

Innovative Combination of PLT, VRC, and SNL Tools Identify Four Phase Flow Profiles in Deviated Well, Normalize Gas and Sand Production



The four phase profiles of water, oil, gas, and sand grains as identified by the combined Weatherford production logging technology and the VRC and SNL tools.

Objectives

- Identify the source of gas and sand production for gas shutoff and sand control. The subject well is an oil producer well of high potential and inclination angle of 48°, but it was suffering from gas and solids production with some water. There was history of electrical submersible pump (ESP) failure due to sand production.

Our Approach

- Considering the well deviation and presence of three phase flow in addition to sand production, the Weatherford team recommended an integrated approach using the innovative combination of production logging tools (PLT), the array fluid velocity resistance capacitance tool (VRC), and the spectral noise tool (SNL).
- This combination enabled the operator to determine the four phase flow profiles for water, oil, gas, and sand flow rates, and identified the main source of gas and sand production.
- The operator performed a cement squeeze for the topmost part of the first layer which was the main source of gas and sand contribution and ran a sand screen for more control.

Value to Customer

- By relying on the high-profile results from this innovative combination and successful gas shut-off and sand control, the ESP remains in a healthy condition and production data showed normal producing gas-oil ratio (GOR) from the well.



The Weatherford array fluid velocity resistance capacitance tool is a compact 6-arm multi-sensor array production logging tool. Each arm provides three measurements via a fluid velocity sensor, and a co-located fluid resistance and fluid capacitance sensor.

LOCATION
Middle East

WELL TYPE
Oil producer

FORMATION
Cretaceous

CASING SIZE
9-5/8 in.

PRODUCTS/SERVICES

- Array fluid velocity resistance capacitance tool (VRC)
- Weatherford production logging tools
- Spectral noise tool (SNL)

