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Improved Drilling Efficiency via Enhanced Water Based Mud in the Niger Delta

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Abstract

This study focuses on latest advances in water based mud as a potential for the Niger Delta, its impact on drilling efficiencies and well productivity. Recently, New mud additives are been developed to enhance the rheology of water based mud to deliver the same characteristics and reliability of an oil based mud when considering the Niger Delta geology. Due to the challenges with Water Based Mud in respect to chemistry and suitability, Oil Based Mud (OBM) has become the main type of drilling fluid in deeper sections during drilling campaign in the Niger Delta. But the use of OBM as come with some challenges that has necessitated the further research and development of Water Based Mud rheology that can deliver the same results as OBM. Some of the challenges associated with the use of OBM include but not limited to high cost and management, contamination of OBM in the storage site during drilling activities, logistics complexity, environmental impact from spills and disposal, and impact on well productivity and reservoir management.

In countries such as Ghana, Columbia, Oman, Mexico, Enhanced WBM mud has been used and is still being used in drilling to deep depths (8000ft-10000ft)TVD in formations with similar geology with that of the Niger Delta. Sample wells will be reviewed from one of these

regions for the project and they will be used to show the evolving new technologies and techniques in WBM rheology formulation.

This study is channeled to label the engineered properties of the mud, mud composition, its effects on drilling efficiency and well productivity, challenges encountered, the concept for an enhancement, added advantage in comparison to OBM, comparative cost advantage. It was discovered that Enhanced WBM has an added advantage hence leading to a reduction in pollution trends in the Niger Delta and cost effectiveness. Other advantages include addressing to an extent the challenges encountered with WBM such as (inhibition, hydration and solids control) leading to an enhanced well productivity and ultimately affects the overall cost of well delivery.

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