

The Value Proposition: A Frac Is Not a Frac

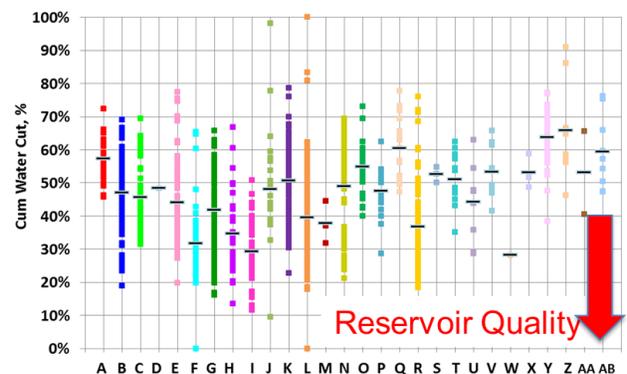
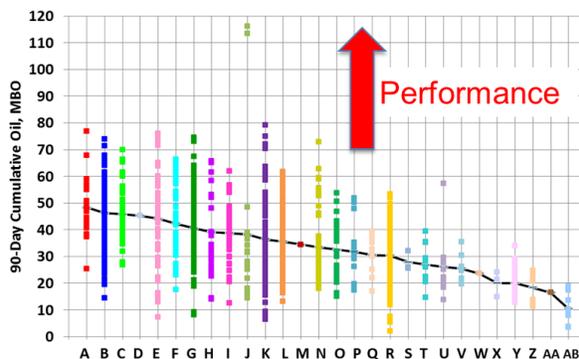
“Price is what you pay. Value is what you get”, Warren Buffett

Completion engineers and geologists always argue about where credit is due for better producing wells: better rock or better fracs? We have developed a comparison approach that allows for a more apples-to-apples well production comparison by combining all geological variations in one simple parameter – long-term water cut.

How can long-term water cut (without the first 90 days of flowback) be the single best indicator of reservoir quality? In the Bakken, it is often the only independent parameter that predicts reservoir quality, as it is tied to oil shale maturation and the depositional environment. Water cut decreases toward the deeper area of the basin as the oil shale has had more time to “cook”. The greater release of oil has resulted in higher reservoir pressures, while the reservoir is also often slightly thicker in these areas due to greater deposition. In addition, as a service company Liberty does not have access to as much detailed geophysical and petrophysical data available as an operator, so the availability of a long-term reservoir quality proxy in state well information is very valuable. Therefore, long-term water cut is our simple yet powerful geological proxy for reservoir quality that is universally available through monthly production in public databases.

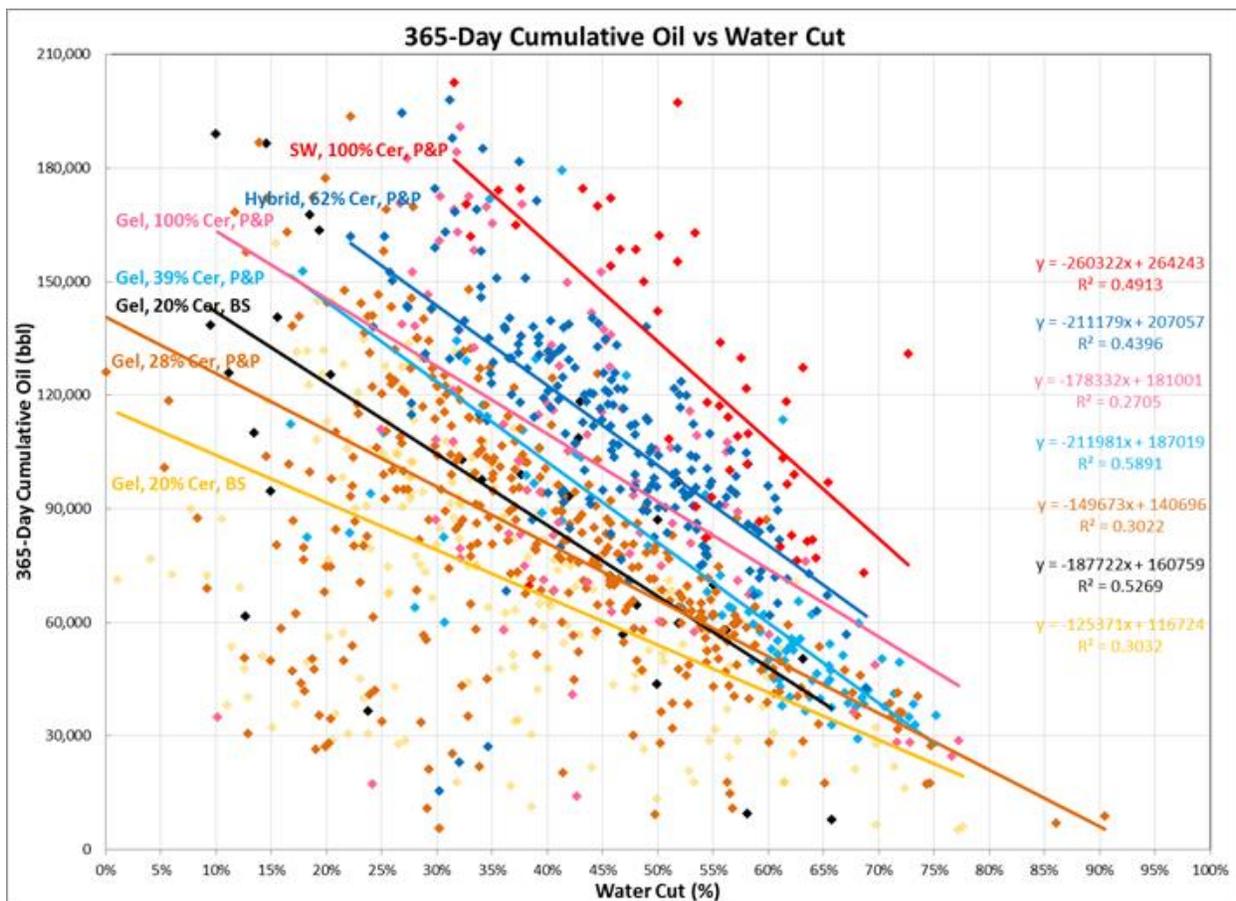
...Liberty uses long-term stabilized water cut in a dramatically effective and simple approach to capture the impact of rock quality in a single, independent and widely available parameter

In the plot below on the left we rank production by operator in the Bakken Central Basin by 90-day production. If geology were the only driver of well production we would expect that long-term water cut in the plot on the right would also show a gradually changing distribution. However, this is not the case, as some of the highest long-term water cuts are associated with the best producers.



We do not argue that geology does not matter. Well quality and productivity depends on geology – but not just geology. Completions matter as well, and – yes! – sometimes even more than geology!

As shown in the figure below, a strategy with a ball-sleeve completion together with a sand and gel frac (represented by the yellow trend line) results in some of the poorest production results observed across the Central Basin. Production substantially increases across a wide range of reservoir qualities for operators who use a higher fraction of ceramics in their proppant volume, use more slickwater as a fraction of their completion fluid, and choose a plug-and-perf strategy.



This analysis has helped to compare completion approaches across a wide range of reservoir qualities. With this paper Liberty shows that spending a little more on “price” will give you a lot more “value”.

More information

SPE Paper 166479, “The Value Proposition for Applying Advanced Completion and Stimulation Designs to the Bakken Central Basin”, by L. Griffin et al.