

Triassic – Early Cretaceous Structural Development of the Central Part of the Northern Eurasia

Konstantin Sobornov¹, Aleksandr Afanasenkov², and Aleksandr Obukhov²

¹Nord-West Ltd., Moscow, Russian Federation.

²VNIGNI, Moscow, Russian Federation.

ABSTRACT

The central part of the Northern Eurasia and adjacent seas host prolific hydrocarbon basins including mature basins of the West Siberia and Timan Pechora as well as underexplored Enisey Khatanga trough. These basins are surrounded by exposed and buried fold belts: the Polar Urals, Pay-Khoy – Novaya Zemlya, and Taymyr. Integrated interpretation of vintage and new G&G data including new regional seismic database permitted a revision of the regional structural framework. The updated regional interpretation provides new insight into the Triassic-Early Cretaceous development of the study area. This may be instrumental in evaluation of remaining exploration potential. It is interpreted that the Late Paleozoic fold belts built in course of the Pangea assembly collapsed in the Early Triassic. This event was marked by extensional faulting which created a system of half-grabens. They provided accommodation space for rapid clastic sedimentation in the West Siberian basin and Enisey Khatanga trough during Early-Middle Triassic. The extensional tectonic setting was interrupted by a major structural reorganization in the Late Triassic-Early Jurassic. It included a large-scale transpressional inversion which most likely resulted from the oblique collision between the Siberian platform and the North Kara plate. The South Kara – Yamal plate escaped from this collision zone to the south-west. It caused an extensive transpressional faulting in the Enisey Khatanga trough and north West Siberia, as well as folding in the Pay-Khoy – Novaya Zemlya fold belt, overprinting the Paleozoic structures. A period of tectonic quiescence and epi-platformal sedimentation throughout much of the Jurassic was followed by an outbreak of intraplate compression in the Early Cretaceous. It reactivated fold belts surrounding the West Siberian basin and led to a general uplift of the Siberian craton. In the West Siberia basin and Enisey Khatanga trough it caused a reactivation of the pre-existing transpressional swells. The Early Cretaceous uplift of the Siberian craton and fold belts flanking the West Siberian basin provided provenance areas supplying clastic material of different composition to the clinoformal complexes, comprising a large part of the petroleum deposits.