Current Problems of Deep Exploratory Drilling in Tatary

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According to the oil prospects of the Devonian sediments of Tatary, we divide the Trans-Kama territory into two parts: west and east.

In the east part where most of the prospecting wells have been drilled, rich oil fields have been discovered. Here in almost all the wells either economic oil occurs or shows are observed in the Givetian stage of Middle Devonian and also in the Pashiy and Kynov beds of the Upper Devonian. The Devonian sediments in this part of Trans-Kama are very favorable.

In the west the terrestrial sediments of the Devonian have been encountered in various structural conditions by more than twenty wells, but no shows of oil have been found. The absence of indications of oil is not sufficient for writing-off this region; the west part of Trans-Kama is, however, adjacent to the unfavorable areas of the right bank of the Volga and seems to be a continuation of the central regions of the Russian Platform.

The east part of Trans-Kama embraces tectonically the south cupola of the Tatar dome and its flanks and also the southeast slope of the north cupola of the Tatar dome and the east border of the Melekess depression.

The absence of any signs of oil in the Devonian terrestrial sediments and the direct contact with the unfavorable regions of the Russian Platform compels us to classify the west part of the Trans-Kama of Tatary as little favorable. Tectonically, the area of Trans-Kama under consideration extends into the western part of the Melekess depression; on the north it abuts against the Kazan-Kinov depression and on the west against the east slope of the Tokmov dome.

The thickness of the Pashiy beds and the overlapping fine-grained Kynov clays decreases in Trans-Kama from east to west with the exception of a belt directly adjacent to the Volga.

We assume that in Shugurov time during a general subsidence of the whole territory, the west part of Trans-Kama experienced more rapid subsidence than the eastern; this governed the migration of hydrocarbons toward the east, which explains the above mentioned distribution of commercial oil accumulations.

We draw the boundary between the little productive west region and the highly productive east region along the meridian Novo-Sheshminsk-Nurlat. This is certainly not a straight line; it weaves back and forth. Also, there will be a transition belt, the width of which is difficult to establish. Individual occurrences of oil may be encountered in this belt in Devonian terrestrial sediments.

The unfavorable areas of Trans-Kama do not represent a single tectonic or paleogeographic zone. The conditions of sedimentary accumulation and the tectonic regime in different parts were not the same. Most of the areas are disposed on the north border of the Melekess depression. The changes of thickness of the sediments described above are correct for these areas. Conditions predominated on the north that were similar to those of the central parts of the Tatar dome, where terrestrial sediments of the Devonian are absent. Areas adjacent to the Volga are close to the tectonic and paleogeographic zone of the Kazan downwarp, which has an unusual geologic history. A. M. Mel’nikov thinks that this area is cut from southwest to northeast by a buried ridge of crystalline basement. See Fig. 1.

Not all geologists classify the Devonian of the west part of Trans-Kama as little favorable. In particular, V. I. Troyepol’skiy thinks that the Devonian sediments here are very favorable. Taking this into account and also the fact that individual oil deposits may be encountered in the transition belt in the west part of Trans-Kama, it is necessary that deep drilling be carried out here. All uplifts in this part of Tatary have not yet been drilled in detail. Deep prospecting is now being carried out on the Akan, Alparov, Bugrov, and Pichkas structures. Wells are also projected for the Al’keev uplift. It seems to us that after completion of the work on these structures the status of the oil prospects of the Devonian sediments of the west part of Trans-Kama will be clarified. For a more complete picture, it can be recommended that a few wells be put down in the areas between the drilled structures and also that a profile of wells be put down from Melekess to Nurlat.

The highly favorable part of the Trans-Kama district of Tatary is located on the south and in part on the north crests and also on the flanks of the Tatar dome. The following zones are distinguished (see Fig. 2):

A. A zone of development of oil deposits of the first stage in which the water-oil interface is at ~1480 to ~1490 m. To this are referred all the main deposits in the Pashiy and Kynov beds of the Romashkin-Minnibaev fields.