

## Gulf of Mexico: ULTRADRIL™ Eliminates Trip for Hole-Opener

*“The ULTRADRIL high-performance water-base drilling fluid established outstanding drilling performance in deepwater troublesome shale by simultaneously drilling and under-reaming from 16 to 20 in., thereby eliminating the trip to pick up a hole-opener. Based on the performance of the first trial on the platform, the operator was confident that the ULTRADRIL system’s inhibition characteristics could eliminate the hole-opener trip.”*

George Sartor – Sr. Technical Service Engineer

### Well information

Location:	Mississippi Canyon, Gulf of Mexico
Spud:	January 2001
Interval drilled:	20-in. hole for a total of 1210 ft – from 6131 to 7341 ft
Water depth:	3797 ft
Disposal method:	Discharged cuttings overboard

### The situation

The operator wanted to save rig time by being able to eliminate a trip to pick up a hole-opener and reduce mud and cement volumes by simultaneously drilling and under-reaming the hole from 16 in. to 20 in. as opposed to previous operations that drilled a 17-in. pilot hole and then tripped for a 22-in. hole opener.

### The solution

Since the ULTRADRIL system exceeded expectations on the previous application while drilling the reactive, shallow gumbo-type shales in this interval, the operator decided to use the system again for this operation.

### The results

- No bit or BHA balling. The interval was drilled with a 16-in. bit and 20-in. under-reamer with no bit or BHA balling, gumbo problems such as flow line plugging or shaker blinding or hole instability.
  - Excellent ROP. Instantaneous penetration rates occasionally exceeded 200 ft/hr but were controlled at 100 ft/hr or less for most of the interval due to directional work.
  - Increased solids removal efficiency.
- Cuttings integrity was excellent throughout the entire interval. The system’s inhibition and encapsulation properties produced dry and well-defined cuttings that did not stick or ball up on the shakers, increasing solids removal efficiency.
- Easily maintained fluid. Fluid stability, excellent inhibition characteristics and easy maintenance produced a stable wellbore that allowed the hole to be drilled in a single pass.

#### ULTRADRIL benefits:

- High ROPs
- Environmental compliance
- Excellent fluid stability
- Superb cuttings integrity
- Outstanding inhibition
- Stable wellbores



## The details

The displacement/drill-ahead volume and dilution volume was built at M-I's liquid mud facility in Port Fourchon, LA. In order to minimize the risk of unhydrated polymer and screen blinding, the completed fluid was circulated through a shearing unit while being transferred to the storage tanks.

No screen blinding occurred during the displacement procedure. Minimal fluid was lost from spacer interface contamination. A 100-bbl DUO-VIS<sup>®</sup> / seawater spacer and 50 bbl of a 10.8-lb/bbl spacer with DUO-VIS, 15% lubricant and 8 lb/bbl NUT PLUG<sup>®</sup> preceded the 10.0-lb/bbl high-performance ULTRADRIL system.

Scalper shakers were fitted with 10 x 20-mesh screens. The primaries were fitted with 84 x 110-mesh screens. The displacement was performed at 800 gpm to avoid activation the under-reamer. Drilling began as soon as the spacers cleared the bit and good mud began returning up the annulus. Previous wells using NaCl/POLY-PLUS<sup>®</sup> fluids experienced severe screen blinding during

their displacements. No screen blinding was observed with the ULTRADRIL system. The ULTRADRIL system was not pretreated prior to drilling cement. No adverse effects were noted from the cement. The highest pH recorded while drilling cement was 10.1. Total hardness increased from 400 to approximately 1200 mg/L, but did not affect mud properties. Acetic acid and sodium bicarbonate were available if needed.

The key components of the ULTRADRIL system were ULTRACAP<sup>™</sup> (shale dispersion inhibitor), ULTRAHIB<sup>™</sup> (shale hydration inhibitor) and ULTRAFREE<sup>™</sup> (anti-crete and ROP enhancer). Concentrations were maintained through pre-mix dilution and direct additions to the system as needed. Inhibition characteristics and depletion rates were such that the MBT values never exceeded 7.5 lb/bbl through the 20-in. interval. Dilution rates averaged 3.6 bbl of premix per bbl of formation drilled.

Once the section was completed, casing set and cemented, the remaining fluid was shipped to an adjacent location and reused in another ULTRADRIL application.

## Questions? We'll be glad to answer them.

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

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