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# Formulation of a Rice Husk based Non-Damaging Drilling Fluid and its effect in Shale Formations

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## Abstract

Drilling a borehole is the most important process in the Petroleum Industry for crude oil or fossil fuel production. This facilitates via drilling fluid or mud for an efficient drilling operation to produce the crude oil. Conventional drilling fluid contains bentonite and barite which is a disadvantage for reservoir formations as these react with shale to cause extensive damage in the formation. Formation damage results in decreased productivity of the well thereby reducing its economic value and thus, this can be overcome by an unconventional fluid to produce the unconventional liquid. The unconventional liquid is crude oil or hydrocarbons which cannot be drilled or produced using the conventional method. Swelling and spalling also have big repercussion during drilling such as borehole collapse and stuck pipe using the conventional drilling fluid. In this work, counter these challenges, the unconventional fluid such as non-damaging drilling fluid (NDDF) of rice husk has formulated which is free of bentonite and barite. Rheological properties and shale stability test have investigated for the formulated NDDF. It is observed that the NDDF of rice husk has shown improvement in the rheological properties as compared to base mud. Also, the filtrate loss is reduced drastically in the presence of rice husk, which has the potential to minimize the formation damage and will be less reactive to the reservoir formations. NDDF is a polymer mud system free from clay or other materials which are used in the pay zone or production section and shale to minimize the formation damage. From the enhancing results of the shale stability test of rice husk based NDDF, this has prevented the swelling of the shale and highly helpful to enhance the wellbore stability which will be a potential advantage to the drilling operations of oil and gas industries.

**Keywords:**
Filtrate loss, Non-damaging drilling fluid (NDDF), Rheological properties, Shale stability, Water-based drilling fluids

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