

Egypt's West Mediterranean Sea – an exploration hotspot

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Egypt's West Mediterranean Sea remains frontier however, a diversity of plays, new 3D seismic data, and recent exploration drilling success are making this area an exploration hotspot.

The area until recently had remained unproven as there were several challenges to exploration when compared to surrounding geographies. Deeper water and challenging seismic imaging have been two of the major obstacles that have hindered exploration progress in this area in the past. However, deep water drilling has become commonplace in recent decades and modern data acquisition (e.g. long offset and wide azimuth or OBN data) and imaging techniques (e.g. elastic FWI) are addressing the imaging challenges caused largely by complex Messinian evaporites as well as mobile shale. We demonstrate, using seismic examples, the improvements that some of these techniques have resulted in.

The area is located to the north of the onshore Western Desert and west of the Nile Delta, and proven plays of these areas extend into Egypt's West Mediterranean Sea. Modern 3D data demonstrates the offshore extension of the Western Desert rift system, that has the potential to expand the proven Jurassic and Cretaceous clastic and carbonate play fairways into this area. The western part of the Nile Delta extends into the area, making Oligo-Miocene clastic reservoirs in combination stratigraphic-structural traps likely targets in the deeper water areas. Clastic channel systems in the Pliocene are other targets in the area. Channel complexes within both the pre- and post-Messinian sections can be clearly mapped in 3D seismic data. Within the deeper basin, it is likely that pre-Messinian targets, in the form of shelf edge pinchouts, base salt closures and combination stratigraphic-structural traps will be the primary targets. Exploration concessions could contain multiple opportunities that include all the above play types in a single block.

Recent exploration well results in the area have been promising and are driving interest, with the Khendjer-1 well (2024 in the North Dabaa concession) and Nefertari-1 well (2025, in the North Marakia concession) targeting the offshore extension of the proven Western Desert hydrocarbon province. The Khendjer-1 well was reported as dry however, the Nefertari-1 well was announced as a gas discovery at relatively shallow depths (~1km below mud line), likely indicating a Cretaceous or younger aged reservoir. Additionally, there has been success to the east with the El King-2 discovery in Messinian reservoirs (North King Mariout concession).

Exploration in this area is set to soar with extensive modern 3D seismic data available and new exploration wells planned. In this presentation, we highlight some of the geological and geophysical complexities and future prospectivity using relevant seismic examples.