

Optimizing Stimulation and Reservoir Characterization Using LWD Measurements in the Eagle Ford Shale

An independent operating company gains in-depth understanding of the Eagle Ford Shale to optimize its stimulation program

CHALLENGE

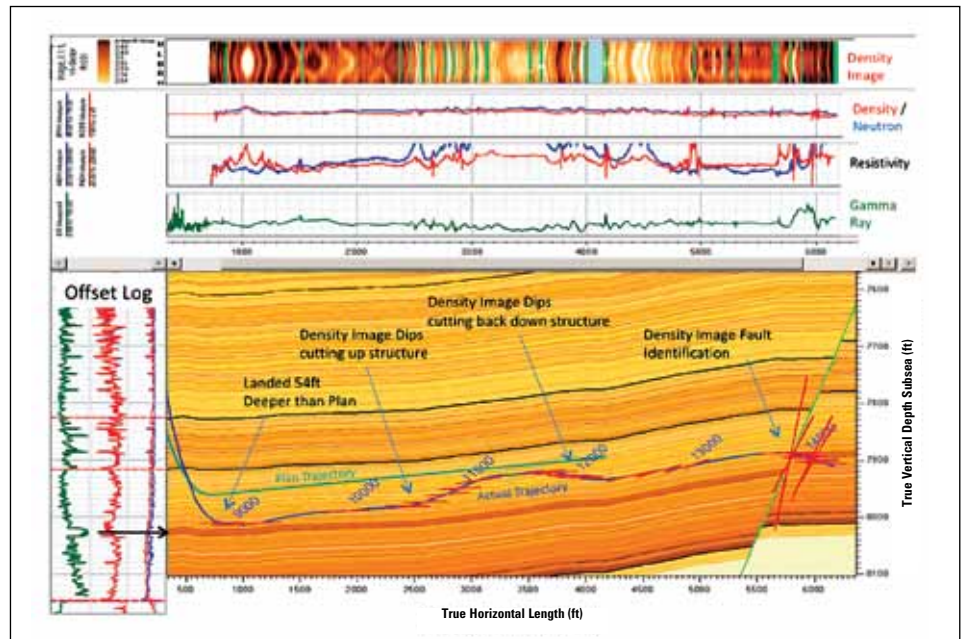
Well placement, reservoir characterization, completion design, and stimulation optimization of a horizontal well in the Eagle Ford Shale.

SOLUTION

EcoScope* and sonicVISION* measurements to steer the lateral in real time, perform structural interpretation using azimuthal borehole images, and derive reservoir and geomechanical properties to optimize completion design and enhance stimulation treatment.

RESULTS

Real-time acquisition, interpretation, and integration of well measurements, which helped the operator to prevent unexpected drilling events, evaluate the reservoir, and optimize the stimulation operation.



EcoScope and sonicVISION data revealed dip changes in Eagle Ford layers. The borehole image enabled the identification of a fault near the toe of the lateral.

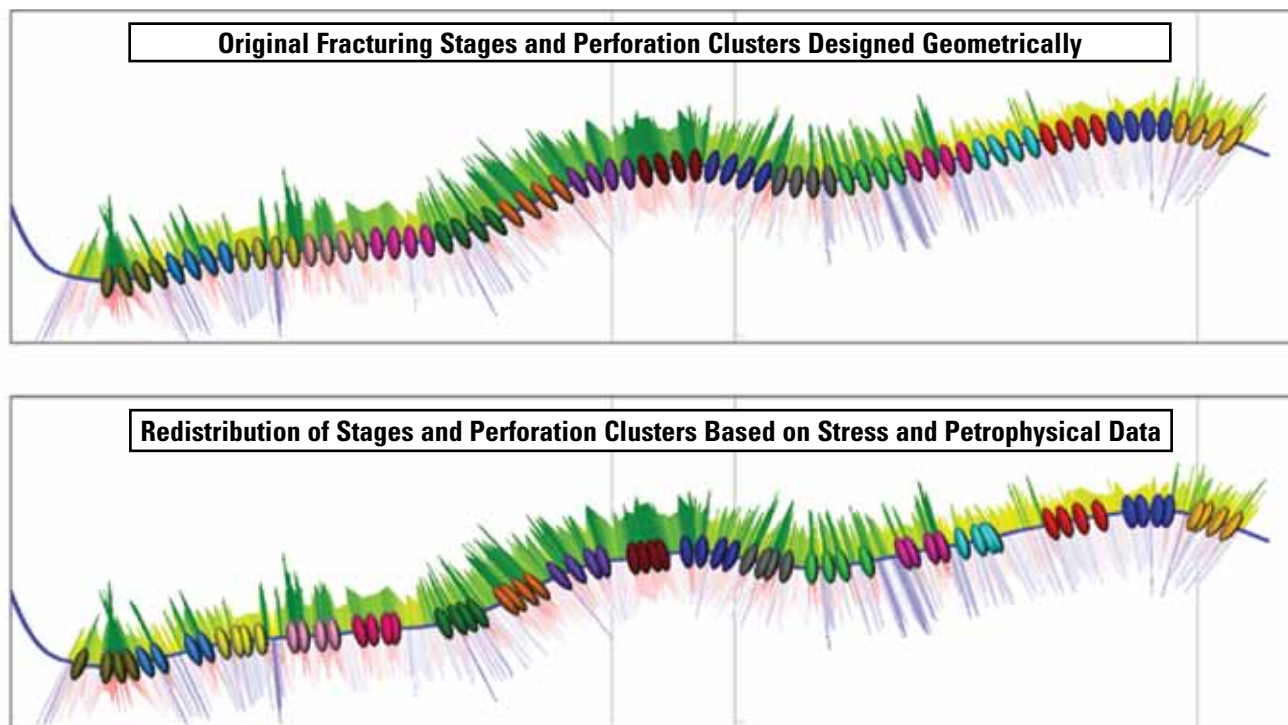
The benefits of LWD data

An independent operator drilling a new well in Webb County, Texas, planned to extend the horizontal section to an area beyond 3D seismic coverage and to log the entire lateral while drilling. LWD measurements were transmitted in real time to help ensure optimal placement of the lateral within the geologic structure and to evaluate the reservoir. Schlumberger provided the resources to acquire, interpret, and integrate logging-while-drilling measurements to influence the stimulation program in real time.

Interpreting LWD measurements for Eagle Ford characterization

To perform shale gas reservoir characterization along the lateral, the operator used combinations of the EcoScope multifunction logging-while-drilling service (including density images and spectroscopy), the TeleScope* high-speed telemetry-while-drilling service, and the sonicVISION sonic-while-drilling tool.





LWD images and stress data helped an independent operating company optimize perforation placement and fracture stages.

With the InterACT* connectivity, collaboration, and information system, real-time data was transmitted from the rig site to Schlumberger OSC* interactive drilling operations and Data & Consulting Services (DCS) scientists and engineers. This remote transmission allowed the operating company personnel to interpret LWD data and monitor drilling mechanics data in real time.

The final interpretation enhanced mineralogy description, structural mapping, and understanding of reservoir and geomechanical properties for integrated shale gas characterization.

Integrated shale gas characterization for stimulation practice

Based on this robust evaluation suite, Schlumberger was able to recommend an optimized completion design by placing the perforation clusters guided by reservoir and geomechanical properties. Furthermore, the stress profile and mineralogy from the evaluation were used to optimize the fracturing strategy.

Close coordination of this integrated workflow of data gathering, processing, and analysis helped in providing final recommendations in time for implementation and execution.

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