Fluid prediction

Predicts reservoir fluid properties from advanced mud-gas analysis using machine-learning models

Applications

- Conventional and unconventional reservoirs
- Continuous gas/oil ratio (GOR), C_{6+} fraction, and the probabilistic estimation of oil, gas, or condensate fluids

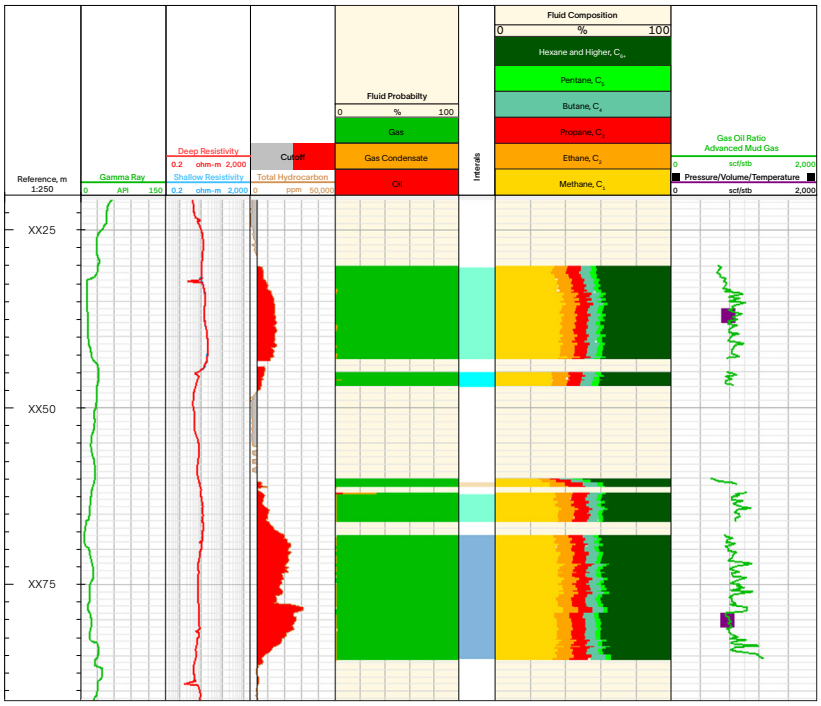
How it improves wells

Fluid prediction is a revolutionary combination of historical downhole data [pressure-volume-temperature (PVT), advanced mud-gas data (AMG), and machine-learning (ML) models], to provide "while drilling" fluid type and GOR. It can be used in conventional and unconventional reservoirs to provide continuous GOR, C_{6+} fraction, and the probabilistic estimation of the fluid type per class (oil, gas, or condensate). Fluid prediction fills the gap where fluid sampling is not feasible, providing an accurate image of fluid properties along the reservoir zone. Fluid properties while drilling can assist in landing and geosteering operations to improve real-time decision making and completion optimization.

In unconventional plays, the fluid type and GOR can be known while drilling, not just when the well starts to produce, considerably improving the well efficiency and enabling rational decisions.

How it works

The workflow uses a set of preconstructed ML models to generate estimates of fluid type, C_{6+} composition, and GOR. The ML models were trained using a proprietary PVT database compiled from laboratory fluid measurements. PVT-equivalent data generated by AMG are used to feed the fluid model that uses advanced ML algorithms to classify hydrocarbon fluids as oil, gas condensate, or gas and predict C_{6+} fraction and GOR. The database can be further expanded with customer data and trained for specific geological settings.



Continuous fluid type and GOR predictions.