

# Operator Runs First Fluid Sampling-While-Drilling Operation in Harsh Environment

## GEOTAP® IDS FLUID IDENTIFICATION AND SAMPLING SERVICE DEPLOYED IN DEEP WATER WELL

OFFSHORE, WEST AFRICA

### CHALLENGE

- » Collect fluid samples while drilling in deep water environment
- » Acquire fast, low-contamination samples
- » Drill in a harsh environment

### SOLUTION

Engineered solution with technical upgrades in close collaboration between Halliburton and the operator

- » GeoTap® IDS fluid identification and sampling service – upgraded to meet job specifications
- » iCruise® intelligent rotary steerable system (RSS) – for precise steering
- » EarthStar® ultra-deep resistivity service – for precise geosteering
- » ADR™ azimuthal deep resistivity service – for optimized wellbore placement

### RESULT

- » Completed first-ever fluid sampling-while-drilling operation for the operator
- » Delivered low-contamination samples from two runs as confirmed by the client
- » Acquired reservoir data to facilitate drilling, completion, and production decisions
- » Reached section TD via accurate geosteering

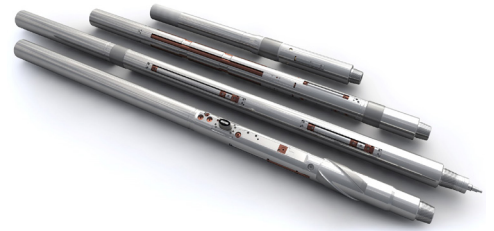
### OVERVIEW

Working from a semi-submersible rig offshore, an operator was focused on a horizontal deep water well. The operator needed to understand the fluid properties of the reservoir while reducing well time and costs.



### CHALLENGE

The operator needed to collect fluid samples while drilling in a potentially corrosive environment. The contamination from drilling fluids needed to be minimized to ensure quality samples were retrieved for reservoir characterization. Normally, fluid sampling would be accomplished using a vertical or low-angle directional pilot well to run gravity-conveyed wireline logging tools; however, to reduce well time, Halliburton worked with the operator to determine a viable solution.



*GeoTap IDS tool (top), and safeguarded sample collection bottles (bottom).*

### SOLUTION

The Drilling Engineering Solutions team recommended including the GeoTap® IDS fluid identification and sampling service in the bottom hole assembly (BHA) to acquire fluid samples while drilling. The GeoTap IDS service delivers real-time reservoir characterization through logging-while-drilling.

Due to the potentially harsh environment, specific technical upgrades to key components and sensors were required to facilitate a safe and successful operation. The component and sensor upgrades were implemented to meet the required specifications to safely operate reservoir and gather data to facilitate drilling, completion, and production decisions. Close collaboration between the customer and the Halliburton Technology Center in Houston enabled the configuration upgrade of the standard GeoTap IDS service and remain on schedule.

In addition to the upgraded GeoTap IDS service, the BHA included the iCruise® intelligent rotary steerable system (RSS), EarthStar® ultra-deep resistivity service, and ADR™

azimuthal deep resistivity service. These additional services allowed pro-active steering decisions to reach the drilling targets.

## RESULT

Two runs were successfully performed for this campaign. The GeoTap IDS service was placed approximately 100 m outside the casing shoe to pump out the water-based mud filtrate and then collected low contamination, single-phase oil samples into pre-charged nitrogen (N<sub>2</sub>) canisters.

For the first run, five sample bottles were filled and over-pressurized with 200 minutes of pumping. The samples to retrieve had times ranging from 82 minutes to 145 minutes. Normal drilling resumed for the rest of the run, after which the GeoTap IDS service was pulled out of hole to surface. All the necessary safety precautions were used to remove the collection bottles and mitigate any potential hazardous threat to rig personnel. The five sample bottles were shipped to the customer's PVT lab for analysis of contamination which found to be an accurate representation of the reservoir, according to the customer.

For the second run, no samples were initially planned, but as operations continued two samples were successfully retrieved. The contamination levels for these samples ranged from 13 wt% to 21 wt% after small pump-outs of maximum 6 liters only (less than an hour).

During the normal drilling operations, the additional Halliburton services successfully landed the well at the desired total depth (TD).

Both runs proved to the operator that the GeoTap IDS service could perform sampling while drilling and with reduced contamination levels. The GeoTap IDS service helps reduce well time and costs by eliminating the need for a pilot well for gathering fluid samples.

Halliburton also showed how collaboration and customized solutions help meet customer needs and maximize their asset value.

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