Characterization and Estimation of Aquifer Properties

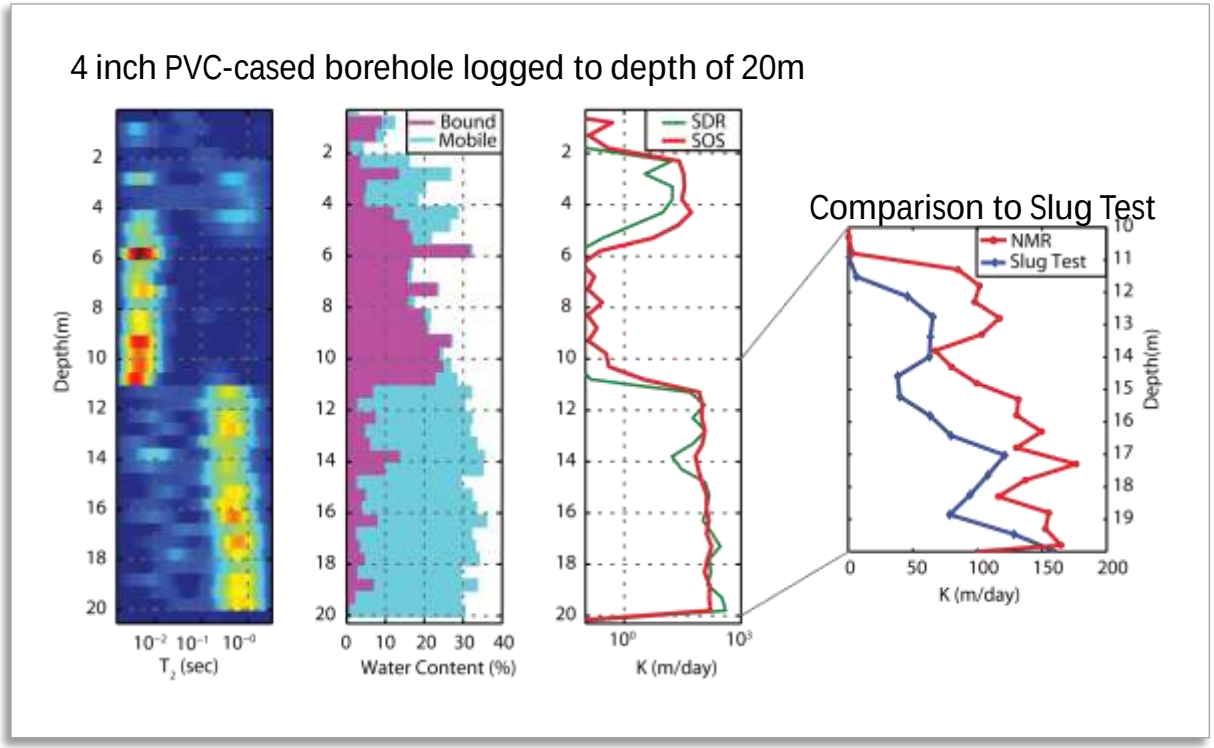
Client/Partner: Kansas Geological Survey

Location: Lawrence, KS

VISTACLARA INC. 21ST CENTURY GEOPHYSICS

Instrumentation: Javelin NMR logging - 3.5 inch probe

Javelin NMR data were acquired at the Geohydrologic Experimental Monitoring Site (GEMS), which has been extensively studied by the Kansas Geological Survey. The geologic stratigraphy of the site is well-characterized and is comprised of distinct layers of sands and clayey silts. The Javelin log was collected in a borehole in which direct measurements of hydraulic conductivity were available from previous multi-level slug tests.



The NMR accurately reflects the known lithology at the site: a silt and clay layer (with short T2) extending to a depth of 11m overlies a sand and gravel aquifer (with long T2). NMR-derived estimates hydraulic conductivity in the sand/gravel aquifer closely track direct hydraulic conductivity measurements from multi-level slug tests. The NMR log also indicates unexpected mobile water in the shallow silt layer from 2m to 5m; this mobile water is thought to be associated with voids left by tree roots or cracks in well grouting. This interesting example illustrates that Javelin logging is not only useful for determining hydrogeologic information but also for potentially assessing soil stability and the integrity of subsurface engineering.

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