

RESERVOIR CASE STUDY SPECTRAL RESERVOIR FLOW [SPEC-RFA*]

Challenge

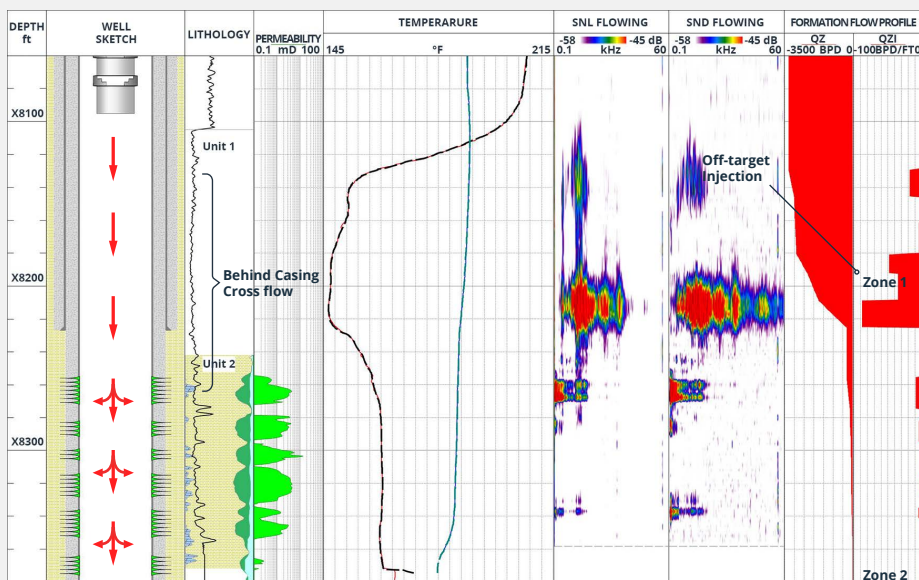
Increasing the reservoir pressure through gas injection is a popular enhanced oil recovery [EOR] technique. However, a high gas-to-oil ratio [GOR] in production wells around a gas injector well, even though the flowing pressure was above the bubblepoint, suggested that the injected gas was being produced rather than enhancing oil recovery.

Solution

Evaluating gas injection effectiveness helps to optimise and control oil sweep efficiency. TGT was asked to profile and quantify injection in the target zone of the gas injector well.

A spectral reservoir flow analysis [SPEC-RFA] survey showed both a cooling anomaly and high-frequency noise across the target zone and above the perforated intervals. This suggested cross-flow behind the casing into zone 1. Quantifying the cross-flow revealed that 95% of the fluid volume was being misplaced above the target zone, where the gas could move from the injector well to the producer wells.

Spectral technology helps to improve gas injection efficiency from 5 to 100%.



The SPEC-RFA survey shows injected gas being lost through a flow path behind the casing into the wrong zone [Zone 1] instead of reaching the target zone [Zone 2]. Injected gas was being produced in nearby wells and resulting in only 5% injection efficiency. A subsequent workover restored the injection efficiency to 100%.

Outcome

The operator worked the well over to eliminate cross-flow, which reduced gas production in nearby producing wells. The injection efficiency in the target zone improved from 5 to 100%.