

LOCATION
Middle East

WELL TYPE
Development

HOLE SIZE
6 in.

CASING SIZE
7 in.

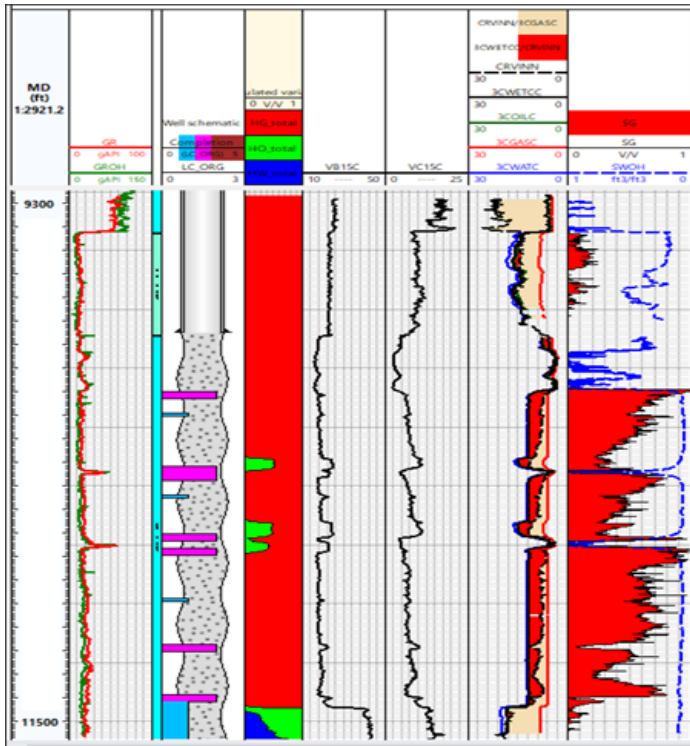
LINER SIZE
4-1/2 in.

TEMPERATURE
250°F (121°C)

PRESSURE
2,900 psi (20 MPa)

MEASURED DEPTH
11,500 ft (3,505 m)

- Raptor 2.0 system
- Cased-hole wireline services
- Thru-tubing services



Objectives

- Identify the source(s) of high gas-oil ratio (GOR) in a horizontal oil producer using the Raptor 2.0 cased-hole evaluation system and a horizontal production logging tool (HPLT) service with real-time surface readout data acquisition.
- Compute gas, oil, and water saturation in a dynamic well state.
- Check if the autonomous inflow control devices (AICD) are successful in blocking the entry of gas into the lower completion.

- Weatherford experts deployed the Raptor 2.0 system, the HPLT, and a multiple array production suite (MAPS) with coiled-tubing conveyance with a real-time surface readout option.
- HPLT sensors provided the borehole fluid holdup along with a three-phase fluid production profile. The HPLT clearly identified the gas entry points in the lower completion.



Raptor™ 2.0 Cased-Hole Evaluation System, HPLT Services Identified Source High GOR, Computed Formation Gas Saturation in Horizontal Oil Producer

Our Approach (continued)

- The Raptor 2.0 system was logged in N-vision™ and Sigma modes. The N-vision mode provided the sensitivity needed to measure formation gas saturation, even in gas-filled boreholes.
- Fluids behind the 4 1/2-in. lower completion—in between the swell packers in the 6-in. borehole—were also identified. This measurement was critical in correcting for gas present in the borehole while computing for gas in the formation.
- The Raptor 2.0 system data also provided insights on gas travel behind the lower completion and in the formation when the well was put on production.

Value to Customer

- Weatherford's Raptor 2.0 system and the HPLT data provided valuable insight on gas entry points into the wellbore and the gas travel path behind the lower completion and in the formation in a producing wellbore.
- The data also confirmed that the AICDs, installed to stop the flow of free gas into the lower completion, were successfully working. Gas, however, was able to travel along the borehole and enter the lower completion from the limited entry liner (LEL) units placed further down in the string. Data confirmed no leak of gas from other completion items.
- Real-time acquisition of HPLT and N-vision data ensured faster logging data acquisition with onsite quality control, ensuring a definitive answer from the intervention.

