Subsurface **Case Study**

Waterflood Simulation Study – North Sea

situation

A client developed a thin, high permeability offshore oil accumulation in North Sea. The water-cut was increasing, and they asked IHS Markit to investigate if water production would plateau.

The static model was built by a third party based on detailed geological study. The client also asked IHS Markit to evaluate the geomodel, and come up with a solution to upscale the model and honor the properties in the model

action

Upstream Oil & Gas Consultants:

- Evaluated the water saturation profile from the Petrophysicist to find any trends and how to represent them in the dynamic model
- Conducted production performance analysis to find any relationships with operations
- Evaluated RCA & SCAL data to establish the permeability-porosity transform and rock-fluid properties
- Evaluated PVT data for simulation purposes
- Evaluated water oil contacts and aquifer strength

result

Study results indicated that the water saturation profile could be matched by capillary pressure curves that honored the petrophysicist's results, while initializing the model with equilibrium to ensure the runs were stable

Simulation results indicated that the rise in water cut was a result of cusping of the underlying water. However, further increase in water-cut was dependent on expansion of the surrounding aquifer and associated with only a slow increase in water-cut and good oil recovery and field production performance.

The client found future production matched simulation forecast.

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