

Well Intervention

PropStopSM Service

Remedial Treatment to Help Control Proppant Flowback and Formation Fines Production in Mature Assets

New PropStopSM service is designed to help address the declining production rates often seen in fractured wells in mature assets. Proppant flowback and formation fines production cost operators millions of dollars every year through loss of production and expensive equipment damage. Wells experiencing these problems require remediation ranging from routine wellbore cleanouts, to complete workovers, to expensive artificial lift equipment repairs. PropStop service addresses these challenges through several important features:

- Provides cohesion between proppant grains without damaging permeability or conductivity of proppant pack.
- Helps maintain highly conductive fractures and long-term productivity.
- Treats proppant pack with low-viscosity curable resin - PropStop service agent.
- Applied using pulsing action provided via Pulsonix TFSM or DeepWaveSM service.

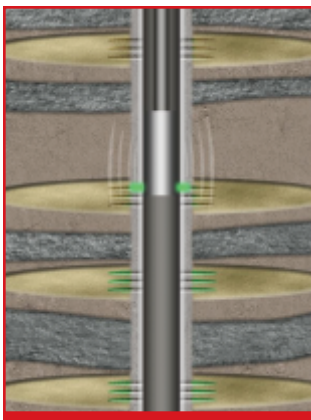


Proppant flowback can inflict significant damage to production equipment. The choke on the left has been completely destroyed and the electric submersible pump on the right is plugged, requiring a costly workover.

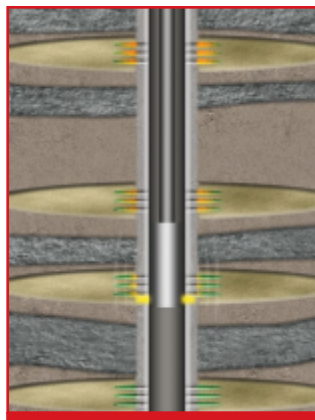
PropStop service not only helps control proppant flowback and fines production but also helps maintain highly conductive fractures and long-term productivity.

The PropStop service process is not a mere treatment of a symptom but is a proven remedy for the fundamental causes of a pervasive industry problem that is escalating as production assets mature.

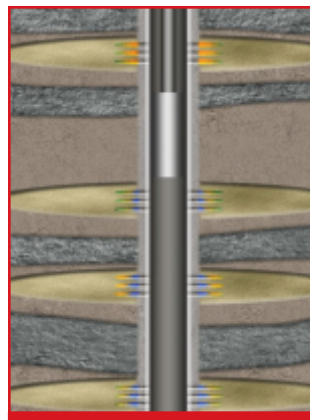
PropStop Service Process



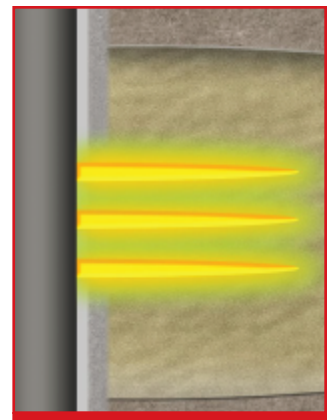
Preflush removes particles away from wellbore and conditions proppant pack.



PropStop agent is injected into the fracture to consolidate the proppant pack.



Overflush forces PropStop agent farther into the proppant pack and into the area surrounding the perforation tunnels.



The process results in about 10 ft penetration into the proppant pack.

Application

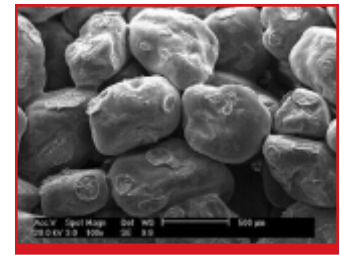
PropStop service is a coiled-tubing deployed, single-trip, rigless intervention service that requires no isolation packers, reducing time, cost and risk of a conventional workover. Additionally, it does not disturb existing completions. PropStop service is implemented using either Pulsonix® TF or DeepWaveSM service based on well requirements.

PropStop WC Service Helps Control Proppant Flowback and Water Production

If, in addition to proppant flowback, water production is an issue, the application of the PropStop agent can be preceded by a treatment stage using WaterWeb® service. Based on a relative permeability modifier, WaterWeb service impedes the flow of water through the reservoir and enhances the flow of hydrocarbons. The pulsing tool used helps assure good penetration of both the WaterWeb water control agent and the PropStop agent.

Case Histories

Arkansas – In an XTO Energy well excessive fracture sand production from a 2003 treatment was damaging the electric submersible pump (ESP), resulting in costly workovers and pump repairs as well as loss of production. In fact, the issue of sand production in this area has become as severe as to shut down production. This particular well was identified due to its maintenance schedule of workover rig clean out every three months. The PropStop service treatment successfully controlled the proppant flowback and increased gas production. Total value to XTO Energy will be \$220,000 to \$400,000 annually.



PropStop service is implemented using pulsing technology to help assure penetration into the proppant pack. Based on well requirements, either Pulsonix TF or DeepWave service will be used. Shown above is proppant coated using PropStop service. The process provides cohesion between the grains without damaging permeability or conductivity of the proppant pack.

Mid-Continent, US – Following a fracture treatment, a well was producing proppant up the wellbore into the ESP, separator, chokes, etc. In addition, water production was 300 bwpd and gas production was 1 mmscfd initial rate. Gas production dropped to zero in less than 1 month. The 14-ft (net) interval was treated using PropStop WC service. Results: 12 days after treatment no sand was found in the choke, separator, dumps and water meter. Four weeks after treatment, wire line found only 1 ft difference from PBSD of coiled tubing clean out. Two months after treatment, the ESP was in place and water rate was about 175 bwpd. Gas rate is still very low but operator is very positive. Absolutely no sign of proppant or formation particles.

For more information about how PropStopSM service can help make your mature assets more profitable, contact your local Halliburton representative or email wellintervention@Halliburton.com.