Nine

CASE STUDY

CEMENTING & DRILLING SOLUTIONS

WOC Times Reduced to Less Than 8 Hours, Saving Approximately $8,000 in NPT Per Well

OPERATOR STOPS WAITING AND STARTS PRODUCING

Challenge: Optimize operational efficiency by increasing speed of cement jobs across a multitude of wells being developed in the Delaware Basin.

Solution: Utilize Nine's Rapid Set 1, a cement specifically formulated to speed set times, allowing the operator to meet or exceed drill-out time expectations.

Results:

- Achieved compressive strength at 500 psi up to 3 hours sooner.
- Reducing wait time to minimum regulatory requirements.

A MAJOR OPERATOR IN THE DELAWARE BASIN NEEDED TO SPEED THE TIME TO 500 PSI ON INTERMEDIATE TAIL SLURRIES TO OPTIMIZED OPERATIONAL EFFICIENCY

Achieving faster set times presented a prime opportunity to boost efficiency on each well, as it would allow the operator to drill out the intermediate shoe at the 8-hour regulated time, or earlier. Thus, downtime due to waiting on cement would be eliminated.

The operator had been running a conventional Class H tail slurry at 15.6 ppg, which was reaching 500 psi in 10-13 hours, causing a 2-3 hour wait per intermediate casing job prior to shoe drill-out. At a spread rate of $3,200 per hour, this was adding up quickly.

Nine innovates and breaks the 8-hour barrier.

Nine's engineering team answered the challenge by innovating the Rapid Set 1 line of cement. This cement is designed to achieve adequate thickening time and fluid properties for an intermediate tail slurry while consistently reaching 500 psi in under 8 hours by using a combination of cementitious materials and specialty additives. The first slurry tested and run on a job was at a density of 15.6 ppg, which consistently reached 500 psi in under 6 hours after a dynamic conditioning time equal to the placement time on the job, usually 2 hours.

Nine continued to develop the Rapid Set 1 line, creating formulations at densities of 13.5 ppg to 14.2 ppg for formations requiring a lighter weight tail slurry, while still maintaining time to 500 psi under 8 hours.

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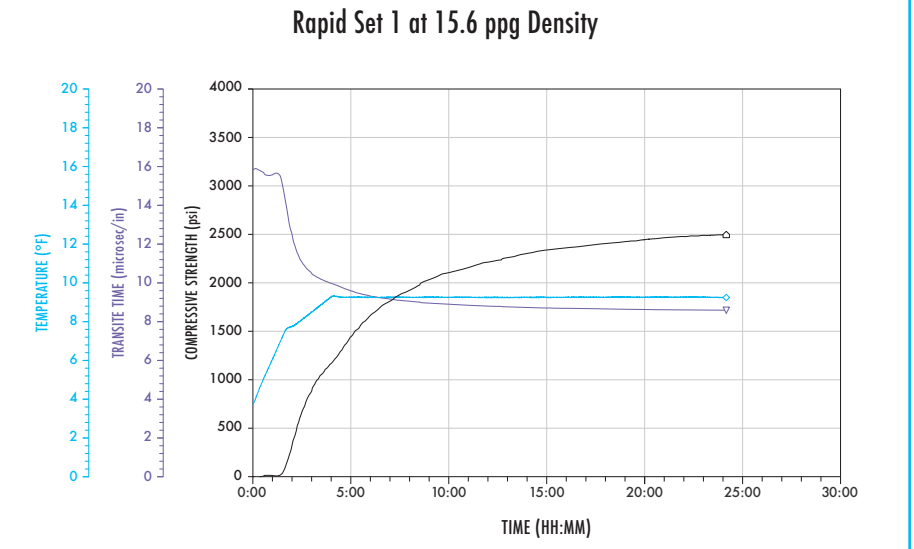
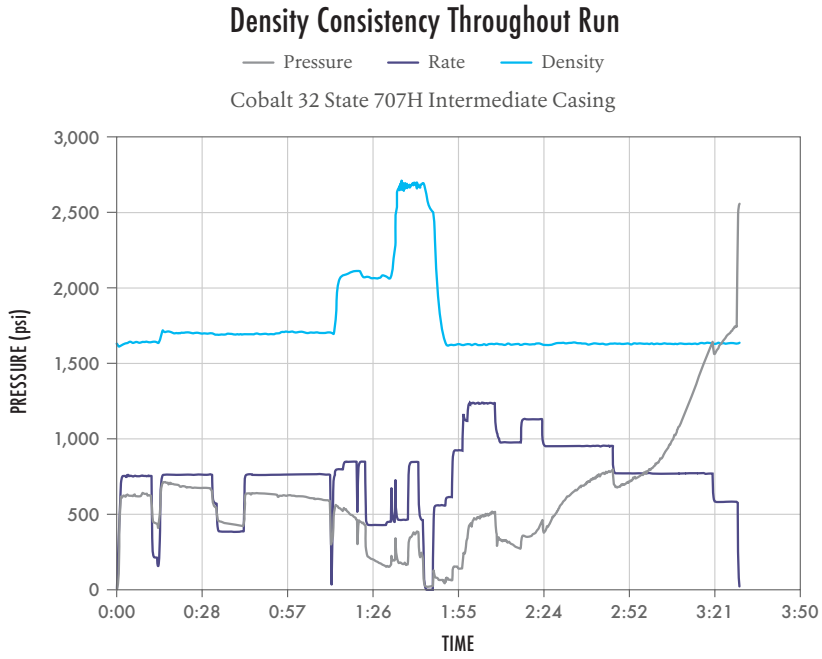
UNCOMPROMISING DENSITY QUALITY CONTROL

Slurries with conventional strength-enhancing additives can result in high viscosities due to the small particle size and increased surface area of the components. Rapid Set 1 solves these issues. It is designed for easy mixing on location to maintain density consistency. Nine regularly mixes and pumps these slurries at 4 to 6 bbl/min and can be mixed faster if needed. Like all Nine slurries, density control is maintained and confirmed with a Micro-Motion densometer, radioactive densometer and pressurized mud scales while mixing and pumping.



A conventional casing flotation device prevents access to as much as 20 ft of pay zone at the toe of the well.



OPTIMAL CONSISTENCY THROUGHOUT RUN

Nine has successfully run over 150 jobs since the Rapid Set 1 line was introduced, saving operators approximately $8,000 in NPT per job by reducing wait on cement time by hours.

Rapid Set 1 maintains consistent density throughout the job as PSI levels increase. Uniform density allows operators to achieve successful isolations and helps to prevent short and long-term failures.