

LOW-RESISTIVITY-LOW-CONTRAST-PAY:

Some examples from Offshore North West Java, Ardjuna Basin, Indonesia

FRODESEN, ERIC, W. and TONY LAWRENCE

ABSTRACT

The Miocene Main and Massive marine sandstones in the Ardjuna Basin are prolific producers. Low - resistivity, low - contrast pay zones (LRLC) occur in all the major fields. A combination of factors is responsible for the low resistivity response. These rocks are undercompacted, highly porous (25-33%), fine to very fine grained quartzose sandstones. Glauconite, chamosite, clays, water salinity and laminated sequences all contribute to the low resistivity response. The most frequently missed LRLC pays exhibit resistivity in the 1.1 to 1.8 ohm range. Commercial production has not been observed below 1.1 ohms and reservoirs above 2 ohms are easy to identify.

The identification of LRLC pays requires rigorous analysis of cuttings, sidewall cores, show reports, mud logs and electric logs. Standard log analysis frequently calculates water saturations in the seventy to eighty per cent range over zones that have produced more than one and a half million barrels of oil. The use of conventional pay cutoffs results in underestimation of reserves. Rwa comparison, an old gulf coast quick look technique, helps identify prospective zones.

The FNA-1 and the EZC-3 wells document production from these LRLC reservoirs. Applying knowledge obtained from these proven examples has helped ARCO Indonesia identify other prospective zones in the Main and Massive sands. Several of these zones were completed and found to be productive. This has resulted in the addition of new reserves from old wells.

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