

# STAR SHIELD® Wellbore Shielding® Additive Deepens Intermediate Casing Point While Maintaining Wellbore Stability in Canada

## North America

### CHALLENGE:

- ▶ Coal seam formations with high pressure influx
- ▶ Potential for whole mud losses and hole collapse
- ▶ Narrow pore pressure and fracture gradient

### SOLUTION:

- ▶ STAR SHIELD pre-treated and maintained in OBM at 25 kg/m<sup>3</sup> (8 lb/bbl)
- ▶ Deepening the intermediate casing point allowing the operator to drill the vertical and curve sections together

### RESULT:

- ▶ Minimized wellbore instability issues
- ▶ Zero mud losses
- ▶ Allowed the operator to then displace to a brine-based mud to increase ROP vertically
- ▶ Drilled to TD and cemented with full returns



### OVERVIEW

Whole mud losses and wellbore instability are common in the challenging Belly River and Edmonton formations in the Kakwa Field. Whole mud losses are often induced when higher mud weights are needed to reduce hole instability while drilling through the Notikewin and Falher formations. Narrow pore pressure and fracture gradient windows make these wells challenging while trying to maintain sufficient mud weight to prevent gas influx or hole collapse.

### SOLUTION

By adopting the use of STAR SHIELD, a wellbore shielding additive, the operator deepened their intermediate casing point while drilling the vertical and curve sections and preventing wellbore instability issues. Impact pre-treated an invert-based mud system with 25 kg/m<sup>3</sup> (8 lb/bbl) of STAR SHIELD before displacing the sodium silicate mud at 2160 m (7,087-ft.). Solids control equipment was fitted with API 70 mesh screens before displacing the mud. Maintenance additions of STAR SHIELD were added to the circulating system while drilling ahead to the top of the Doe Creek formation (2554 m, 8,380-ft.). An open-hole formation integrity test (FIT) was performed to determine if STAR SHIELD provided sufficient stability to prevent mud losses to the Belly River formation. Upon completing a successful FIT, the 251 mm (9 7/8-in.) hole was drilled through the Notikewin and Falher formations to the landing point, through the vertical and curve section of the intermediate interval, from 2160–3,404 m (7,087–11,168-ft.).

### RESULT

By using STAR SHIELD, the wellbore was able to withhold pressure limits up to 1300 kPa (1405 kg/m<sup>3</sup> EMW) without inducing mud losses. The use of STAR SHIELD enabled the operator to use higher mud weights to deepen the intermediate casing point through the Belly River and Edmonton formations. The casing was successfully ran and ultimately cemented with full returns.