BOREMAX® Fresh-Water System reduces costs and enables drilling of interval in one-third of expected time
Location: Kharyaga Field, Russia

OPERATOR’S CHALLENGE – An operator working in Russia’s Kharyaga Field wished to improve penetration rate and reduce non-productive time (NPT), caused by overloading of the solids control equipment and flowline plugging. Specific problems encountered included:

- Plugging of bell nipples and flowlines often occurred while drilling reactive clays in deviated 16-inch upper intervals at 196 to 393 ft (60 to 120 m)
- 12 hours required to clean out flowlines
- Standard potassium chloride (KCl) drilling fluid solution often used locally was unsuccessful
- Issues with inadequate mud inhibition in dispersive red Triassic clays at 2788 to 4265 ft (850 to 1300 m) resulted in flowline plugging
- Excessive cuttings and drilling waste

HALLIBURTON’S SOLUTION – Halliburton Baroid recommended BOREMAX® non-dispersed, ultra-low colloidal content freshwater system for the surface 16-inch and intermediate 12¾-in. intervals. The BOREMAX system includes BORE-HIB® DP (dry powder) additive.

The new fluid system demonstrated significantly lower dilution and treatment requirements, with faster mixing. CLAY GRABBER® non-ionic polyacrylamide polymer controlled the colloidal content of the system. This unique polymer flocculated out drill solids and maximized wellbore stability by preventing washout. BORE-HIB DP additive significantly decreased flowline cuttings plugging, decreased mud dilution volumes, and controlled MBT value as per drilling fluid program target.

ECONOMIC VALUE CREATED – The interval was drilled in less than a third of the time it takes when using traditional KCl-Polymer mud. Using the BOREMAX system with BORE-HIB DP additive enabled the operator to drill the red bed clays faster and set surface casing with minimum NPT due to flowline plugging.
Drilling waste volumes were significantly reduced and the drilling waste contained no salt. Mud mixing was simplified and faster without KCl. Chemical transport costs were greatly reduced and a much smaller chemical storage area was used. Material handling was reduced by approximately 50% for rig personnel increasing safety on the rig and also decreasing packaging waste. Because it is fresh-water based the system had no harmful effects on the environment.

In summary, Overall fluid costs per well did not increase.

The BOREMAX system makes it possible to:

- Drill higher ROPs with a water-based fluid
- Minimize hole washout and reduce near-gauge hole cementing costs
- Reduce drilling waste cuttings by 30-40%
- Minimize mud material transport and storage costs

The graphs show the economic value created through reduced drilling days and mud volume used, for each hole interval.