

Al Bashair Formation opportunities, Mabrouk Field, Oman

Salmeen A. AlMarjibi¹, Rinat Lukmanov¹

¹ Exploration, PDO, Muscat, Muscat, OMAN

ABSTRACT

The Late Cambrian aged Al Bashair Formation of the Andam Group (Haima Supergroup) of Oman known from the subsurface consists mainly of thin (3 – 20cm) interbedded layers of siltstone and mudstone that are occasionally interbedded with thin sandstone layers and various types of carbonate sediments (usually <1m thick). The Al Bashair Formation is widely distributed over north-central Oman in the subsurface, and its equivalent succession is exposed in a relatively small area named as Qarn Mahatta Humaid (QMH) in the north of the Huqf region. Until recently (2011), limited work has been published on this succession, particularly the relationship between the exposed succession and its equivalent in the subsurface.

In the context of Oman's petroleum system and regional play understanding the Al Bashair Formation is known as a seal for the deep Haima gas reservoirs (Miqrat and Amin Fm.) until the first commercial rate production in the eastern side of the country (operated by CCED company) proved the existence of producible economically viable reservoir.

Recent detailed studies by Al Marjibi (2011) mainly on the Al Bashair outcrops prove the existing of 25 m thick succession of interbedded sandstone /mudstone packages (2 – 4 m thick) intercalated by thin(<1m) porous oolitic grainstone. From the well correlation of north central Oman this succession is lateral extent and correlatable. Historically, no commercial Al-Bashair hydrocarbon accumulations were discovered in the PDO concession area, probably because of low sand thickness and no obvious hydrocarbon shows.

Recently, during the appraisal campaign of deep reservoirs in the Mabrouk Field, good gas shows were observed in the Al-Bashair interval. Four correlatable units with the individual sand thickness up to 3m were identified. Reliable pressure data acquired with wireline formation testers illustrates very consistent gas gradient for all units and very good mobility in six wells. Pressure data reveals that the confirmed accumulation height exceeds 100 m, and the accumulation could be slightly overpressured. The Borehole Image, sidewall core and gas samples were acquired and followed by successful well test which showed good commercial gas rates without fracturing.

Investigation of the Al-Bashair reservoir sweet spots continues on other hydrocarbon fields.

*Al Marjibi, S., 2011, Unravelling the depositional environments within the Lower Andam Group of north-central Oman, PhD thesis, University of Aberdeen, Scotland