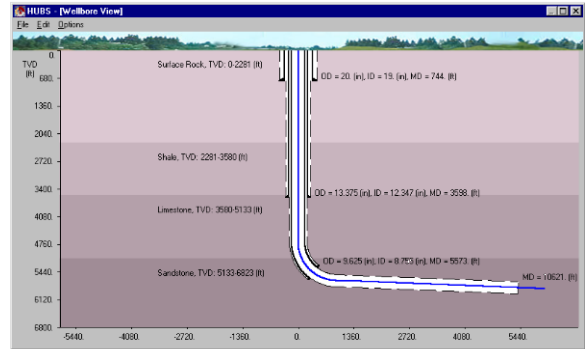
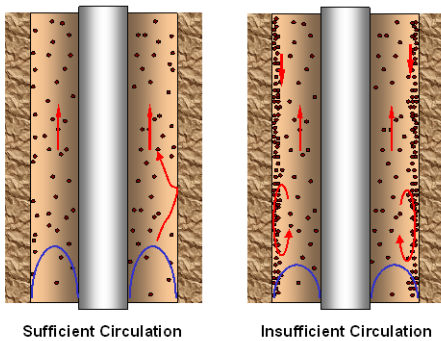


# Hydraulic UnderBalanced Simulator (HUBS)

Successful UnderBalanced Operations (UBO) require an optimum circulation rate and sufficient hole cleaning capacity to maintain underbalance with minimum power and equipment. **HUBS** eliminates the shortcomings of other multi-phase hydraulic simulators, predicting adequate hole cleaning and maximizing penetration rate while maintaining underbalance.



Using a new approach to cuttings carrying capability that replaces dependence on inadequate theories, **HUBS** accounts for cuttings accumulation.

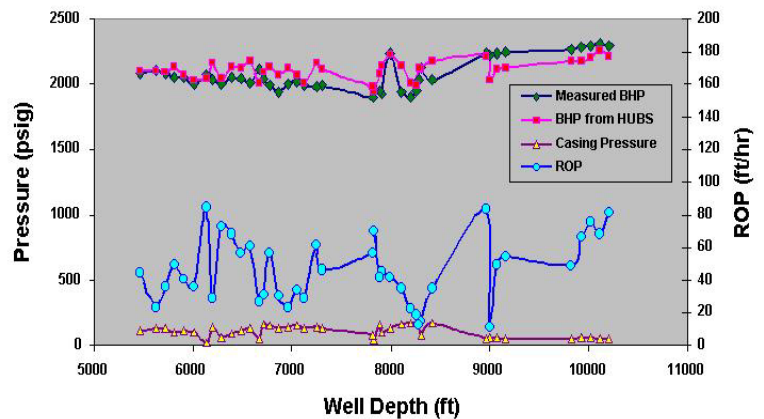
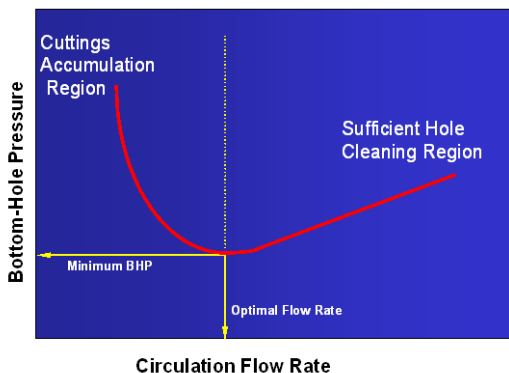


To improve user productivity, **HUBS** includes:

- MS Office compatibility
- Only one wellbore description entry required
- Up to six coexisting fluid phases
- Offshore rig capability (accounts for air gap and negative temperature gradient in riser)
- Multiple fluid rheology models
- A newly developed 2-Phase flow jet sub model
- Productivity Index calculation
- Lookup tables for tubulars and fluids
- Customized units option
- Flow rate design and selection
- Pressure matching feature

**HUBS** accounts for a variety of dynamic situations that frequently accompany UBO, including:

- Formation influx and lost circulation
- Phase change and gas solubility
- Parasite strings and concentric casing injection
- Reverse circulation during UBO.



Comparison to field data revealed agreement within 5% between **HUBS** calculations and actual measurements.

For a free trial, please visit:

[www.signaengineering.com](http://www.signaengineering.com) or contact George Medley or Shifeng Tian at the address or phone number shown below.