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Analysis of Exploration and Exploration of Oil and Gas Deposits of Uzbekistan

Davron Juraev Amir oglu [1], Ergashev Akrom Kholmominovich [2], Khudoyorov Mirzokhamdam [3]

[1, 2] Assistant, Termiz Institute of Engineering and Technology

[3] Student, Termiz Institute of Engineering and Technology

Abstract: This article provides information on the formation of oil and gas deposits in the territories of Uzbekistan, their composition, finding deposits and the period to which these deposits belong. In addition, it was discussed about the location of mines underground and the factors influencing the increase of mines.

Keywords: oil, gas, mine, sediment.

The underground layer of Uzbekistan has a great potential for oil and gas production: 60% of its territory with a total area of 447.4 thousand km2 is promising for oil and gas. Currently, 162 oil and gas fields have been opened in Ustyurt, Bukhara, Khiva, South-West-Hissar, Surkhandarya and Fergana regions, 92 of them are producing.

Extensive geological, hydrogeological and geophysical research is being carried out on the Ustyurt Plateau, studying the section of Mesocenezoic, Permian-Triassic and partially later Paleozoic sediments.

The oil-and-gas range spans from Early Jurassic to Paleozoic sediments, with productivity associated with approximately Carboniferous limestones. Information on the lithology and reservoir properties of these rocks is currently limited, but open gas wells in the Karachalok and Chibin fields indicate that these rocks are promising.

Hydrocarbon accumulation in Jurassic sediments is associated with sandstones from the dome and flank parts of anticlinal uplifts. The depth of productive horizons is 2300-3550 m. The open porosity of rocks reaches 20-25%, the amount of working product of gas wells is several hundred thousand cubic meters per day. The amount of condensate in the gas is 20 g/m3 in the early Jurassic deposits and increases to 200 g/m3 and even more in the later Jurassic deposits.

6 hydrocarbon deposits have been opened in the region, the total geological reserves of gas in them are more than 50 billion cubic meters, and liquid hydrocarbons are 6.6 million tons. industrial-scale flows of gas and oil have been identified in 8 fields of exploration. The main prospects of the region are associated with the exploration of Jurassic rocks, the search for traditional and non-anticlinal covers. In particular, the Arol zone stands out, where the Urga gas condensate mine was opened and put into operation.

Productivity in the Kuanish-Koskalin zone is also associated with Jurassic and early Paleozoic carbonate sediments. There, 13 wells are prepared for deep drilling and 16 oil and gas wells have been discovered.

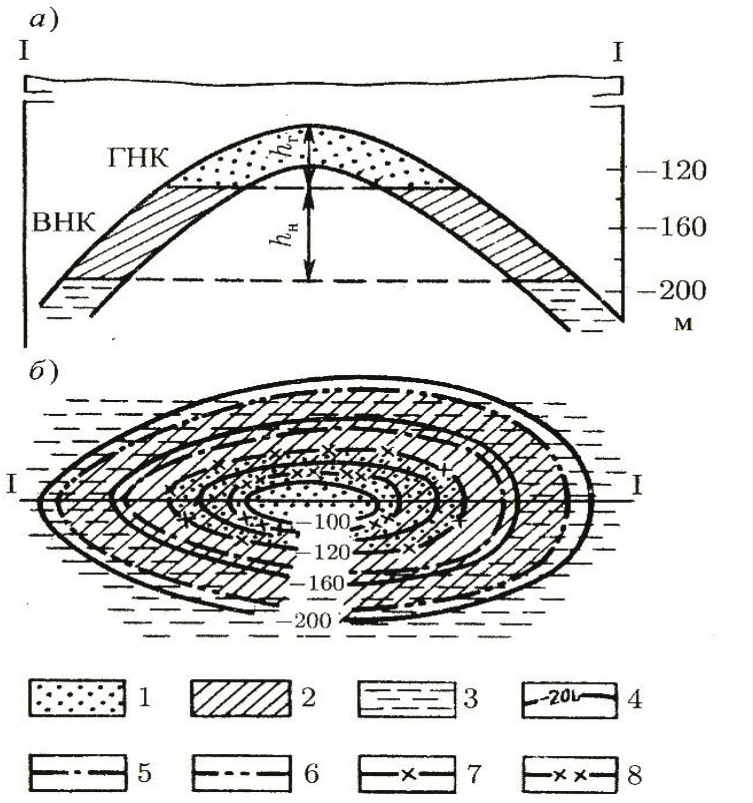

Figure 1. Conditional designation of oil and gas field drawings.

More than 110 oil and gas fields have been discovered in the Bukhara-Khiva oil and gas region. Important target research objects are associated with carbonate sediments of the Upper Jurassic and Lower Cretaceous periods, along with them, exploration is also being carried out in later periods, Middle Jurassic and Upper Paleozoic deposits.

The possibilities of opening new oil and gas deposits in the Bukhara-Khiva oil and gas region have not yet ended, especially in the poorly explored area of Beshkent (if we take into account the small number of searched fields), the coefficient of opening fields is quite high, i.e. 30%.

One of the important features of the Beshkent zone is the presence of a thick layer (more than 500 m) of Kelloway-Oxford carbonate sediments composed of organogens, which correspond to high-rate hydrocarbon deposits characterized by a large concentration of reserves per unit area. For example, the Kandim field, located in the olite facies of the shallows, has more than 150 billion m3 of gas reserves in an area of more than 600 km2. On the other hand, the total gas area of Alan field is 37 km2, but the gas reserve is more than that. Kokdumaloq, one of the largest oil and gas condensate fields in our country, is also located in this region. Alan and Kokdumalak mines the hydrocarbon pile is associated with isolated reef formations of Oxfordian age. The use of modern technology and equipment in this area is still very abundant and at the same time makes it possible to open large hydrocarbon deposits. This includes Jurassic deposits with a depth of 2,500 to 4,000 m as the main object.

The border of the Hisar region passes through the Karail-Lyangar flexural-discontinuity zone in the north-west, the state border of the Republic of Turkmenistan in the south-west, and the Hisar mountain ranges in the north-east. 13 hydrocarbon deposits have been opened on its border, these deposits are associated with carbonate deposits of the Upper Jurassic period. This area differs from the neighboring areas in that it has a relief that has been formed as a result of complex tectonic activity.

The main structural elements of the area are thrust zones, these zones consist of tectonic longitudinal plates oriented mostly to the southwest, divided into blocks of various sizes by a series of transverse faults.

From the point of view of oil and gas, the most likely are subsalt sediments of the upper age, these sediments are composed of limestones and dolomites, and the upper part is composed of anhydride layers. The collector is in the form of hole-crack hole (cavity)-hole, crack-hole. Open porosity 3–18%, conductivity 0.1–1000 mD. The mounds belong to massive, tectonic barrier types. According to the composition of hydrocarbons, gas condensate, oil gas condensate and oil fields have been opened here. The largest of them are related to the Shorton, South Tandircha, Jarquduq, South Qazilbairok deposits and the barrier reef system that continues to Turkmenistan. The depth of productive horizons is from 1200 m to 3500 m will change. In the area of Hisar, 9 handles have been prepared for deep drilling and 29 promising fields have been opened. The territory of Surkhandarya is bounded by the Kelif-Sarikamish hill in the west, the state border of Tajikistan in the north and east, and the Amudarya in the south.

The appearance of the present-day geological structure of the area in question was formed during three main development stages: geosynclinal - ended at the end of the Paleozoic, platform - from the upper Permian to the Neogene period continues.

The sedimentary cover is represented by rocks of continental marine and lagoonal origin lying on the washed surface of the Paleozoic.

Three oil and gas complexes are distinguished in the section:

- Jurassic period, composed of 400–800 m thick Upper Jurassic subsalt carbonates; the organogenic species lying in the upper part of this thick layer are collectors;
- Cretaceous (Neocom–Aptian) period, represented by terrigenous and partially caronate reservoirs; open porosity of sandstones is from 12 to 30%, permeability is from 3 to 5000 mD (more in the range of 300–600 mD), that of limestone layers is 9–11% and 5–30 mD, respectively;
- includes fractured carbonate reservoirs of the Paleogene, Paleocene and sandy-carbonate periods, these reservoirs are covered by a thick layer of clay. Their porosity is 10–25% and permeability is 200–250 mD.

The depth of the Kelloway-Oxford limestone varies from 3 km to 9 km from north to south, and the surface of the overlying heterogeneous bedrock varies from 5 km to 12 km.

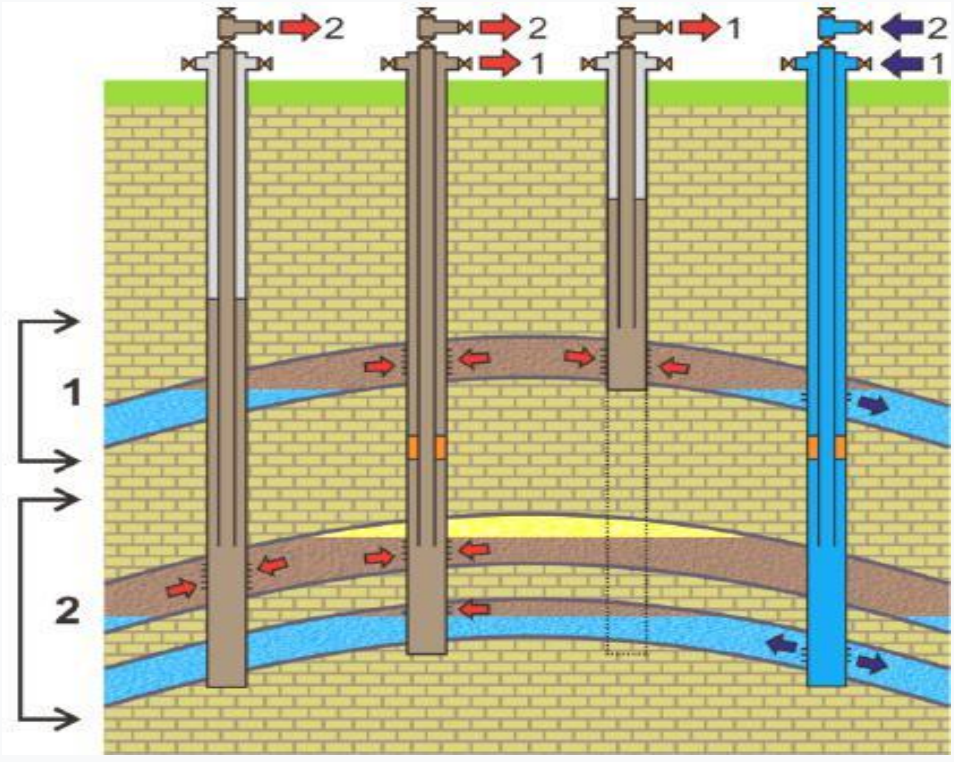

Figure 2. Finding mines

The stratigraphic range of distribution of oil and gas accumulations includes deposits from the Jurassic period to the Paleogene period. Jurassic deposits in the region are promising after the discovery of a huge gas pile in the Upper Jurassic carbonates in the Gajak field, as well as in the Bukhara-Khiva region. from the region and the southwestern ridges of Hisar are highly valued due to the high productivity of the carbonate Jurassic deposits.

11 oil and one gas fields were opened in the Surkhandarya region, 3 objects were prepared for exploration drilling as a result of seismic exploration, 31 objects were identified and opened.

The Fergana oil and gas region is surrounded by a mountain range, a large depression with an area of 16,000 km2, lies in the internal negative structure of the Tien-Shan.

28 oil fields have been opened in the territory of the Republic of Uzbekistan on the border of the oil and gas region of Fergana, most of them are associated with deposits of the Paleozoic, Jurassic, Cretaceous, Paleogene and Neogene periods.

The structure of the Ferghana region is very complex. New researches have classified the traps in it by the density of placement and their types, the depth of the productive bed and the level of complexity with interruptions. there are regions with different structures. Based on these and other indicators, the peripheral and central parts, called the Southern and Northern Step and the Central Graben, are clearly distinguished from each other. The graben is divided by the discontinuities that limit the distribution area of the thick-sectioned beds of the Neogene and the large lying depressions (up to 6-7 km). From the deep and little-explored, but promising central part of the Fergana depression, more than 30 structural traps have been opened so far, which, unlike the traps in the peripheral zones, are relatively large. It has a simple structure, although it has dimensions and is complicated by interruptions.

In the central graben zone, oil deposits were found in several areas (Mingbulok, Northern Niyozbek, Karaqqiqum, Makhram, Gumkhana, Voriq) in a very large stratigraphic range, from Paleozoic deposits to Neogene sediments. The fact that the main sought-after objects lie at a great depth of the productive layers at the intersection of the Paleogene and Neogene deposits makes it much more difficult to develop the traps.

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