



Panel: The Acquisition Trifecta: How Valuations, Reserve Base Lending and Private Equity Impact M&A Deals

SPE-GCS BD Study Group
Houston – Four Seasons
October 24, 2018

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Typical Process & Points of Interest

- NSAI typically engaged by the E&P Company (current owner or company acquiring properties)
- Receive data from company, including:
 - Reserves database with inventory of PDP and upside cases
 - Lease operating statements
 - Geologic information, maps
 - Completions details by well
- NSAI performs an independent evaluation of reserves
 - Can be performed on a subset of properties initially (highest value cases)
 - Additional properties added as evaluation matures
- General understanding of Reserve Based Loan (RBL)
 - Based primarily on PDP
 - PUDs allow for more full valuation of PDP reserves
 - Can include hedges

Typical Process & Points of Interest

- Common Points of Interest
 - Projection parameters for newest (and highest value) PDPs
 - Product differentials, firm transportation
 - Operating costs
 - Number of upside locations
 - Geology
 - Selection and normalization of “analog” wells
 - New completion techniques
 - Well spacing
 - Drilling pace, historical PUD conversion, capital costs, access to capital

Engineering Methods for Unconventional EUR Analysis

- Performance analysis for shale and tight gas reservoirs

- Analogy performance
- Traditional Analysis – Decline Curve Analysis
- Transient versus Boundary Dominated Flow (BDF)
- BDF Analysis
- Transient Flow Analysis
- Type Curves
- Analytical models
- Fekete Harmony – Shale
- Flowing Material Balance
- Productivity Index

$$q = q_i(1 + bD_it)^{-1/b}$$

$$P_p = \left(\frac{\mu_{gi}z_i}{P_i}\right) \int_0^P \frac{P}{\mu_g z} dp$$

and

$$t_a = (\mu_{gi}c_{ti}) \int_0^t \frac{1}{u_g \bar{c}_t} dt$$

Material Balance Equation

$$C_t = -\frac{1}{V} \times \frac{\Delta V}{\Delta p}$$

$$p_i - \bar{p} = m_{pss} N_p$$

$$\bar{p} - p_{wf} = b_{pss} \times q_{oil}$$

$$\frac{q}{p_i - p_{wf}} = \frac{1}{m_{pss} MBT + b_{pss}}$$

$$\frac{m(p_i) - m(p_{wf})}{q_g} = \frac{1.632 \times 10^6 T}{kh} \left[\log\left(\frac{kt}{\phi \mu c_t r_w^2}\right) - 3.23 + 0.87s \right] \dots \text{gas}$$

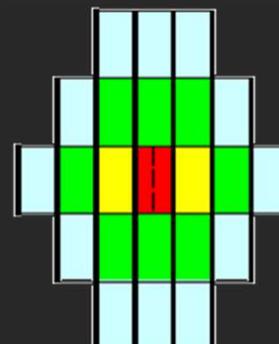
Undeveloped Locations - Quantity

- How should area away from well control be booked?
- New SEC – PUDs beyond 1 offset away "can be claimed in a conventional accumulation or a continuous accumulation...":

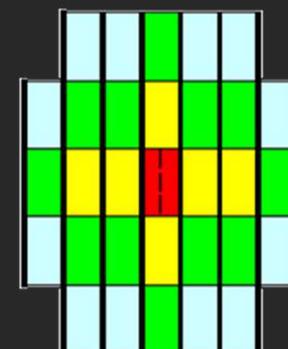
"Reliable Technology"

- Property maturity
- Data rich/poor
- Consistency of results & methods
- Geologic understanding
- Analogy to other areas
- Economic robustness
- Leasehold ownership
- Development schedule
- Leverage effect
- Operator intent

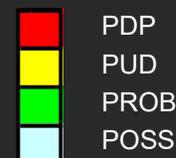
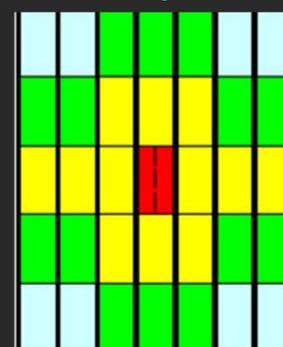
Early Development



Middle Development

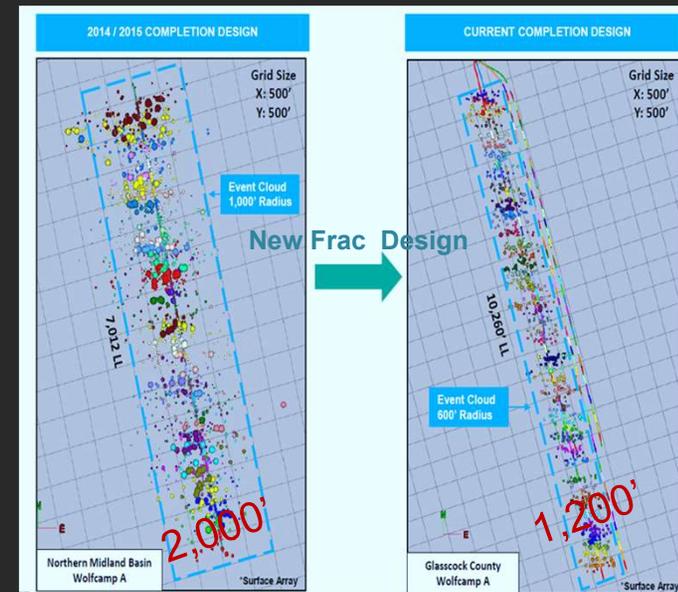
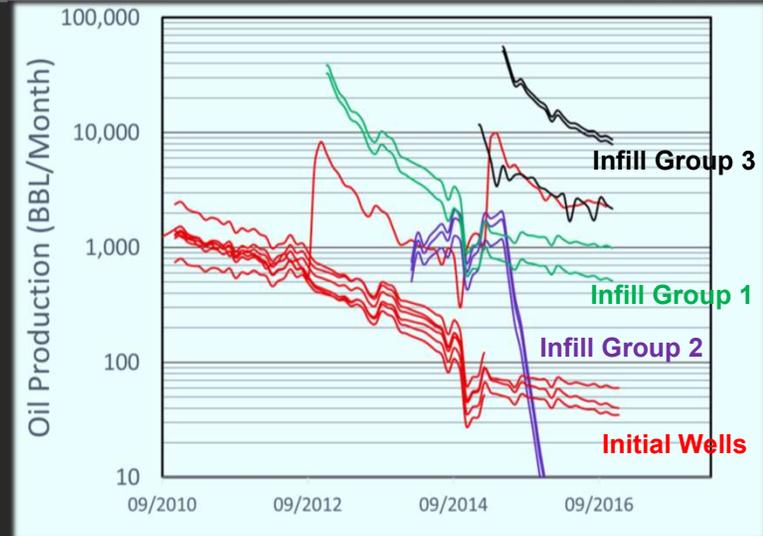


Late Development



Undeveloped Locations - Quality

- Spacing (Child – Parent impact)
 - What is your anticipated final well spacing for this area/field?
 - Maximizing reserves or present worth?
 - What reduction in children well's EUR can still achieve a reasonable return on children wells?
 - Has down-spacing already been demonstrated?
- Completions
 - “Completion design to fit spacing plan” or “Spacing design to fit completion plan”
 - Demonstrated improvements in completion design
 - Room for continued improvement?



Access to Capital, 5-Year Rule

- Regarding PUD reserves, SEC recently noted:
 - 3rd Party evaluators should review financial position of company
 - PUD reserves require both an approved development plan and access to capital for development
- SEC has stated that wells must be expected to drilled & **completed** within 5 years of initial booking
- SEC recently clarified that original intent of 5-year rule was to apply to all undeveloped locations (proved, probable, and possible)

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