Case History
Reservoir Fluids

N-FLOW™ 325 Filter Cake Breaker System Leads to Increased Production Rate

Location: North Buzachi Field, Kazakhstan

OPERATOR’S CHALLENGE – The operator, Buzachi Operating Ltd (BOL), was concerned about oil production rates from their reservoirs and requested that Halliburton Baroid engineer a solution to help in removing filter cake and near wellbore damage. BOL was in search of a solution that would help reduce formation damage in newly drilled 6” production intervals and in older wells during workover operations.

HALLIBURTON’S SOLUTION – Halliburton Baroid proposed a non-damaging drill-in fluid along with a delayed reaction filter cake breaker. The recommended drill-in fluid was BARADRIL-N® clay-free reservoir drilling fluid. This non-damaging fluid contains thermally stable polymers for suspension and filtration control as well as acid soluble, sized calcium carbonate bridging particles. With the engineered bridging materials, BARADRIL-N fluid can be designed to build an impermeable filter cake to help stop solid and fluid invasion. The acid-soluble filter cake can then be easily removed to avoid restricting the flow of hydrocarbons into the wellbore during production.

After extensive testing, including permeability plugging tests, and simulation of the filter cake removal, the N-FLOW™ 325 system was also customized for the operator’s well conditions and proposed as the filter cake breaker system.

Fig 1. Lab tests with ceramic disks – before and after treatment with N-FLOW 325 system

The laboratory tests results were reviewed by Baroid Completion Global Technical Advisors (GTA) in Houston and region technical management team prior to approval and submission to the customer. The program was approved by customer and implemented on 5 trial wells of the North Buzachi field.

ECONOMIC VALUE CREATED – After treatment of wells by the N-FLOW 325 system, the operator’s production department measured an increase in the Productivity Index. In comparison to surrounding production wells and previous outputs, the oil production rates of these five wells increased as follows:

1. Well NB 2-1 — production rate increased 65%
2. Well NB 1048-1H — production rate increased 6%
3. Well NB 1076-1H — production rate increased 80%
4. Well NB 736-1 — production rate increased 140%
5. Well NB 602-2H — production rate increased 140%

Averaged over the 5 wells, the increased production rate amounts to 86.2 % improvement in produced oil volume.
The following graph illustrates the increase of oil production value after N-FLOW 325 system application of North Buzachi wells. As a result of the successful application on these 5 wells, the operator has elected to continue with BARADRIL-N drill-in fluid and the N-FLOW breaker technology.