

Low Permeable Turbidite Formation Stimulated with a Non-Acid Nano Foam

SITUATION ANALYSIS

GoM operator lost 800 bbls of KCl during a gas lift repair. This resulted in a loss of 60% of the oil production. The client believed that the KCl was insufficiently inhibitive and caused clay swelling or fines migration. The PIC technical staff examined its mineralogy archive and conclude that the highest probability was the well had become water blocked with a 100% irreducible water saturation.

OBJECTIVE

These lower perm and turbiditic formations often fail to recover from any aqueous fluid loss. Traditional water block treatments must be enhanced to better penetrate the reservoir, and then mobilize the water to achieve flow efficiency.

SOLUTION

PIC's technical staff designed an acid free Nano Foam treatment that would simultaneous displace the trapped water from the near wellbore, provide better zonal coverage by foam diversion, alcohol to azeotropically lower the boiling point of water to put it in a vapor phase, a nanosurfactant to lower the surface tension to 22 dynes/cm³ and the interfacial tension too near zero. By foaming the treatment the water requirement is cut in half, better diversion results and greater energizing effects are achieved because of minimizing nitrogen dissipation into an infinite reservoir the solvent system contacted the deposition problem areas.

TREATMENT PROCEDURE

1. Establish Injection with nitrogen. Do not exceed 0.5 BPM equivalent. NOTE: No pickle treatment required with this acid-free treatment.
2. Pump a 65 Quality foam containing inhibited brine, alcohol blend, soft nanosurfactant and foaming agent.
3. Displace treatment to the perforation with nitrogen.
4. Immediately return the well to production.

RESULTS

	Before Treatment (12.5.15)	After Treatment (4.21.16)
K*h	11,000 md*ft	47,000 md*ft
PI	0.14	1.51
Skin	22.6	3.0
Flow Efficiency	31%	78%
Drawdown due to skin	1446 psi	109 psi
Total Drawdown	2086 psi	500 psi
P*	3250 psi	3370 psi