

Vaca Muerta Formation,  
Argentina

# Illusion<sup>®</sup> plug saves operator approximately USD 515,000

Interventionless solution allows multiple wells to be placed on production after stimulation

## CHALLENGE

- Eliminate intervention to lower operator's cost per BOE
- Minimize millout times
- Provide viable solution for remote locations with long intervals

## SOLUTION

Illusion<sup>®</sup> dissolvable frac plugs, which provide:

- Interventionless solution with field-proven success
- Optimal dissolution while maintaining isolation

## RESULT

- Reduced operator's costs by USD 515,000
- Omitted coiled tubing from operation
- Reduced well complexity

## Overview

Continuous improvement is a critical component to a company's sustainability. With the need to actualize improvements using new technologies, many companies are reach out to service leaders, like Halliburton, to provide solutions that lower the cost per BOE and increase production.

Halliburton deployed new technologies, along with local experience and lessons learned from previous success, to provide a solution to lower an operator's cost per BOE.

## Challenge

A major operator in the Vaca Muerta shale play used 20 to 28 composite frac plugs in a completion design. Although efficient and low-cost in nature, composite plugs must be removed before wells can be placed online for production. In search of an alternative solution that does not require intervention, the operator looked to Halliburton for assistance.

Milling composite plugs requires the availability and logistics coordination of coiled tubing, which can be a challenge in remote locations. To complicate this further, operators actively extend the laterals in their wells, which increases the complexity involved with identification of available coiled tubing that can reach the composite plugs and supply sufficient force to mill them out.



Illusion<sup>®</sup> dissolvable frac plug



Customer saved USD 515,000

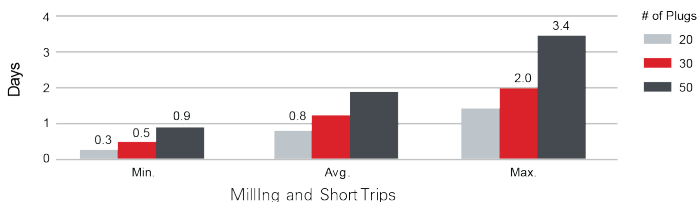
## CASE STUDY

Once milling begins, operators usually incur an average of 20– to 40 minutes of millout time per composite plug. Hybrid plugs, composite plugs with cast slips, or brass mandrel plugs with cast slips can greatly increase mill time.

Short trips in hole are also necessary to reduce the risk of coiled tubing being stuck in the well by allowing circulation of larger milling debris to surface, instead of cumulating behind the mill and the bottomhole assembly (BHA). The chart below illustrates intervention time estimates based on input from Argentina. Based on the values reflected, intervention time, on average, can require 12, 29, and 48 hours for 30 composite plugs. On four-well pads, for example, intervention can require anywhere from two to eight days to complete.

Ancillary equipment is not included in the estimates shown, but the impact increases total cost, time, and risks attributed the additional work and personnel required to perform these interventions.

### Intervention time / well composite plugs



## Solution

Understanding the challenges that operators face and using experience and success within country, Halliburton recommended the Illusion® dissolvable frac plug. The plug's design is based on the field-proven Fas Drill® Ultra and Obsidian® frac plugs with pumpdown rates that exceed many competitors. The metallurgy used in the Illusion plug is value-engineered to provide the optimal dissolution and maintain isolation integrity before and during the fracuring operation. The proprietary Illusion dissolvable metal has several variants that provide a semi-customized product solution based on well conditions. As one of the pioneers of dissolvable frac plugs in this region, Halliburton's knowledge and experience enabled recommendation of the optimal solution for this operator.

## Result

Initially, the operator used coiled tubing to validate the plugs dissolved as predicted during simulations. After validation that the Illusion plugs disappeared from the wellbore, and after following Halliburton best practices, the operator omitted coiled tubing intervention and successfully placed several wells on production shortly after the frac crew moved off location. This achievement allowed the operator to place its wells on production faster, and eliminated the risk and complexity associated with interventions on multiple wells. Ultimately, using Illusion dissolvable frac plugs saved the operator approximately USD 515,000.

For more information, contact your local Halliburton representative or visit us on the web at [www.halliburton.com](http://www.halliburton.com)

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