

Optimized Workflow Reduces Filtrate Volume and Rotational Torque in Reactive Interbedded Formation

M-I SWACO products and services improve drilling efficiency in Montana, USA

CHALLENGE

Enhance drilling operations in challenging interbedded strata in Montana.

SOLUTION

Deploy a suite of M-I SWACO products and services to optimize drilling performance.

RESULTS

Achieved high-quality drilling performance with reduced rotational torque.



Improve drilling performance in challenging core drilling program

A customer in Montana was drilling core holes ranging in depth from 900 ft [274.32 m] to 5,000 ft [1,524 m] and had to bore through various formations, including loam, sandstone, clay, and shale with alternating layers of talc and clay stringers intermingled in the hard-rock formations. Some of the interbeds are reactive and others are hydratable.

Deploy M-I SWACO products and engineering expertise

After collaborating with the customer on its drilling objectives, M-I SWACO recommended replacement products and timely, in-depth engineering services. An M-I SWACO engineer was dispatched to the site to facilitate the requested product replacement and to make appropriate adjustments in the product mix. The following M-I SWACO products were deployed:

- PLATINUM LUBE[†] lubricant for greater control of solids-related torque issues
- PLATINUM PAC[†] cellulosic filtration control polymer and PLATINUM PAC UL[†] low-viscosity cellulosic filtration control polymer to improve carrying capacity, minimize filtrate invasion, and enhance clay protection
- POLY-PLUS[†] high-molecular-weight liquid clay inhibitor, POLY-PLUS RD[†] readily dispersible liquid clay inhibitor, and POLY-PLUS LV[†] low-viscosity clay inhibitor for preventing hydration and subsequent squeezing of the clay formations into the core hole
- RINGFREE[†] polymeric thinner to control bit balling and to reduce mud rings for reduced torque
- MAX GEL[†] viscosifier for high-quality hole cleaning and enhanced filtration control.

Save time and costs with optimal drilling parameters

Drilling performance improved immediately after the suite of M-I SWACO drilling fluid products was deployed. The use of PLATINUM LUBE lubricant enabled the topdrive hydraulic pressure to drop from above 3,500 psi [24.1 MPa] to less than 2,400 psi [16.5 MPa]. This drop was aided by the RINGFREE thinner, which controlled bit balling and mud-ring formation. After the PLATINUM PAC polymer systems were deployed to minimize filtrate invasion and provide protection of the clay formations, filtrate volume decreased from 1.10–1.22 in³ [18–22 cm³] to 0.37–0.49 in³ [6–8 cm³].

The combination of M-I SWACO technologies and services helped improve hole stability, and all holes reached planned depths at targeted sizes. The customer realized cost savings from longer-laster drilling fluid and additional savings from less rig time and wages, lower per-foot drilling costs, and reduced transportation and disposal expenses.

Drilling Parameter	Conventional Products	M-I SWACO Products	Difference
Topdrive hydraulic pressure	>3,500 psi	<2,400 psi	–31%
Filtrate volume	1.10–1.22 in ³	0.37–0.49 in ³	–65%

M-I SWACO products outperformed conventional products in terms of rotational torque and total filtrate volume, resulting in cost savings to the operator.

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