

STRUCTURAL GEOLOGY AND STRATIGRAPHY OF THE DAGESTAN CAUCASUS AND THE TEREK-CASPIAN FOREDEEP

Daniel D. Schelling¹; Dimir Mirzoev²; and Zilfikar Dashtiyev³

¹ Energy & Geoscience Institute, University of Utah

² Dagestan Science Center, Russian Academy of Sciences

³ Dagneft

Underlain by a northward-dipping Benioff zone, the Greater Caucasus of Azerbaijan, Georgia and Russia defines an active continent-continent or arc-continent collision zone driven by the continued northward motion of the Arabian Plate relative to the Eurasian continent. However, despite the fact that the Greater Caucasus is a south-vergent tectonic system, a well-developed fold-thrust belt and foredeep has formed on the northern side of the Greater Caucasus within Dagestan and Chechnya, in an apparent “back-arc” tectonic setting. Regional seismic lines which cross the Terek-Caspian foredeep indicate clearly that this southward-deepening, asymmetric structural depression began developing as a foreland basin during the middle to late Miocene as a result of thrust loading along the southern margin of the Seythian platform, which further indicates the timing of initial rapid uplift and compressional deformation across the Greater Caucasus to the south. The Dagestan Caucasus, located to the immediate south of the Terek-Caspian Foredeep, is frequently characterized by tectonic wedging, with north-vergent thrust faults at depth transferring displacement up-section to dominantly south-vergent thrust faults above the highly incompetent shales and mudstones of the Oligocene-Miocene Maikop Formation. Rapid southward thickening of the Jurassic sedimentary section, from only several hundred meters within the Terek-Caspian Foredeep to an estimated four kilometers within the Dagestan Caucasus, indicates that the Dagestan Caucasus is an inverted Jurassic basin which may be located above a Triassic, fault-bounded basin as well. However, Triassic grabens located within the northern Terek-Caspian Foredeep have not undergone any identifiable Cenozoic inversion, and therefore compressional deformation related to the collision of the Arabian and Eurasian plates has not yet migrated north of the “frontal culmination wall” which defines the northern flank of the Greater Caucasus.