A major operator drilling a deepwater water injector project through depleted reservoir sands needed a non-damaging, weighted drill-in fluid with a low coefficient of friction to avoid circulation losses.

In response, Baker Hughes, a GE company (BHGE), customized its MAX-PRIME™ reservoir drill-in fluid solution (RDIF) with the OMNIFLOW™ invert emulsion fluid, a completion fluid designed for reservoirs that contain shale.

MAX-PRIME RDIF are engineered to lower overall completion costs while optimizing production rates. These fluids deliver all the properties required from typical drilling fluids while protecting the pay zone against costly formation damage.

The OMNIFLOW drill-in fluid produces a thin, noninvasive filter cake, minimizes borehole problems during the drilling and completion phase, increases drilling rates, and improves production. The fluid is also resistant to contaminants such as carbon dioxide, hydrogen sulphide, salts, and shale cuttings.

The fluid performed flawlessly while drilling the well’s long horizontal interval. A competitor’s synthetic-based mud system, used to drill the upper interval, was also replaced by the 11.5 lbm/gal (1,378 kg/m³) OMNIFLOW fluid. High-viscosity sweeps were pumped for borehole cleaning, although there was no indication of an increase in cuttings volume or size. Equivalent circulation densities (ECD), which were closely monitored, averaged between 12.8 and 13.0 lbm/gal (1,534 and 1,558 kg/m³).

BHGE also added two of its MIL-CARB™ series bridging agents to further minimize losses to the formation. After reaching a measured depth (MD) of 23,815 ft (7,259 m), the hole was circulated and the mud weight was increased to 12.1 lbm/gal.

**Results**
- Reduced torque and drag in the horizontal interval
- Maintained ideal fluid properties throughout the well
- Maintained quality borehole
- Drilled 1,100 ft (225 m) of 6½-in. hole section to total depth
- Successfully ran completion screens to bottom

**Challenges**
- Avoid loss of circulation in depleted reservoir sands
- Land completion screens in a long horizontal interval
- Provide a non-damaging fluid with good hole-cleaning properties without increasing ECD

**BHGE solution**
- MAX-PRIME RDIF solution
- OMNIFLOW invert emulsion RDIF
- MIL-CARB additive
(1,450 kg/m³) to maintain wellbore stability during the completion. Completion screens were successfully run to bottom and then set at 23,770 ft (7,245 m) MD.

Due to the successful performance of the MAX-PRIME RDIF, this operator plans to award future work in these types of challenging applications to BHGE.

MAX-PRIME RDIF such as OMNIFLOW minimize reservoir damage during and after the drilling phase.