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Geology and reservoir quality changes in the Aptian M'Cherga series in Central-Northern Tunisia

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In Central-North Tunisia, the Aptian deposits constitute, at least locally, good hydrocarbon targets. The Aptian M'Cherga deposits consist of fractured fine-grained carbonates associated to sandstones and shales. However, lateral facies changes in varied directions (North-South, East-West) are very common, sometimes on short distances. These facies lateral changes guide the quality of the reservoir sandstones and carbonates. On the basis of reservoir rock quality variations, the studied area could be subdivided into two main sectors. A first sector located to the South, in Kasserine area, includes proven reservoirs, commonly oil bearing, such as in the Douleb, Semmama and Tamesmida fields. In the Douleb field, for example, the relatively good quality of the reservoir carbonates is essentially due to fracturing and diagenetic fabrics, especially dolomitization and solution-karstification processes. However, to the North, in the second sector occupying the El Kef area, the reservoir quality appears, at a first glance, obviously decreasing; however, oil seeps and shows are still common. In this sector, the reservoir rocks associating fractured fine-grained carbonates, siltstones and sometimes sandstones, commonly reputed of being "tight reservoirs", could be considered as potential reservoirs. On the whole, the proven and potential Aptian M'cherga reservoirs still constitute potential targets in the studied area. In terms of Petroleum Systems, the Aptian reservoirs are commonly sourced from the Albian Fahdene black-shales. However, recent studies show that Barremian-Aptian thin-bedded argillaceous limestones and marlstones could constitute additional source rocks. Concerning traps, layers folding is common and anticlines are frequent. In addition, unconformities, tectonic and stratigraphical traps are also common. A regional unconformity which constitutes a real barer between impermeable Late Albian marls and porous Aptian fractured carbonates, is of a high interest in terms of stratigraphical trap in the area.

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