A high resolution investigation, comprising stratigraphy (biostratigraphy and Strontium isotope analyses) and sedimentology, of 19 onshore wells in Kuwait has been undertaken. Data from c. 500 core and cutting samples have been integrated with electric wireline log data to establish a biostratigraphically constrained depositional sequence stratigraphic framework for the tripartite Marrat Formation of Kuwait. The Marrat Formation rests unconformably on the Minjur Formation, which is no younger than Hettangian in age. A further hiatus is identified at the base of the overlying Dhruma Formation, with the probability of some Bajocian strata missing.

A locally applicable microfaunal biozonation has been established for the Marrat Formation, comprising three zones. The Pseudocyclammina maynci Zone, of Aalenian age, characterises the Upper Marrat. The Siphovalvulina spp. Zone, of early - middle Toarcian age characterises the bulk of the Middle Marrat, while the basal part of the Middle Marrat and the upper part of the Lower Marrat is characterised by the Amijiella amiji Zone (early - middle Toarcian to Pliensbachian - Sinemurian). The latter zone is tentatively divided into two subzones: the A. amiji and Haurania deserta Subzones. Palynofloral, nannofloral data and Sr isotope analyses have assisted in age determinations with varying success.

A wide range of shallow, neritic to supra tidal facies are identified. Eleven depositional sequences have been recognized, most of which are considered to be of third order hierarchical status and calibrated where possible to those of Gradstein et al. (2004). The Lower Marrat essentially comprises informal Sequences Si-Pl1 to Si-Pl3 and Sequence Pl8. The uppermost part of Sequence Si-Pl3 and Pl8 are well constrained using biostratigraphy and Sr isotope results, being dated as earliest late Pliensbachian and earliest Toarcian respectively. The uppermost part of the Lower Marrat and the Middle Marrat comprise at least four third order sequences (Toa1 to Toa4), with an early - middle Toarcian age range. An intra-Marrat Formation unconformity occurs at the base of the Upper Marrat, with the latter comprising three third order sequences (Aa1, Aa2 and Bj1-Bj2). While the lower two sequences are confidently dated as Aalenian, the youngest sequence is poorly age constrained.
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