AccessAcid[SM] Stimulation Service

IMPROVED RESERVOIR ACCESS THROUGH EFFECTIVE ACID STIMULATION TREATMENT DIVERSION

OVERVIEW

AccessAcid[SM] stimulation service helps improve acid coverage in sandstone and carbonate reservoirs, beyond the capabilities of conventional diversion systems during acid stimulation treatments. AccessAcid integrated service delivers optimum acid placement through self-degradable particulate with proprietary multi-modal, customized particle blends to optimize acid placement. The diversion agent is placed in alternating stages with the acid service throughout the entire treatment. Once the acid stimulation treatment is completed, the particulates in the diversion agent will self-degrade based upon reservoir temperature, eliminating the need for a cleanup or removal treatment.

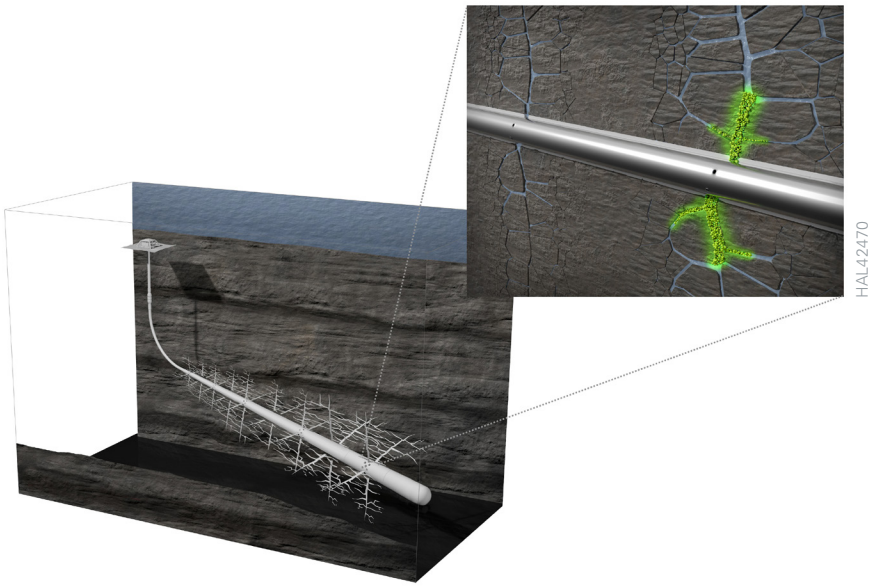

Figure 1 - AccessAcid[SM] stimulation service helps improve acid coverage in sandstone and carbonate reservoirs, beyond the capabilities of conventional diversion systems during acid stimulation treatments

FEATURES

- Effectively diverts acid stimulation treatments from high permeability and naturally fractured zones to low-permeability zones to maximize reservoir contact.
- Provides diversion fluid properties for optimum coverage when targeting long intervals, independently of the pumping rate.
- Self-degradable particulates providing leak-off control properties by bridging against the formation or fracture face. Customized particle blends to provide near-wellbore and/or far-field diversion.
- No mechanical isolation required. It can be bullheaded or placed through a coiled tubing (CT) unit.
- Particulates in the diversion system will self-degrade completely at a predicted time based upon bottomhole temperature.
- Easily mixed (batch-mixed or pumped on the fly).
- No need for breaker or cleanup stage. Excellent regained permeability to hydrocarbons.

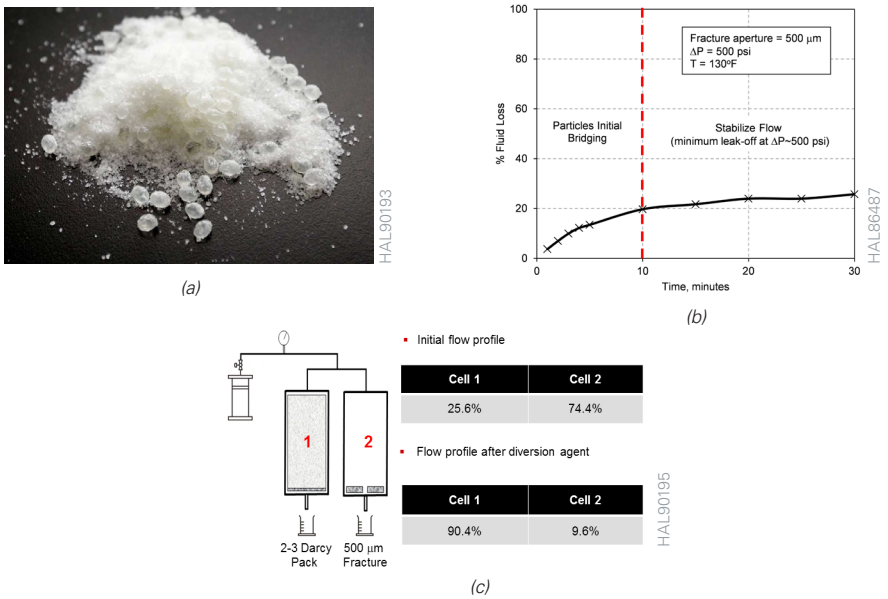

Figure 2 – AccessAcid℠ stimulation service – Optimizing acid diversion in in challenging reservoirs conditions: (a) it uses self-degradable particulate with proprietary multi-modal, customized particle blends to optimize acid placement, for near-wellbore and far-field diversion (b) Fluid loss test shows AccessAcid stimulation service ability to provide bridging and leak-off control properties, even in fractured environments (500 µm fracture aperture, ΔP~500 psi, testing temperature = 130°F), (c) Core flow test in parallel shows optimum diversion properties, effectively changing the fluid distribution profile away from naturally fractured zones to lower permeability zones.

FIELD PROVEN

Case History – Well A is a land well in Latin America completed in a mature, oil producing, naturally fractured carbonate reservoir. This well had a casedhole and perforated completion with eight (8) different perforated intervals (gross interval ~1368 ft, net perforations ~650 ft). After multiple acidizing treatments (5), it was not possible to positively impact the decline curve in this well, mainly due to high reservoir heterogeneity and a thief zone identified at the bottom zone.

Halliburton successfully implemented AccessAcid stimulation service to effectively distribute the acidizing treatment across the eight intervals. Well intervention was enhanced with SPECTRUM℠ Diagnostic service (real-time coiled tubing service) to optimize fluid distribution. The real-time fiber optic integrated service allowed adjusting the diverter design in real time to obtain optimum acid coverage as illustrated by Figure 3. Four alternating stages of acid and AccessAcid stimulation service were used.

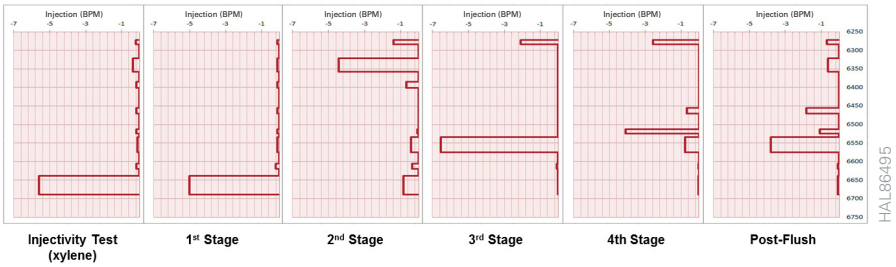

Figure 3 – Acid stimulation treatment was optimized with AccessAcid stimulation service using four (4) diversion stages. The above charts show the acid fluid distribution being monitored in real-time with SPECTRUM℠ Diagnostic service. For Stage 1, diverter concentration was adjusted on-the-fly from 1 to 5 ppg to effectively divert acid away from the thief zone to the upper, less permeable intervals

BENEFITS

- Wide temperature range of application, ranging from 120°F (49°C) to 300°F (149°C).
- Applicable to sandstone, carbonate, and shale reservoirs. Compatible with most common acid stimulation treatments, including Halliburton's Carbonate 20/20™ and Sandstone 2000™ acidizing services.
- Service can be combined with SPECTRUM Diagnostic service for real-time injection and diversion monitoring.
- Suited for new completions and re-stimulation treatments in mature, deepwater, and unconventional assets. Applicable to matrix acidizing and/or acid frac treatments.

After the treatment AccessAcid℠ stimulation service provided a steady hydrocarbon production uplift of 82%, increasing oil production from 920 to 1680 BOPD, under the same choke conditions. Figure 4 shows the final acid fluid distribution across the 8 different intervals. AccessAcid stimulation service effectively optimized acid diversion and reservoir access during this wellbore intervention.

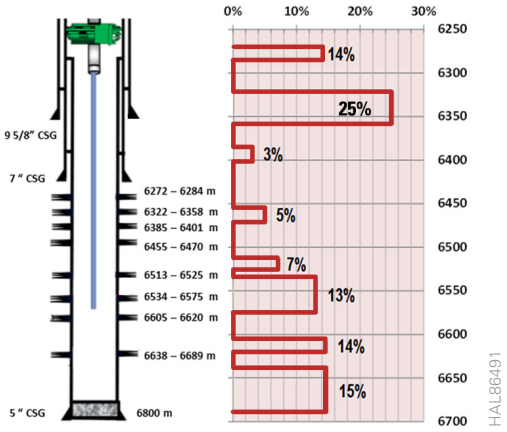

Figure 4 – AccessAcid℠ stimulation service for Well A – (a) wellbore schematic (gross interval ~1368 ft, net perforations ~650 ft), (b) Optimized acid fluid distribution after 4 diversion stages with AccessAcid stimulation service

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com