

Igapo Achieves Record Drilling Performance with BOREMAX® High-Performance Freshwater Fluid

CUSTOMIZED DRILLING FLUID HELPS SAVE OVER THREE DAYS OF RIG TIME IN MATURE FIELD

ECUADOR

CHALLENGES

- » Drill a “J”-shaped directional well with a 4,700-foot-long (1432-meter-long) section and 12¼-inch hole
- » Drill across heterogeneous lithology that included swelling clay, conglomerates, shale, limestone, and depleted sandstone
- » Avoid high probability of wellbore instability and bit balling events, as well as offset wells with longer wiper trips and casing run times

SOLUTIONS

- » BOREMAX® high-performance freshwater fluid to promote excellent wellbore stability and optimum rheology
- » Integrated teamwork from Sperry Drilling, Drill Bits and Services, and Project Management to optimize hydraulics, drilling parameters, and operational procedures

RESULTS

- » Drilled the 4,700-foot-long (1432-meter-long) section in just one single run
- » Completed section in 9.7 days, which was 3.1 days sooner than planned
- » Achieved 168 hours of wellbore exposition without wiper trips
- » Completed drilling without any negative incidents or NPT
- » Achieved best drilling trip times in the Pucuna field

OVERVIEW

Igapo currently operates in four mature fields of the Ecuadorian Amazon including in the Pucuna and Palo Azul fields. To help Igapo optimize its drilling performance, Baroid drilling fluids provided wellbore stability, zero issues while tripping, and longer exposition time with water-based mud (WBM). These drilling fluids also eliminated the necessity for wiper trips to condition the hole prior to the casing run.

On previous jobs in the Pucuna field, analysis of offset wells revealed issues related to wellbore stability and also to wiper trips with backreaming. At the time, it was a common operational practice to run a wiper trip after each 40 hours of drilling and before each casing run.

CHALLENGES

The operator needed to drill a complex “J”-shaped directional well. The challenges included drilling a 4,700-foot-long (1432-meter-long) section, with a 12¼-inch hole, across heterogeneous lithology that included swelling clay, conglomerates, shale, limestone, and depleted sandstone – indicating high chances of wellbore instability and bit balling events, as well as offset wells with longer wiper trips and casing run times.

SOLUTION

To deliver a high-performance water-based mud (HPWBM), Baroid designed a customized BOREMAX® high-performance freshwater fluid for these wells through several tests and offset well analyses. Additionally, to ensure the successful drilling of this section, integrated Halliburton teams from Sperry Drilling, Drill Bits and Services, and Project Management worked together to optimize the hydraulics, drilling parameters, and operational procedures.

RESULTS

The 4,700-foot-long (1432-meter-long) section was drilled successfully in just one run, and all of the client’s objectives were achieved. The uniquely formulated BOREMAX drilling fluid provided superior hole cleaning, and also enhanced wellbore stabilization by “holding back” the different formations drilled along the section. No tight hole was observed, and tripping time was reduced, thus allowing the client to trip out on elevators instead of with backreaming. The casing string was also run without incident, and was cemented with full returns to surface, even after more than 168 hours of wellbore exposure to the BOREMAX high-performance freshwater fluid.

The section was completed in 9.7 days, which was 3.1 days sooner than planned. No shale sloughing, cavings, or mud losses were encountered during drilling, and no non-productive time (NPT) related to drilling fluid was incurred – thus achieving the best drilling trip times recorded as of that date in the Pucuna field. Key performance indicators (KPIs) are shown below.

Analyses of wiper trips show the best KPIs and casing runs.

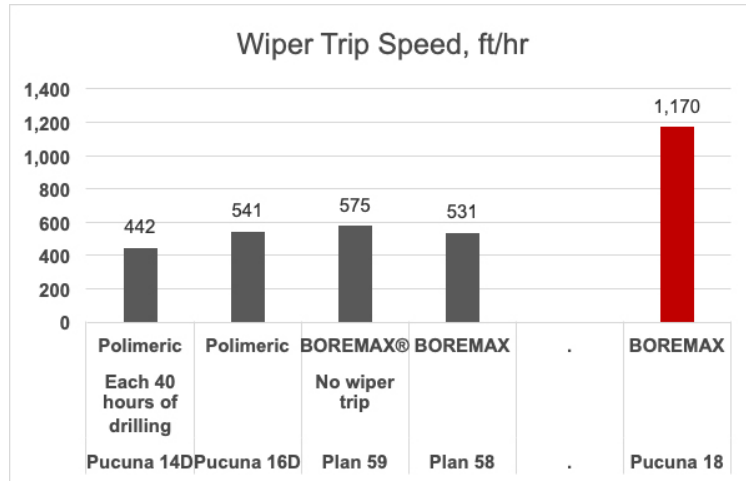


Fig 1. Wiper trip analysis.

The drilling fluid properties were maintained easily within the programmed ranges and tailored during the section to achieve higher rates of penetration (ROPs).

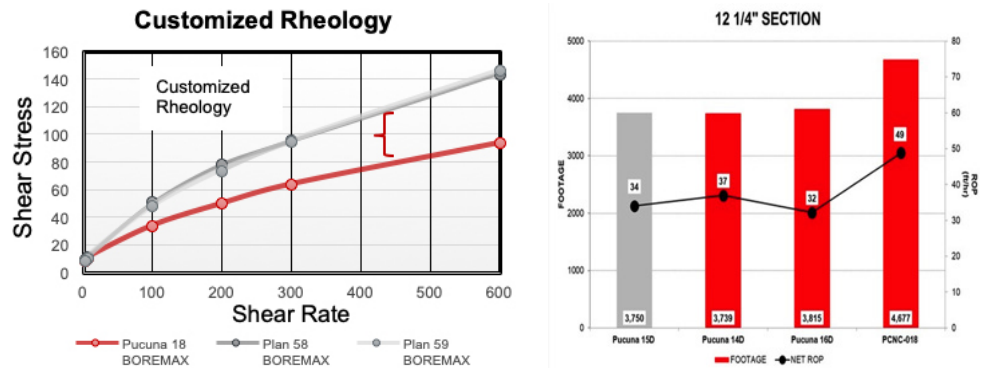


Fig 2. Rheology and ROPs in different wells.

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