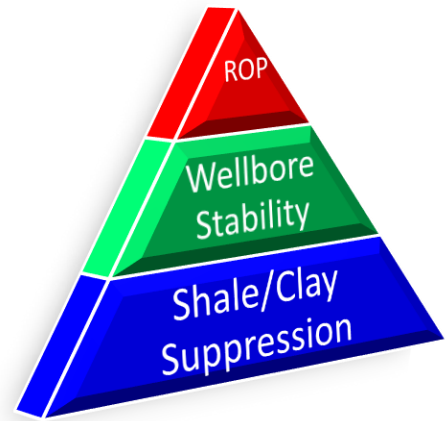


VANGUARD™ HPWBM



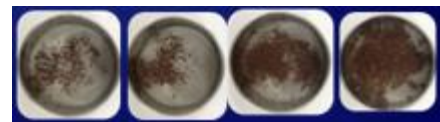
Drilling land-based unconventional, deviated, and lateral wells often presents significant operational and logistical difficulties, predominantly wellbore instability and low rates of penetration (ROP) due to increased friction, torque, and drag. The time and costs associated with fluid maintenance, product transportation, and storage are additional concerns. Traditionally, the use of non-aqueous fluid (NAF - SBM/OBM) was preferred for these challenging wells. Although NAF provides inhibitive and lubricious characteristics, it poses environmental risks and logistical downsides. With the Vanguard™ high-performance water-based fluid system, Vertechs offers a competitive, water-based fluid alternative to address operational and performance needs in challenging wells, while offering exceptional environmental, logistical, and economic benefits. The Vanguard™ system consists of core products that work together: VDril 250 multifunctional additive, V-Guard & ULIA wellbore stabilizers, and VC LUBE Primary lubricant and ROP enhancer



Cuttings Recovery Testing

Shale cuttings were added to fresh water and diesel to establish a performance range for base fluids. Then typical formulations of regionally used WBM, OBM, SBM and VANGUARD™ drilling fluid were tested to determine cutting recovery capacity.

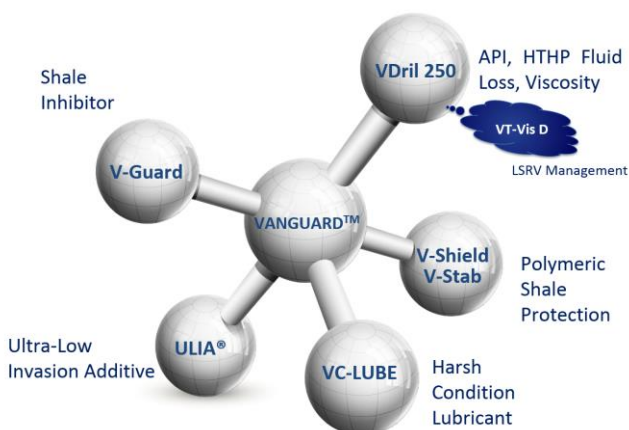
(All samples were hot rolled for 16 hours at 176°F / 80°C, then all cuttings were recovered for dry weight analysis.)



Recovery results

In Fresh water:	2.6 % were recovered
In Diesel oil:	100 % were recovered
Sulfonated KCl	65% were recovered
VANGUARD™	99% were recovered
2.2 S.G. SBM	99% were recovered

VANGUARD™ - Product Family



Properties comparison

Rheological Properties (BHR&AHR)

