WIRELINE LOGGING SOLUTIONS

CASE STUDY

CoFrac™ Completion in a Tight Carbonate

LOCATION

State: OK
Basin: Anadarko

WELL DESCRIPTION:

Direction: Vertical
Services: Plug & Perforating
Stages (if applicable): 4

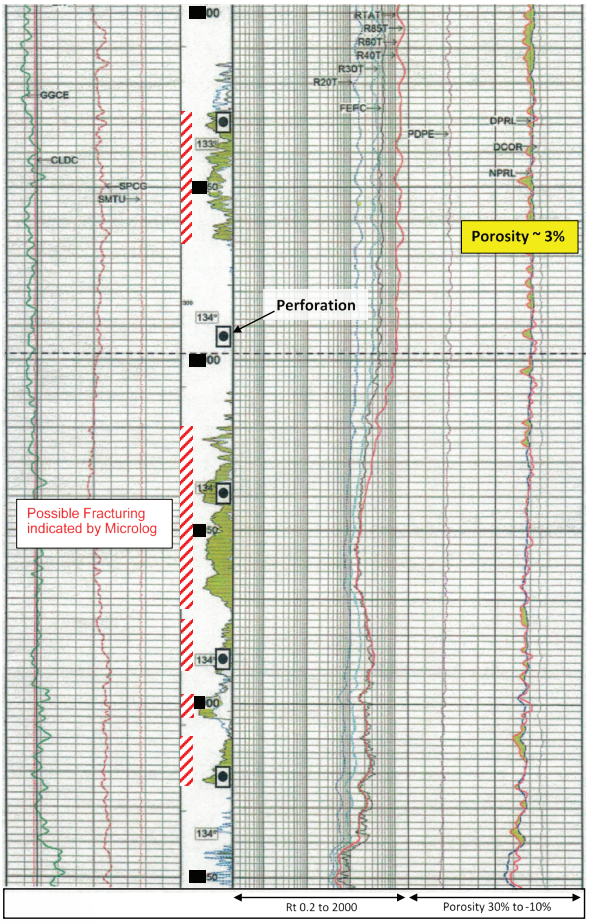
THE CHALLENGE:

This is a vertical stage completion in a tight carbonate with average porosity ~ 3%. The reservoir is ~ 950 ft. thick, with varying intervals of porosity ranging from 1-7%. Based on the Microlog response, there were intervals with fracturing indicated, mostly in stage 3.

Low porosity carbonate reservoir can be difficult to breakdown and hydraulically fracture. The key to production is to connect the wellbore to the natural fracture network.

OUR RESPONSE:

A small 4-stage frac job was designed, pumping 4k gals acid, 33k bbls fluid and 200k lbs of sand per stage. Each stage of the frac job was tagged with a chemical tracer.



Stage 3 Open-Hole Logs – porosity is very low, with possible fractures indicated by Microlog. Perforations are marked.

We are WIRELINE™

CASE STUDY

Details of Operation: Perforated with 6 ft. 2spf CoFrac guns, 5 guns per stage, for a total of 60 perforations per stage. Each perforation (shaped charge) deploys 13.5 grams of propellent into the formation, which equates to 162 grams per gun, or 810 grams per stage (~ 1.8 lbs). An M-67 hand grenade has about 180 grams of explosives, so each of the 6 ft. 12 shot perforating guns had an equivalent volume of propellant (that is 5 hand grenades per stage!).

Propellant is an explosive product that can be poured into a form and baked into a rubbery solid material that burns furiously when ignited and creates large volumes of gas. Solid propellant boosters are used as the fuel to propel rockets into orbit and the material will produce more energy than an equivalent volume of gun powder.

The CoFrac perforating method allows solid propellant, formed into a cap that is snapped onto the face of the shaped charge, to be physically displaced from the perforating gun, pulled/pushed through the casing exit hole behind the perforation jet and deployed into the perforation tunnel before it is ignited and deflagrated (burned). The force of the gas produced from the propellant deflagrating will fracture the rock around the perforation tunnel, improving permeability.

THE RESULTS:

Each stage frac was successfully completed with 100% of proppant pumped.

The initial oil production on this well (170 bopd) exceeded customer expectations and is much better than offset wells. The results of the chemical tracer matched the Microlog fracture indications, with 50% of production from stage 3. The customer comments…***"the only thing different on this well compared to offset completions was CoFrac. We believe CoFrac made a difference!"***

Contact your local Wireline Logging Solutions Representative or visit us online.

wirelinelogs.com

WIRELINE LOGGING SOLUTIONS

We are WIRELINE™