

Vaca Muerta Formation, Argentina

# Operator overcomes casing restriction and saves 3,280 ft of productive zone

Illusion® high-expansion dissolvable frac plugs eliminate coiled tubing intervention, reduce risk, time, and costs

## CHALLENGE

- Potential loss of production zone caused by casing restriction
- Increased risk and costs for intervention

## SOLUTION

- Illusion® HE dissolvable frac plug

## RESULT

- Completed first seven fracturing stages without issues
- Saved 3,280 ft (1000 m) of productive zone, approximately 35% of the lateral length
- Eliminated coiled tubing intervention, which mimized risk, time, and costs

## Overview

During hydraulic fracturing operations in the Vaca Muerta formation, operators often face casing deformation issues that increase operational risks and costs, which in some cases, leads to lost production. Attempts to recover a productive zone can generate additional costs attributed to non productive time (NPT), unexpected services, bottomhole assembly (BHA) losses, and fishing operations.

A major operator in the Vaca Muerta oil field encountered a significant casing restriction near 16,404 ft (5000 m) of a 20,013-ft (6100-meter) well with 9,514-ft (2900-meter) lateral length. To avoid the uncertainty of coiled tubing intervention and potential abandonment of stages, the operator approached Halliburton for a solution.

Halliburton recommended Illusion® High-Expansion (HE) dissolvable frac plug technology, which enabled completion of the first seven fracturing stages, without issues, and saved 3,280 ft (1000 m) of lateral length to significantly minimize time and intervention costs.



# 35%

lateral length recovered

## Challenge

The operator discovered a 3.62-in. diameter restriction in the 5-in. 21.4-lb/ft casing (4.126-in. inner diameter) at 16,692 ft (5088 m) measured depth (MD). This prevented execution of the original well plan, in which plug-and-perf operations were planned with standard frac plugs larger than the restriction.

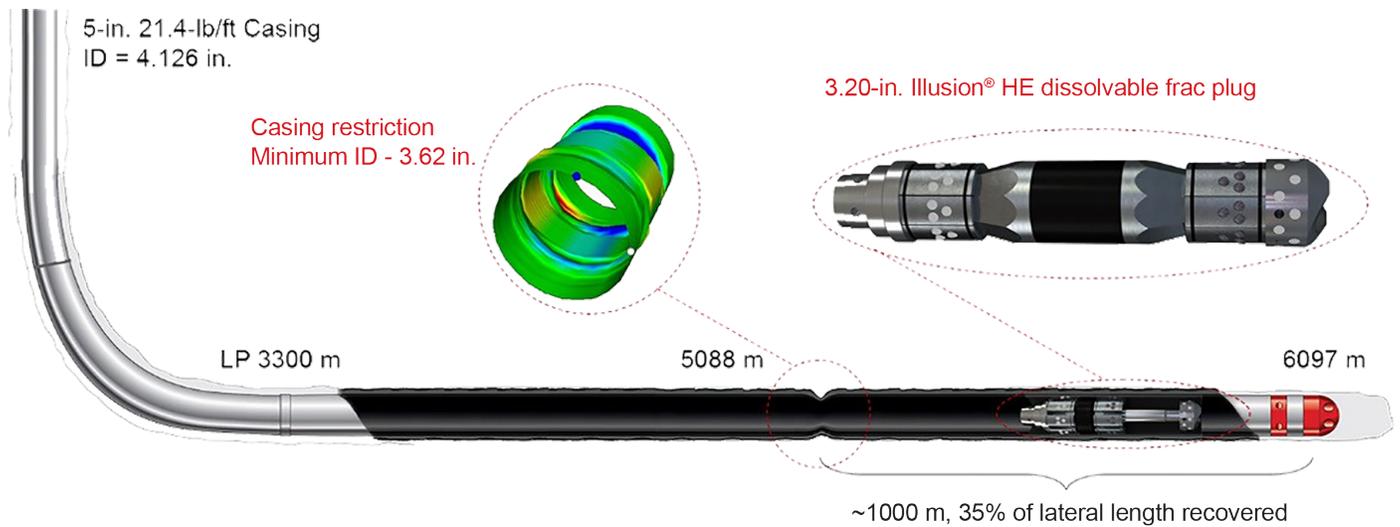
## Solution

Based on the operator's expectations and previous experience in the region, Halliburton proposed the field-proven Illusion® HE dissolvable frac plug. The plug design allows for use in a wider range of casing sizes, which makes it ideal for wellbores with casing restrictions typically impassable for standard diameter frac plugs. Additionally, this fully dissolvable plug helps eliminate the risks associated with milling a standard composite high-expansion device that requires undersize milling in a restricted environment. During the first fracturing stages, Halliburton recommended placement of the 3.20-in. Illusion HE frac plug below the casing restriction, with standard 3.68-in. Illusion frac plugs above.

## Result

Halliburton deployed the Illusion frac plugs during the first seven fracturing stages, and all plugs passed through the restricted section successfully to provide reliable isolation during plug-and-perf operations. The Halliburton solution maximized the operator's asset value and saved 3,280 ft (1000 m) of productive zone, approximately 35% of lateral length.

The fully dissolvable plug also minimized risks, time, and costs associated with coiled tubing intervention, which allowed the operator to perform minimally invasive well cleanup using an undersized mill, without compromise to the casing thickness and integrity.



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