AFTER CLOSURE ANALYSIS IN TIGHT GAS RESERVOIRS: A CASE HISTORY OF PRE-FRACTURE INJECTION TESTS PERFORMED IN THE BRASSEY FIELD

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ABSTRACT
The design of a fracture treatment can vary and is dependent on parameters such as formation type, formation height, reservoir pressure, porosity and flow capacity (or KH). Most of these parameters can be determined prior to the fracture stimulation relatively easily at minimal cost using well logs, static gradients, DST's, cores, etc. The exception is flow capacity. Although it can be difficult and costly to determine prior to the fracture treatment, it could be considered the most important fracture design parameter.

Another consideration is whether a zone should even be completed. Without an accurate idea of the formation flow capacity, it is difficult to decide prior to fracturing the zone if it will be worth the cost of the completion. This is especially true in tight gas formations where the economics of the zone can be marginal. If a zone can be determined to be un-economic prior to the fracture treatment, then significant cost savings can be realized by aborting the treatment.

After Closure Analysis (ACA) is one method of easily determining a formation's flow capacity prior to the fracture treatment at minimal cost. ACA involves pumping a small volume of fluid into the formation above fracture pressure and recording the pressure falloff that follows. The pressure data can be analyzed, and once the radial flow regime is achieved, the formation's flow capacity can be determined. If the results from ACA are to be used for making completion decisions, then the method must first be proven to be practical and reliable. This paper examines field examples of ACA used on a zone in the Deep Basin that can be considered as tight gas. The ACA was completed using a software model and then compared with the results of post fracture pressure transient analysis. This was done to determine the accuracy of the ACA.

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