CASE STUDY: *Organic Water Block helps operator avoid plugging well with minimum cost.*

Organic Water Block in Cement

Organic Water Block used in remedial cement kept operator from having to plug well and allowed proper placement of cement behind pipe

Location: Oklahoma

Overview

Being confronted with a catastrophic casing failure, the operator had the choice of plugging the well or trying a remedial cement squeeze utilizing the Organic Water Block cement additive. The well was located in Payne County Oklahoma and had a casing failure at approximately 2,070 feet. The casing failure was allowing water under pressure to flow to the surface at approximately 1/3 to 1/2 barrel per minute. See the picture below. The influx of water and drilling mud had already infiltrated the producing zone and had completely plugged off the perforations. Other wells in the area which had similar failures had multiple squeeze jobs (2 to 3) performed in attempts to stop the water influx and repair the casing. This was confirmed by the downhole tool company which had performed several of these other cement squeeze jobs. The problem was that the cement without the OWB, which was being pumped into the water zones, was disappearing without properly sealing the casing leaks. The cement was being diluted to the point it had lost all effectiveness. Some of these cement squeeze applications were never successful and others required multiple squeeze attempts.

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Organic Water Block Solution

After setting the squeeze packer, and testing the back side, KCL water was pumped into the casing leak to establish the pump pressure and rate. It was determined that 1.75 bpm could be pumped into the hole at 650 psi. After establishing the rate and pressure, 100 sx cement with 2% CaCl and 33 pounds of Organic Water Block (OWB) were mixed. The slurry was then pumped at a rate of 1.5 bpm. After pumping approximately 60 sacks of the slurry into the casing leak, pressure began to climb and flush pump in was initiated being very careful not to over flush the tubing and casing volumes. After waiting on the cement to stop moving, pressure of 750 psi was applied to test the potential movement of the cement. Once determined the cement was setting and not moving, the tubing and packer were flushed and the packer was tripped out of the hole while maintaining hole fluid volume. The well was shut in for 36 hours with 300 psi applied at the surface. Approximately 70 feet of cement was drilled out of the casing before entering into the bad spot where the casing leak was. After drilling through the cement plug past the bad spot, no other influx of water was encountered and mechanical integrity was established with pressure on the entire long string. Picture of the job below.

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Economic Value Created

The cost for achieving these results in this well can hardly be measured when comparing the savings involved and the value created.

To begin with, the results were achieved with only one attempt. The cost savings on average is the total cost of all the subsequent squeeze jobs that are normally required to achieve similar results. When analyzing cost, look at the repeat attempts on average for similar wells in an area. When Organic Water Block is properly applied, the repeat cement jobs and squeeze attempts are on average eliminated.

The real value created, in addition to minimizing the number of squeeze attempts, is the value of the reserves that would have to be written down or eliminated if a well cannot be salvaged. If the well is salvaged and the reserves are preserved, this value can be attributed to the usage of OWB. This was the case in the current well.

The operator had pre-determined that if the squeeze cement application did not work on the first attempt that the well would be plugged, as the cost associated with multiple squeeze attempts, rig time, and drilling out would have been prohibitive. Had this well been plugged there would have been a complete loss in the value of the remaining reserves.

Thanks to this unique product, this catastrophic failure was turned into one more success story. OWB has been used in hundreds of applications with very high success rates.

CHALLENGE	SOLUTION	RESULTS
Remediate a catastrophic casing failure/leak that destroyed the producing capacity of a well by performing a cement squeeze procedure with only one attempt.	Organic Water Block cement additive was used at the ratio of 1/3 pound OWB for each sack of cement. For this job, 100 sacks of cement mixed with 33 pounds of OWB was recommended. A squeeze application was performed utilizing this cement additive to place the cement.	The equivalent of 60 sacks of cement and OWB additive was pumped behind and up the backside of the casing. The casing leak was repaired without having to repeat the squeeze procedure multiple times. The OWB allowed the operator to properly place the cement across the casing failure, across the water zone, and up the backside with minimum cost.