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Preliminary Sequence-Stratigraphic Framework and Reservoir Characteristics of the Mauddud Reservoir, West Qurna 1 Field, Iraq

S. Van Simaey* (ExxonMobil Upstream Research Company), S. Fullmer (ExxonMobil Upstream Research Company), L. Yose (ExxonMobil Development Company) & N. Stephens (ExxonMobil Iraq Services Ltd)

SUMMARY

A new sequence-stratigraphic framework is proposed for the Mauddud formation at West Qurna 1 Field, based on the integration of core, well-log, biostratigraphic data, and limited 2D seismic data. The Mauddud Formation is ~150m thick in the West Qurna 1 field area and was deposited on a broad carbonate shelf developed during the Albian (Early Cretaceous).

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The lower part of the Mauddud Formation represents a transgressive system (lower 2 sequences) and displays a fairly uniform lithology across the field. The vertical and horizontal extension of this facies all over the Arabian basin indicates long-term stability of the basin. In areas of relatively higher energy, localized rudist banks were established on the basin margin. Local lagoons were also formed wherever the topographic or hydrodynamic settings allowed. These are characterized by algal-pelletal facies.

The Mauddud highstand sequence set displays a lateral change in lithology ranging from good quality grainstones in the northern and central part of the field to lower quality peri-tidal packstone/wackestone facies in the southern part of the field. In general, most Mauddud lithofacies have moderate porosity and low permeability, with microporosity as the dominant pore type. Intervals with enhanced reservoir quality can be related to fracturing and faulting or the presence of rudist floatstone-rudstone facies.

The proposed sequence-stratigraphic framework and the sequence-stratigraphy-keyed facies scheme result in a predictable distribution of reservoir and seal facies and allow for a better prediction of the vertical and lateral distribution of reservoir quality and reservoir continuity at both field scale and regional scale. Results are being incorporated into reservoir models and integrated with well test and additional core data to further evaluate well productivity and controls on flow within the reservoir.