Eagle Ford Completion Optimization Strategies Using Horizontal Logging Data

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A consortium of Eagle Ford operators joined Schlumberger in initializing a project to acquire open hole logging data, use this data to generate completion designs for fracture stage and cluster positioning and then measure the results with horizontal production logs. This paper will outline the processes used to acquire the data, the analyses made on that data, application, results and conclusion.

The study draws on previous work showing perforation cluster contribution variation and other work showing the effect of targeting similarly stressed rock for fracture treatments. The objective was to improve the quality of the well completion, increasing recovery by reducing the number of perforation clusters that showed no contribution. To achieve this, an analysis was made to devise the minimum amount of horizontal log data that could be acquired to characterize the rock with minimal interruption to existing work flows. This data was used to group rock under similar conditions and/or with similar properties for stimulation treatment. Following the treatment, horizontal production logs were run through the zones to measure the cluster contribution.

The report will show the results of data acquired over approximately 12 to 15 horizontal wells in the Eagle Ford Shale. Basic petrophysical and geomechanical analysis was based on the horizontal logging measurements and used to feed into a Completion Advisor package to generate a recommendation on well design. Comparisons can be made between the optimized completion designs and the original designs to see how the measurements influenced them. This data can then be compared with the production logging results so conclusions can be drawn regarding the technique.

The results of the study have the potential to

change the way Unconventional Resources are developed. Recent trends have seen a shift away from data acquisition to blind geometrical fracturing. This paper examines the value of acquiring petrophysical data in the lateral section and its application to optimize the completion design and impact on production.