CASE HISTORY

CARBOAIR enables the effective completion of a long open hole gravel pack (OHGP) in the North Sea

CARBOAIR® high-transport, ultra low-density (2.0 ASG) ceramic proppant technology enables operators to efficiently create a high-quality gravel pack at low fluid viscosity and pump rates

North Sea, UK Sector

The challenge

Offset wells in this field offshore the Shetland Islands have been completed with CARBOLITE low-density ceramic proppant applying the Alpha-Beta wave technique and slick water. While past operations provided good results, a planned well presented new challenges and tested the limits of the technique. The new well featured an uphill heel to toe trajectory with a maximum angle of 103^0 and 250 ft up dip over the length of the lateral. As a result, simulations showed higher-than-usual pump rates to carry the gravel in the uphill section would be needed, generating high bottom hole pressure that would risk breaking down the formation and possible incomplete gravel pack.

The length of the lateral (4,850 ft) and significant washouts experienced in the 8 ½" section further compounded to the challenge.

The solution

In Alpha-Beta wave gravel packing operations, the pump rate, carrier fluid viscosity and proppant density determine the height of the alpha wave and pressure applied to the formation through the treatment. CARBOAIR ultra-low density ceramic (2.0 ASG) proppant technology lowers the height of the alpha wave leaving more space above it to place the beta wave and enable effective gravel transport at lower pump rates. This reduces the pressure, preventing fracturing the formation.

The results

A successful pack was achieved despite the significant challenges faced. A total of 102,100 lbs of CARBOAIR 20/40 proppant were placed in the annulus representing a 36% excess over the hole caliper. A total of 8,350 BBL of brine were circulated in 27 hours of continuous operation to complete the pack. Downhole gauge analysis from the job confirmed the full annular pack, no bridging and completion of the Beta wave with complete packing the end of the Beta wave.

Well Data

Location: North Sea, UK Sector

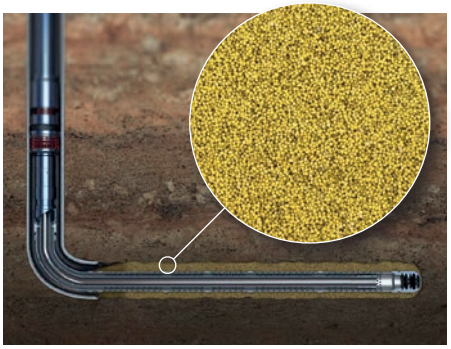
Reservoir: Unconsolidated sandstone

Completion type: OHGP, 8½" hole

Lateral length: 4,850 ft

Well trajectory: Maximum deviation angle of 103^0, 250 ft up dip

Significant washouts, 36% excess over the hole caliper



In Alpha/Beta gravel pack completions, CARBOAIR ultra low-density ceramic proppant consistently lowers the height of the Alpha (lower) wave to provide more space and full coverage of the Beta (upper) return wave.

Talk to CARBO to find out how we can help you enhance your production.

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