



About Opportunity of Monitoring of Geophysical and Geochemical Fields in Super Deep Wells of Tatarstan

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The tectonic evolution of the Volgo-Ural Region since Late Proterozoic has been characterized by periodical vertical and horizontal movements. Geodynamic processes have produced numerous dislocations or faults in the crystalline basement of the STA, which have been revealed by exploratory drilling. Many wells in and near the Tatarstan and Romashkino oil fields have penetrated the crystalline basement to a depth ranging from 30-50 m to 4 km and can give information on its fractured zones, fluid and gas content. Fractured zones with varying thickness, degree of decompression and fluid content have been observed in numerous wells. All previous evaluation of the crystalline basement's prospects have been primarily based on the conventionally conducted drill-stem formation tests (DSFT). However, oil and gas inflows from the crystalline basement of the Dnepr-Donetsk trough showed that the sole use of DSFT results for evaluating the hydrocarbon potentials can be erroneous. Moreover, the available drilling data from deep wells show that excessively high repressuring and the use of loaded drilling mud can drive filtrate deeply into the reservoir. When the drilling rate is low, the time interval between penetration and testing of prospective zones becomes quite long. If reservoir pressure is equal to or is lower than hydrostatic, mud solution penetrates the reservoir and forms seals, preventing formation fluid from flowing out during DSFT procedures. The quantitative evaluation of oil replenishment can be conducted through oil-field studies of the geophysically located anomalous zones using new geological and geophysical criteria of the location of such zones. Thus, the integrated studies including chemical, structural and radiological analyses can effectively help to more precisely locate areas for further detailed geochemical and geophysical surveys to reveal hydrocarbon potentials of great depths. The quantitative evaluation

of oil replenishment can be conducted through oil-field studies of the geophysically located anomalous zones using new geological and geophysical criteria of the location of such zones. Thus, the integrated studies including chemical, structural and radiological analyses can effectively help to more precisely locate areas for further detailed geochemical and geophysical surveys to reveal hydrocarbon potentials of great depths. Degassing at a great depth should primarily be studied by the monitoring of geophysical and geochemical fields, which is possible through the deep wells that can serve as geo-observatories, which are now possible to create in Tatarstan.