

Gas Production Increases by 35% in Cotton Valley Sand Formation

Case study: Optimize fracturing treatment using StimMAP data

Challenge

Determine actual geometry of induced hydraulic fractures to improve efficiency of fracturing design, optimize reservoir performance, and increase production.

Solution

Used StimMAP* hydraulic fracture stimulation diagnostics service, which maps hydraulic fracture systems in 3D as they are created.

Results

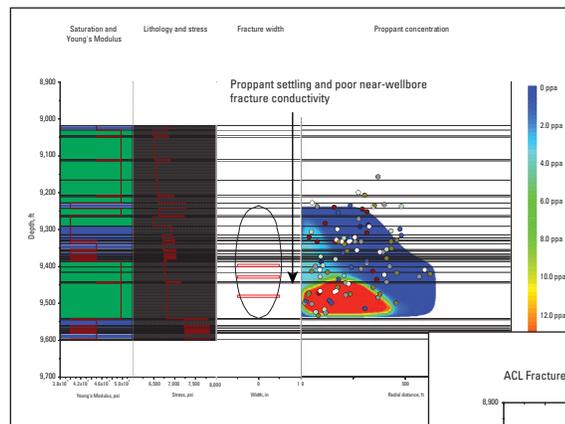
Increased production by an estimated 35%.

Analyze poor fracturing results

An operator working in the Cotton Valley sand needed to evaluate the fracturing treatments to optimize production. Underperforming stimulated wells could be a result of fracturing treatments not yielding the designed performance production.

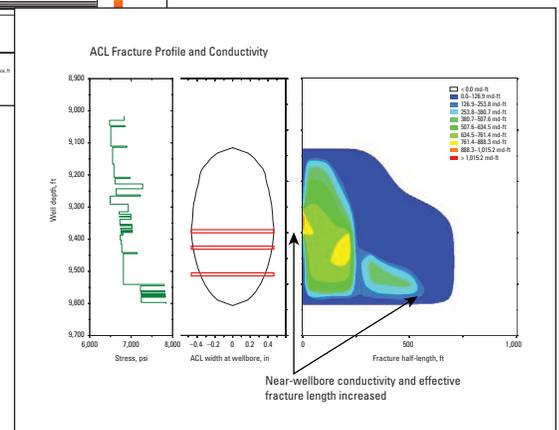
Map fracture system

The operator selected the StimMAP hydraulic fracture stimulation diagnostics service. In an era of demand for technical resources, the Schlumberger integrated solution offered industry-leading experience and expertise. StimMAP diagnostics map hydraulic fracture systems in 3D as they are created. These measurements can be used to ensure optimal hydraulic fracture placement and improve reservoir development. Information collected is processed on site to refine the fracturing design for the next stage. The service can also be used to evaluate the influence of treatment communication with offset wells.



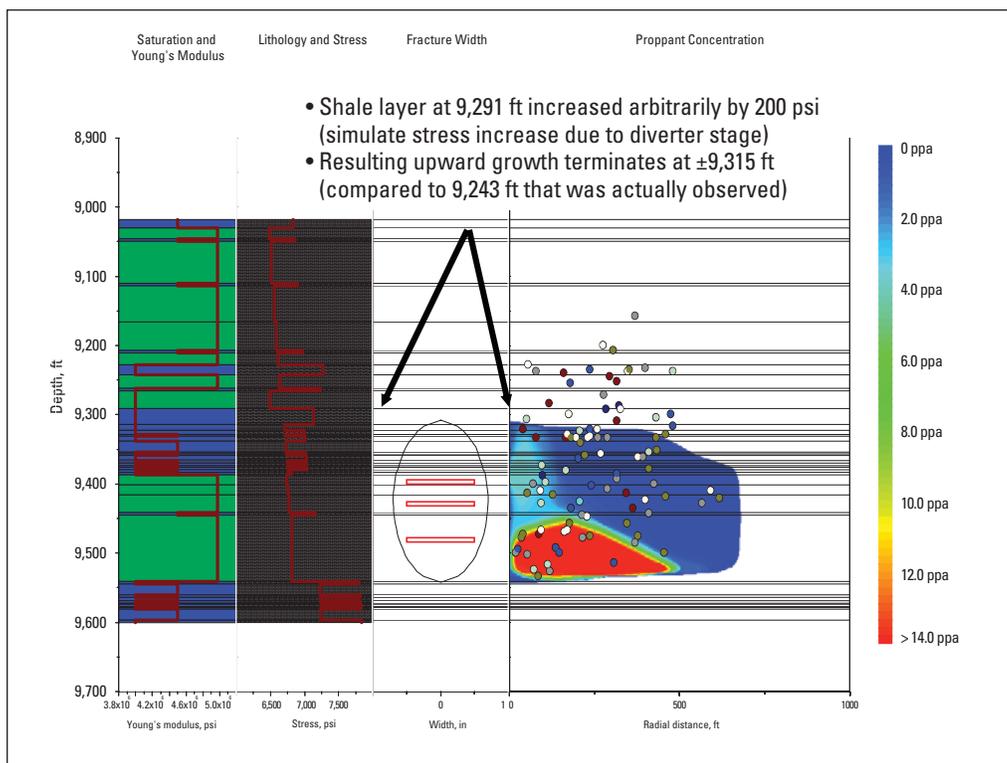
After-treatment fracture conductivity plot of actual slickwater stimulation with microseismic mapped events.

After-treatment fracture conductivity plot of recommended hybrid slickwater treatment.



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The StimMAP service helped increase production by 35%.



Fracture conductivity plot with an increased shale barrier layer simulating the effects of a diverter stage or fluids to lower net pressure to minimize upward height growth.

StimMAP technology was used to generate an event map to confirm that hydraulic fracture half-length matched the design half-length and to analyze the height growth of the fracture stimulation treatment.

Optimize future treatments

The original fracturing design assumed that the fracture was contained within the Cotton Valley sand. However, StimMAP microseismic monitoring showed that the fracture grew out of the desired zone. The actual fracture half-length was only 18% of the design. The StimMAP plot also revealed that the slickwater treatment as designed demonstrated proppant settling and low near-wellbore conductivity. With this knowledge, the operator was able to optimize future treatments to minimize height growth and increase fracture conductivity.

Production modeling now estimates an increased initial productivity of 35% (26.5% by the end of the first year).

Other recommendations included the use of a hybrid slickwater schedule, which employs 39% less fluid volume, 9% more proppant volume, and a modeled fracture half-length 25% larger than the previous results, and the use of FiberFRAC* fiber-based fracturing fluid technology to prevent proppant settling while creating greater propped length.

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