

# European operator secured needed cores to prove subsidence models to government

Halliburton's 5.5-inch RockStrong™ Coring System delivered larger, undamaged core samples with near 100 percent reliability



## OVERVIEW

A European oil and gas exploration company needed larger, undamaged core samples of a formation as it started to drill a new well in a nature reserve area. To continue drilling operations in this environmentally sensitive region, the company needed the core samples to prove its subsidence model to the government.

The operator turned to Halliburton, which recommended its 5.5-inch RockStrong™ Coring System to collect samples from the 6-inch hole. The system can obtain 3.25-inch diameter core samples, larger than other systems that size. Halliburton also developed new methods to keep the samples undamaged during the retrieval and transportation to testing labs. Halliburton successfully retrieved nearly 100 percent of the requested core samples. This successful coring operation marked the first time the 5.5-inch system was used in Continental Europe.

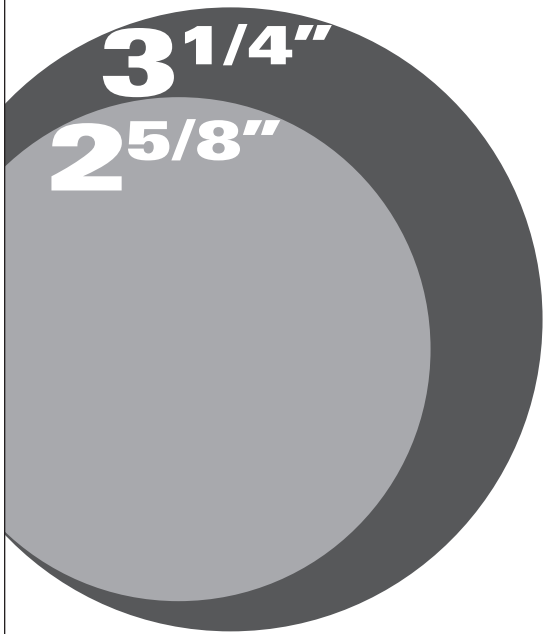
CHALLENGE	SOLUTION
<p><b>Testing required larger core size</b></p> <p>The operator needed cores from the complete reservoir and some formations on top of the reservoir. These cores needed to be large enough in diameter to accommodate the testing required for the operator to demonstrate its subsidence model met government regulations.</p>	<p><b>RockStrong system produced larger core diameters</b></p> <p>The 5.5-inch RockStrong Coring System was used in the 6-inch hole. The system obtains 3.25-inch diameter cores, large enough to satisfy the testing requirements. Other coring systems can only collect a 2.625-inch diameter sample from the same hole size.</p>
<p><b>Type of formation caused jamming during coring</b></p> <p>Previous attempts to obtain core samples from offset wells in this area jammed systems and limited core recovery. The type of formation, the drilling of the shoetrack, and the operator's need to start core sampling just outside the shoetrack all contributed to the possibility of jamming.</p>	<p><b>RockStrong system helped prevent jamming problems</b></p> <p>The RockStrong system incorporates anti-jamming features, including a completely redesigned swivel, making it the most robust coring tool on the market. The design enabled Halliburton to retrieve core samples without jamming, obtaining 117 out of 120 meters of formation successfully.</p>
<p><b>Core treatment at surface</b></p> <p>The core sample needed to be handled as safely as possible to prevent any damage. Certain laboratory tests could only be conducted if the core was completely undamaged, without even one crack.</p>	<p><b>Vertical foaming and special core cradles insured safety</b></p> <p>Halliburton foamed the core inside the inner tube while it was still vertical, helping ensure the sample wouldn't crack before it was moved. The 9-meter long core samples were cut to 4.5 meters and placed in specially made core cradles to help eliminate damage during transport.</p>



Halliburton used its 5.5-inch RockStrong™ Coring System for the first time in Continental Europe to retrieve core samples from the 6-inch hole. The operator needed these samples to be undamaged for laboratory tests.

# FIRST TIME

## IN CONTINENTAL EUROPE



**LARGER**  
CORE SAMPLE  
THAN **ANY** OTHER  
IN THE INDUSTRY

*The 5.5-inch RockStrong Coring System produces a 3.25-inch diameter core sample, larger than any other in the industry.*

*Halliburton foamed the core samples vertically instead of horizontally to minimize the risk of damage before moving the sample to the rig floor. Halliburton also cut the cores from 9 meters in length to 4.5 meters and used special core cradles to prevent damage during transport.*

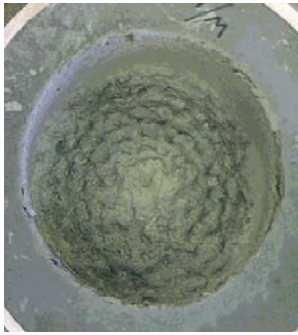
**NO**  
CRACKS

# 117 OUT OF 120

## METERS RECOVERED

*Halliburton retrieved 117 meters out of the 120 meters of core samples the operator needed in order to conduct these critical tests – a near 100% retrieval rate.*

## Halliburton's 5.5-inch RockStrong™ Coring System delivered larger, undamaged core samples with near 100 percent reliability



### **Core samples needed for new well in nature reserve**

A European oil and gas operator began drilling a new well in a nature reserve area. Government regulations required the operator to produce a subsidence model that proved it could safely drill the well in order to secure a license in this environmentally sensitive area. To do that, the operator needed core samples from the complete reservoir and some formations on top of the reservoir. These core samples needed to be undamaged and large enough in diameter to complete the required laboratory tests. The operator turned to Halliburton to help obtain these critical samples.



### **First time RockStrong Coring System used in Continental Europe**

Halliburton recommended using its 5.5-inch RockStrong Coring System to collect samples from this 6-inch hole. The system provides a larger diameter core sample at 3.25 inches than any other coring system for that sized hole. Other coring systems typically can only produce a core sample 2.625 inches in diameter for a 6-inch hole. This marked the first time the 5.5-inch system was used in Continental Europe.



### **RockStrong system collected samples without jamming**

The type of formation, the location where the operator wanted to begin taking core samples, and the previous drilling of the shoetrack for this well meant that jamming could occur during coring. Previous attempts to take core samples from offset wells in this area also led to jamming. However, Halliburton believed the 5.5-inch RockStrong Coring System could handle this challenge. The system includes anti-jamming features like a unique swivel assembly that is stronger than conventional swivels. This assembly makes the system the most robust coring tool on the market. The system was also built to overcome high vibration levels encountered in tight multilayer formations and was designed for extreme wellbore environments.

## Halliburton's 5.5-inch RockStrong™ Coring System delivered larger, undamaged core samples with near 100 percent reliability



### **Special core cradles and vertical foaming maintained quality of sample**

The core samples needed to be handled as safely as possible to prevent damage. Certain laboratory tests could only be done if the sample was completely pure and had no cracks. Halliburton made special arrangements to maintain the quality of these core samples both during the retrieval from downhole and during transportation to the laboratory.

First, Halliburton foamed the cores vertically to minimize vibration and movement. Cores are typically foamed horizontally once they are moved to the rig floor but that method could have caused cracking. Second, Halliburton cut the 9-meter long core samples in half to 4.5 meters to reduce sagging and possible cracking in the middle of the core samples. The cores were then placed on cradles specially designed to accommodate these smaller-length samples. Finally, shock meters were used to monitor the samples during transport.



### **Halliburton retrieved nearly 100 percent of required core samples**

The operator wanted up to 120 meters of continuous rock to conduct its tests. Halliburton used the RockStrong system to provide 117 meters, a 97.5 percent retrieval rate. Halliburton retrieved the cores in just five trips downhole, averaging about 24 meters per trip. The cores were foamed and packaged for the trip to the laboratory without incident. The samples were needed quickly so that drilling could continue without having to put the rig on standby, which could have cost money and nonproductive time (NPT). Halliburton completed the job in just 23 days, without any NPT.



Halliburton's ability to retrieve these critical core samples without damage impressed the operator. This was this operator's first coring job in over a decade in the region, and the company plans to use Halliburton again if more coring samples are needed.

**“We are very pleased with how the coring job proceeded. The staff approached the job in a very professional way, paying utmost care in preserving the quality of the core.”**

*European oil and gas operator*