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High frequency peritidal cycles in the lower member of the Late Cretaceous (Turonian, Coniasian-Santonian) El Hefhuf Formation, Bahariya Oases, Western Desert, Egypt

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Abstract

Carbonate lithofacies of the lower member of the El Hefhuf Formation (Turonian, Coniasian-Santonian) in the Bahariya Oases, Western Desert of Egypt comprise dolostone, burrowed dolostone, cherty dolostone, calcareous dedolostone, dolomitic quartzose lime-mudstone, and caliche,. The dolostone and cherty dolostone formed in intertidal to supratidal environments, while dedolostone and caliche were formed during subaerial exposure. The dolomitic quartzose lime-mudstone was deposited in a restricted subtidal environment. Stable isotope analyses of the dolostone lithofacies are consistent with dolomitization by normal marine to evaporatively enriched dolomitizing fluids with only slight mixing of meteoric water. Therefore, dolomitization occurred in the intertidal and supratidal environments immediately following deposition. The dolostone and cherty dolostone lithofacies display pronounced cyclicity at the sub-meter scale, with individual cycles consisting of one (monolithic), two (diad) or at