



HALLIBURTON

Roundtable for Unconventionals: 14-15 March, 2013

**Mary McGowen
Adelaide**

“Roadblocks to Efficiency”

P90 for Frac

ASSUMPTIONS:								
Average number of frac stages per vertical well is 8, and average for horizontal is 12								
12-hour ops								
24 crew members per shift								
Each person has a back-2-back								
2 office-based engineers dedicated per spread								
	2014		2015		2016		2017-2028 (12 years)	
Drilling rigs	3		5		9		15	
Type of wells	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
Wells Tally	26.25	16.5	43.75	27.5	78.75	49.5	1575	990
Total frac stages per year	210	198	350	330	630	594	1050	990
Number frac spreads/crews dedicated to unconventional	1		2		3		5	
PERSONNEL								
Frac personnel to support unconventional	46		77		139		232	
WATER								
Water per stage (bbl)	7000	10500	7000	10500	7000	10500	7000	10500
Water per stage (MI)	1.11279	1.669185	1.11279	1.669185	1.11279	1.66919	1.11279	1.669185
Total annual water (bbl)	3,549,000		5,915,000		10,647,000		17,745,000	
Total DAILY water (MI)	1.55		2.58		4.64		7.73	
POLYMER								
Polymer for gelled fluids per stage (lb)	3500	5250	3500	5250	3500	5250	3500	5250
Total annual polymer needs (lb)	1,774,500		2,957,500		5,323,500		8,872,500	
SAND								
100-mesh sand per stage (lb)	30,000	45,000	30,000	45,000	30,000	45,000	30,000	45,000
Total annual sand needs (lb)	15,210,000		25,350,000		45,630,000		76,050,000	
PROPPANT								
proppant per stage(lb)	200,000	300,000	200,000	300,000	200,000	300,000	200,000	300,000
Total annual proppant needs (lb)	101,400,000		169,000,000		304,200,000		507,000,000	

Increased/Improved Infrastructure

- Frac water availability
 - Deliverability
 - Storage
 - Sustainability/recycle?
- Transport services: chems, proppant...
- SEALED ROADS PLEASE
- Access to location: more flights
- Remote Camps: Larger, more
- Expanded Permanent Accommodation: Moomba, ?other
- Real-estate for expanded contractor equipment/storage/maintenance needs:
- Waste management
- Joint Industry Super-Community

Expanded Operational Capacity

- Geographical coordination of projects: within operators
- Bulk Plants: Larger for CMT, sand, proppant, ?etc
- Wellsite preparation services (pre and post frac)
- Equipment/personnel needs increase ~30%, minimum
- More HP wellheads for shale
- Proppant handling

Regulatory Inconveniences/Delays

- Permit Rules for Over-dimensional/weight equipment: agreement across state lines.
- Road Commission requiring equipment redesigns: months of delays
 - Trailers inches too long, or don't fit pre-defined designs
 - Brakes replaced with poorer quality to meet regs
- International Personnel:
 - Have to wait for 457 visas, rather than work under ETA.
 - High-risk equipment licenses not always recognised: e.g. can run a loader, but not a forklift
- Inductions: standardised, online

Action Plans

