

Jurassic Sequence Stratigraphy of the Southern Mesopotamian Basin, Kuwait

Anthony J. Lomando¹, S.K. Singh², N.H. Al-Ajmi², G. Al-Sahlan², and M. Al-Bhaghl². (1) ChevronTexaco, PO Box 6046, San Ramon, CA 94583, Kuwait, phone: 965-627-5076, alomando@kockw.com, (2) Kuwait Oil Company, Kuwait

The Jurassic Period in the Kuwaiti sector of the Mesopotamian Basin is a complex, highly cyclic suite of carbonates, evaporites and shales. The earliest Jurassic is marked by the Rhaetian-Hettangian Minjur Fm which is unconformably overlain by the Marrat Fm. The base Marrat is the major Early Jurassic sequence boundary found throughout Arabia. The Middle Marrat reservoirs are shoals and associated facies which produce from several large structurally controlled fields. Understanding Marrat cycles are contributing to a major stratigraphic trap exploration effort. The top of the Marrat was tested for a late Toarcian-Aalenian sequence boundary reported in several regions of Arabia. The Middle Jurassic Dharuma Fm shale is the only true siliciclastic section found in the Jurassic of Kuwait and may represent a regional lowstand followed by the TST Sargelu Fm carbonate cycles. The Late Jurassic Najmah formation, the regional organic-rich carbonate source rock, may reflect more of a basinal anoxic restriction than a major deepening event, but culminates in a series of carbonate debris flow units. These debris flow units may be a reflection of a recently proposed Middle-Late Jurassic (Late Callovian) ice age and would represent an ice house spike in a green house world. Conversely, the debris units may also reflect a tectonic pulse pushing up the intrashelf basin margins leading to restricting circulation. Major basin restriction continued through deposition of the 1500' thick Gotnia Formation carbonate-anhydrite-halite cycles but are interpreted as an overall transgressive system rather than lowstand-drawdown conditions. The final Jurassic cycle is the carbonate-anhydrite Hith.
