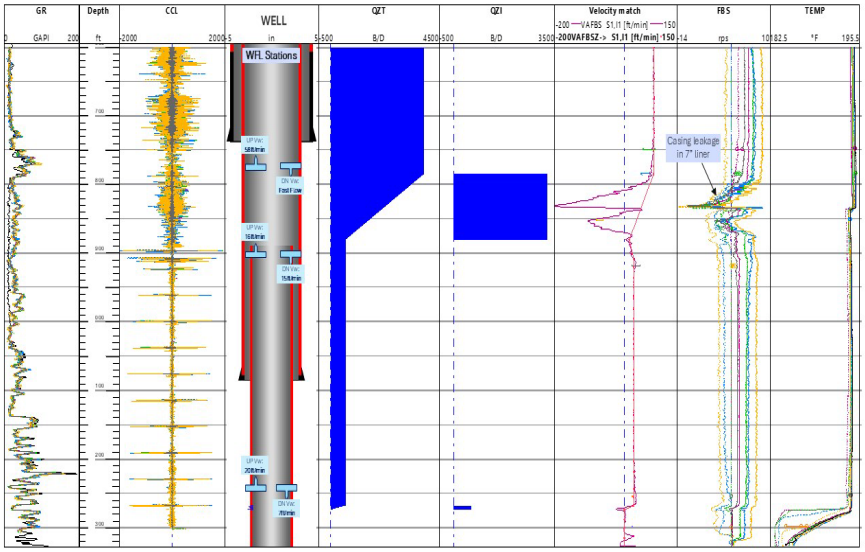
Unique Combination of Logging Tools

Identify Casing Leak, Source of Water Production, Enable Successful Workover



Summary of results from the PLT and the Raptor WFL stations for casing leak detection.

Objectives

- Confirm if a casing leak existed, determine the source of water, and identify the water source feed behind the casing, if any. The subject well showed abnormal well performance and 100% water production after recompletion to a new zone of good oil potential.

Our Approach

- To evaluate the situation and understand the reasons for the 100% water production from the well, Weatherford engineers collaborated with the operator and agreed to the following workover operations:
  - Run an electromagnetic multi-barrier and multi-finger caliper for corrosion analysis of different casings and liners after pulling the tubing
  - Run an electrical submersible pump (ESP) test string with a Y-tool to clean the well and set the pump above the section of possible casing damage from corrosion analysis results
  - Record the flowing passes of the production logging tool (PLT) across the source of inflows to the wellbore and some water flow log (WFL) stations above and below to identify the source of the water feed behind casing, if it is there

LOCATION
Middle East

WELL TYPE
ESP producer

FORMATION
Cretaceous

LINER SIZES
5 and 7 in.

PRODUCTS/SERVICES
- MultiView™ multibarrier corrosion logging tool
- CalView™ caliper tool
- Production logging tools
- Raptor™ 2.0 cased-hole evaluation system

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Our Approach (continued)

- The data from the PLT and WFL stations showed a strong casing leak in the 7-in. liner, and it proved to be the source of water production. This turned out to be consistent with the corrosion analysis from the MultiView and CalView tools.
- In addition, WFL records confirmed that there was water flow behind the casing and the water feed to the casing leak was coming from a water-bearing zone just above the leak.

Value to Customer

- By using the unique combination of Weatherford technology—the MultiView and CalView tools, PLT, and the Raptor system—the operator was able to identify the casing leaks and the source of water inside and behind the casing.
- The operator isolated the leakage section with a straddle packer. Testing data after the workover showed a stable well performance and good oil gain.