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ROLE OF THE TECTONIC AND GEODYNAMIC ACTIVITY IN THE NORTH-WESTERN PART OF THE SOUTH CASPIAN BASIN

(in the example of the Bulla Sea structure)

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ABSTRACT. *The South Caspian Basin is a part of the modern Azerbaijan territory of the Alpine-Himalayan active zone (AHAZ), which is formed with the oil-gas area, regions rich in carbohydrate (KH) in the active and passive outer basins of the ancient Tethys ocean.*

Basic tectonic units of Meso-Cenozoic complex the known tectonic elements, the tectonic structure of the territory of Azerbaijan which is not a huge area but has its own complex folded was formed as a result of a sharp change in the difference in the geological-tectonic connection.

Keywords: Tectonic activity, tectonic faults, mud volcanoes, composition of fluids, geodynamic tension, seismic zone, hydrodynamic activity, seismogram, screen type deposit.

Evaluation of the oil potential of the Caspian basin and correct orientation of exploration in the deep layers are one of the most actual problems of the day.To study each structure based on new data, conducting fundamental scientific researches can help to find a positive solution to all the projects implemented in the development of deep layers in the future.

Caspian basin appropriate to Plate tectonic's model covers the eastern part of the Tethys ocean which is developed by Alpine-Himalayan orogenic movements in the early Paleogenic period.

The basin area consists of three main geotectonic elements:

- Caspian (Russian platform);
- Central part (Iskit-Turan Epi-Hersin platform);
- Alpine geosynclinal zone in the south.

Three (north, middle and south) bottom basins are separated related to the basic structural elements.

Southern Caspian Basin that is studied to some extent in detail with large-scale researches is separated from the central Caspian by the Caucasus-Kopetdagh fault [1]. The Southern Caspian basin is divided into several tectonic regions: Absheron Balkhanyani anticlinal zone; - Absheron archipelago; - Beach archipelago; - The deep-sea part of the Caspian Sea.

These oil-gas-rich regions are separated by geophysical methods, according to seismic exploration and data from drilled wells, in turn, consist of structures and exploitation deposits (Fig.1). Mud volcanoes are widely spread in existing anticlinal areas of this region and play a major role in the formation of deposits and the distribution of hydrocarbons. Mud volcanoes are considered as the main factors that confirm the oil and gas prospect of the area. So that, in addition to the favorable paleotectonic and paleogeographic conditions for the formation of hydrocarbons, there is also a sedimentary complex with lithophysical properties suitable for the migration, collection and bed formation of hydrocarbons in the basin.Sedimentation of the productive layer (PL) coming with rivers has occured in several directions (Fig.2). Being the small flows in addition to large rivers as Paleo Volga, Paleo Kura and Paleo Amudarya, show the sharp variability of the lithospacial environment of the basin.

The existing tectonic regions are associated with large-deep faults recorded in the South Caspian basin. Because the sediments coming with PaleoVolga have the better reservoir, NGR

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structures situated in the distribution area of this sediments have high oil and gas potential. Contact section of Paleo Volga distribution area for MG with Paleo Kura with the weaker reservoir are compatible at the same time with the border of Baku archipelago (N.-N.W.) with the Absheron

Figure 1. Oil and Gas prospect of the Caspian Sea [1].
1-very perspective areas
2-Perspective for hydrocarbons search
3 - Detected structures
4-Oil and Gas Fields

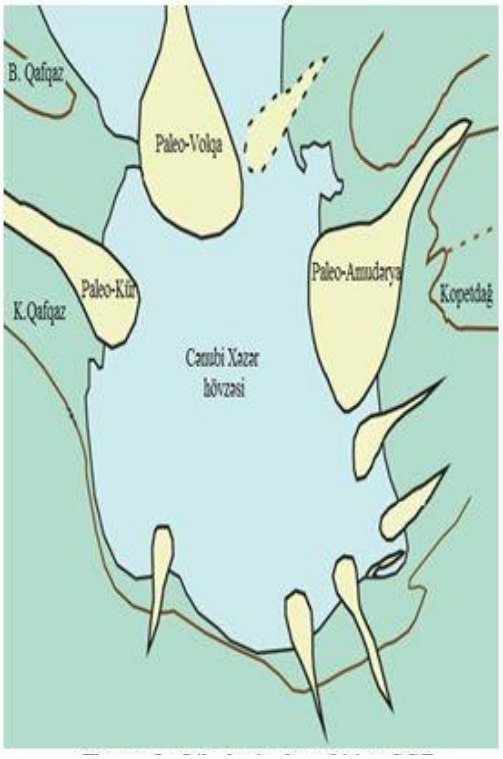

Figure 2. Lithological nutrition of SCB

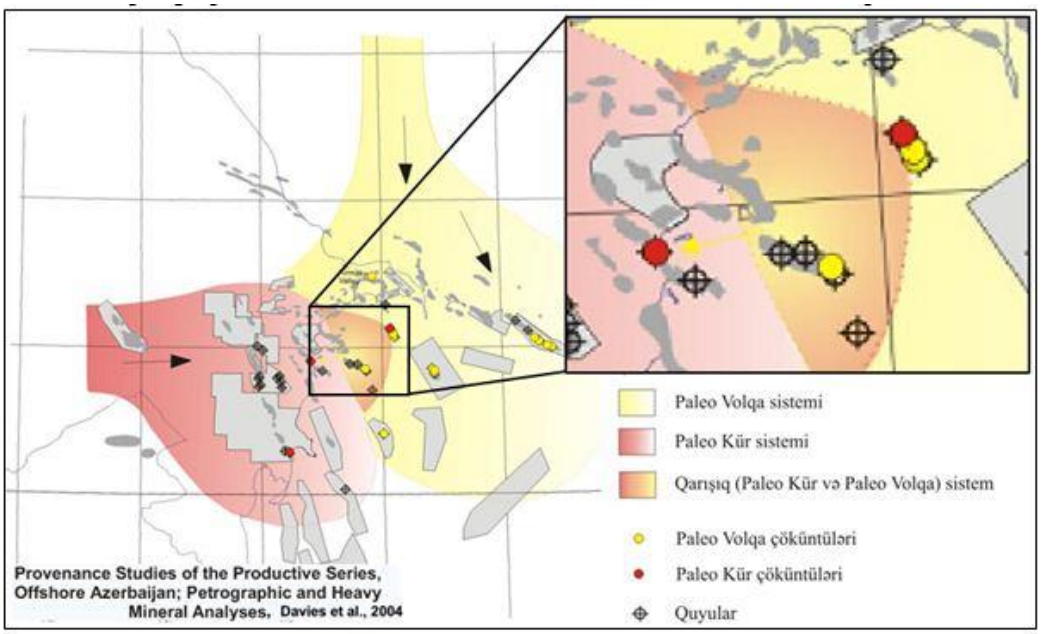

Figure 3. Sedimentation basin during breaks [2]

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archipelago. From this point of view, the complexity of the geological-tectonic structure requires high attention in the formation of the structure located in the research area also in the direction of evaluation (Fig.3).

In recent years, the presence of tectonic movements along with sedimentological processes in the direction of the existing data specification on structures located in the north and north-eastern part of the Baku archipelago, purchase of new information allow us to formulate a certain point in this field. Works carried out with the application of new methods, delivery channels of paleo rivers, products and their petrophysical features allow you to express your ideas about the sedimentation processes and tectonic structure.

This can be explained more widely as an example of seismic exploration work the carried out with modern equipment in the Bulla-sea field.The researches specified the geological-tectonic structure of MG sediments and the deeper layers and the Bulla-sea structure are described as a complicated, slightly asymmetric brachy-anticlinal in the results. The arch part of the structure is complicated by a number of tectonic faults with slip-strike type direction of extension change related to the mud volcano. As the results of the faults, the arch part and CQ flank of the structure relative to one another was a normal fault to the south. Faults with slip-strike type are monitored throughout all field and on the whole depth of the transection and the amplitude of this reaches about 1200 m in the center of the structure starting at about 600 m in the north-west within the area and then decreasing to 100 m in the direction of south-east (Fig.4) [3]. These faults going on the north-west direction continue related to the Alat-sea structure. The materials obtained as a result of the research will help to formulate ideas about the sedimentation conditions (CTS). Followed green-colored horizont in the seismic profile, which is located in the N.W.- S.E. direction of the Bulla structure in the Fig.5 reflects the FLD ceiling . As mentioned, there have been enough changes in the sedimentation at the beginning of the Lower Pliocene. As shown in the figure, sedimentation has been stable at higher intervals. Unlike that, low intervals are characterized by a more chaotic wave area. The reason for this was a sharp change in the sea level at the same time with active tectonic movements.

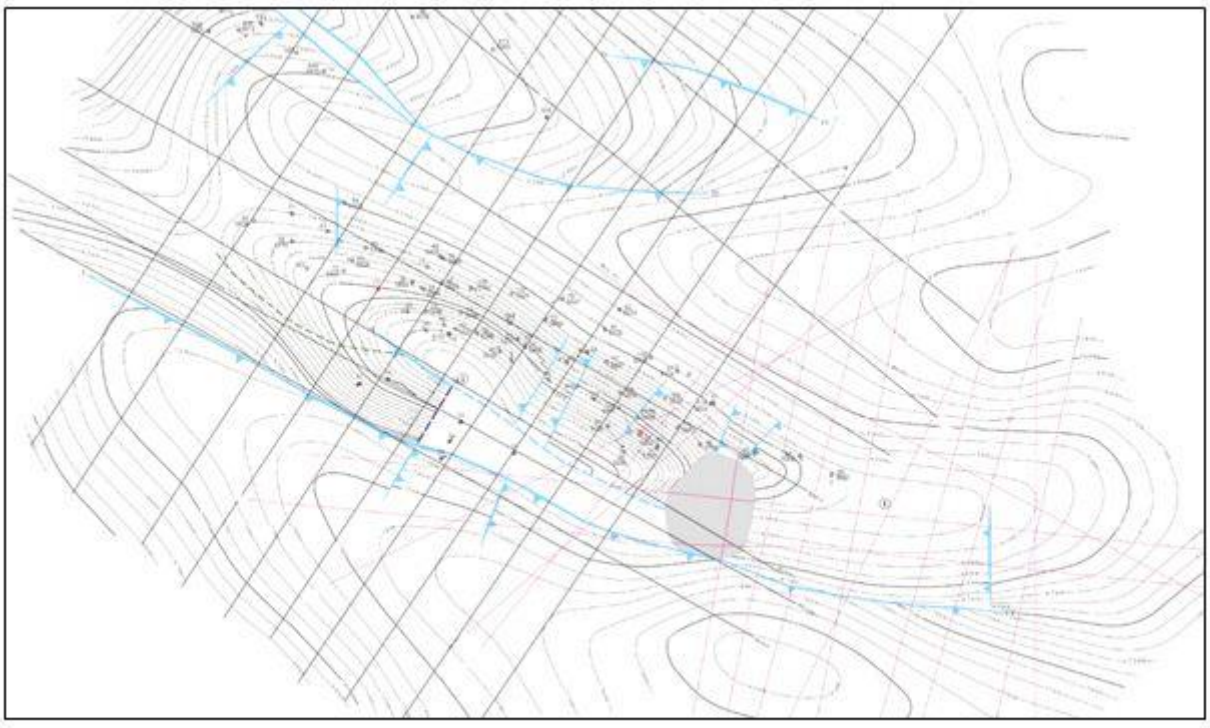


Figure 4. Structural Model of Bulla Area VII Horizon

The southern and northern wings of the Bulla-sea structure differ in their lithological and physical properties from each other. Such distinctive signs may arise related to the existing conditions on the contact line of the Paleo rivers.

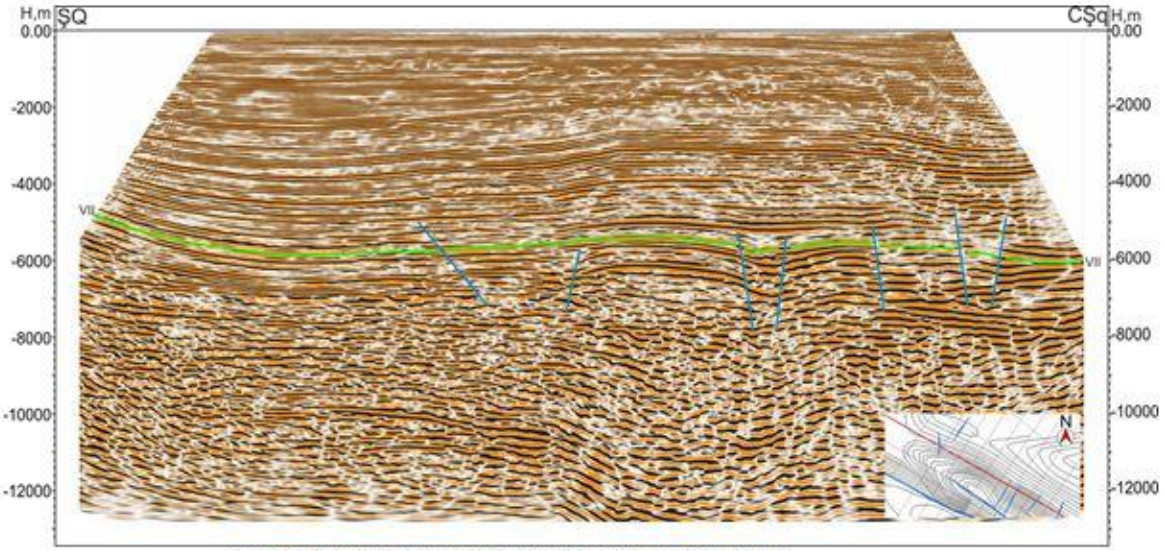
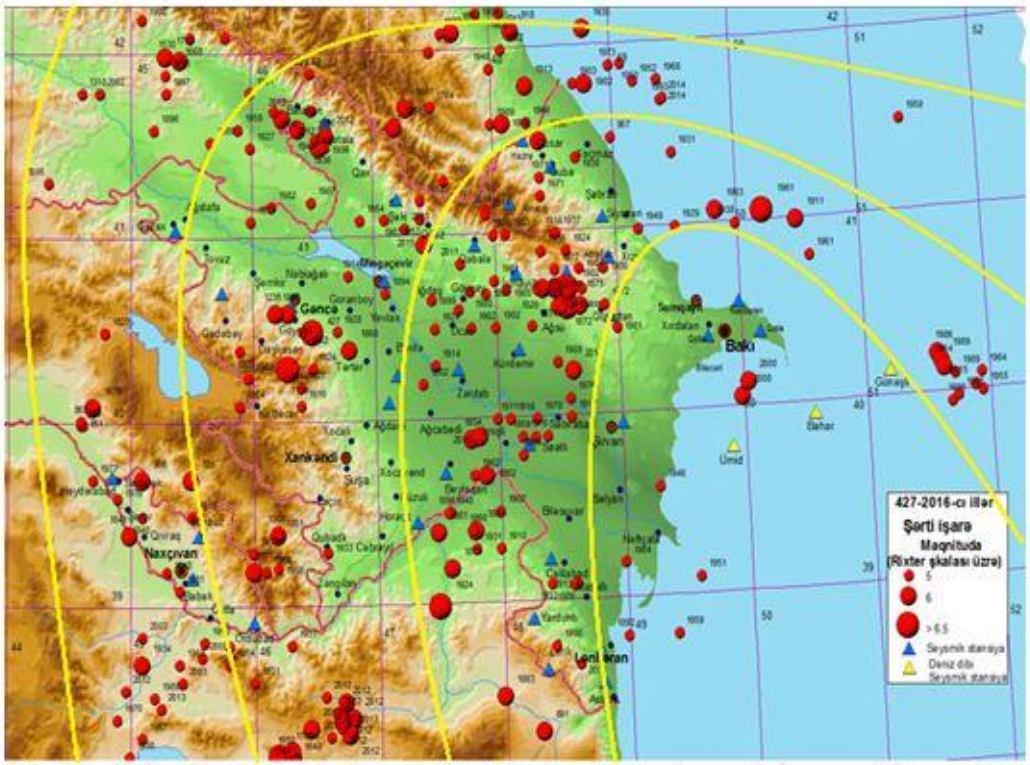


Figure 5. Seismic research results conducted in 2016



Seismic activity observed more characteristic in the Caspian basin area in the rounded zones. [5, Veliyev, 2018].

The seismogeodynamic condition observed in this area has been very active in geological periods [4, 5]. Seismic activity is stable in the seismic map of 427-2016 years in the Azerbaijan area

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where are Bulla sea, Shah sea, Umid, Babek structures, but Geodynamic processes that have arisen from effects of earthquakes in nearby areas have resulted in the complication of sedimentary tectonic faults. Tectonic disturbances and faults create a density up to 6-7 km of sedimentary layer depending on the geodynamic tension. The number of faults decreases in the 7-20 km interval in deeper layers.There is a similar landscape on the upper and deep layers. The shape of the anticlinal structure and the stabilization of the layers have been preserved in the deeper layers, there are more favorable conditions for collecting hydrocarbons and formation of deposits.

Results

1. The geological structure of the Bulla-sea has been analyzed on the basis of newly acquired seismic and seismological data.
2. The geodynamic-tectonic structure, paleogeographical conditions of the sedimentary complex at 6-10 km interval in deeper layers are considered to be valuable for the formation of deposits.
3. It is estimated that the deep layers are perspective in terms of oil-gas.

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