

Data-Driven Improved Waterflood Management in Mature Oil Fields: The Use Case for Streamline Surveillance

S. Salchenegger¹, D. Oliva Marti¹, A.-M. Burchisis²

¹OMV Exploration & Production GmbH, Reservoir Optimization, Gaenserndorf, Austria, ²OMV Petrom SA, Bucharest, Romania

Streamline surveillance is a powerful technique for modeling fluid flow and optimizing waterflood performance in reservoirs. The technology was applied to numerous mature oil fields in Austria and Romania, where waterflooding has been implemented for more than 60 years, as well as to younger fields in Abu Dhabi and New Zealand. The results of the proposed changes in the field are compared with historical data and it is shown that simply adjusting injection and production rates on regular basis can increase the oil recovery, improve injector efficiency, reduce the water cut and water cycling.

It is shown that the methodology is working on a huge variety of fields with partially limited input data. Simplified models have been built using only historic rates, fluid properties and well trajectories and gross geological features. More complex ones are based on geological models including reservoir properties, faults, etc.

The benefit of being able to perform the analyses in a time and resource efficient way - as no history matching is necessary – is highlighted. Together with the low implementation efforts, streamline surveillance is a cost-effective way to optimize waterflooded reservoirs as a continuous process.

In this paper we show the different model building workflows depending on input data quality, highlight “do’s” and “don’ts” and present several use cases. We also present the ongoing efforts to implement this methodology to be a mandatory part of the reservoir analyses in each single waterflooded oil field in OMV.