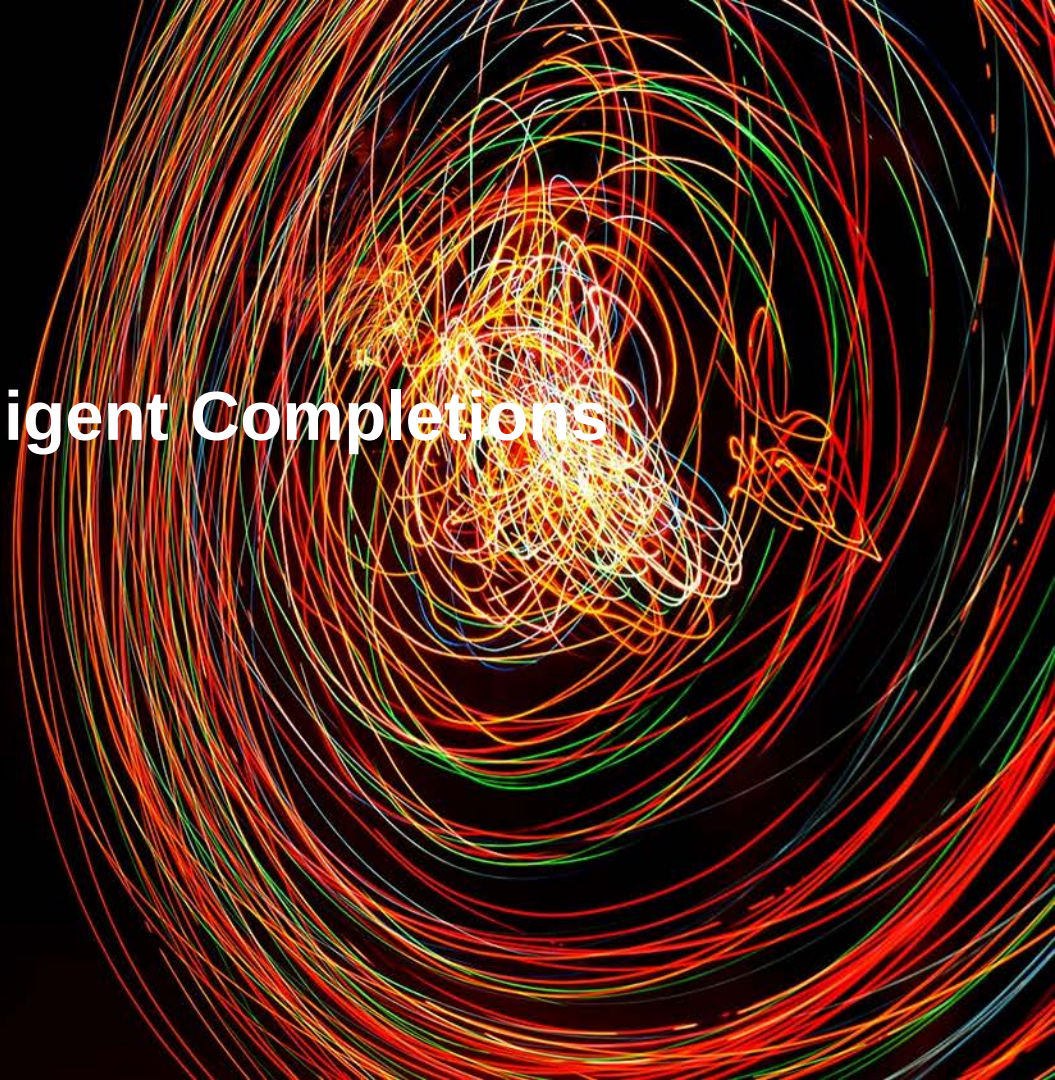


Intelligent use of Intelligent Completions

22nd August 2017

Ian Phillips

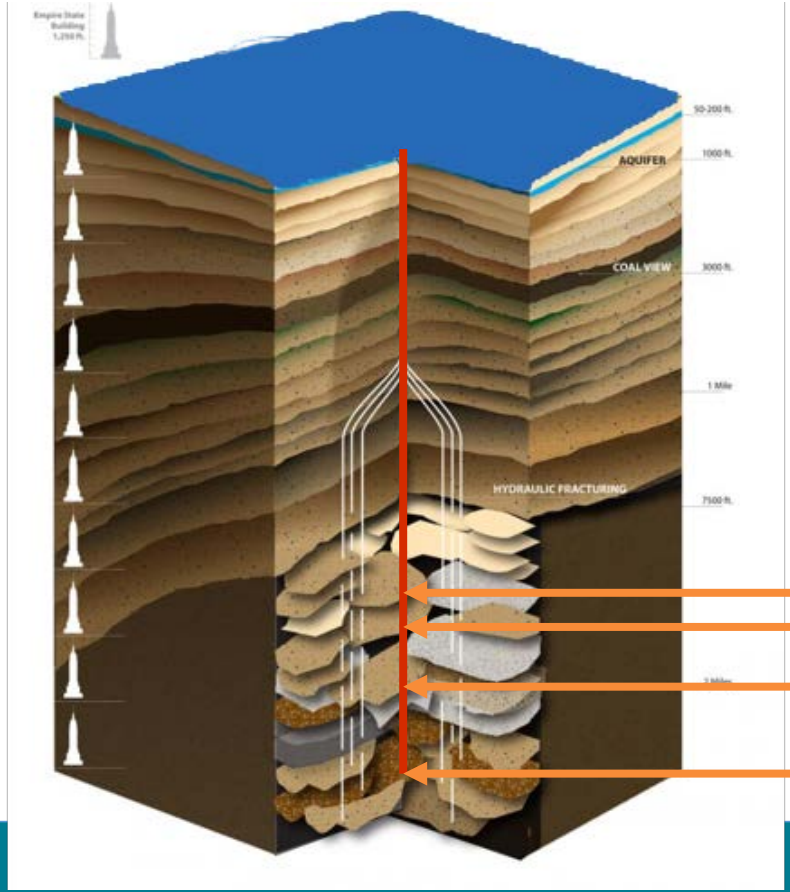
Chief Executive

fostering and funding innovation

Agenda

- Why Intelligent Completions
- The technology
- Making a decision

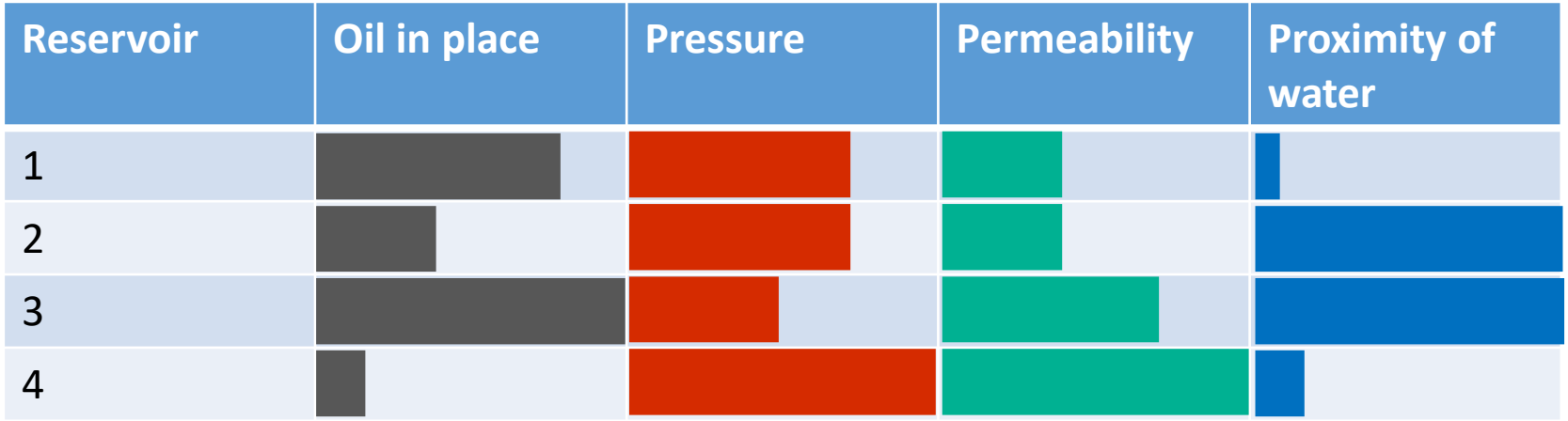
It’s complicated



- Conventional approach
  - Perforate everything
  - Maybe perforate in sequence

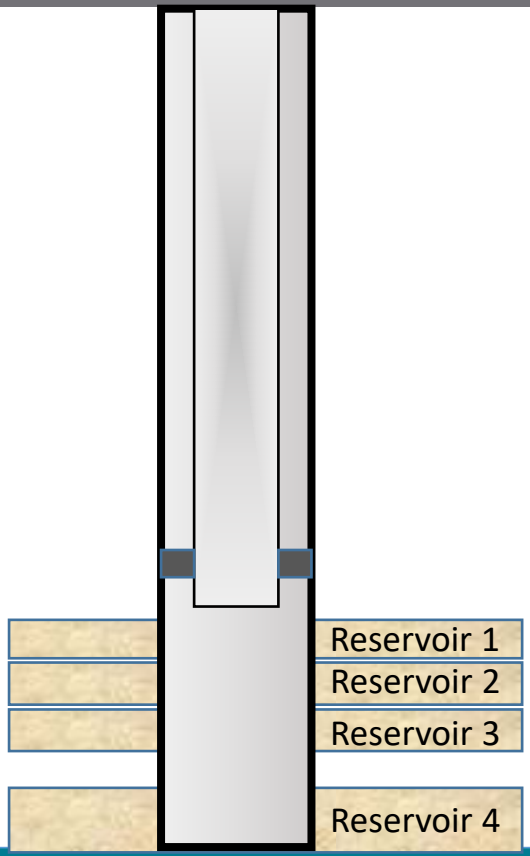
Reservoir 1
Reservoir 2
Reservoir 3
Reservoir 4

Reservoirs are not uniform



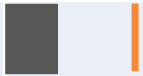
Reservoir understanding at the start of the field life

Conventional approach to well management



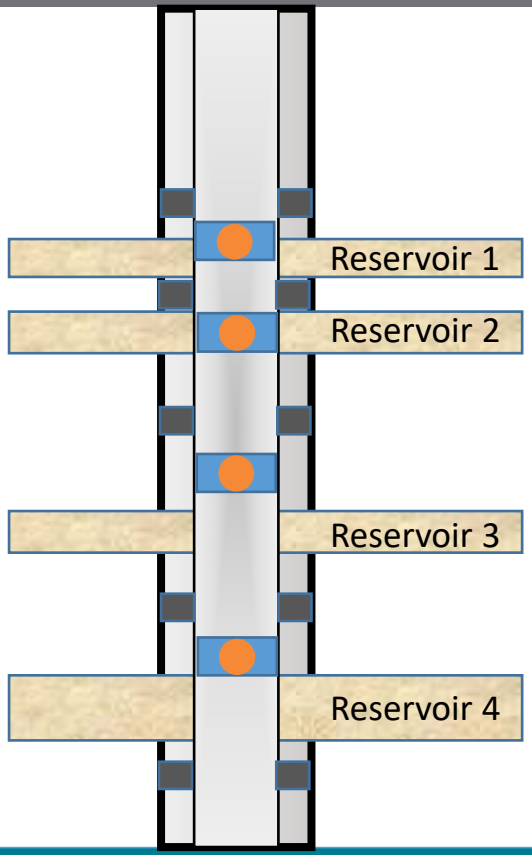
- Drill your well
- Run your production tubing
- Perforate all four reservoirs to maximise early production
  - And hence revenue
- Ad hoc data collection
- Deal with problems later
  - Try and shut off water production
  - Re-perforate if scale forms

There is uncertainty – and reservoirs are not uniform

Reservoir	Oil in place	Pressure	Permeability	Proximity of water
1				
2				
3				
4				

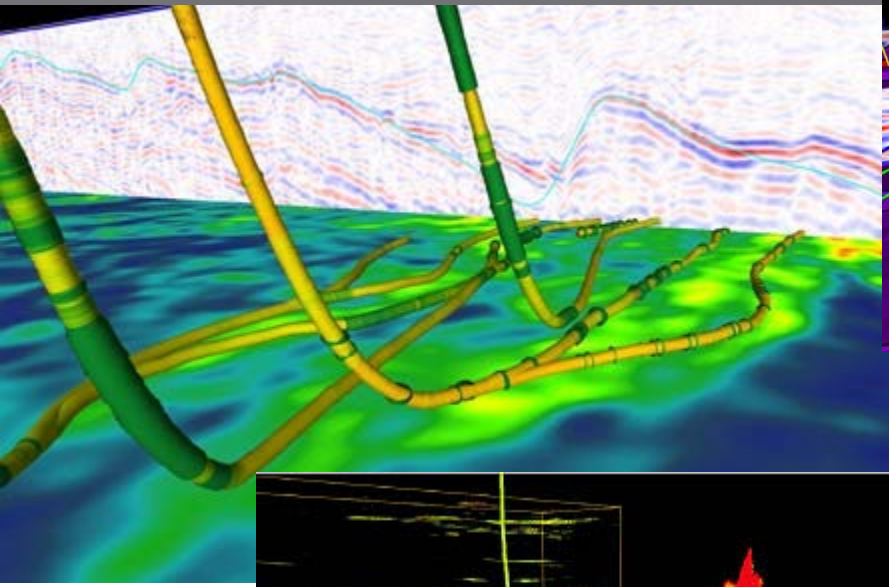
Reservoir understanding 5 years later

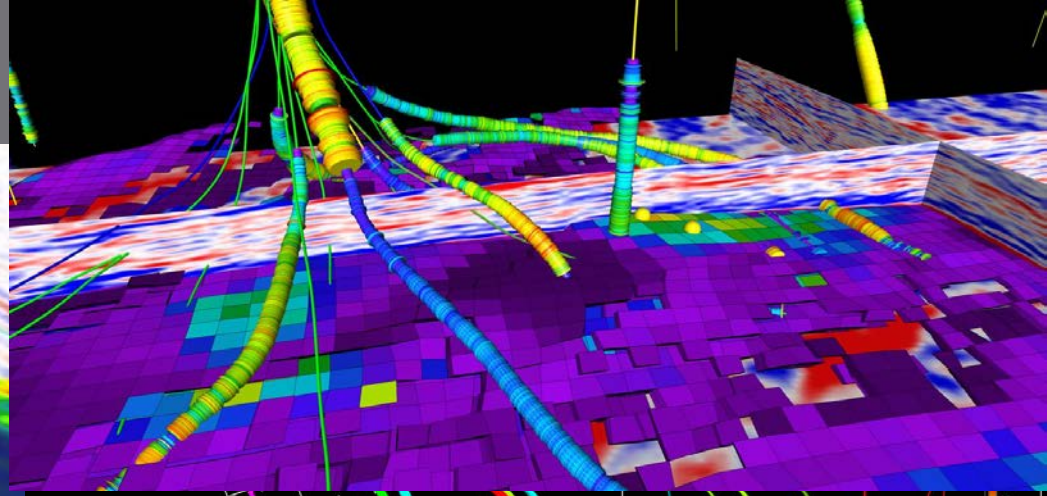
A more intelligent approach to well management

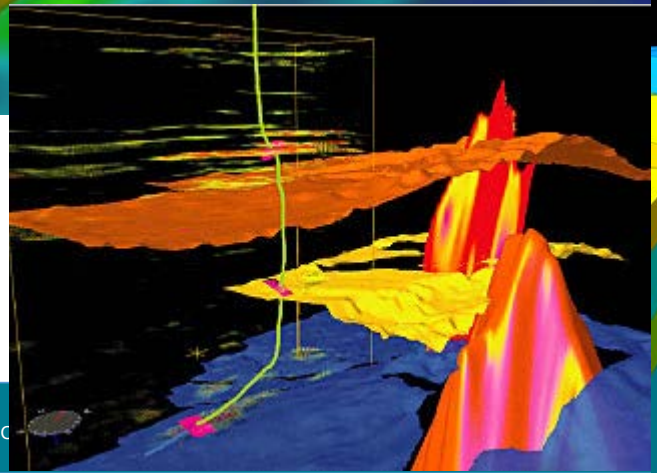


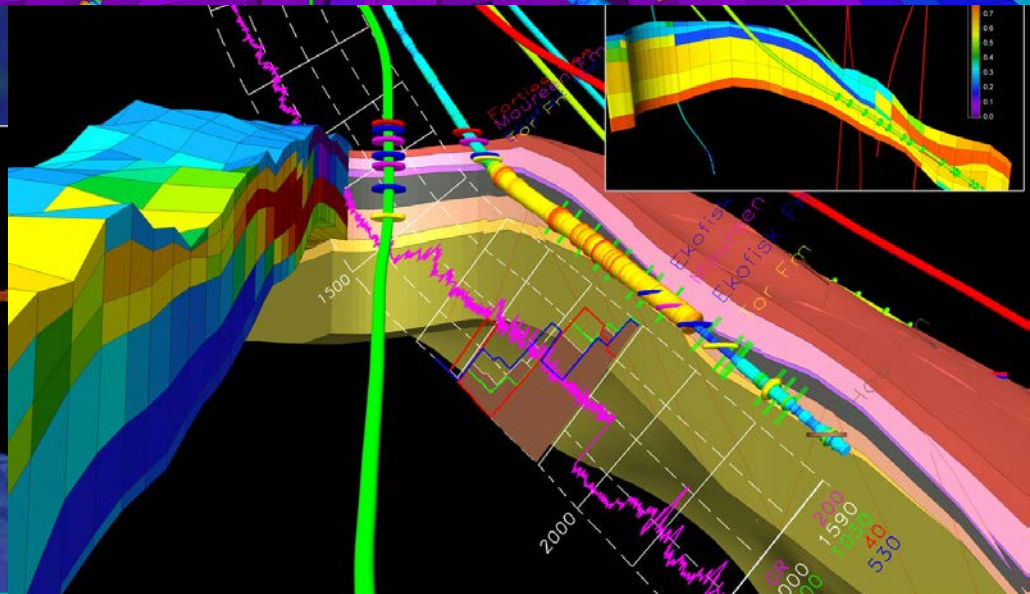
- Perforate all four reservoirs
- Run an intelligent completion
- Real time monitoring
- Manage the problems proactively
  - Prevent or defer water production
  - Re-perforate if scale forms

Reality is more complicated

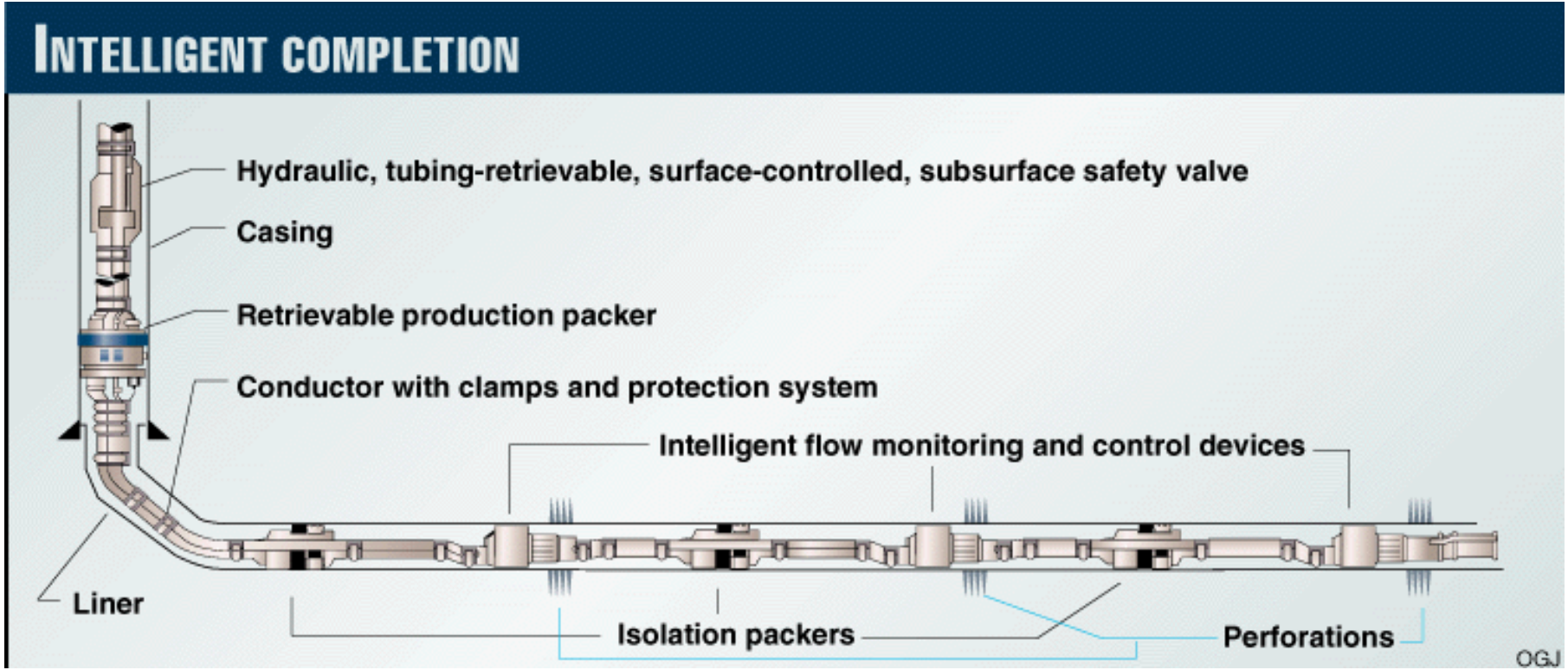








Typical intelligent completion in a horizontal well



Typical intelligent completion components

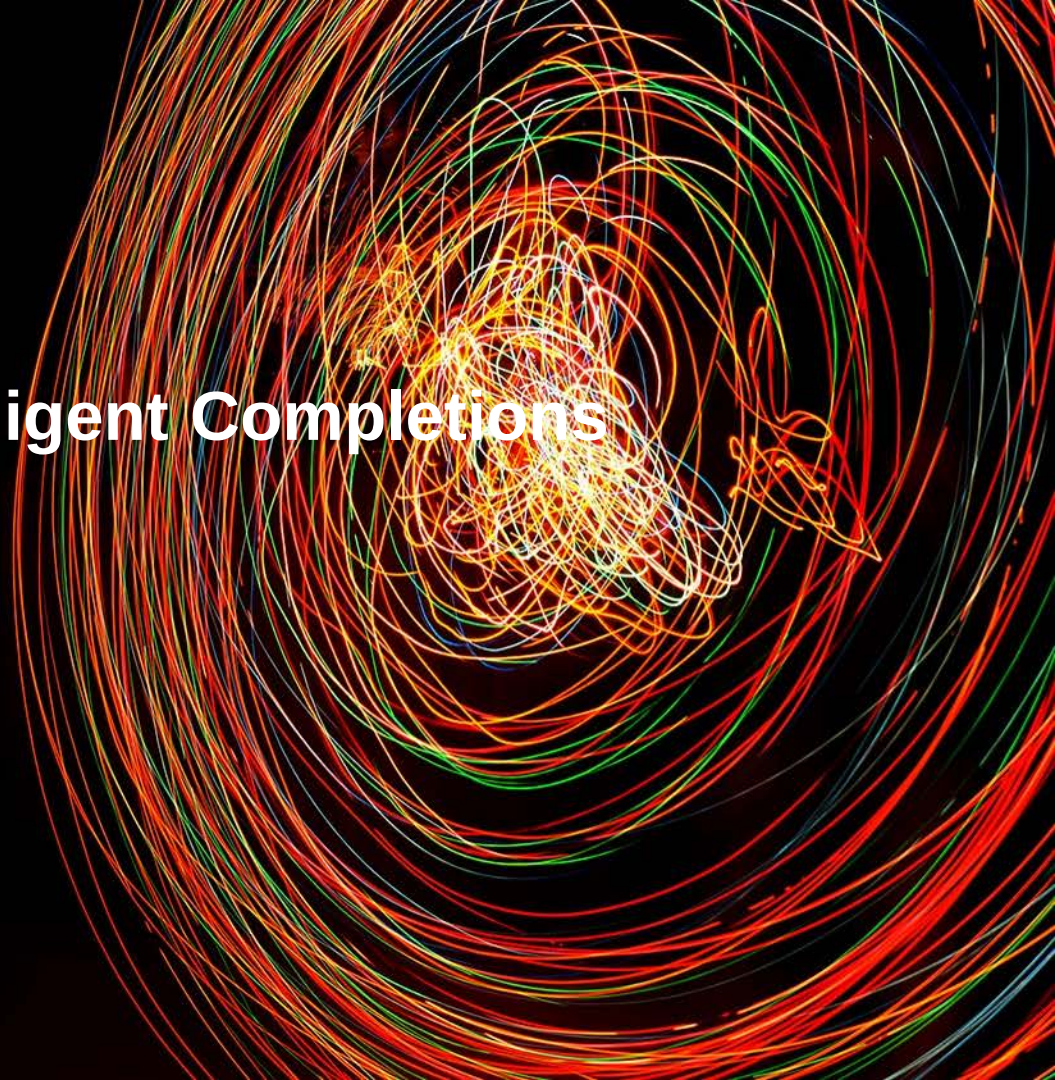
Making the decision to run an intelligent completion

Advantages

- Better information about reservoir performance
- Greater recovery = greater profitability
  - Adjust well to maximise recovery
- Fewer production problems
  - Less water (can impede flow and can kill well)
  - Less scale (can block flow)

Disadvantages

- Higher initial cost
  - Often applied to more complex wells
- More moving parts
  - reliability to be considered – now largely addressed
- More sophisticated reservoir management
  - Real time decision making



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