**Title of article:** Simulation Study on Waterflood Front: Block Hade of Tarim Oilfield in Northwest China

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**Abstract**

Block Hade consists of a deep thin sandstone reservoir of two sub-layer reservoirs. The thickness is about 1.5 m for each layer. The two-layer “staircase” horizontal well is used for recovery. In order to determine water displacement front and edge water movement, tracer test is conducted in the reservoir. But the cycle of field tracer monitoring is about 150-360 days. This prevented the efficient monitoring of waterflood swept area and waterflood advance direction and velocity, after the cycle of tracer monitoring. Conservation of mass with respect to tracer flow and history performance matching of tracer enabled the study of water-flood front and edge-water advance. The simulation result is basically consistent with the monitored field tracer results. Therefore, numerical model can be used to conduct a longer monitoring period. It can make up for the disadvantage of the complexity of the tracer monitoring setup, its implementation, and time-consuming monitoring cycle. The water-flood front, water-flood swept area, advancing velocity and the predominant water injection direction can be obtained. Furthermore, it is possible to evaluate and predict the injection-production well interaction and can also provide a reliable basis to deploy reasonable flood patterns to enhance oil recovery.