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Hydraulic Fracturing of Unconventional Plays with Unconventional Water

Andrew Bonnell, P.Eng.
Schlumberger Canada Limited

Summary

As the use of hydraulic fracturing has proliferated in the development of horizontal unconventional oil and gas wells in the recent decade, the amount of water used by the stimulation process has increased significantly. The amount of water used on an average Montney well has nearly tripled in just the last 5 years. Due to an increased cost of water per well, operators are now re-using water from the fracturing operations and also sourcing water from alternative water sources including collected run-off water, non-potable water wells, waste water from other processes or industries, and many others. Multiple sources can be used for fracturing operations for a single well and the characteristics of the water can often change on an hourly basis. Fracturing service provider are tasked with providing an optimum fracturing fluid package for operators as it performs with respect to compatibility, scaling tendencies, emulsion tendencies, friction reduction, proppant transport, and proppant pack and formation damage. Test methodologies have been developed that are completed on the timescale of: project preparation, pre-job testing, and on site testing. Fluid systems have also been developed that are both cost effective and flexible enough to work with the hourly variance in water characteristics. An example of a post fracturing emulsion investigation with an operator will show how out-of-the box thinking was used to identify the issue and provide a solution after all standard test methods had failed.