

Interpretation and Evaluation Services and Compact™ Microimager Data Help Operator to Improve Reservoir Targeting Accuracy by 50%

Objectives

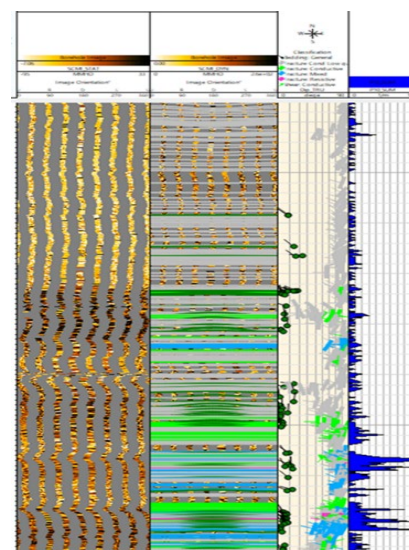
- Riglessly run logging tools to total depth (TD) in a short-radius, horizontal, heavy oil well.
- Acquire high-quality wireline log data to characterize the structural trends and extent of a reservoir and to optimize plans for a multiwell drilling campaign.

Our Approach

- When complex well geometry and small tubing size precluded logging by other companies, the operator called on Weatherford to obtain wireline logs to determine the structure, orientation, quality, and extent of a heavy oil reservoir.
- After learning that the drilling rig had already moved offsite and that logging would be impacted by high dogleg severity, small-diameter tubing, and heavy oil in the wellbore, Weatherford logging experts teamed with their pressure pumping colleagues to devise a plan.
- Weatherford crews deployed to the wellsite with a suite of openhole logging tools, coiled-tubing (CT) unit, and crane. The crane suspended the CT gooseneck over the wellhead, and Compact logging tools were made up to the CT.
- The CT unit carefully controlled the descent of the logging toolstring through the short-radius interval and from the production tubing into the horizontal openhole section.
- The crew ran battery powered slim-hole 2 1/4-in. Compact logging tools instead of conventional wireline-powered tools. They activated the tools upon reaching TD. The Compact quad-combo and microimager tools recorded formation measurements in memory mode as the CT was pulled out of the hole.
- After the logging data was downloaded and processed, Weatherford Interpretation and Evaluation Services (IES) petrophysicists worked with operator geologists to analyze the log data and assess reservoir quality.

Value to Customer

- By riglessly conveying Compact logging tools on CT, Weatherford crews overcame structural and logistical problems to obtain a full suite of logs for comprehensive reservoir evaluation after other logging companies had failed.
- The operator used data from the slim Compact microimager to evaluate reservoir rock texture and determine dip direction, fracture density, and structural trends. The IES log analysis helped the operator refine the drilling plan to target the best drilling locations and directional-drilling azimuths, which improved successful drilling outcomes by 50%.



Weatherford IES petrophysicists used the microimager log to visualize structure, identify faults and fractures, and determine formation dip.

LOCATION

Tamaulipas, Mexico

WELL TYPE

Onshore openhole heavy oil development well

FORMATION

Cretaceous limestone

HOLE SIZE AND ANGLE

6-1/4 in., 90.8°

TUBING SIZE

3-1/2 in., 9.3 lb/ft

TOTAL DEPTH

2,887 ft (880 m)

PRODUCTS/SERVICES

- Interpretation and evaluation services
- Wireline services
 - Compact memory logging (CML) service
 - Compact array induction (MAI) tool
 - Compact gamma ray (MCG) tool
 - Compact dual neutron (MDN) tool
 - Compact photodensity (MPD) tool
 - Compact sonic sonde (MSS)
 - Slim Compact microimager (SCMI)
- Pressure pumping services
 - Coiled tubing unit
 - Bowen lubricators
 - Double stripper packer
 - Injector

