

EnduraDril

Inhibitive divalent water-based drilling fluid

APPLICATIONS

- Drilling intermediate and lateral sections in the Bakken shale play

ADVANTAGES

- Is compatible with Bakken base brine
- Improves drilling rate
- Enhances hole cleaning
- Aids in wellbore stability

LIMITATIONS

- Optimum performance in applications with mud density ≤ 13.5 lb/galUS (1.62 sg)
- Thermal stability ≤ 275 degF [135 degC]

EnduraDril* inhibitive divalent water-based drilling fluid is a low-solids, nondispersed system that is highly compatible with the Bakken base brine. The EnduraDril fluid is versatile in applications for the Bakken plays and is proven to match and exceed the performance of the traditional oil-based fluids (OBM). EnduraDril fluid chemistry works with existing produced water for a full range of clear water drilling to a fluid exhibiting inhibitive characteristics and a rheological profile like OBM yet solids-free. Because EnduraDril fluid is saltwater based, impacts from saltwater contamination are largely reduced. Depending on the salinity of saltwater inflow, density is minimally impacted. Viscosity dilution, if encountered, is easily recovered. EnduraDril can be weighted to 13.5 lb/galUS (1.62 sg) with barite if desired to control water flows.

The EnduraCap L* encapsulating polymer additive in the system enables the mud density to be maintained as close to the base brine density as possible, i.e., 9.6 to 10 lb/galUS (1.15 to 1.2 sg).

The combination of DI-TROL* divalent brine system primary viscosifier additive and DI-BALANCE* divalent brine system secondary viscosifier creates the desired rheological profile.

EnduraTrol* fluid loss control additive enhances filtration properties.

EnduraSurf* anticrete and ROP-enhancing additive prevents bit and BHA balling while improving ROP.

Toxicity and handling

Always consult the SDS for information on the personal protection equipment required for handling the EnduraDril fluid. For additional environmental support, contact the M-I SWACO Environmental Department in Houston through InTouch.

Typical Fluid Properties

| | |
|------------------------|--|
| Drilling fluid density | 9.6 to 13.5 lb/galUS [1.15 to 1.62 sg] |
| Operating temperature | ≤ 275 degF [135 degC] |

Typical Formulation

| Product | Primary Function |
|--|---|
| 9.6- to 10-lb/galUS [1.15- to 1.2-sg] base brine | Base fluid, density |
| DI-TROL additive | Rheological profile |
| DI-BALANCE viscosifier | Rheological profile |
| EnduraTrol additive | Fluid loss control, shale stabilizer, viscosifier |
| EnduraSurf additive | ROP enhancer |
| EnduraCap L additive | Drill solids flocculant |
| M-I WATE* high-quality barite | Density |
| DEFOAM-X* all-purpose liquid defoamer | Defoaming agent |