

PETROLIZE® HTA Cleanup System Restores Injectivity in High-Density CaCl₂ Brine Well for a Major Middle East Operator

Case Study:

A major operator from the Middle East encountered injectivity and cleanup challenges during completion operations in a horizontal open-hole section drilled with high-density calcium chloride brine. The operation required effective filter-cake removal and restoration of injectivity without compromising wellbore integrity or damaging sensitive completion equipment.

Epygen Labs deployed the PETROLIZE® HTA Cleanup System, specifically formulated for high-salinity environments, to improve wellbore cleanup efficiency and restore injectivity across the open-hole interval. The treatment demonstrated excellent compatibility with high-density CaCl₂ brines and successfully enhanced fluid mobility in the targeted section under challenging well conditions.

Challenge

The operator was conducting cleanout and completion operations in a horizontal section with approximately 4,000 ft of open hole using high-density calcium chloride brine.

The well conditions included:

- Brine density: 71 pcf
- pH: 8.5
- NTU: 170

Prior to reaching total depth (TD), the 9.5 ppg CaCl₂ brine system was prepared and conditioned. The cleanup program was designed for approximately 4,000 ft of horizontal open hole.

The operator required an effective cleanup solution capable of removing compacted filter cake and organic drilling-fluid residues while maintaining compatibility with the completion brine system. Conventional cleanup methods presented risks of incomplete cleanup, restricted injectivity, and potential operational inefficiencies in the extended horizontal interval.

Solution

Epygen Labs designed and deployed a customized PETROLIZE® HTA Enzymatic Cleanup Fluid system specifically formulated for high-density calcium chloride brine conditions.

The treatment program consisted of two stages:

Fluid A – Surfactant Pre-Flush

Additive	Concentration	Quantity
Brine (71 pcf)	98%	75 bbls
EC-106 Surfactant	2%	63 gals

Fluid B – PETROLIZE® HTA Enzyme Cleanup Fluid

Additive	Concentration	Quantity
Brine (71 pcf)	98%	187 bbls
PETROLIZE® HTA Enzyme	5%	420 gals
EC-106 Surfactant	0.35%	29.4 gals
Acetic Acid (90%)	1%	84 gals

The cleanup **fluid system** was pumped across the open-hole interval to hydrolyze and disperse **organic and polymeric filter-cake residues accumulated during drilling operations.**

The enzymatic formulation was specifically developed to maintain effectiveness under extremely high salinity conditions while preserving compatibility with completion fluids and downhole equipment.

Results

The PETROLIZE® HTA Cleanup System demonstrated effective performance under high-density calcium chloride brine conditions.

Key operational results included:

- Improved wellbore cleanup efficiency across the horizontal section.
- Enhanced injectivity and fluid communication within the open-hole interval.
- Effective degradation of organic and polymeric filter-cake residues.
- Excellent compatibility with high-salinity CaCl_2 completion brines.
- Reduced operational risks associated with aggressive acid-based cleanup systems.
- Improved overall completion efficiency in the extended-reach horizontal section.

The field application confirmed the ability of PETROLIZE® HTA technology to perform under challenging salinity conditions while supporting safe and efficient completion operations.

Conclusion

The PETROLIZE® HTA Cleanup System demonstrated a reliable and operationally effective solution for cleanup applications in high-density calcium chloride brine environments.

Unlike conventional aggressive cleanup methods, the enzymatic approach provided controlled degradation of filter-cake polymers and organic residues while preserving completion-fluid compatibility and minimizing operational risk.

The successful field deployment validated PETROLIZE® HTA technology as an efficient, environmentally responsible, and high-performance cleanup solution for horizontal completion operations in the Middle East.

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