

# ACTive Q Service Key to Improving Injection Rate of Dual-Lateral Power Injector by 600%

ACTive DFLO tool and Discovery MLT system efficiently confirm lateral entry and accurate placement of treatment fluid to deliver outstanding stimulation results

## CHALLENGE

- Determine pre- and poststimulation injection rates for each lateral.
- Access each lateral efficiently.
- Acidize the long openhole interval of each lateral effectively.
- Improve the well's injection rate to 5,000 bbl/d [795 m<sup>3</sup>/d] from 2,000 bbl/d [318 m<sup>3</sup>/d].

## SOLUTION

- Use the Discovery MLT\* multilateral reentry system to access each lateral and the ACTive GR\* CT real-time gamma ray logging tool to verify treatment of targeted laterals.
- Use the ACTive Q\* CT real-time downhole flow measurement service along each lateral to evaluate flow distribution between laterals and identify thief and tight zones.
- Use ACTive Q service to obtain poststimulation injection profile of each lateral and assess treatment effectiveness and new flow distribution.

## RESULTS

- Increased well's injectivity to 14,000 bbl/d [2,226 m<sup>3</sup>/d].

## Operator needs to improve declining injection rate in dual-lateral injector well

A Middle East operator had drilled and completed a dual-lateral water injector well to provide pressure support and enhance reservoir sweep efficiency. The well had two openhole laterals of more than 4,000 ft [1,219 m] each. Initial injection rates were 5,000 bbl/d with 2,800 psi [19 MPa] of wellhead pressure, but injection gradually declined to 2,000 bbl/d (maintaining the same injection pressure). The operator decided to acidize the two laterals with the aim of restoring the well to its initial injection rate of 5,000 bbl/d.

## Original combination of technologies provides unprecedented guidance for advanced stimulation strategy

Schlumberger recommended performing the treatment using the Discovery MLT system to locate the entrance of each lateral. Once accessed, each lateral was immediately identified using the ACTive GR tool by comparing real-time data with the operator's reference logs. To optimize stimulation fluid placement, the operator needed accurate data about the injection contribution to each lateral as well as the distribution of intake and tight zones along both openhole sections. To this end, the ACTive DFLO\* CT real-time flow measurement tool was used to profile flow along the entire sections of interest.

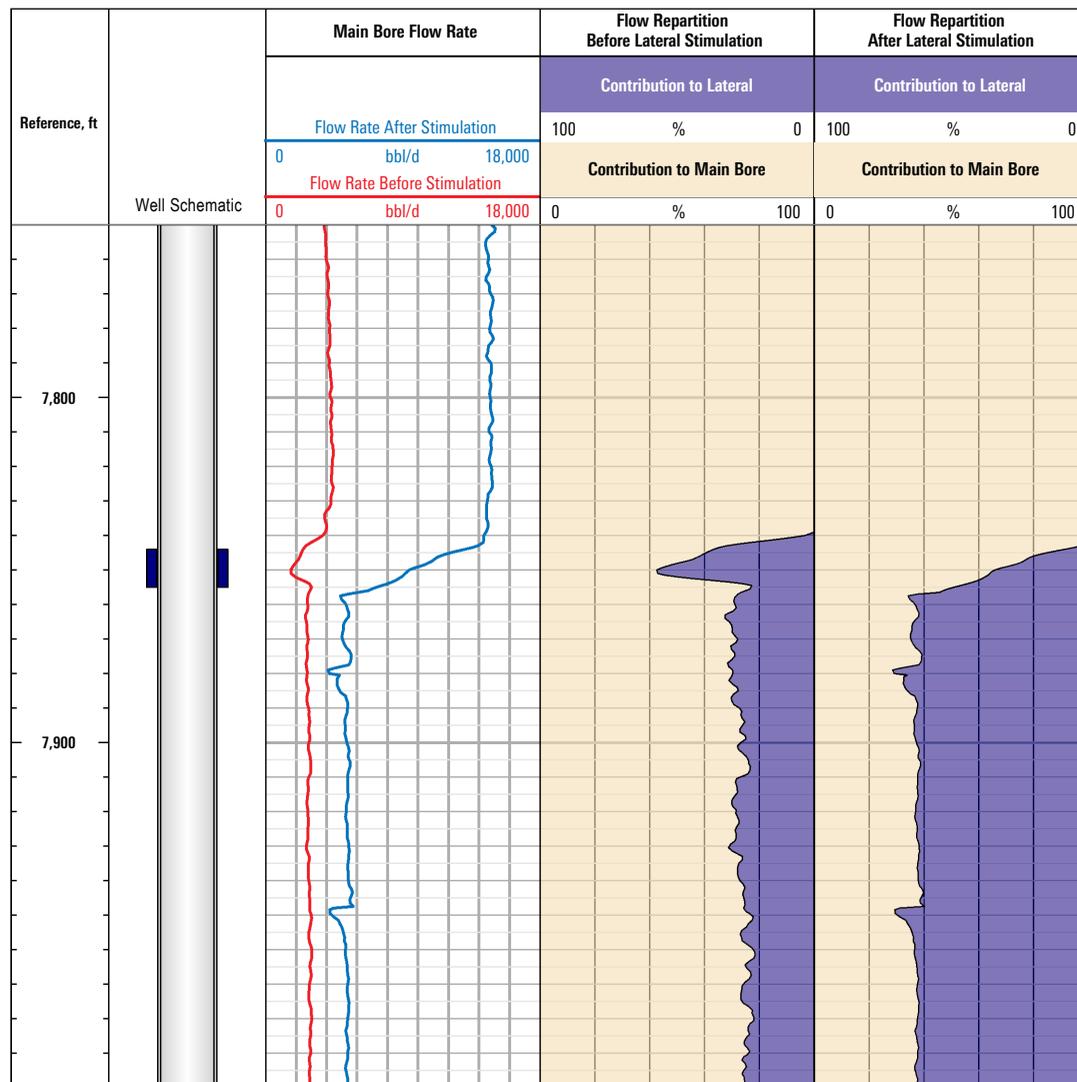
Once it was determined that most of the injected water was flowing to the main bore, Schlumberger engineers worked with the operator to adjust the pumping sequence along each lateral and maximize acid coverage to obtain a more uniform intake.

## Results far exceed target injection rate

The comparison between the pre- and poststimulation ACTive Q service profiles showed a significant improvement in coverage along the two laterals and a more balanced injection distribution between them. As a result of this intervention, the well's injection rate increased to 14,000 bbl/d, an impressive 600% improvement over the prestimulation level. These results also substantially exceeded the target injection rate of 5,000 bbl/d.



**CASE STUDY:** Dual-lateral injectivity increased by 600% with Discovery MLT system and ACTIVE Q service, Middle East



Comparison of ACTIVE Q service profiling above, across, and below the lateral window before and after stimulation verifies the significant improvement in injection to the lateral. The lateral window is represented by the blue boxes on the well schematic.

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