CASE HISTORY

Kol-Seal® Lightweight Cement System Enables Effective Placement and Long-Term Zonal Isolation in West Texas Wells

Location: West Texas, USA
Application: Primary cementing with lightweight slurry system
Product: Kol-Seal® Lost Circulation Material / Cement Extender

Challenge

- Low fracture gradient formations required reduced hydrostatic pressure
- Risk of formation breakdown during cement placement
- Low annular velocities created challenges for effective displacement
- Operator required lightweight cement system without sacrificing strength

Solution

- Implemented Kol-Seal lightweight cement extender technology
- Reduced slurry density to manage hydrostatic pressure in weak formations
- Controlled particle size distribution enabled effective bridging
- Optimized blending procedures ensured stable slurry performance
- Maintained pumpability and placement efficiency

Results

- Lightweight cement system prevented hydrostatic formation damage
- Uniform cement coverage achieved despite low annular velocity
- Reliable hydraulic bond and zonal isolation established
- High compressive strength maintained in lightweight system
- Significant cost savings compared with alternative additives

CHALLENGE

A major West Texas service company was cementing a series of wells characterized by low fracture gradients and relatively low temperature conditions. These formations presented a narrow pressure window where excessive hydrostatic pressure from conventional cement slurries could damage the formation and compromise cement placement.

Maintaining effective slurry placement while preventing formation breakdown was critical to achieving long-term hydraulic isolation. In addition, the wells exhibited low annular velocities during displacement, increasing the risk of incomplete cement coverage and poor bonding conditions.

The operator required a cement system capable of reducing slurry density while maintaining strength and placement efficiency, ensuring uniform cement coverage and preventing formation damage during cementing operations.

SOLUTION

The cementing program incorporated Kol-Seal® lost circulation material and cement extender into a lightweight cement slurry design.

Kol-Seal is a lightweight granular additive engineered with a controlled particle size distribution that enables mechanical bridging across permeable and fractured formations while maintaining slurry pumpability and placement integrity.

The additive enabled the design of a lower-density cement system, reducing hydrostatic pressure applied to weak formations while preserving slurry performance. The engineered particle size distribution allowed coarse particles to establish an initial bridging framework, while finer particles packed the matrix openings to create an effective seal.

Proper blending and dosage optimization ensured stable slurry rheology and efficient displacement throughout the cementing operation.

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RESULTS

The Kol-Seal-enhanced cement system successfully achieved uniform cement placement and long-term hydraulic isolation across the interval. The lower-density slurry reduced hydrostatic pressure on the formation while maintaining sufficient compressive strength for long-term well integrity. High displacement efficiency allowed the cement to achieve consistent annular coverage despite low annular velocity conditions.

By preventing hydrostatic pressure damage and ensuring proper cement placement, the operator achieved reliable zonal isolation and avoided costly remedial treatments.

In addition to technical success, the operator realized significant cost savings compared with alternative lost circulation extender materials, while still meeting all operational objectives.

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