

Optimizing stage spacing in a vertical well — Utah, USA

CARBONRT helps determine if fractures are growing past packers.

Dolomitic Sand, Utah, USA

The challenge

CARBO alternated between CARBONRT inert tracer technology and high-performance, low-density ceramic proppant to create contrast between stages. If CARBONRT was detected in the non-NRT stages, it was determined that the NRT fractures had grown past the packers.

Stages 1, 3, 5 and 7 used CARBONRT with stages 2, 4 and 6 using CARBOLITE without NRT. This allowed for three situations to indicate if propped fractures were growing vertically out of the intended zone and three situations to determine if propped fractures were growing downward past the plug.

The Results

The client was able to trace the CARBONRT and determine that in none of the situations did the propped fractures grow excessively vertically and into the next stage's area. Excessive growth down past the packer did occur in stage 5, resulting in 8 ft of propped fracture growth into the stage 4 area. Stage 3 had minor growth downward past the packer into the stage 2 area. Stage 7 was fully contained, with no growth past the packer.

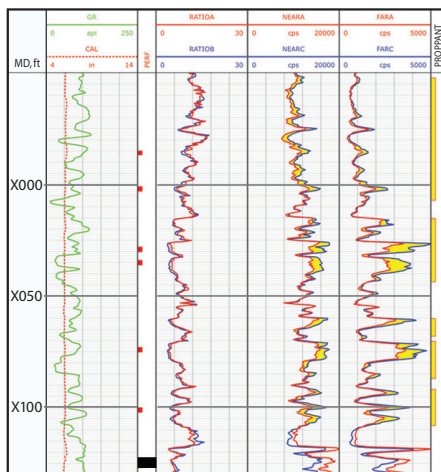
Well Data

Location: Utah, USA

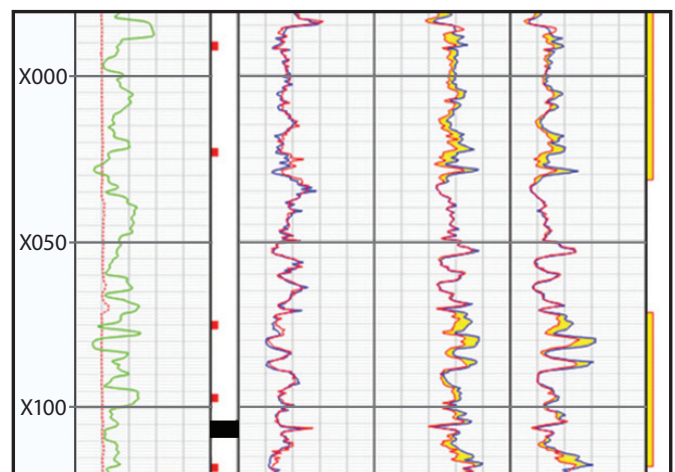
Well Type: 7-stage vertical well, 4 with CARBONRT®

Proppant: CARBONRT® LITE® 20/40 — 535 klb total in 4 stages
CARBOLITE® 20/40 — 82 klb total in 3 stages
CARBONRT stages alternated with CARBOLITE stages to determine if the propped fractures grew out of zone

Well Conditions: 10,500 - 12,400 ft MD
0.90 psi/ft fracture gradient, 240°F BHT



Fracture was contained in stage 7; 141 ft total stage frac height.



About 8 ft of propped frac height bypassed packer into stage 4; 110 ft total stage frac height.

Contact:

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

carboceramics.com



Production. Enhanced.