Unconventional Ways to Support Formation Evaluation in Fractured Reservoir Using Mudlogging Data

Carlo Carugo, *Cecilia Peduzzi, and Luca Ferrario. ENI E&P, S. Donato Milanese, Italy, phone: +39.02.63541, carlo.carugo@agip.it*

The fractured reservoirs currently represent one of the most interesting sources for hydrocarbon production in different countries. In the future, an increase of production coming from this type of reservoir is also expected. Conventional Formation Evaluation (Logs and Imaging) could be challenging in this complex environment. The main reasons are related to the evaluation of reliable petrophysical parameters to apply in the reservoir modelling, to the correct spotting and count of productive events (open fractures) and to the identification of formation fluids contacts. In order to support and integrate the conventional FE methodologies, an original approach, based on Mud Logging data, has been applied during the development phase of a large oil field in Southern Italy. These cost effective data are routinely acquired while drilling and available in near real time. The approach is carried out by: • mud gas analyses, using the GWD (Gas While Drilling) methodology, to identify the more porous intervals defining a preliminary net/gross pay. Also information about the formation fluid type can be achieved. • drilling mud microlosses analysis, to identify and characterise the permeable zones. The combination of these two analyses, integrated with the other information acquired at wellsite (conventional and image logs, cores, formation testing, PLT), can provide a more complete and reliable reservoir description. A better identification of porous and permeable zones enables the optimisation of critical well operations such as formation testing, coring and selective acid jobs. Moreover, in hostile environment (for example bad hole conditions) where logs cannot be run, the Mud Logging data are the only way to obtain a qualitative Formation Evaluation.