

**KERN COUNTY WATER AGENCY
STUDY OF THE REGIONAL GEOLOGIC STRUCTURE RELATED TO GROUND WATER
AQUIFERS IN THE SOUTHERN SAN JOAQUIN VALLEY GROUND WATER
BASIN, KERN COUNTY, CALIFORNIA**

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1.0 CONCLUSIONS

1.1 The shallow structure (less than 2,000 feet below surface) in the study area is more complex than previously mapped, as established by the following:

- a. Extensive subsurface deformation exists, and shallow structural highs can be used to subdivide the valley into ten structural subbasins.
- b. Some of the subsurface structures have little or no surface expression (e.g. Paloma anticline, Bakersfield Arch).
- c. There are several regional and many local unconformities.
- d. Faulting is observed which extends into the near surface sediments.

1.2 The "E" Equivalent Clay as identified in well 23S/24E-16B can be mapped as far south as T.30S.-R.24E., MDB&M, within the Buttonwillow trough. The clay can be correlated with confidence from the deepest part of the basin eastward to a line that extends roughly from Delano through McFarland and west of Shafter. The clay reaches depths of -900 feet subsea (1,100± feet subsurface) in T.25S.-R.20E., MDB&M, at the Kern County line.

1.3 A widespread clay informally named the "Paloma" Clay is mappable south of the Bakersfield arch. It is identified in wells 31S/25E -15R, 31S/25E -36A, and 32S/25E-1H in the Buena Vista lake bed area. This clay is eroded to the north (including the Kern Water Bank area) and is deeper than 4,400 feet below sea level in the depocenter at the southern end of the valley near Mettler (Plate X). Stratigraphic correlations indicate the "Paloma" Clay is older than the the "E" Equivalent Clay as mapped in this study.

1.4 There are other shallow correlatable units in the southern San Joaquin Valley. None of these clays appear to be as areally extensive as the "E" Equivalent and "Paloma" clays mapped in this study. However, some of these clays may have significant hydrogeologic importance to local ground water conditions.

1.5 Seismic surveys can be an effective (and sometimes essential) tool for mapping the shallow subsurface.