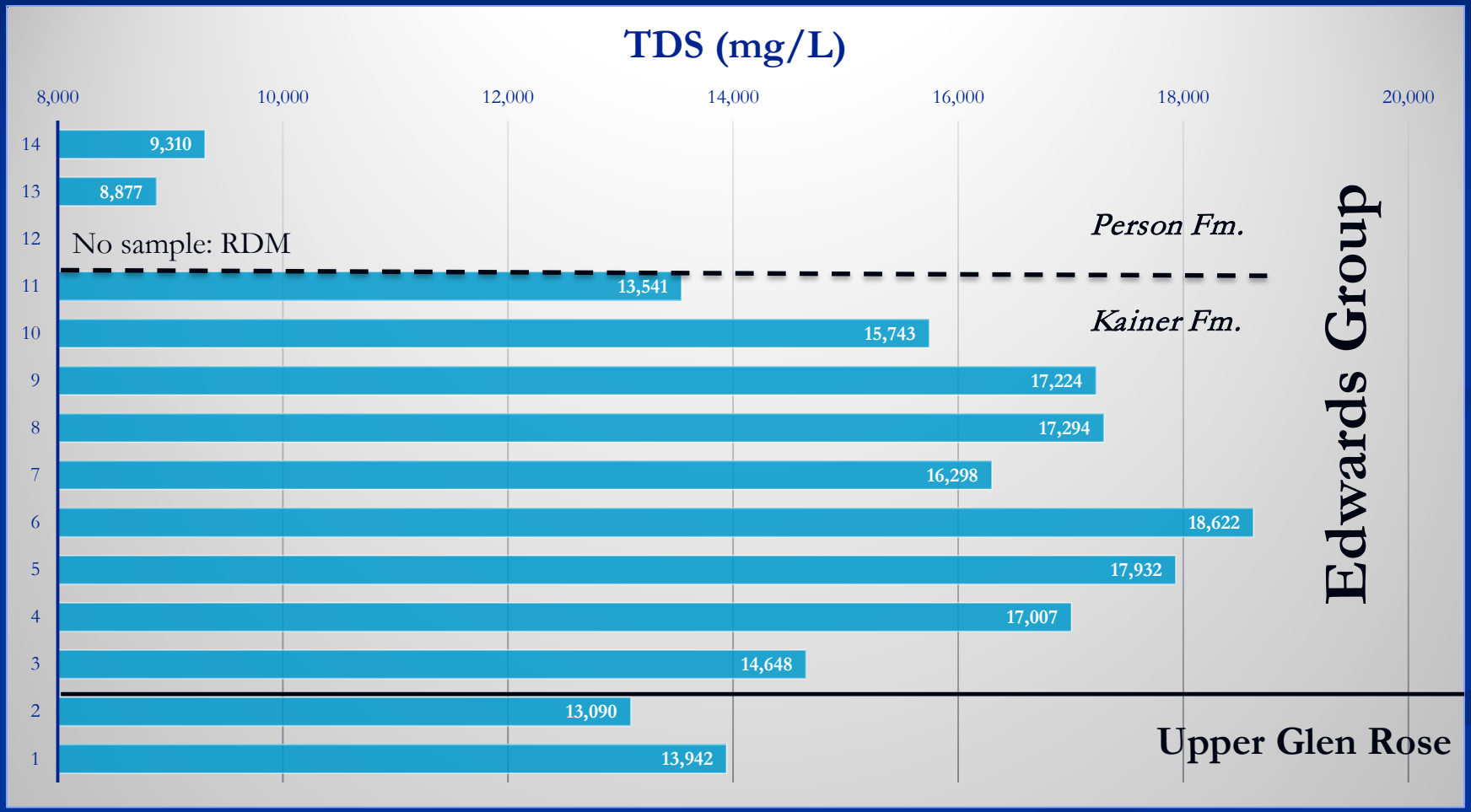
Results: Geochemistry



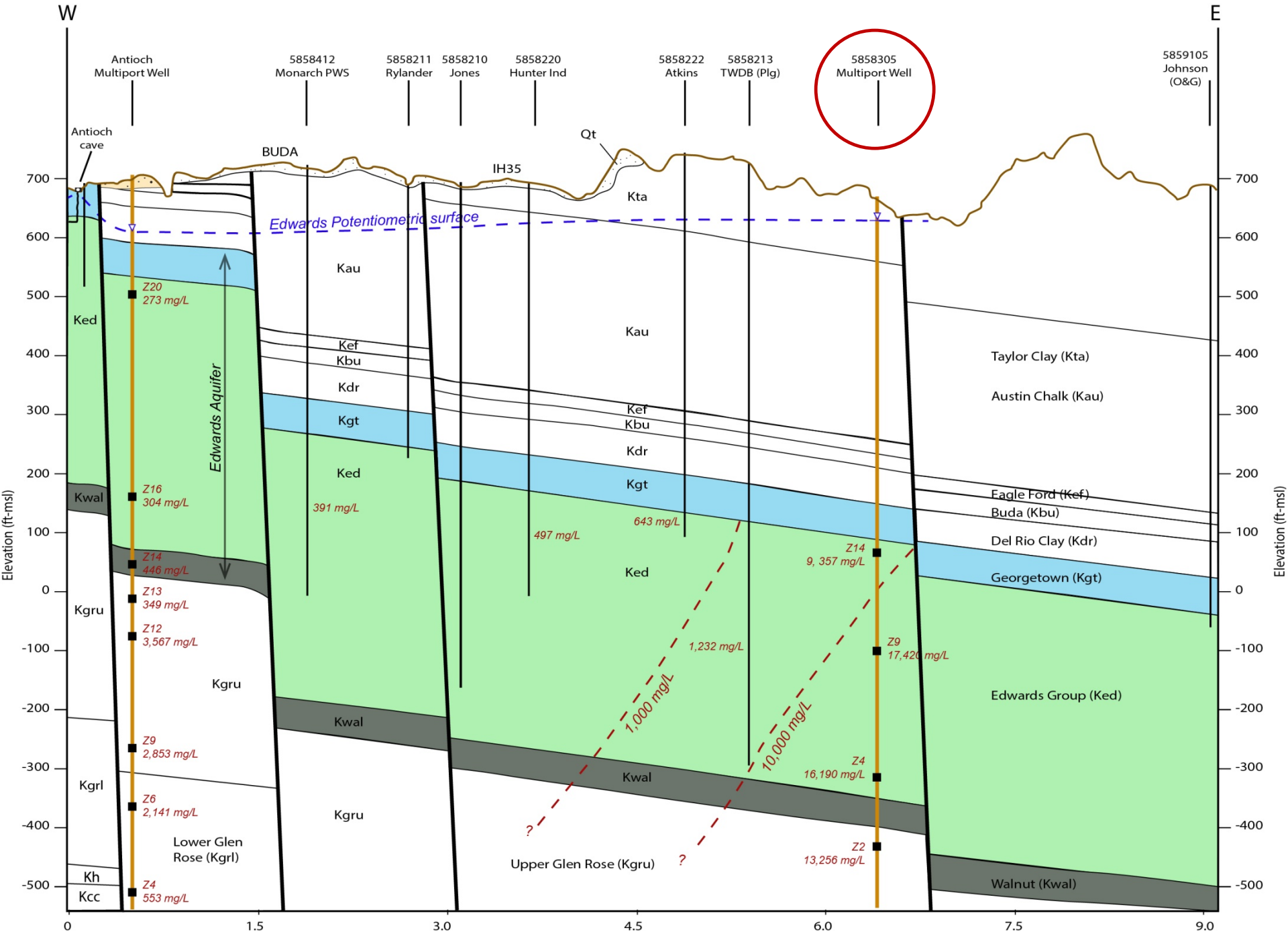
- 13 samples
- Sodium-Chloride facies
- TDS varies from

8,800 to 18,600 mg/L

Results: Geochemistry

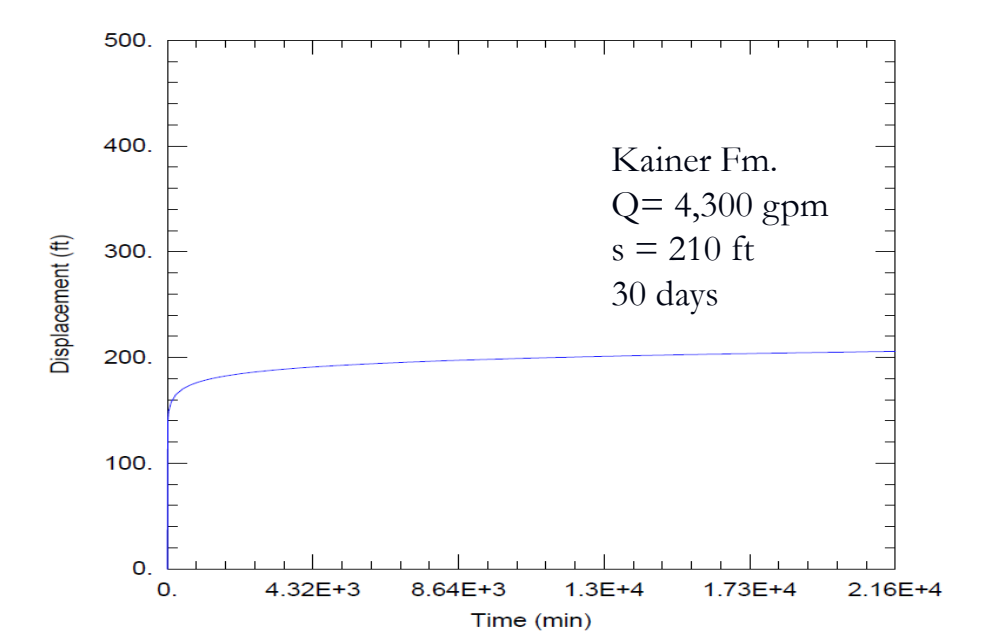


Hydrogeologic Cross Section: Fresh- to Saline-Water Edwards Aquifer



Potential Well Yields?

Aquifer Interval	thickness (ft)	T avg (ft^2/d)	Storativity	TDS (mg/L)	Drawdown (ft)	Q (gpm)
Upper Edwards (Person)	79	2,477	0.0002	9,094	179	1,300
Lower Edwards (Kainer)	271	7,141	0.0002	16,707	214	4,300



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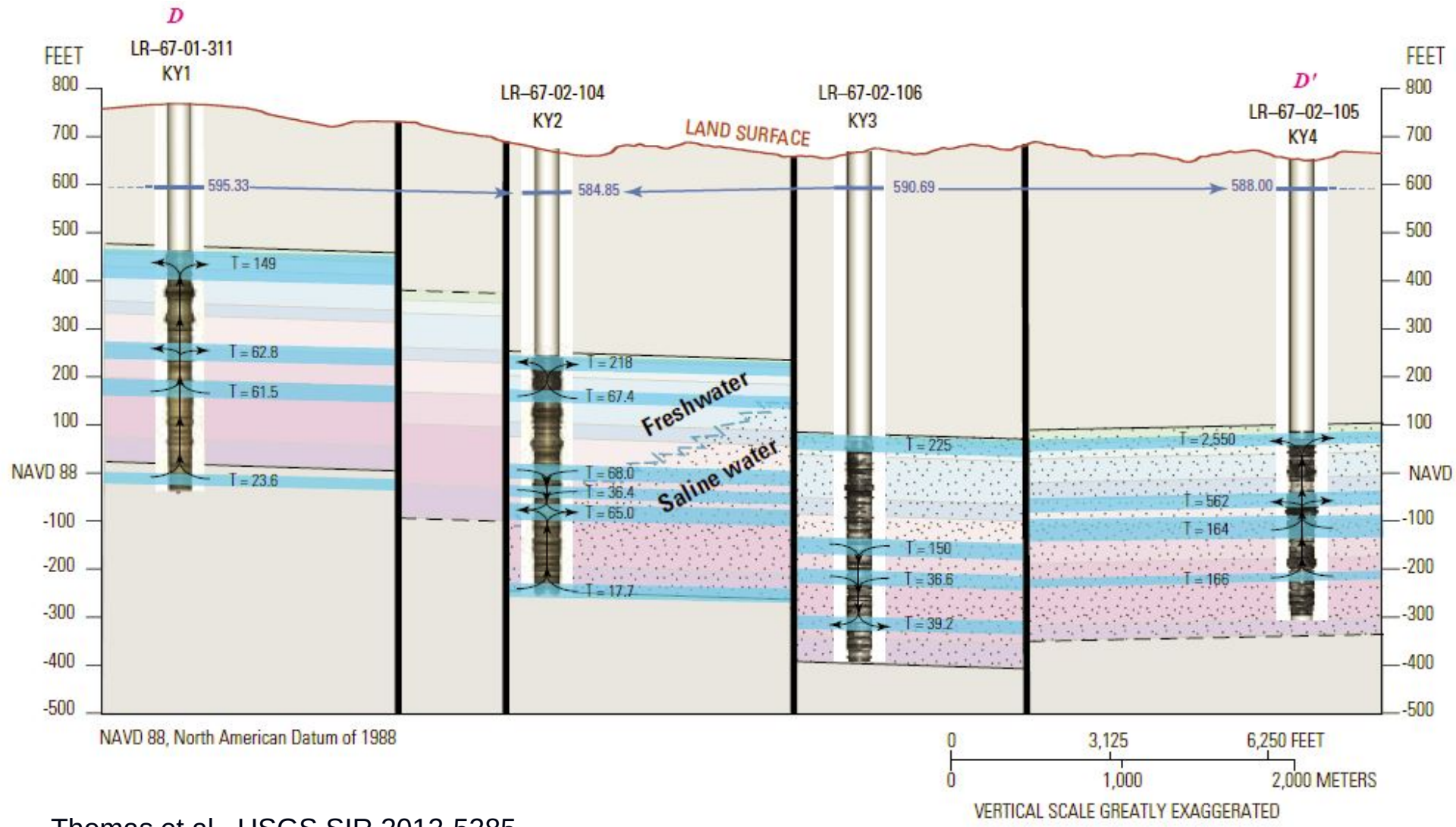
Kyle Transect



Thomas et al., USGS SIR 2012-5285

Conclusions

- Data provide detailed data on the brackish Edwards
  - TDS 9k-18k mg/L; K 0.001- 474 ft/d
- RDM appears to provide hydrogeologic stratification between Person and Kainer Fms.
- Saline Edwards/Upper Glen Rose appear very transmissive
- High-yielding wells possible

Questions?

Thank you:

- TWDB
- Texas Disposal Systems