

Using 2-D Seismic Data to Determine the Role of Bedrock Structures in the Location and Nature of the Oil Traps in Onshore Oil Field, Northern Nile Delta

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Abstract

The present study aims to interpret the available data, derived from well logs and 2-D seismic reflection data, in the northwestern area of the onshore Nile Delta, in order to delineate its structural regime and also to detect the locations that could be valid traps for hydrocarbon accumulation at the Tertiary-Quaternary sedimentary section. The study area lies between latitudes 30° 31- and 31° 17- north ,and longitudes 30° 38- and 31° 21- east.

Using the available well logs, the average velocity gradients are calculated at Mit Ghamr, El-Wastani, Kafr El Sheikh, Abu Madi, Qawasim, and Sidi Salem Formations and velocity contour maps are constructed. The available 2-D seismic sections were interpreted and utilized to construct the iso-time structure contour maps on the tops of for mentioned tops. These maps are used to draw depth maps, and also to construct three-dimensional relief maps. The depth maps show the predominance of two tectonic trends. These trends are: the E-W trending faults (orienting WNW-ESE), which characterize the Mediterranean Sea tectonic trend, and the NW-SE trending faults that characterize Gulf of Suez tectonic trend. By integrating the structure contour maps together with the different kinds of maps have been done using different sources of data, the possible locations that can be oil traps for hydrocarbon accumulation have been detected.