
Improved Core Quality Through Application of a Low Invasion Water Based Mud, Tracer Technology, Half Moon Inner Barrel Coring, and Improved WellSite Core Handling in a Sandstone Reservoir in North Kuwait For Oil in Place Calculations and Development Planning

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Two carefully selected wells were cored recently in Lower Burgan (LB) reservoir in Sabiriyah field in North Kuwait to improve reservoir description, reservoir performance prediction, and to reduce uncertainty on remaining reserves. In these cored wells, the coring objectives were to obtain (1) complete coverage of the oil bearing section of the LB reservoir for sedimentological and petrographic description, (2) high quality samples for waterflood and electrical SCAL measurements from representative reservoir facies. These planned SCAL measurements are (a) relative permeabilities (b) wettability (c) capillary pressure, and (3) conventional core analysis. The LB reservoir comprises fragile sandstone, which will require careful handling. The coring and core handling must be carried out without disturbing the fabric of the rock to ensure minimal alteration of in situ fluid saturations, and without irreversibly modifying the wettability of the rock. This means that low invasion coring techniques, using water based bland mud system, and very careful surface handling of the core are required to minimize any damage. Additionally, the core acquisition program was designed to plug and trim the SCAL plugs and preserving both the plugs and trims immediately at rig site. This should provide fresh-state and representative center plugs for saturation and SCAL analysis. D2O Tracer was mixed with the mud system to enable quantification of the filtrate invasion. Onsite Gamma ray recording was applied and about 50% of the recovered cores were preserved. In one of the cored wells, ½ moon inner barrel was used for the first time in Kuwait with the low invasion water based mud.
