

Секция «Актуальные проблемы геологии нефти, газа и угля»

**Seismic analysis and hydrocarbon potential of Miocene-Quaternary deposits in the Western sector of delta and the detection of the underwater alluvial fan of the Nile**

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The Nile Delta is one of the major hydrocarbon regions in Egypt. The Nile Delta is considered to be a suitable place for alluvial kinds of channel sediments, especially in the Pliocene and Miocene times. There was a rifting in the Passive continental margin of Egypt during the upper Jurassic-lower Cretaceous, a basin is created after rifting by thermal subsidence which is known as Nile Delta Basin [3]. It comprises a province of more than 248,000 km<sup>2</sup> of the Mediterranean sea in the east. The Nile Delta Basin possesses more than 6.5 km thick of Upper Paleogene-Pleistocene clastic deposits [1], which were carried by the Nile River with flows until emptying into the Basin in the Mediterranean Sea.

This study focuses on the subsurface Miocene-Pleistocene sedimentary sequence of the Western Delta of Deep-Sea (WDDM) concession. Analysis of seismic, based on obtainable well data, and seismic data, allows us to divide the studied stratum into two mega sequences: Pre. and Post. Messinian complexes resulting in transgressive-regressive sedimentation cycles of sea level during the evolution of the Miocene -Pleistocene subsurface sedimentary sequence. The Relative level of the sea was extremely falling in the time of the Messinian period, although it was largely rising at the time of the lower to Middle Pliocene [2]. Pre/Messinian complex encompasses the Miocene strata, while the Post/Messinian complex consists of a thickness pattern of deposits in the time of Pliocene to Pleistocene and ended up with Holocene. The comprehensive study presented here divides these complexes into several orders of sea level cycles. Pre/and Post/Messinian complexes consist of several third-order cycles, which is called a depositional sequence, hence the thickness pattern starts from Sidi Salem Formation and ends up with MitGamr Formation (Pleistocene). The interpreted anticline represents a characteristic overlap that can create an appropriate structural trap for hydrocarbons in the sandy intermission of the formations of the Western Deep-Sea Delta field such as Kafr Elsheikh siliceous clastic. Besides, the recognized individual and various hidden routes, such as channel and sub/channel in Pre/Messinian complex are approved for additional inspection to discover hydrocarbons.

### References

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- 2) Barber, P.M., 1981. Messinian subaerial erosion of the proto-Nile delta. Mar. Geol. 44, 254pp.
- 3) Dolson, J.C., Shann, M.V., Matbouly, S., Harwood, C., Rashed, R., Hammouda, H., 2001. AAPG Memoir 74, Chapter 23: The Petroleum Potential of Egypt. 1369 pp

### Illustrations



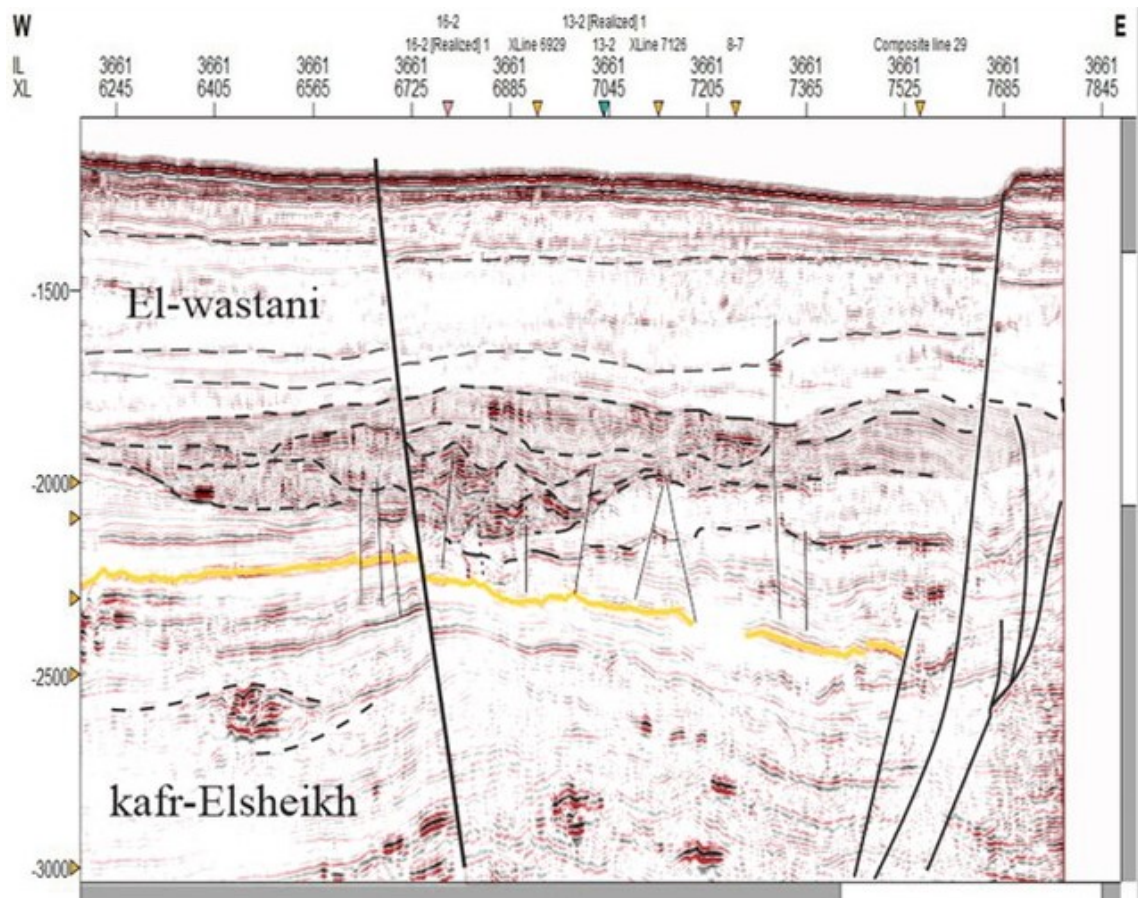


Рис. 3. Inline 4480 shows buried lenticular form channels in Kafr elsheikh formation