Table 1: Aquifer units of northeastern New Mexico, including those present in the study area.

Aquifer Unit	Geologic Age	Yield	Quality	Recharge Potential	Comments
Alluvium	Holocene	Moderate to high	Good	Good	Limited to modern drainages.
Volcanics	Pliocene-Holocene	Moderate to high	Good, locally high in Mg, Ca	Good	Tend to be hydrologically connected to underlying, older rock units
Ogallala Formation	Miocene-Pliocene	High	Good	Poor to good	Limited to the eastern border of NM
Greenhorn Limestone	Cretaceous	Poor to moderate	Poor, high in sulfate	Poor	Water can be basic due to carbonates
Dakota Sandstone	Cretaceous	Moderate	Good	Poor	Primary aquifer unit in the region
Morrison Formation	Jurassic	Moderate to good	Moderate, high in sodium	Poor	Water is confined to isolated fossil river channels and is very difficult to target for drilling
Exeter Sandstone	Jurassic	Moderate to good	Good	Poor	Thickness varies locally from a few inches to >100’
Dockum Group	Triassic	Moderate to poor	Moderate, high in sodium, magnesium, iron	Poor	Santa Rosa Sandstone at the bottom of the group is highest potential for groundwater
Glorieta Sandstone	Permian	Moderate	Good	Poor	
Sangre de Cristo Formation	Permian	Moderate to poor	Moderate, high in sodium, iron	Good	Water can be mildly acidic due to contribution of granite debris

Table 2: Proportions of "recharge types" from tritium samples collected from all participant producers as part of parallel studies of groundwater recharge in the region.

Recharge Type	Number of Samples
No recharge (<0.16 TUs)	16
Insignificant modern recharge/prolonged drought suppression (0.16-0.80 TUs)	3
Some modern recharge/prolonged drought suppression (0.80-2.0 TUs)	7
Modern recharge (>2.0 TUs)	10

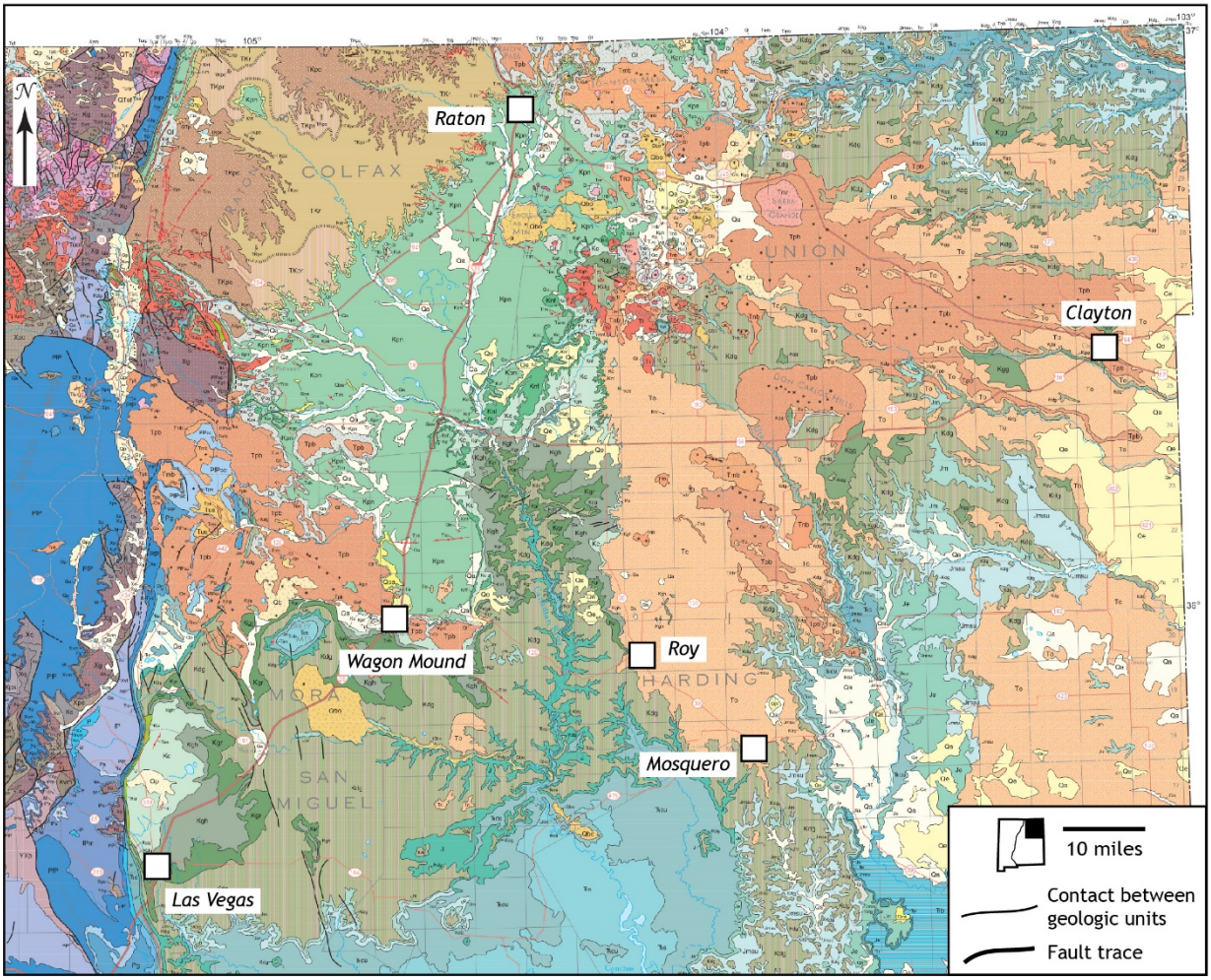

Figure 1. Regional geologic map of northeastern New Mexico showing the wide variety of rock types exposed at the surface.

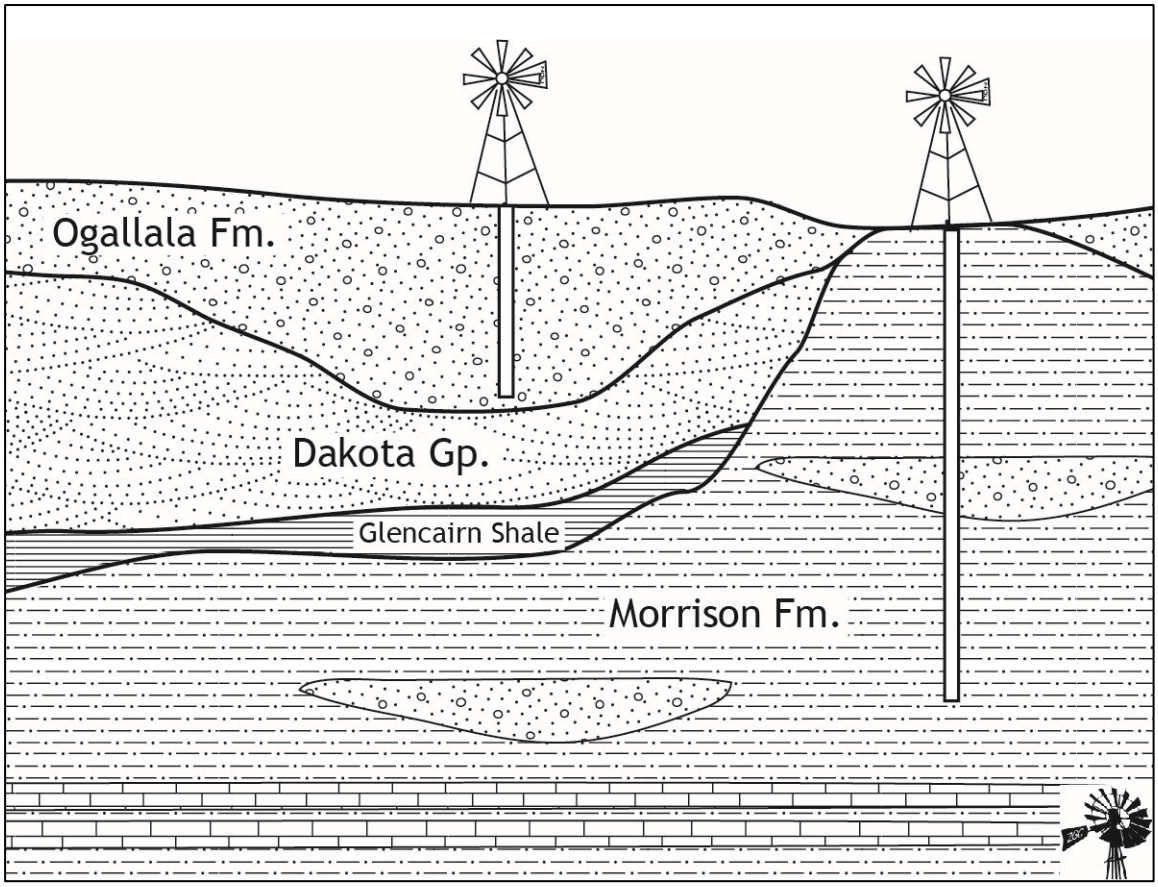

Figure 2. Schematic subsurface diagram for east-central Union County, modified from Zeigler et al. (2019b, copyright New Mexico Geological Society). Paleovalleys filled in with porous and permeable Ogallala Formation are inset adjacent to fossil ridgelines of the Morrison Formation, predominately impermeable blue shale and mudstone with rare channel sandstones that can yield reasonable groundwater.

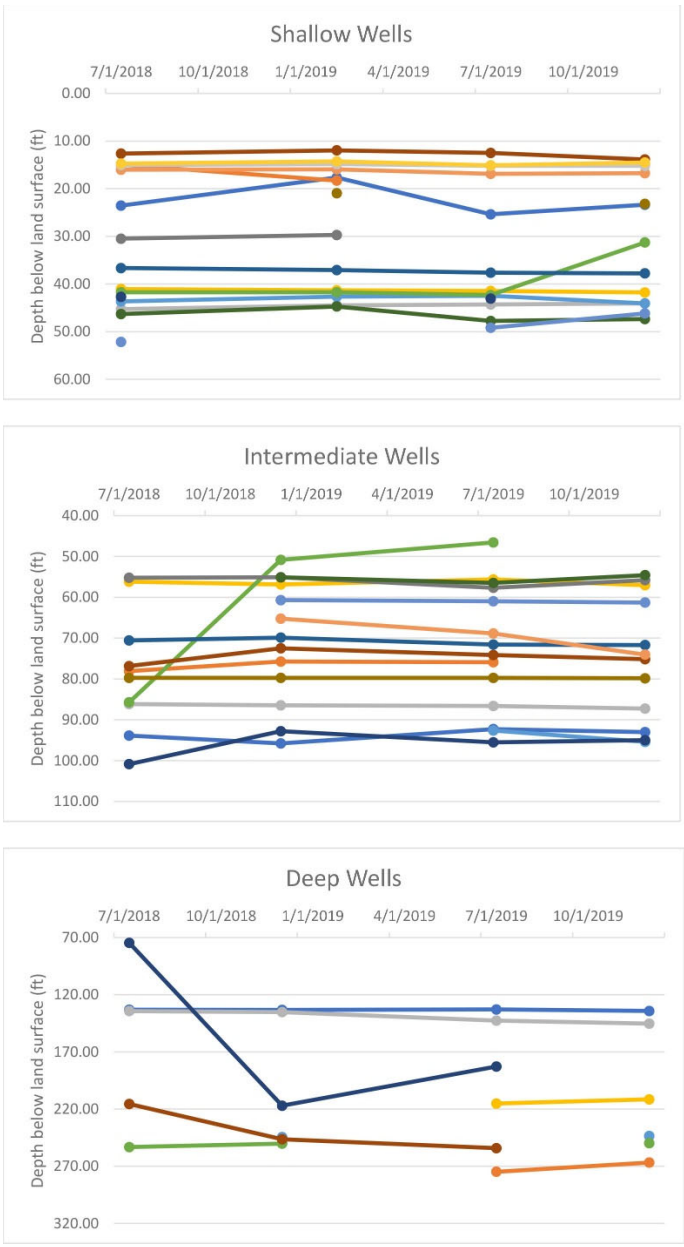

Figure 3. Stacked hydrographs for A, shallow (depth 0 - 50 feet below ground), B, intermediate (depth 50 - 100 feet below ground), and C, deep (greater than 100 feet below ground) wells in this study. Many of the wells show only moderate fluctuations, with small declines in water level for intermediate to deep wells, or small-scale fluctuations in shallow wells. Individual hydrographs exhibiting more extreme behavior are related to changes in infrastructure in these wells. These data were included to illustrate the importance of consistent monitoring for early detection of infrastructure concerns or rapidly declining water availability.