

# ACTive Q Service Helps Operator Improve Wells' Injectivity Index Nearly 300%

Innovative real-time CT flow measurement technology enables unprecedented control and optimization of dual injection stimulation in horizontal openhole injection wells

**CHALLENGE**

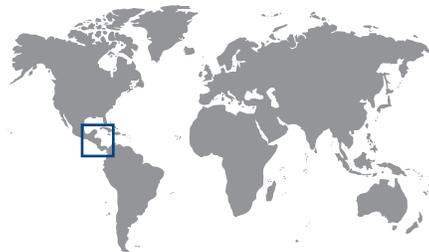
Successfully acidize two water injection wells after previous stimulation treatments proved ineffective.

**SOLUTION**

Maximize fluid coverage and treatment effectiveness through the control of dual injection with downhole measurements acquired by the ACTive DFLO\* CT real-time flow measurement tool.

**RESULTS**

Improved injectivity index of both wells almost 300%.

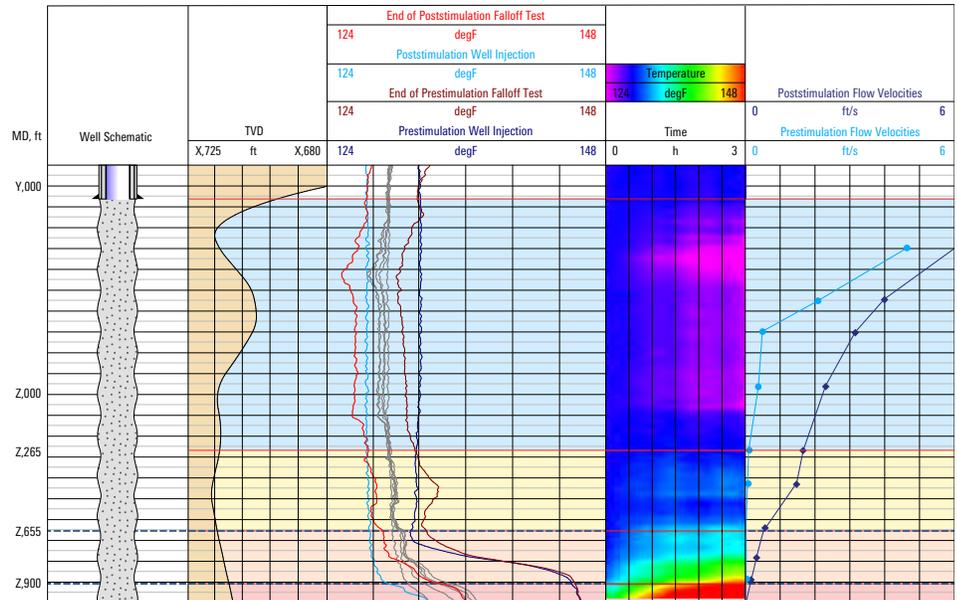


**Optimize stimulation operation after ineffective bullheading**

Bullheading stimulation fluids into two long horizontal openhole water injection wells in Central America left much of the reservoir untouched. There was little available information about the permeability, porosity, or fracture distributions of the formation to prepare a thorough design analysis, and the remote location of the site further complicated matters. To optimally acidize the dolomitic carbonate formation, the operator needed high-quality, real-time flow data to assess the true fluid intake along the horizontal interval, and to monitor and adjust the treatment while it was still in progress.

**Target the stimulation using real-time CT flow measurement technology**

Schlumberger suggested ACTive\* real-time downhole coiled tubing services to acquire the real-time downhole data needed to optimize the acid treatment. First, ACTive Profiling\* CT real-time distributed temperature sensing and production logging services and ACTive Q\* CT real-time downhole flow measurement service were used to evaluate the initial zonal coverage along the openhole interval while water was bullheaded at the nominal surface pump rate and injection pressure.



DTS and flow monitoring data after stimulation indicate improved zonal coverage of the water injection at the same nominal surface injection pressure.

## CASE STUDY: Horizontal wells' injectivity index boosted nearly 300% with ACTive Q service

---

Based on the initial profile results and a falloff test, the stimulation strategy was revised to target different intervals, introduce the use of dual injection for a deeper reach along the interval, and adjust pumping rates and volumes. ACTive Q service was used during the dual injection process to ensure that the stimulation fluid pumped through the CT was being forced into the right section of the wellbore, as opposed to flowing back to shallower thief zones as it had during simple CT spotting. As part of the ACTive Q service, the ACTive DFLO tool measured the fluid velocity and detected flow direction during the stimulation job. Throughout the process, communication and remote decision making were facilitated by InterACT\* global connectivity, collaboration, and information service.

### **Injectivity increased nearly 300%**

After the treatment, ACTive Profiling and ACTive Q services were again used to assess the results of the stimulation, and a new falloff test was performed. The results of those studies showed improved zonal coverage of the injection water (at equal surface injection pressure) and deeper reach along the horizontal sections. A reduced skin value indicated that formation damage had been effectively bypassed. Most importantly, the injectivity index of both wells improved almost 300% following treatment.

[slb.com/ACTiveQ](http://slb.com/ACTiveQ)