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Stratigraphic Trapping The Natih Formation in North Oman

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SUMMARY

With more than 50 years of exploration in Oman it is not surprising that the conventional structural plays have been creamed. Exploration in Oman has been focusing therefore more and more on the more difficult unconventional plays, including stratigraphic traps. The Natih was recognised early on as a potential candidate for stratigraphic trapping because of strong lateral facies variations in combination with intercalated source rocks that have been proven to contribute to charge in some areas.

The Natih Formation forms the interior part of an extensive carbonate platform that covered the eastern margin of the Arabian Shield during the mid Cretaceous. The formation consists of a number of repetitive sedimentary cycles ranging from several tens to 150 m in thickness. Each cycle starts from basal, generally thin, variably argillaceous mud-supported units (potential seals and source rocks) followed by thick deepening and shallowing carbonates ending with shell-rich or pelletal-skeletal grain-supported units (the reservoirs). Superimposed on these cycles, two to five third-order, generally shoaling-upward sequences have been distinguished by previous studies.

Extensive penetrations and supporting studies and seismic have provided the very detailed understanding that is required to assess its stratigraphic trapping potential and the definition of stratigraphic traps conceptually. The testing of one of these traps confirmed the models, but the absence of hydrocarbons indicated a low sealing potential of the intra-Natih mudstones. A full assessment of the stratigraphic trapping potential of the Natih led to a consolidation of the play, essentially remaining in monitoring mode. Play geometries with trapping potential exist, but they remain very subtle and are difficult to distinguish from subtle structural traps or combinations of structural stratigraphic traps. Volume potential is therefore also difficult to assess and remains a challenge. Recent serendipitous Natih discoveries in 2008 and 2009 confirm this potential, but also confirm the difficulty in volume assessment.