CASE HISTORY

# Kol-Seal® DF Provides High-Temperature Fluid Stability and Reduces Friction in Geothermal Drilling Operation

## Location: Southern California, USA
## Application: Friction reduction and fluid stability in geothermal drilling
## Product: Kol-Seal® DF Engineered Fine-Particle Lost Circulation Material for Drilling Fluids

### Challenge

- Extreme geothermal temperatures exceeding 1,000°F (538°C)
- Extended horizontal drilling sections requiring friction reduction
- Strict particle size distribution engineering requirements
- Drilling fluid additive required to preserve fluid stability under extreme conditions

### Solution

- Implemented Kol-Seal DF engineered particle technology
- PSD matched required D10, D50, D90 engineering specifications
- Thermally stable in geothermal environments
- Used as both spot pill treatment and system additive
- Maintained drilling fluid stability in extended lateral sections

### Results

- Stable performance at temperatures exceeding 1,000°F (538°C)
- Maintained drilling fluid properties in extended horizontal sections
- PSD specifications matched engineering requirements
- Reduced torque and drag through wellbore stress-caging effect
- Reliable performance in extreme geothermal drilling environment

## CHALLENGE

A geothermal drilling operator in Southern California required a specialized drilling fluid additive capable of reducing friction and maintaining stable fluid properties in extended horizontal well sections. The geothermal environment presented extremely demanding operating conditions, including downhole temperatures exceeding 1,000°F (538°C).

The drilling program required an additive that could remain thermally stable under these conditions while maintaining predictable fluid rheology throughout the drilling interval. In addition, the material needed to meet strict particle size distribution (PSD) specifications to ensure compatibility with the drilling fluid system and provide reliable performance across the wellbore.

The operator needed a technology capable of meeting these engineering specifications while functioning effectively in one of the most demanding drilling environments encountered in geothermal operations.

## SOLUTION

After technical evaluation, the operator selected Kol-Seal® DF, a finely engineered additive designed to provide effective bridging and fluid stability in demanding downhole drilling environments.

The engineered particle distribution matched the operator's PSD requirements, allowing the additive to integrate seamlessly with the drilling fluid system. Kol-Seal DF was deployed both as a spot pill treatment and as a system additive, allowing the operator to address localized friction and fluid stability challenges while maintaining consistent drilling performance throughout the extended horizontal section.

Kol-Seal DF promotes a stress-caging effect that strengthens the wellbore and reduces torque and drag during drilling, improving overall drilling efficiency in the geothermal environment.





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## RESULTS

Kol-Seal DF successfully met the operator's technical performance requirements during drilling operations.

The additive remained stable under extreme geothermal temperatures while maintaining drilling fluid integrity and predictable rheological behavior throughout the drilling interval. The engineered particle distribution effectively sealed micro-fractures and supported wellbore strengthening, reducing friction and improving drilling efficiency.

By maintaining fluid stability and reducing torque and drag in the wellbore, Kol-Seal DF enabled reliable drilling performance in a demanding geothermal environment.





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