

Geophysical and Geological Assessment of Hydrocarbon Potential in the Northern Palmyra Basin, Syria

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Geophysical-geological data and a 3,000-line-kilometer 2D seismic survey were used to assess the oil and gas potential of the northern Palmyra Basin in central Syria. The study aimed to estimate hydrocarbon reserves by interpreting seismic reflection data, creating detailed structural maps, and correlating well logs. The seismic data provided insights into subsurface geometries, fault systems, and stratigraphic relationships, helping identify potential hydrocarbon-bearing zones.

Core samples from key intervals were analyzed to assess lithological characteristics, geological structures, and petrophysical properties like porosity, permeability, and fluid saturation. These samples were also examined for direct hydrocarbon indicators, such as oil stains, fluorescence, and gas effluence, confirming active petroleum systems.

The integrated analysis of seismic data, well logs, and core samples revealed hydrocarbon-bearing formations from the Cretaceous to the Neogene-Paleocene intervals. These formations showed favorable reservoir properties, including porosity-permeability relationships and sealing mechanisms, essential for hydrocarbon accumulation. Direct hydrocarbon indicators (DHIs), such as amplitude anomalies and flat spots on seismic profiles, along with structural and stratigraphic traps, further confirmed hydrocarbon presence.

The study estimated recoverable reserves in the northern Palmyra Basin at approximately 200 billion cubic meters of natural gas and 950 million barrels of oil and condensate. These findings highlight the basin's significant hydrocarbon potential, making it a promising target for future exploration and development. The results enhance understanding of the region's petroleum systems and provide a foundation for strategic resource planning and investment in Syria's energy sector.

References

- 1) Al-Saad, D., Sawaf, T., Gebran, A., Barazangi, M., Best, J. and Chaimov, T. (1992) 'Crustal structure of central Syria: The intracontinental Palmyride mountain belt', *Tectonophysics* 20, p 345-358.
- 2) Brew et al., *Tectonic and Geologic Evolution of Syria*, GeoArabia, Vol. 6, No. 4, 2001 Gulf PetroLink, Bahrain
- 3) Searle, M.P. 1994. Structure of the intraplate eastern Palmyride Fold Belt, Syria. *Geological Society of America Bulletin*, v. 106, no. 10, p. 1332–1350.