

# Unconventional Gas

A Service Company Perspective on Effective Engagement

8 May 2013

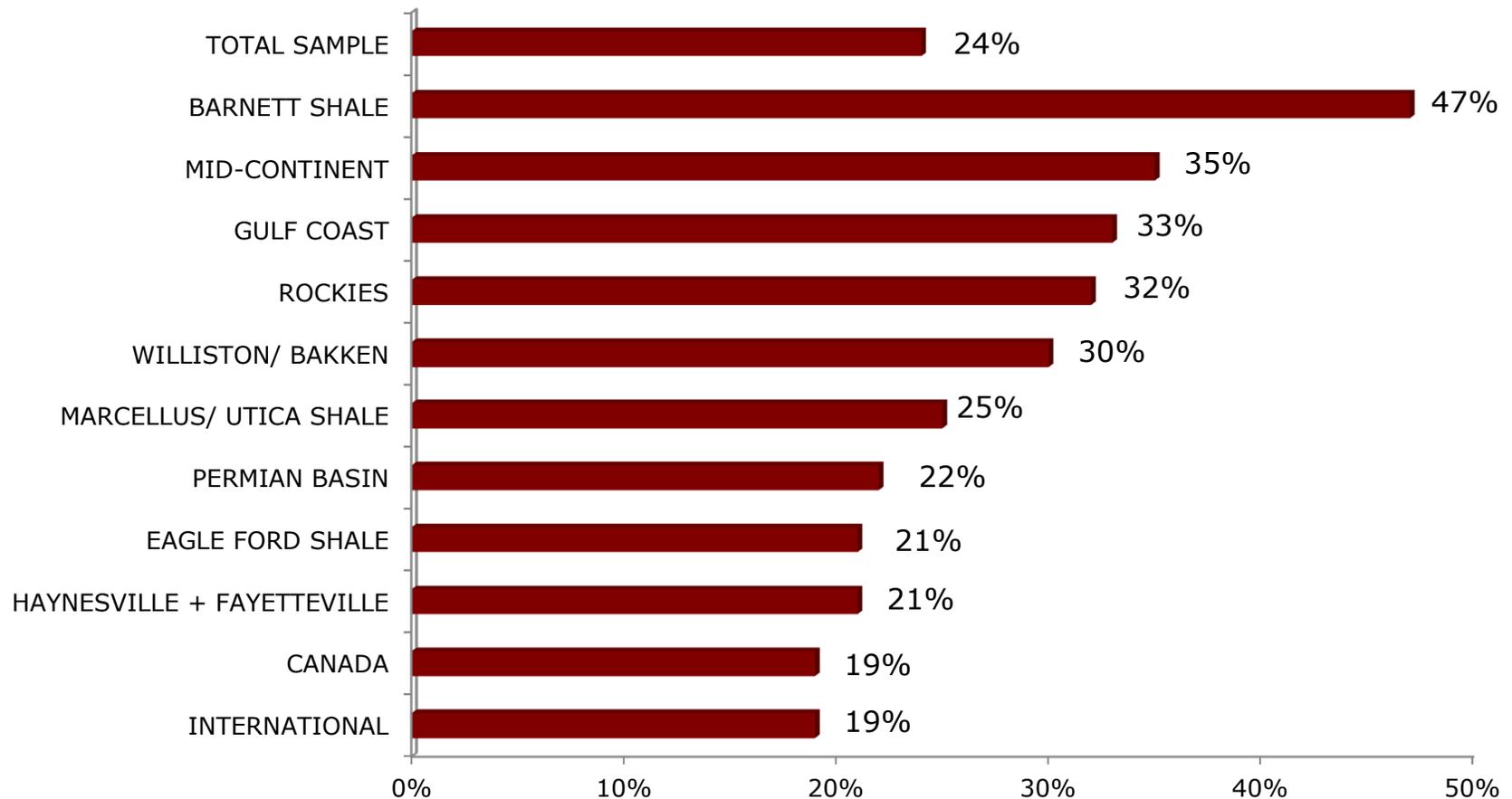
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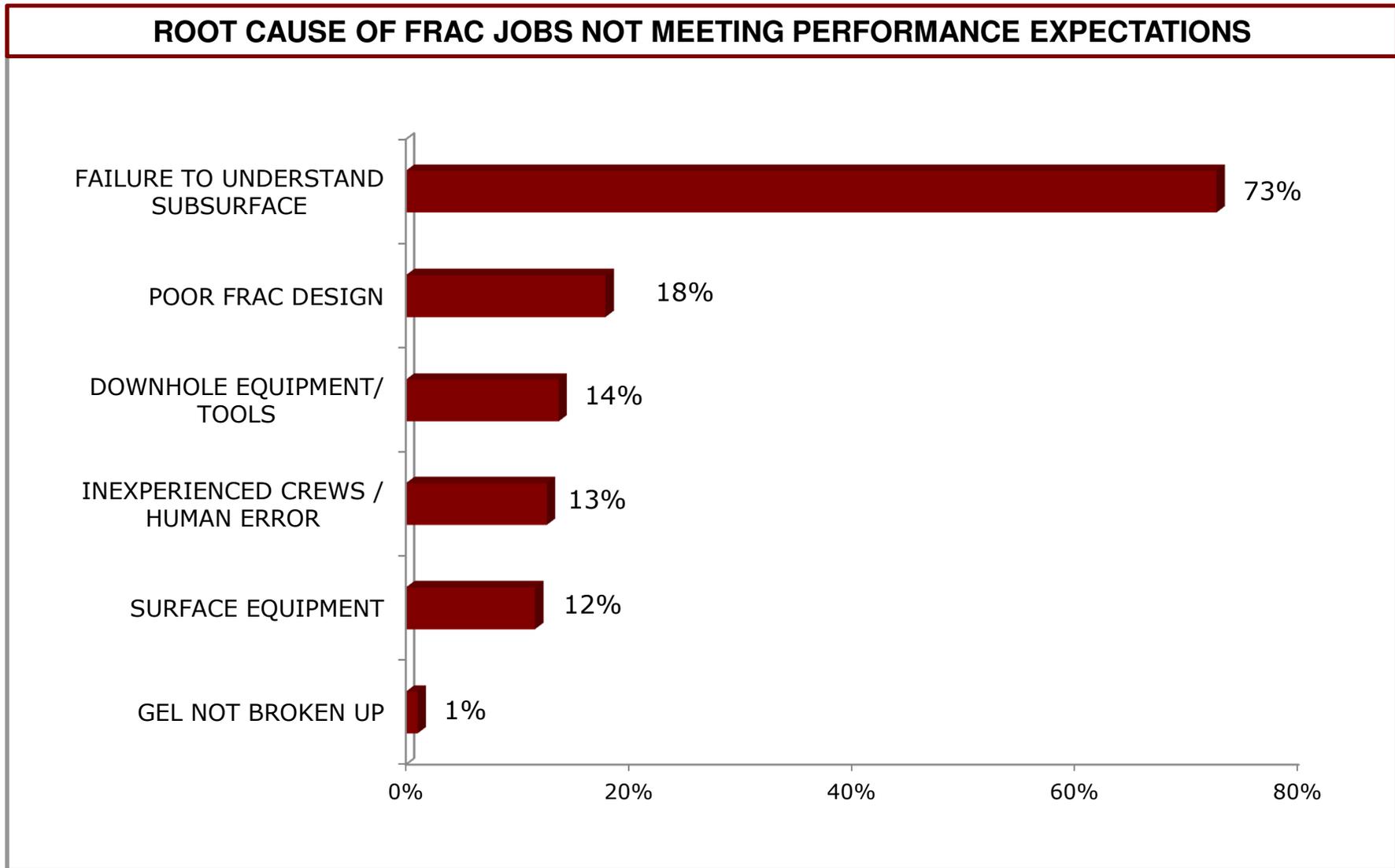


# Unconventional: Satisfaction Survey

## SHARE OF FRAC JOBS NOT MEETING PERFORMANCE EXPECTATIONS

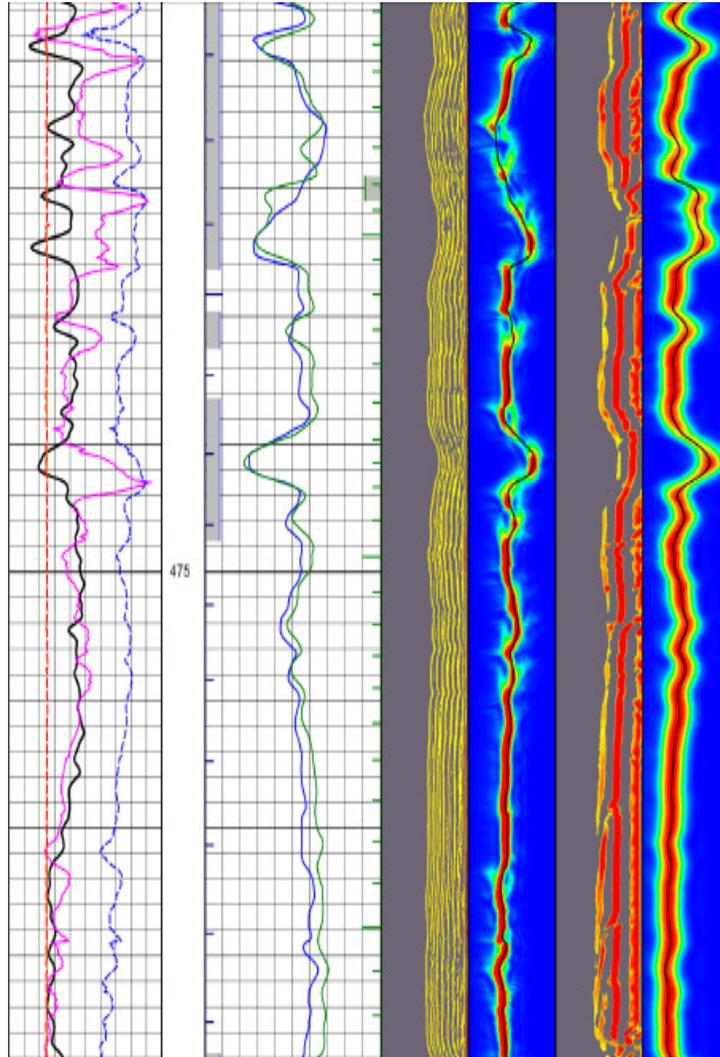


# Root Cause to Challenges in Unconventional Exploitation

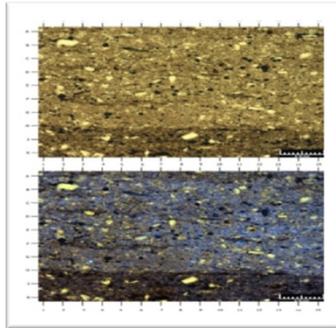


# Engagement Strategy

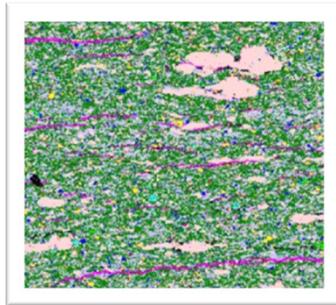
- The most effective strategy is to position the service company as a solution provider, focused on delivering answers rather than tools
- This is a very different approach to conventional O&G



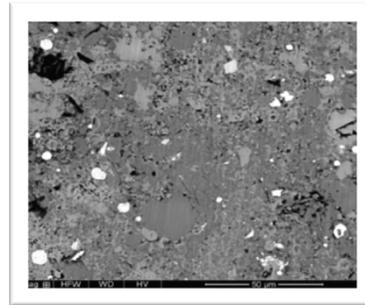
# Conventional Developments as Analogs?



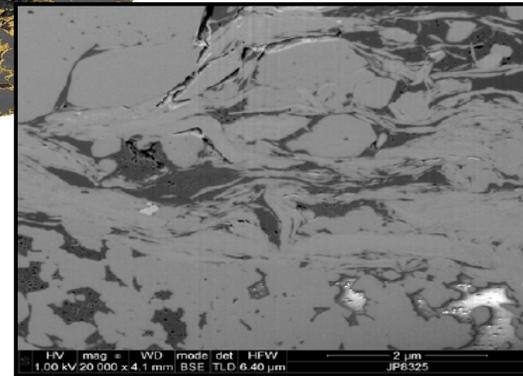
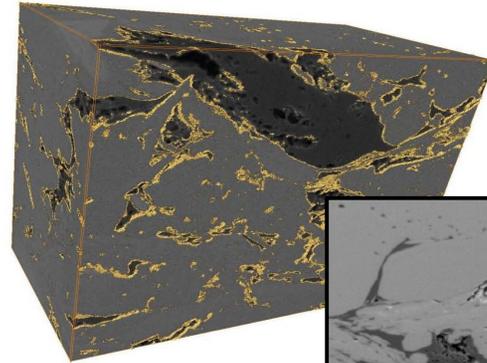
Ultra-Thin Sections



Elemental Fabric Mapping

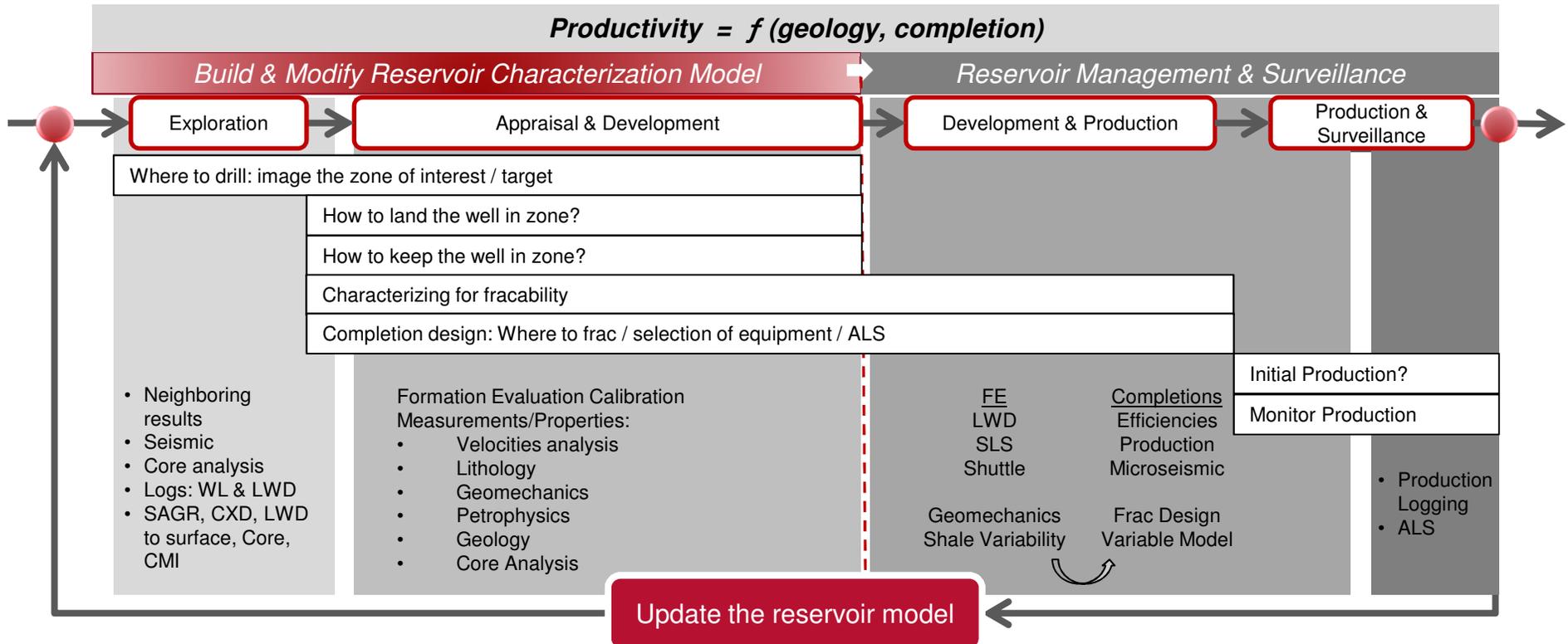


2D Nano-Scale Imaging



- “Shale Reservoirs” are different
- Economics of two wells 1km apart might be very different
- Compare to conventional reservoirs – homogeneous over several kms

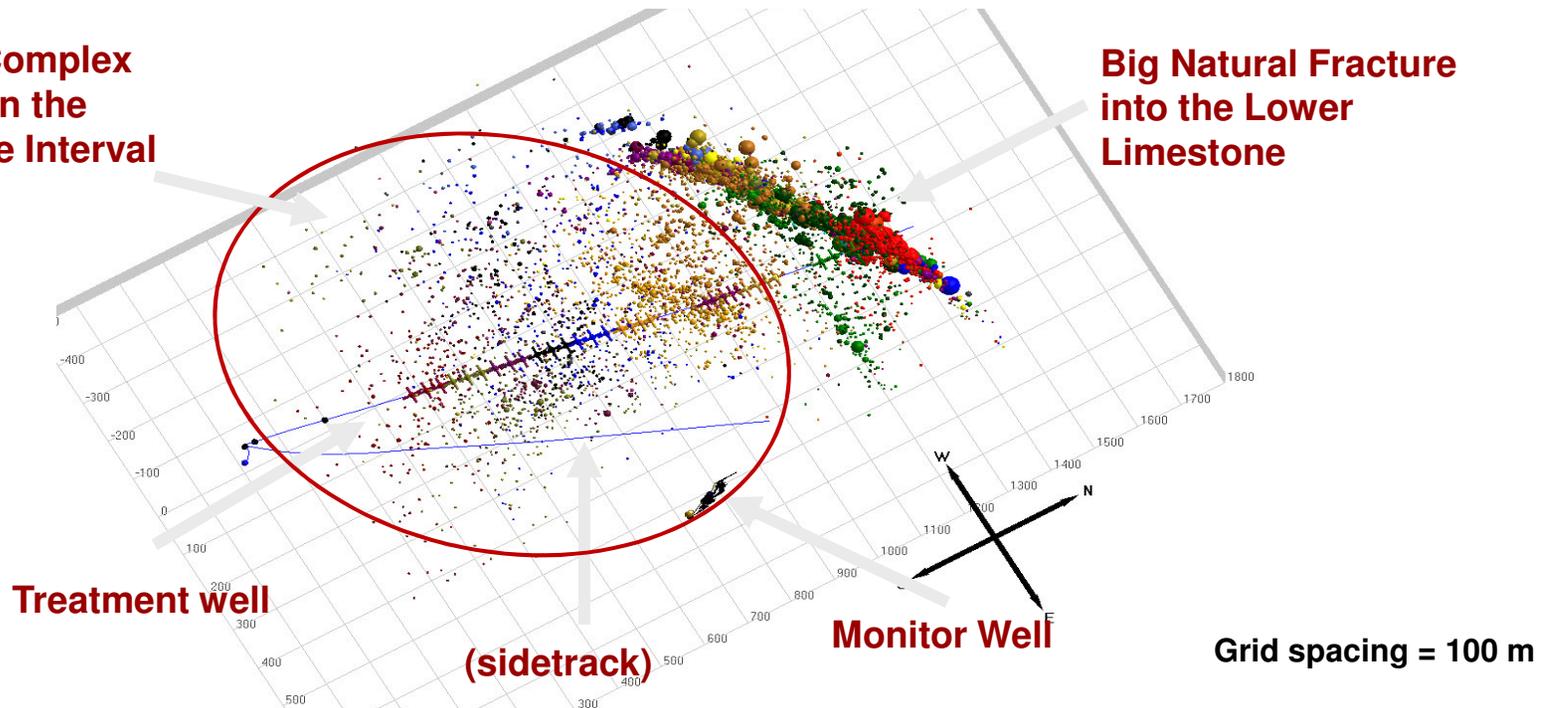
# Technical Advantages of Delivering Solutions



# Realizing the Technical Advantages

Region of Complex Fracturing in the Target Shale Interval

Big Natural Fracture into the Lower Limestone



Map View All Stages – 6,722 events (100 meter grid lines), with large natural fracture in underlying limestone

# Effective Engagement



- Outstanding critical questions
  - Where to drill – are there sweet spots?
  - Which sections are most frackable?
  - How to measure fracture performance?
  - To re-frac or not to re-frac?
  - Reservoir characterization – learning from experience
- Genuine case for “partnership” between operator and service companies
  - This is not an off the shelf offering
  - Appraising and developing unconventionalals – technologies and experience

# Summary

- Shifting emphasis from tools to solutions
- Solution provider and operator working together
- Regulatory environment accepting closer relationships
- Commercial success lies in working together to solve the problem, not client-vendor relationship

