

Geochemical Synopsis

1. Four crude oils from Eddy and Lea Counties, NM (Permian Yeso reservoirs) were geochemically assessed using geochemical fossils (biomarkers) and bulk carbon isotopes in order to predict the corresponding source rock depositional environments, geologic age, and level of thermal maturity of the corresponding source rocks (for analytical details see Zumberge *et al.*, 2005, AAPG Bull. v. 89, pp. 1347-1371):
2. These oils all appear to have been generated from the same distal marine shale of likely Permian age based on terpane and sterane biomarkers. Multivariate statistics, using biomarkers and carbon isotopes, show good correlation with Oil Family 5 of GeoMark's Permian Basin Study. These Yeso oils are also geographically close to GeoMark Family 5 oils which are produced from Pennsylvanian and Permian reservoirs.
3. Although of general moderate thermal maturity within the oil window, thermally sensitive biomarkers show a consistent maturity trend between the following fields: Fren < Loco Hills < Maljamar < Empire (most mature and highest API gravity).