Fluid Mapping While Drilling for Optimal Well Landing Decision – A Case Study From Malaysia

Presented for the DEVEX 2023

Presented by Marcus Turner SLB on behalf of:
Aldrick Garcia Mayans (SLB)
Siti Najmi Farhan Zulkipli (PETRONAS)

20-21 June 2023
Outline

- Pre-job planning
- Methodology and workflow
- Field overview
- Case studies
- Results
- Best practices
- Conclusion

Our Objectives

- Key elements for success
- Case Studies & Best Practices
- FMWD Application for Well Landing
Field Overview

- Uncertainty in current GOC and OWC
- Low resistivity contrast between oil (> 11 ohmm) and water (≤ 10 ohmm)
- Uncertainty in structural dipping
- Uncertainty in transition/swept/depleted zone producibility
- Uncertainty in reservoir compartmentalization
- Uncertainty in well placement due to thin oil rim
Pre-Job Planning

Well Profile

Fluid properties

Recommendations for acquisition parameters

Integration in Drilling Program

BHA planning, fluid and sampling requirements

Pump rate, speed and drawdown

Clean-up time

Real time fluid ID channels/frame
Case Study One

Horizontal landing point

38 liters PO volume, 10-15 cc/s pump rate

57 liters PO volume, 5-10 cc/s pump rate
Case Study Two

- **81 liters PO volume, 20-30 cc/s pump rate**
- **174 liters PO volume, 40 cc/s pump rate**
- **58 liters PO volume, 10 cc/s pump rate**
- **45 liters PO volume, 10-20 cc/s pump rate**

**Side-track to down dip location**

**GOC**

**OWC**
Case Study Three

127 liters PO volume, 20-30 cc/s pump rate

66 liters PO volume, 10-20 cc/s pump rate

63.6 liters PO volume, 15-20 cc/s pump rate

38.5 liters PO volume, 5 cc/s pump rate
Conclusion

• Strategic data acquisition and fluid characterization plan play a critical role in brown field reserves monetization
• In mature field environment where current fluid contact movement is uncertain with long transition zone and reservoir sweep is non-uniform, drilling a pilot hole to acquire data to determine horizontal landing point is highly recommended
• Uncertainty in hydrocarbon fluid type can best be addressed through real time monitoring of fluid clean-up, contamination monitoring and acquiring physical samples to be opened at surface
• Integration of seismic attributes, 3D simulation model and optimized well placement for the best drainage area will maximize the reserves addition in a mature field development
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THANK YOU FOR LISTENING

Time for Questions

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