

Sequence stratigraphy of the Raha Formation, Bakr Oil Field, Gulf of Suez, Egypt: Insights from electrical well log and palynological data

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The sequence stratigraphic framework of the Upper Cretaceous Raha Formation is constructed using the lithologic, palynologic as well as palynofacies stratigraphic variations in addition to gamma ray data and is based on sixty cuttings from three wells (Bakr-114, B-115, and B-109) in the central province of the Gulf of Suez. The gamma-ray log is commonly used and relied upon to construct the illustrated sequence stratigraphic framework proposed for the three sections of the present study of Bakr Basin. Biostratigraphic analysis reveals a Cenomanian age for the studied samples. Some palynofacies parameters and palynological criteria (e.g., spore:pollen ratio, marine:terrestrial palynomorphs, total dinocyst count, equidimensional: lath-shaped opaques ratio, translucent phytoclasts %, opaque phytoclasts % and amorphous organic matter % (AOM%)) were used as environmental indicators for the proximal-distal trends within the various facies present. The nature of terrestrial organic matter was utilized for delineating the depositional sequences and their bounding surfaces. The Raha Formation corresponds to a second-order depositional sequence, which can be further subdivided into eight third-order depositional sequences. Furthermore, the correlation between the three studied wells illustrates the vertical and lateral distribution of the depositional sequences of the Raha Formation. The general results of the palynofacies analysis suggest that the Raha Formation predominantly records a transgressive episode, interrupted by short-lived regressive phases. The unit reflects deposition within a continental shelf setting, with facies ranging from supratidal to middle neritic conditions, and reflects a low-rate of accumulation of <200 m during ~6 Myr.