

Evolved Understanding of Reservoir Distribution and Connectivity in a Complex Fluvial System, A Case Study from Development of the Dentale Formation in the Tsiengui and Obangue fields, Onshore Gabon

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The Tsiengui and Obangue Fields have been under appraisal, production and active development onshore Gabon since 2005, to date they have produced a total of 22 MMbbls from over 50 horizontal wells. The producing interval is overlain by a large gas caps and underlain by a large connected aquifer systems with formation permeabilities of 1 to 5 Darcies.

The adjacent onshore oil fields of Tsiengui and Obangue in Gabon are four-way dip closures in the high quality Gamba sandstone. This reservoir unconformably overlies the synrift fluvial-lacustrine Dentale Formation. The hydrocarbon contacts are shared across the two reservoir units, despite the significant difference in reservoir quality and the pronounced angular unconformity between them.

The Dentale Formation has always been considered to be markedly less productive and secondary in potential to the Gamba, but production from the fields has exceeded predictions and indicates that the reservoir quality and continuity have been underestimated.

A full understanding of the reservoir architecture has been developed through integration of static and dynamic data from the fields in order to improve predictions of future performance and understand the behaviour of the aquifer. Key components include a semi-regional structural framework; conceptual models of the depositional system; multiple realisations of the geological model; and an understanding of the reservoir subcrop geometry and transmissibility across the unconformity into the Gamba Formation.