

## STATUS AND PROSPECTS FOR THE DEVELOPMENT OF OIL AND GAS PRODUCTION IN THE NORTHWESTERN CASPIAN REGION

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The area under consideration is situated within the North-Western rim of the Caspian Sea and comprises two heterogeneous tectonic elements: the South-Western part of the Caspian depression and the Karpinsky swell. The structure of the South-Western part of the Caspian depression features a thick (up to 15.0 km) sedimentary Paleozoic-Cenozoic sequence. The primary tectonic element is the Astrakhan dome clearly identified in the structure of the subsalt sequence and the base. It measures from 120 to 180 km and has an amplitude of approximately 2000 m. The Astrakhan dome is the most salient positive structure of the Caspian depression and naturally is the largest zone of oil and gas accumulation. In the central part of the dome at the top of the middle Carboniferous formations (at a depth of 4,000 - 4,100 m) is located the Astrakhan sulfur and gas condensate deposit which is unique in terms of the fluid system composition and reserves. One accumulation contains some 6.0 trillion m<sup>3</sup> of gas, 1.2 billion tons of condensate and 2.0 billion tons of sulfur. A high capacity gas processing complex was built on the basis of this field. In 1998 the field produced about 8.0 billion m<sup>3</sup> of gas, 2.5 million tons of condensate and 2.0 million tons of sulfur. Given the current production volume the reserves will last for hundreds of years.

We predict discovery of major accumulations of oil and gas without hydrocarbon sulfide with reserves similar to those of the Astrakhan and Tengiz fields which underlie the gas condensate accumulations in the Devonian-Lower Carboniferous, primarily carbonate, sequence proceeding from the peculiarities of paleotectonic development and the established mechanism of formation of hydrocarbon accumulations. Drilling of Volodarskaya well No.2 (which bottomed out at 5,974) yielded intensive oil and gas shows, including gushing of oil and gas for three hours. The area of the oil and gas prospect is around 10,000 sq km. Based on the estimated reserves, volume of oil production may amount to 25-30 million tons.

The primary pay zones are confined to the Devonian and Carboniferous formation which are regionally oil and gas-bearing. The prospect is crossed by the Tengiz-Novorossiysk oil pipeline, the gas pipeline to the Caucasus, the Astrakhan - Moscow railway and motorway and is in the vicinity of the Volga River.

The sedimentary overburden (up to 3.0 km thick) is primarily composed of Mesozoic-Cenozoic terrigenous deposits. A number of small oil and gas fields have been discovered in the area. Approximately 0.3 million tons of oil were produced in 1998. The amount of reserves is not high.

The peculiarities of the geological structure, paleotectonic development and the extent of exploration evidence that oil and gas fields which have small or medium reserves can be discovered within the Karpinsky swell.

### Conclusions:

1. Major oil and gas-bearing potential is associated with the Devonian-Carboniferous deposits of the Astrakhan dome.

2. The annual volume of gas production may be increased up to 18.0 billion m<sup>3</sup> and that of oil, up to 25-30.0 million tons.
3. The availability of the existing infrastructure, favorable climatic and geographical conditions predetermine high economic efficiency of operations in the long term.