

Argentina

# Innovative cement solution improves zonal isolation in new bedrock development

ChannelFix™ cement additive and Tuned® Defense™ cement spacer support excellent CBL results and successful well completion

## CHALLENGE

- Evaluate deeper, unexplored bedrock with a horizontal well
- Tight operational window created by slim well geometry and limited offset data
- Multistage fracturing required strong, reliable zonal isolation

## SOLUTION

Deploy cement solution comprised of:

- Tuned® Defense™ cement spacer
- ChannelFix™ cement additive
- Commander™ full-bore cementing head

## RESULT

- Completed cementing with zero lost circulation
- Achieved strong mud displacement and full radial cement coverage
- Mitigated channeling risk and delivered dependable zonal isolation

## Overview

After several years of conventional development in the Vaca Muerta basin in Argentina, an operator decided to pursue a new strategy to unlock additional gas potential. A deeper vertical exploratory well delivered promising results, so the operator advanced the evaluation program and drilled a horizontal well with an unconventional completion. This approach increased reservoir exposure and allowed for a more thorough assessment of the bedrock's gas-bearing potential.

## Challenge

Operators frequently drill horizontal wells in Argentina, particularly in the Vaca Muerta basin, and most operators understand the operational window in those reservoirs. This project differed. The deeper bedrock interval remained largely underexplored, and limited offset data combined with slim well geometry created a narrow, unforgiving operational window.

The planned multi-stage fracture completion required strong zonal isolation throughout the well's operational life. To meet this requirement, the operator required a slurry that still maintained low rheology and low density to avoid losses that could compromise the top of the cement (TOC).

Low-rheology designs often struggle to suspend elastomeric materials, which makes it difficult to include additives that improve cement elasticity and channel-mitigation performance. The operator needed a system that balanced all of these requirements without an increase in ECDs or a risk of circulation losses.

## Solution

The Halliburton team used 3D displacement modeling to design a fluid system tailored to the well's narrow margins. Halliburton pumped 50 bbl of 13.6-lbm/gal Tuned® Defense™ cement spacer to displace the oil-based mud. The team tuned the rheology and density to maintain proper hierarchy and

prevent excessive ECDs. This approach protected the TOC inside the previous casing and eliminated the risk of costly remediation or future sustained casing pressure.

In addition, Halliburton pumped a 14.5-ppg slurry that included ChannelFix™ cement additive and Microbond HT™ expansive cement additive. The ChannelFix cement additive would mitigate residual OBM channels and create a dependable barrier that withstands the pressure cycles typical of unconventional completions. The Microbond additive would increase cement sheath elasticity and improve long-term isolation.

The team deployed a Commander™ full-bore cement head with one-piece centralizers. This equipment allows full casing rotation throughout the operation, as validated with WellPlan® software. The rotation also improves mud removal, cement coverage, and barrier effectiveness.

## Result

The tailored fluid system enabled placement of all cement volumes with no circulation losses. Mud pit recordings confirmed full return of spacer and slurry volumes, which validated ECD control throughout the operation. Casing rotation during placement helped improve mud displacement, reduce channeling risk, and provide radial cement coverage in the logged interval.

Subsequent cement evaluation indicated strong isolation and dependable bonding in the vertical section. With the zonal isolation achieved as designed, the operator completed the well without remediation and proceeded with the planned unconventional stimulation program. The outcome demonstrated that a tailored cementing strategy can help operators safely explore deeper, previously undeveloped rock while minimizing risk and preserving operational efficiency.

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