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## **Sequence Stratigraphy and Source Rock Potential of Upper Jurassic Diyab Formation in the United Arab Emirates**

The combination of a eustatic sea-level rise and differential subsidence over the platform resulted in the development of the Diyab intrashelf basin. This basin was filled with bituminous lime mudstones, which pass laterally into non-source, shallow-water platform carbonates. As the basin shallowed, platform carbonates extended across the basin to form the major reservoir units.

The Diyab Formation has been dated as Oxfordian to mid-Kimmeridgian, varies in thickness from 750-1350 ft, and is interpreted to have been deposited in an intrashelf basin, slope, shelf margin and shelf interior. It consists of argillaceous lime mudstones wackestones (rich in organic matter) that change laterally eastward into peloidal packstones and grainstones. TOC in offshore areas ranges from 0.3-5.5% and the kerogen is sapropelic oil-prone type, sometimes mixed sapropelic-humic. The onshore areas are generally characterized by low TOC values (<1 wt%) and low pyrolysis.

Vitrinite reflectance ranges from 0.55-1.3%, with most of the onshore being overmature to highly mature. The offshore shows much lower maturity, decreasing toward the north and northwest. This is the area within the maximum oil generative stage. The isopach and paleomigration maps show initial hydrocarbon generation occurred during the Campanian and maximum oil generation occurred during the Eocene. The Early Tertiary was the major explosion phase, with more than 75% of the total oils being generated from Diyab source rock. The migration pathways of the oil generated from the Diyab source are interpreted to have been mainly toward the offshore and central onshore structures. The Arab and Araej oils were sourced mainly from the Diyab Formation and form giant fields in the area.