



## Wedge 625™ proves successful in challenging Granite Wash shale

Anticipation of severe doglegs with horizontal well requires use of TenarisHydril premium connections.

### Summary

#### Developing Granite Wash shale

The exploration of challenging shale formations is becoming progressively important to the successful increase of global energy reserves. Among the shale formations being developed by oil and gas operators is the Granite Wash shale, which lies beneath north Texas and western Oklahoma.

One operator exploring the Granite Wash is a world-class independent oil and gas exploration and production company with a reputation as a leading developer of oil and gas assets and, as such, requires high quality pipes and connections for drilling and completing its wells. Its long-term agreement (LTA) with Tenaris enables the customer to take advantage of the full range of OCTG products. TenarisHydril Wedge 625™ connections were selected to overcome the severe doglegs within the customer's horizontal well. The operator successfully and efficiently completed the well to produce oil and liquids.

### Challenge

#### High build rate curves

The operator's well in the Granite Wash shale region anticipated severe doglegs, which made extreme bending capacity essential when choosing a connection. The connections used in these sections would require significant mechanical resistance to overcome the bending stresses encountered in the well's high build rate sections.

Horizontal wells impose extreme loads on both pipe and connections. In this environment, connections are often subjected to excessive tension and compression forces in high build rates that transition the wellbore from vertical to horizontal. This outside curvature tension and inside curvature compression mandate a superior bending rating to ensure they will not fail.

### PROJECT PROFILE

#### Location

Granite Wash shale formation  
Roger Mills County,  
Oklahoma

#### Products highlighted

TenarisHydril Wedge 625™  
connection



▲ TenarisHydril Wedge 625™ connections in the Granite Wash shale horizontal well.

## Solution

### Wedge 625™ used for most challenging sections of the well

The customer used API tubular products in less demanding sections of the well, but it was agreed that premium connections would be needed for the high build rate dogleg sections when running the production casing. Tenaris recommended TenarisHydril Wedge 625™ connections, which then crossed over to TenarisHydril Wedge 513™ connections for the toe of the well.

The TenarisHydril Wedge 625™ connection is particularly apt for use in horizontal and deep wells that require, among other features, a strong bending capacity. This capability is key when coping with high dogleg severity found in many shale regions. To achieve this bending strength (up to 90%, truly exceptional for a semiflush connection) the TenarisHydril Wedge 625™ connection relies on the simultaneous engagement of opposing flanks of the connection's double-hooked dovetail threads, reinforced by the step-to-step Wedge™ design. At the same time, its extreme torque capability combined with its high clearance, with a box outside diameter (OD) approximately 5% over pipe body OD allows for it to be pushed and rotated into place even in long horizontal sections. Because it met all of the requirements of the operator's well design, the application of the TenarisHydril Wedge 625™ connection in this Granite Wash shale well was a natural fit.

### Support in the field

Tenaris field service specialists provided 24-hour assistance throughout the running. With their deep understanding of Tenaris products as well as their familiarity with the peculiarities of oil and gas exploration and production in the region, Tenaris specialists ensured running was performed as smoothly as possible. Early on, local Tenaris technical sales representatives also assisted the customer with product information as needed, playing an important role in the project's success.

### Long-Term Agreement (LTA)

In addition to utilizing Tenaris field services and technical sales assistance, the customer benefited from its LTA with Tenaris. Tenaris long-term agreements provide alternatives for fast-track deliveries, risk reduction, lower stock levels, cost reduction, increased flexibility and other advantages.



▲ TenarisHydril Wedge 625™ connection helped successfully and efficiently complete the well.

## Results

### Improved Efficiency

The development well was drilled and completed to produce hydrocarbons from horizontal completions in the Granite Wash shale. In the well, 388 joints of 5 ½ inch TenarisHydril Wedge 625™ connection were utilized. With the assistance of Tenaris field services, the joints were installed at a running speed of 23 joints/hour over the course of a single day. Also, the reduced number of turns and easy makeup offered by the TenarisHydril Wedge 625™ connection enabled a faster makeup time as compared to other semi-flush connections.

The operator chose the TenarisHydril Wedge 625™ connection because it offered a more robust cross-section when compared to other available connections. The operator stated that the connection's higher parting load and joint yield strength simply made for a better connection and, as a result, the company felt better about running it in this particular Granite Wash formation environment. In fact, the company said it expects to utilize other TenarisHydril Wedge 625™ connection sizes (i.e., 5 in., 23, 3#) in other Granite Wash wells and is contemplating expanding its use to other exploration and development operations.



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