



Investigation of Rheological and Filtration Behavior of Polyanionic Cellulose and Tapioca Starch in WBM

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Abstract—Drilling induced problems in the near-wellbore region are directly associated with drilling fluids rheological and filtration characteristics. These properties are dependent on the appropriate selection of additives utilized in the mud. Various polymers and other additives are added to improve the rheology and reduce the filtrate loss into the near wellbore region. The objectives of this work are to formulate a non-damaging drilling mud composed of locally available tapioca starch and to investigate its rheology and filtration in the presence of xanthan gum. In this study, tapioca starch in various concentrations has been assessed in combination with Calcium Carbonate. Xanthan gum was used as a rheology enhancer. All the mud properties have been measured according to API specifications. The obtained results were compared with a commercial fluid loss additive; Polyanionic Cellulose (PAC). Eight experiments have been conducted to assess the effect of PAC and tapioca starch on the rheology and filtration characteristics of drilling mud. The laboratory results concluded that tapioca starch can be applied as the rheology modifier and filtrate loss additive. PV, YP and AV were improved using tapioca starch. The fluid loss was reduced in LPLT conditions and a thin filter-cake was observed after filtration.

Keywords—Water Based Mud, Tapioca Starch, Rheological Properties, Filtration Control