

BLACK FURY Enhances Wellbore Stability and Reduces Number of Trips

“With the intent of reducing time and cost, BLACK FURY* product made the difference, providing hole stability, drier cuttings, no bit-balling and no extra wiper trips with an inhibitive polymeric water-base mud.”

Ernesto Limpias, M-I SWACO Operations Manager Poza Rica District

Well Information

Location	Poza Rica, Veracruz, Mexico
Date.....	October 2005
Fluid in hole	Inhibitive Polymeric, 1.38 sg
Open hole size	9½ inches 335 to 1,667 ft (102 to 505 m)
Angle.....	43.58 degrees

The Situation

An operator drilling 9½-in. holes in the Poza Rica district of Mexico encountered problems with inhibitive muds, problems with extra short trips, stuck logging tools and difficult casing runs.

In one well, a 9½-in. bit was made up with a directional bottomhole assembly (BHA) and was run into the hole. The drilling team drilled out cement from 335 to 1,667 ft (102 to 505 m), circulated the hole clean and pulled the BHA to surface. Wireline logs were run in the hole, but could not pass beyond 1,362 ft (415 m), so the tool was pulled out of the hole and a bit made up for a check trip. Once the bit was on bottom, two high-viscosity pills were pumped and circulated out to clean the wellbore before tripping pipe.

An additional cleanout trip was required to run casing to bottom and cement in place.

The operator wanted a better approach for a subsequent well.

Borehole instability has been found when passing through other reactive shale formations:

- **Lower Palma Real Formation:** Composed of soft, slightly sandy shales with inter-bedded fine grained sands that are well cemented.
- **Tantoyuca Formation:** Greenish, gray shales with interspersed sands and conglomerates.
- **Chapopote Formation:** Grayish-to-green marls with thin inter-bedded streaks of bentonitic clays.
- **Guayabal Formation:** Brown shales; dark gray and dark green shales, slightly sandy in some instances, causing frequent sloughing, alternating with medium hard shales and medium-to- fine grained sands.

The Solution

The Poza Rica District team made a technical proposal to minimize the problems for the 9½-in. hole. The team designed a water-base mud formulation to assure hole stability and eliminate short trips.

Studies of the interaction between rock and fluid on cuttings samples from the Agua Fría and Coapechaca fields at the laboratory (Laboratorio Central Veracruz) defined the shales as dispersive rather than swelling. Based on this information, the team proposed a water-base mud system that would reduce the amount of dispersion in the claystones found above 1,667 ft (500 m).

The BLACK FURY product was selected as an additive for hole stability and to help reduce dispersion of water sensitive shales. During the laboratory testing with the BLACK FURY product, the fluid showed 80% of recovered material in the dispersion test. This led the operations staff to propose the application of a new inhibitive polymeric mud with the BLACK FURY (10 L/m³) product.

The Results

During the drilling of the 9½-in. hole on the second well, there were no torque problems, the cuttings appeared to be inhibited and no gumbo attacks blinded the shaker screens or plugged flow lines.

At the end of the interval, the wireline logs and the casing run were completed without problems. A short trip was not required to stabilize the hole. Washout was minimal.

The Details

M-I SWACO used all of its tools and experience to support the drilling operations using INTEGRATED FLUIDS ENGINEERING* (IFE*) services to deliver integrated solutions with advanced engineering applications and new technologies. This approach provides successful solutions to the day-to-day challenges that are faced by this project during drilling, completion and workover operations.

Questions? We'll be glad to answer them.

If you'd like to know more about the BLACK FURY product and how it's performing for our other customers, please call the ALPINE or M-I SWACO office nearest you.



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