A Comparative Analysis of Multi-Stage Fracture Stimulation Treatments within the Bakken Formation, Kisbey Area, SE Saskatchewan

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The rapid development of the Bakken play in SE Saskatchewan through the drilling and fracture stimulation of horizontal wells has led to an impressive increase in oil production from this low permeability formation. This talk will examine a small contained geographic portion of the play area in which the geological characteristics of the Bakken and the placement of the wellbore in the formation are believed to be relatively consistent such that the focus of the analysis can be on the drilling and stimulation techniques employed by a variety of operators.

The technical data collected includes horizontal wellbore length, orientation, total tonnage deployed, tonnage per stage, number of stages per wellbore, pump rate, sand concentration and other operational observations. Thirty-eight horizontal wells were included in the analysis representing six different operators with a range of wellbore length from 600 to 1400 metres, total tonnage from 42 to 88 tonnes and 7 to 11 treatment stages per wellbore. All of the wells examined have used a packer/liner system for lateral isolation of the stimulated intervals.

Post-stimulation daily production data have been analyzed with respect to the above technical parameters in order to evaluate early-time oil production characteristics, water-cut and total fluid production decline. Initial evaluation concludes that the range of currently deployed treatment parameters indicates that the treatments are contained within the Bakken and only minor variations in 30-, 60- and 90-day production data are observed regardless of treatment parameters or horizontal wellbore length. We will also try to show our estimate of how these treatment and wellbore variables will affect ultimate recoverable reserves on a per well basis.

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