Case Study 3

Improved Inhibitor Return and SI Placement

An analytical study to understand inhibitor placement, diversion and inhibitor return; which ultimately helped in design of next SI squeeze, inhibitor selection and understand inhibitor placement along formation.

Challenge

An operator wanted to analyse their SI squeeze treatment, executed in recent past in their well (vertical well with four perf, producing 1300 b/d at 70% WCT, 7.5% SI, 20 M3). And then calibrate wellbore model against field measured SI return profile; which then used for forecast and planning for next SI Squeeze for the same well.

Solutions

ChemPlace (Scale Inhibitor Squeeze Module) is used for SI squeeze job design, analyse SI distribution and diversion along reservoir formation, and return profile calculation.

Model Input Data Need

- Reservoir lithology (perm & porosity etc.)
- Well design & completion detail
- Fluid properties (viscosity, and density etc.)
- Basic multi-stage Injection Plan

Model Out Data

- Treatment Pressure (for model calibration/history match)
- SI placement and penetration
- SI Return profile
- SI diversion strategy
- SI capacity selection
- Job design and optimisation
- Pre/post production analysis
Application

Our team used its diverse oilfield knowledge and expertise along with remarkably robust SI squeeze job design capabilities of ChemPlace for this study. We analysed their past SI squeeze to find how they executed and what they need to do in next SI squeeze to maximise diversion and inhibitor return. Here is how we carried out this study using ChemPlace to bring extensive value gain for operator:

- **Wellbore Model Building**: wellbore data (reservoir lithology, well design, completion, SI squeeze design executed and fluid properties) is received from operator. We built wellbore for SI squeeze treatment study.
- **Initial Simulation and Analysis**: We simulated past SI squeeze design and analysed simulation results to understand, how and what they executed their squeeze and what was post-squeeze formation coverage and return profile.
- **Model Calibration (History Match)**: SI Return profile and inhibitor placement was calculated and compared against measured SI return profile (as shown in figure 1).
- **Post- Prediction analysis and Planning Next SI Squeeze**: Calibrated model is used for design of next squeeze job, based on predicted inhibitor placement, diversion, design and post-squeeze return profile.

Results

ChemPlace delivered value gain for operator by assisting their scale management team to understand how inhibitor was placed along reservoir formation and estimated return profile. This helped scale management team to select best-in-class diverting technique for even inhibitor placement and maximum inhibitor return. They were able to plan their next squeeze to maximise value inhibitor return and long continued production.