



# CleanDrill™ HD Divalent Brine-Based Drilling Fluid Helps Operator Set Drilling Records on Multi-Well Campaign in the Moroak-Betaloo basin, Northern Territory, Australia

Newpark's fluids expertise and use of a customized CleanDrill™ HD fluid enables compacted sandstone formation to be drilled 100% faster, and Maverick interval drilled 314% faster than previous records

CHALLENGE	SOLUTION	RESULT
<ul style="list-style-type: none"> <li>• Hard abrasive rock, and compacted formation</li> <li>• Environmentally sensitive area</li> <li>• Previous wells in the region used multiple drill bits resulting in excessive drilling time</li> <li>• High bottom-hole temperature (BHT)</li> <li>• Horizontal well profile</li> <li>• Logging program required</li> </ul>	<ul style="list-style-type: none"> <li>• Offset well analysis and detailed expert laboratory testing</li> <li>• Customized CleanDrill™ HD divalent brine-based water based drilling fluid</li> <li>• Formulation of a compatible lubricant and background lost-circulation material to optimize drilling performance</li> </ul>	<ul style="list-style-type: none"> <li>• Record drilling rates of penetration (ROP)</li> <li>• Zero drilling-related NPT</li> <li>• Reduced torque</li> <li>• 314% improvement in drilling the Maverick interval</li> <li>• Sandstone formation drilled 100% faster</li> <li>• Successful Well Logs completed</li> <li>• Environmental compliance met</li> </ul>

## CHALLENGE

An operator in the Northern Territory of Australia planned a drilling campaign for multiple well types including vertical pilot holes and horizontal directional profiles.

Geology in the Moroak-Betaloo basin is characterized by hard abrasive rock, and slow drilling performance on previous wells was due to low rates of penetration (ROP) requiring frequent replacement of drillbits to finally reach total depth (TD).

Strict environmental regulations in place demanded the use of only water-based drilling fluids (WBM) which, if not formulated correctly, can exhibit lower lubricity and be less tolerant to entrained low-gravity solids. When drilling laterally, accumulation of drilled solids in the lateral section becomes an increasing problem and creates challenges maintaining the desired drilling fluid properties.

The operator specified multiple logging runs and sidewall coring, which requires a stable wellbore with a high quality filter-cake. Logging would also expose the open-hole section to the drilling fluid for a longer period, creating concerns around wellbore stability.

Reducing costs by increasing drilling performance compared to the previous wells in the region was a high priority for the operator. In this regard, the operator also requested the high-performance water-based drilling fluid system (HPWBM) should be capable of drilling in both the intermediate and reservoir sections.



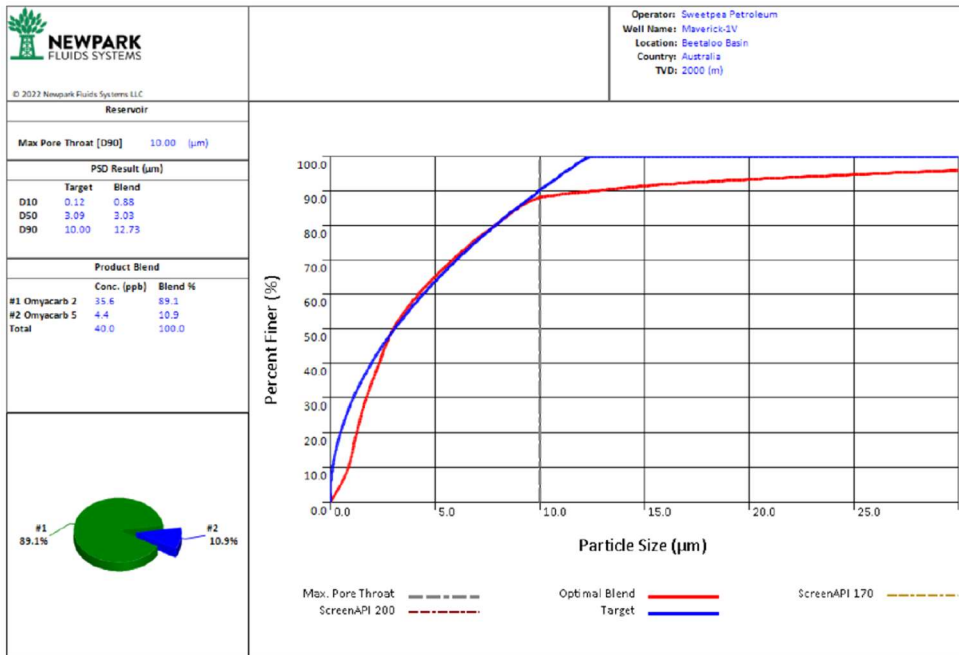
## SOLUTION

After careful analysis of offset well data and extensive laboratory evaluation, Newpark fluids specialists proposed a customised high-performance CleanDrill™ HD divalent brine-based fluid system. This system was chosen not only for its capability to perform as a minimally-damaging reservoir drill-in fluid (RDF), but specially formulated also for drilling performance in the intermediate well section.

The divalent brine phase in CleanDrill HD provides the high density required without the need to add weighted solids, and this improves the ROP performance. The fluid system also provides a higher quality filter-cake which assists in successful logging.

To customize the fluid for increased drilling performance, Newpark specialists also incorporated a divalent compatible lubricant into the formulation to minimize torque and facilitate better weight transmission to the bit.

In addition, a background quantity of lost circulation material (LCM) was also incorporated into the fluid to prevent downhole fluid losses, which have the potential to impact drilling performance and costs.



### Calcium carbonate bridging package

## RESULTS

Newpark's expertise and industry leading water-based fluid ensured that the multiple wells were drilled successfully with no fluids related non-productive time (NPT).

Drilling records for the basin were set, owing to the outstanding performance the CleanDrill™ HD divalent brine-based drilling fluid.

The compacted sandstone formation was drilled 100% faster than the previous record for the area, and the Maverick interval was drilled 314% faster than any other well drilled in the field.

Well logging programs were also complete successfully.