

Practical Software for Optimum Bore Hole Cleaning Using Drilling Hydraulics Techniques

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Abstract : A proper well planning is very vital to achieve any successful drilling program on the basis of preventing, overcome all drilling problems and minimize cost operations. Since the hydraulic system plays an active role during the drilling operations, that will lead to accelerate the drilling effort and lower the overall well cost. Likewise, an improperly designed hydraulic system can slow drill rate, fail to clean the hole of cuttings, and cause kicks. In most cases, common sense and commercially available computer programs are the only elements required to design the hydraulic system. Drilling optimization is the logical process of analyzing effects and interactions of drilling variables through applied drilling and hydraulic equations and mathematical modeling to achieve maximum drilling efficiency with minimize drilling cost. In this paper, practical software adopted in this paper to define drilling optimization models including four different optimum keys, namely Opti-flow, Opti-clean, Opti-slip and Opti-nozzle that can help to achieve high drilling efficiency with lower cost. The used data in this research from vertical and horizontal wells were recently drilled in Waha Oil Company fields. The input data are: Formation type, Geopressures, Hole Geometry, Bottom hole assembly and Mud reghology. Upon data analysis, all the results from wells show that the proposed program provides a high accuracy than that proposed from the company in terms of hole cleaning efficiency, and cost break down if we consider that the actual data as a reference base for all wells. Finally, it is recommended to use the established Optimization calculations software at drilling design to achieve correct drilling parameters that can provide high drilling efficiency, borehole cleaning and all other hydraulic parameters which assist to minimize hole problems and control drilling operation costs.

Keywords : optimum keys, namely opti-flow, opti-clean, opti-slip and opti-nozzle

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