

# Halliburton Drills Fastest Directional Well in Napo Basin

## SOLUTION OPTIMIZES DRILLING TIME BY 14.75 DAYS

ECUADOR

### CHALLENGES

- » Design and execute a main pay well
- » Manage geological risks
- » Minimize non-productive time (NPT)

### SOLUTION

- » BHA optimization
- » DES implementation
- » Customized bits via the DatCI<sup>SM</sup> process
- » GeoTech<sup>®</sup> PDC bit
- » Geo-Pilot<sup>®</sup> Duro<sup>™</sup> RSS
- » ADT<sup>®</sup> drilling optimization service
- » Geomechanics services
- » BOREMAX<sup>®</sup> drilling fluid
- » iCem<sup>®</sup> cementing services
- » VersaFlex<sup>®</sup> liner hangers

### RESULTS

- » Completed Halliburton operation with zero NPT
- » Achieved fastest directional well with a horizontal displacement of < 1000 meters (3,280 feet)
- » Saved USD 3.5 million in costs and 14.75 days, including completion

### OVERVIEW

A client in Ecuador turned to Halliburton to perform its 2016–2017 drilling campaign in order to maintain production in the Napo Basin.

The objective was to safely and effectively deliver a production well in the main pay reservoir, within the specified budget and with effective hydraulic isolation. The project scope included basic integrated services with a coordinator managing all activity in the one field.

### CHALLENGE

Halliburton was challenged to design, drill, and deliver wells in the Napo Basin – and to do this safely, efficiently, on time, and within the allocated budget. The geology in the field presented significant obstacles, including drilling through highly reactive shale sequences with borehole instability issues and depleted formations at critical points within the well geometry. These conditions, which tend to slow drilling with associated problems and to historically increase the total well time, required proper engineering.

### SOLUTION

To reduce drilling time and well costs, the Halliburton Project Management (HPM) team developed plans and procedures from lessons learned on previous campaigns that would overcome the anticipated downhole issues. Halliburton Project Management created a synergy between all groups involved in the well construction, including all Halliburton product service lines (PSLs) and third parties. This included:

- » Developing an optimized well drilling program based on field experience and lessons learned to date
- » Reducing frequency of trips to change change the bottomhole assembly (BHA) and avoiding tight hole events
- » Increasing rate of penetration (ROP) and reducing tripping time
- » Optimizing sliding/rotary drilling using field experience and rotary steerable system technology
- » Coordinating the plan with all service lines and third parties to deliver services and materials on time

**HALLIBURTON**  
PERFORMANCE  
helped save over  
**14 DAYS AND**  
**USD 3.5 M**

### Highlights/New Technology

- » Implementation of the Halliburton critical well process, including the Drill Well on Paper (DWOP) process
- » Drilling engineering service (DES) implementation and real-time operations monitoring in place of Applied Fluids Optimization (AFO), ADT® drilling optimization service, and geomechanics
- » On-time delivery of base for oil-based mud, with no incidents or spills reported
- » Quick delivery of influx control device for the 6-inch hole section
- » Good performance for the inhibited polymer used in the 16-inch hole section
- » Good performance of BOREMAX® 12¼-inch section
- » Use of roller reamers and torque reducers to improve tripping
- » Hole exposed up to 118 hours before performing a trip – no major hole condition issues reported
- » No sticking events related to mud condition or drilling practice recorded attributable to Halliburton
- » Use of high-torque liner hangers
- » Good ROPs in each section of the well
- » Well successfully completed with influx control device technology
- » BHA optimization
- » Customized bits via the Design at the Customer Interface (DatCISM) process
- » GeoTech® PDC bit and Geo-Pilot® Duro™ rotary steerable system (RSS)
- » BOREMAX® drilling fluid
- » iCem® cementing services
- » VersaFlex® liner hangers

### RESULTS

Through proper planning and efficient execution, Halliburton Project Management safely delivered a J-shaped high-angle well 14.75 days ahead of the planned time to ultimately save the customer approximately USD 3.5 million. The plan was based on best practices and field experience gained by all the Halliburton product service lines involved in the well construction. Effective pre-planning in advance of drilling the well played a major role in having a smooth, seamless operation. This outstanding performance was a result of strong integrated services leadership, effective collaboration between the parties, and processes and execution with the right Halliburton technology application and operational support.

The well was delivered significantly ahead of the original plan, while still meeting all of the following client objectives:

- » Fastest directional well with a horizontal displacement of < 1000 meters (3,280 feet)
- » Saved approximately 8.5 days against the planned drilling time
- » Saved a total of 14.75 days, including completion
- » Entire Halliburton operation completed with zero non-productive time (NPT)
- » 1.7 percent overall well NPT

[www.halliburton.com](http://www.halliburton.com)

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