

Drilling fluid formulation and properties play a fundamental role in drilling operations. Clay minerals behave initially as a beneficial rheological adjuvant in drilling muds. Nevertheless, the contamination of oil reservoirs by clay minerals present in the drilled geological formation (shales) may generate major problems during drilling as plug formation. In this context, our study deals with the optimisation of drilling conditions in the Hassi Messaoud Algerian field. The mineralogical heterogeneity of this field is first discussed. The rheological and filtration characteristics of water-based muds with different polymer and electrolyte concentrations are investigated. The physical and chemical changes of both drilled formation and drilling fluid during the drilling process are studied. Therefore, depending on the clay present in the geological formation, an optimised drilling fluid system using a new filtration procedure is proposed. A good correlation is found between filtration/rheological properties and inhibition