

AADE Mid Continent Chapter

Bakken Shale Resource Play

Revisited



January 14, 2009

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Marathon



Marathon 2007 History – One Year Ago Today



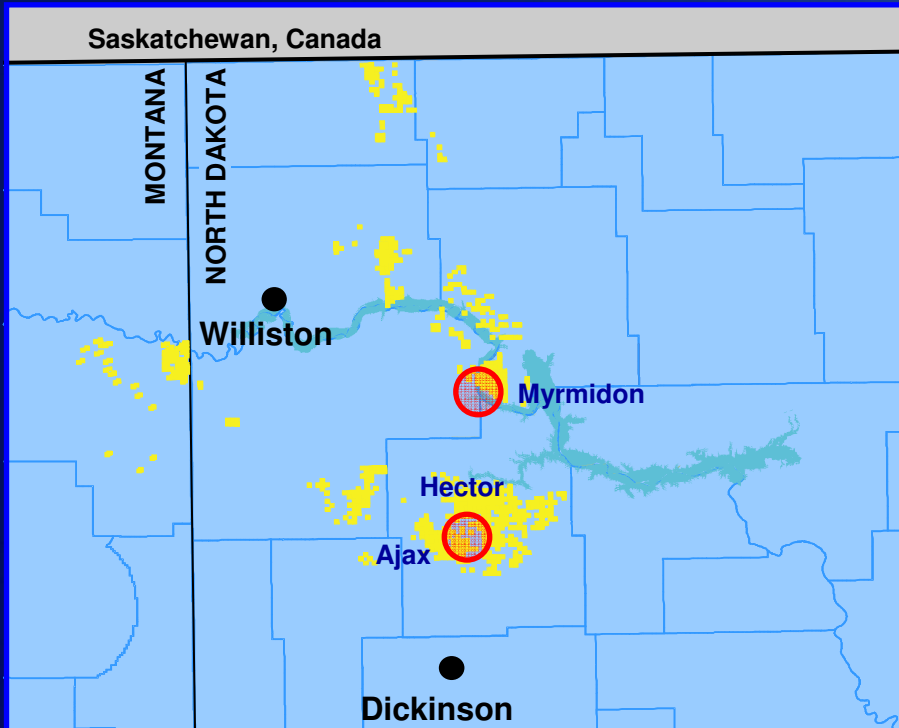
- ♦ Re-entered basin in May 2006
 - Hit the ground running with two conventional kelly rigs inherited with acquisition
- ♦ Ordered 5 New Generation Onshore Rigs
 - Rig 1 delivered in March 2007
 - Rig 5 delivered in September 2007
- ♦ Kept one conventional rig on payroll (released other 1/07)
- ♦ To date
 - Spudded 41 wells (TD'd 35)
 - Frac'd 30 wells
 - Have run tubing in 24
 - Have 12 wells on rod pump

Marathon 2008 History – Today



- ♦ Re-entered basin in May 2006 inheriting two conventional rigs
- ♦ Ordered 5 New Generation Onshore Rigs
 - Rig 1 delivered in March 2007 & Rig 5 in September 2007
- ♦ Kept one conventional rig on payroll (released other 1/07)
- ♦ Picked up a 7th rig – conventional in July 2008
- ♦ Td'd 73 wells in 2008
- ♦ Frac'd 65 wells in 2008
- ♦ To date
 - Drilled and TD'd 108 wells
 - Frac'd 95 wells
 - Have 40 wells on rod pump

2008 Areas of Activity



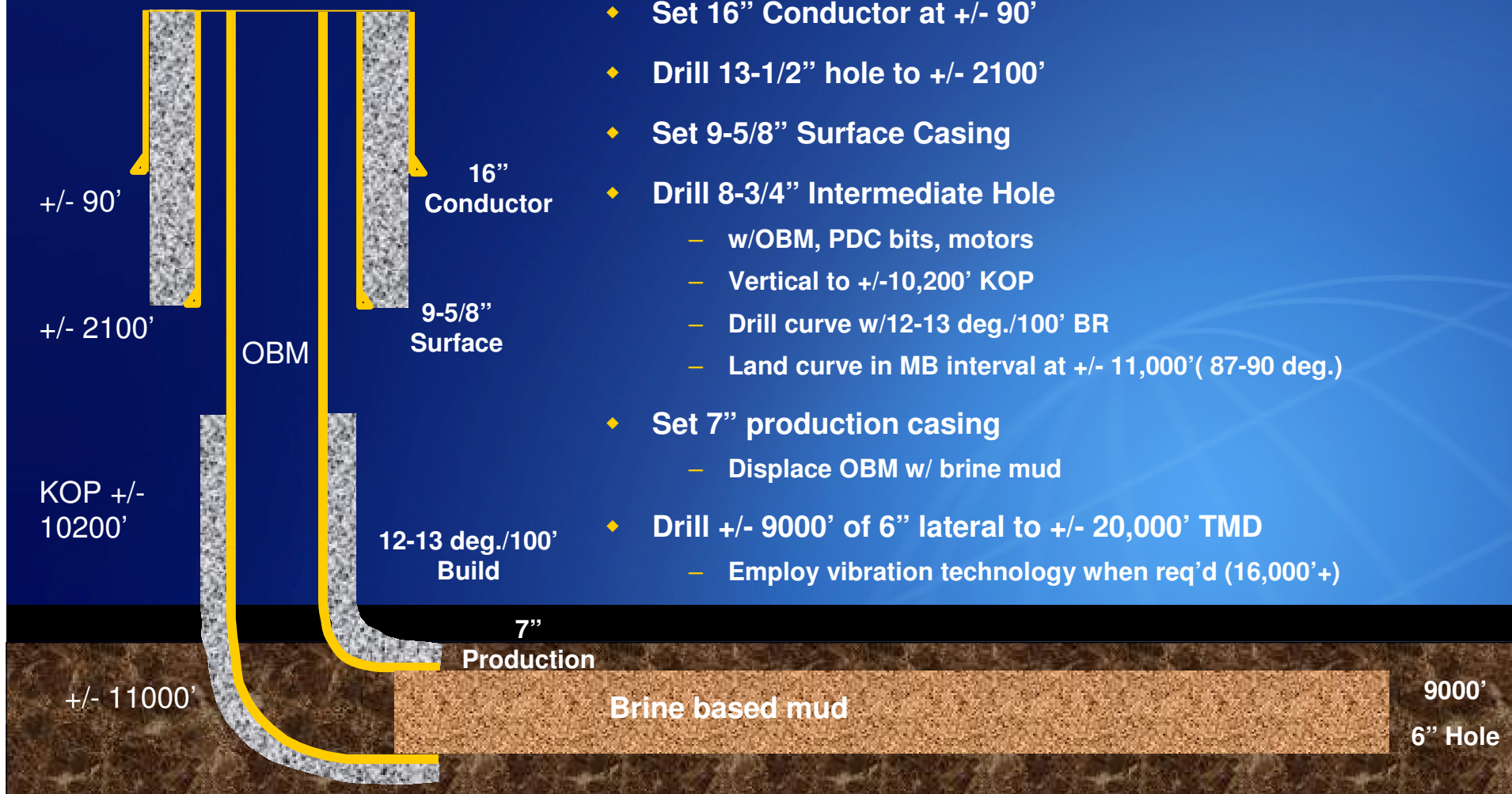
- Hector Area – Kildeer and Dunn Center
- Ajax Area – Manning
- Myrmidon Area - FBIR

Bakken Well Construction – No Changes in 2008



MOC Drilling Program:

- ◆ Set 16" Conductor at +/- 90'
- ◆ Drill 13-1/2" hole to +/- 2100'
- ◆ Set 9-5/8" Surface Casing
- ◆ Drill 8-3/4" Intermediate Hole
 - w/OBM, PDC bits, motors
 - Vertical to +/-10,200' KOP
 - Drill curve w/12-13 deg./100' BR
 - Land curve in MB interval at +/- 11,000' (87-90 deg.)
- ◆ Set 7" production casing
 - Displace OBM w/ brine mud
- ◆ Drill +/- 9000' of 6" lateral to +/- 20,000' TMD
 - Employ vibration technology when req'd (16,000'+)



Drilling Technologies – Use Where Appropriate

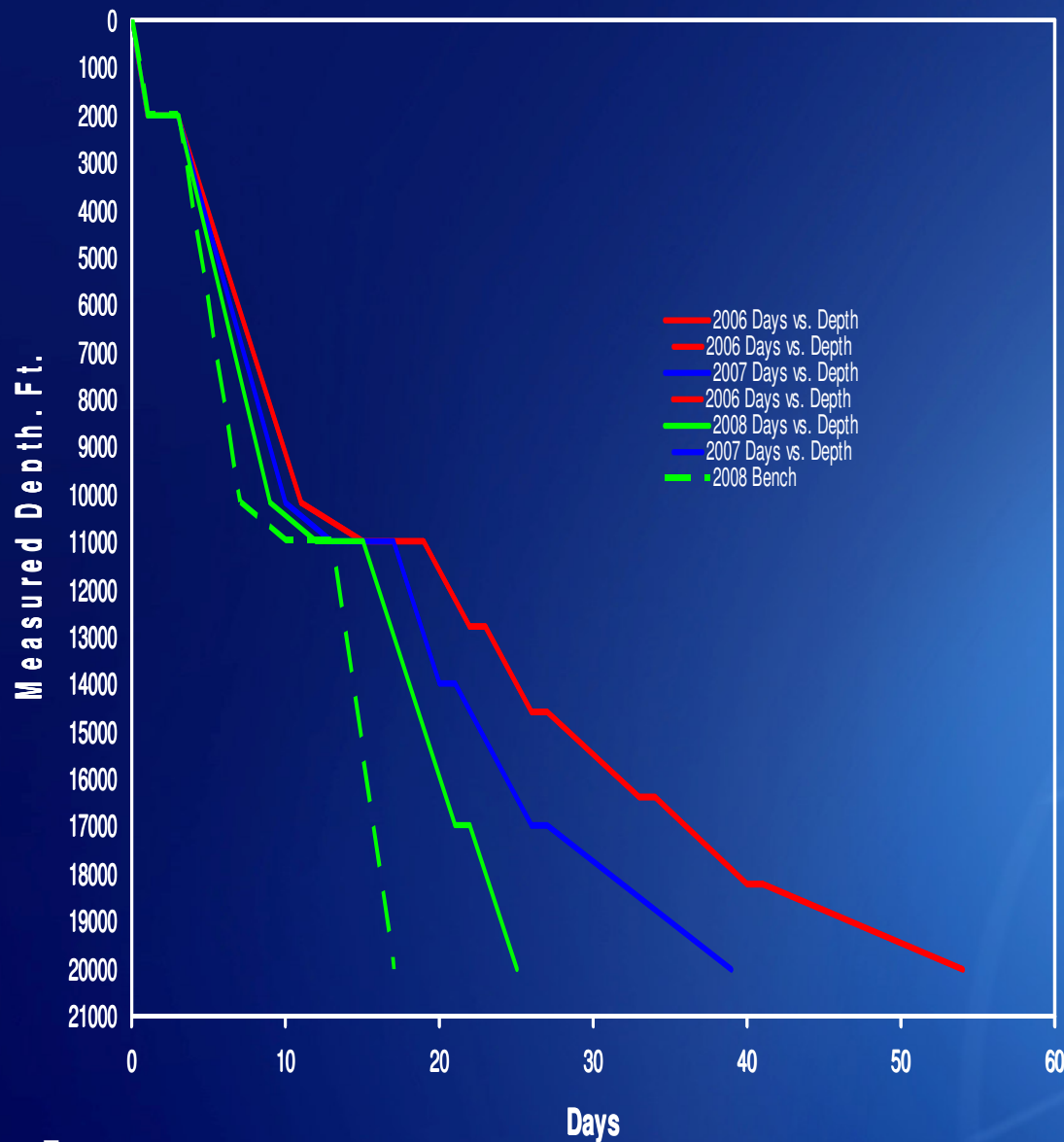


- ♦ Directional Drilling (ROP & Stay in Zone)
 - Rotary Steerables
 - Vibration vs **Oscillation**
 - Adjustable gauge stabilizers
 - Turbines (ROP)
- ♦ OBM in lateral
- ♦ High Pressure rotating heads for UBD
- ♦ PDC Bit / Motor Assemblies (ROP)
- ♦ Top Drive Casing Running Tool
- ♦ Even Wall / Hardened Rubber Motors
- ♦ Resistivity Steering
- ♦ **RFID Circ Sub**

Increasing Bakken Drilling Efficiency



Bakken Drilling Trends - 2006 to Present



| Metric | 2006 | 2007 | 2008 |
|-----------------|------|------|------|
| Avg. Drlg. \$MM | 5.93 | 4.22 | 3.46 |
| Avg. Ft/Day | 376 | 525 | 811 |

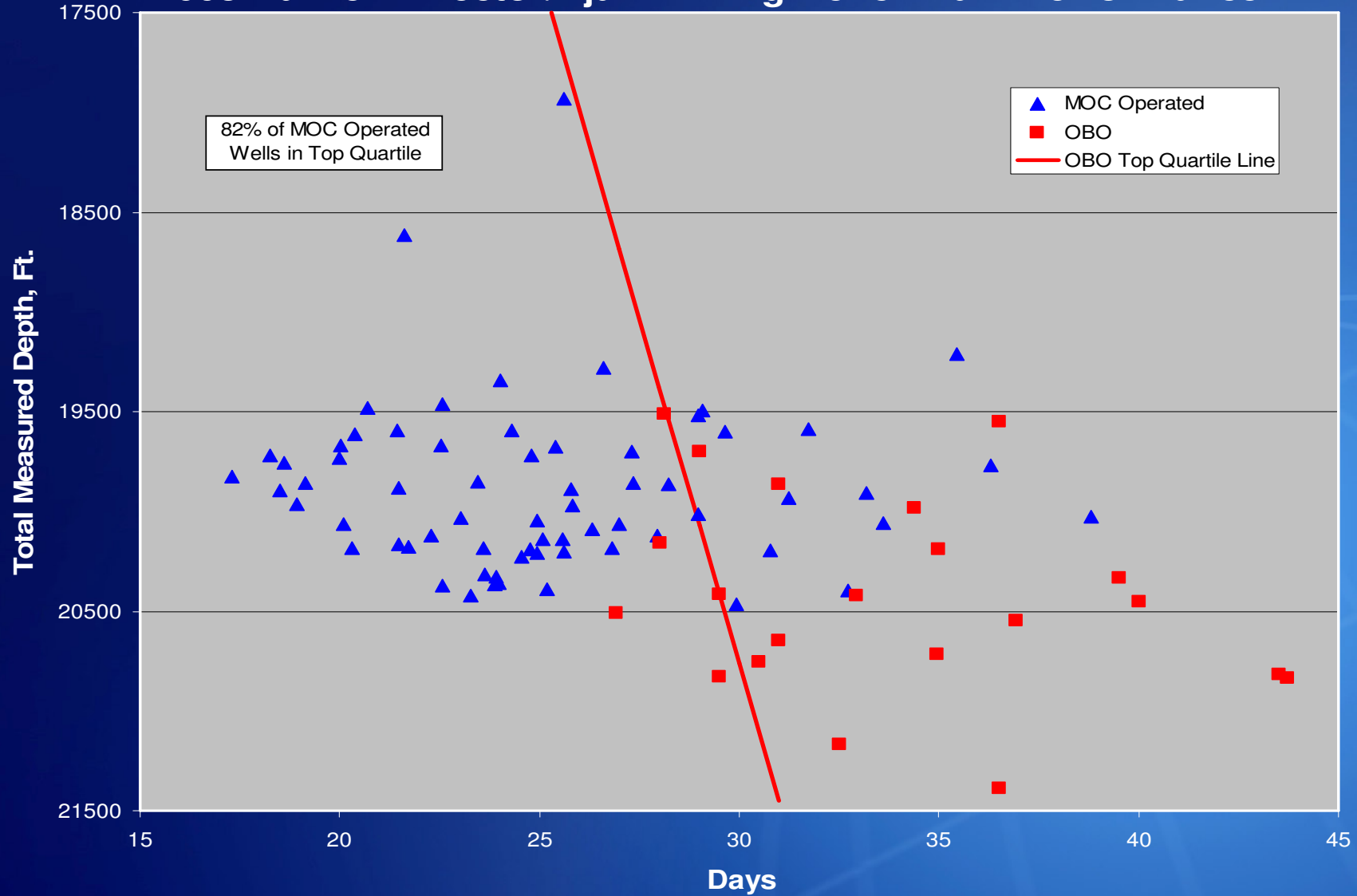
*Hector/Ajax/Mymidon Areas based upon wells TD'd

- ♦ Reducing well cost, cycle times while providing superior safety culture / environment
 - >40% cost reduction
 - >50% drilling time reduction

MOC Performance Comparison



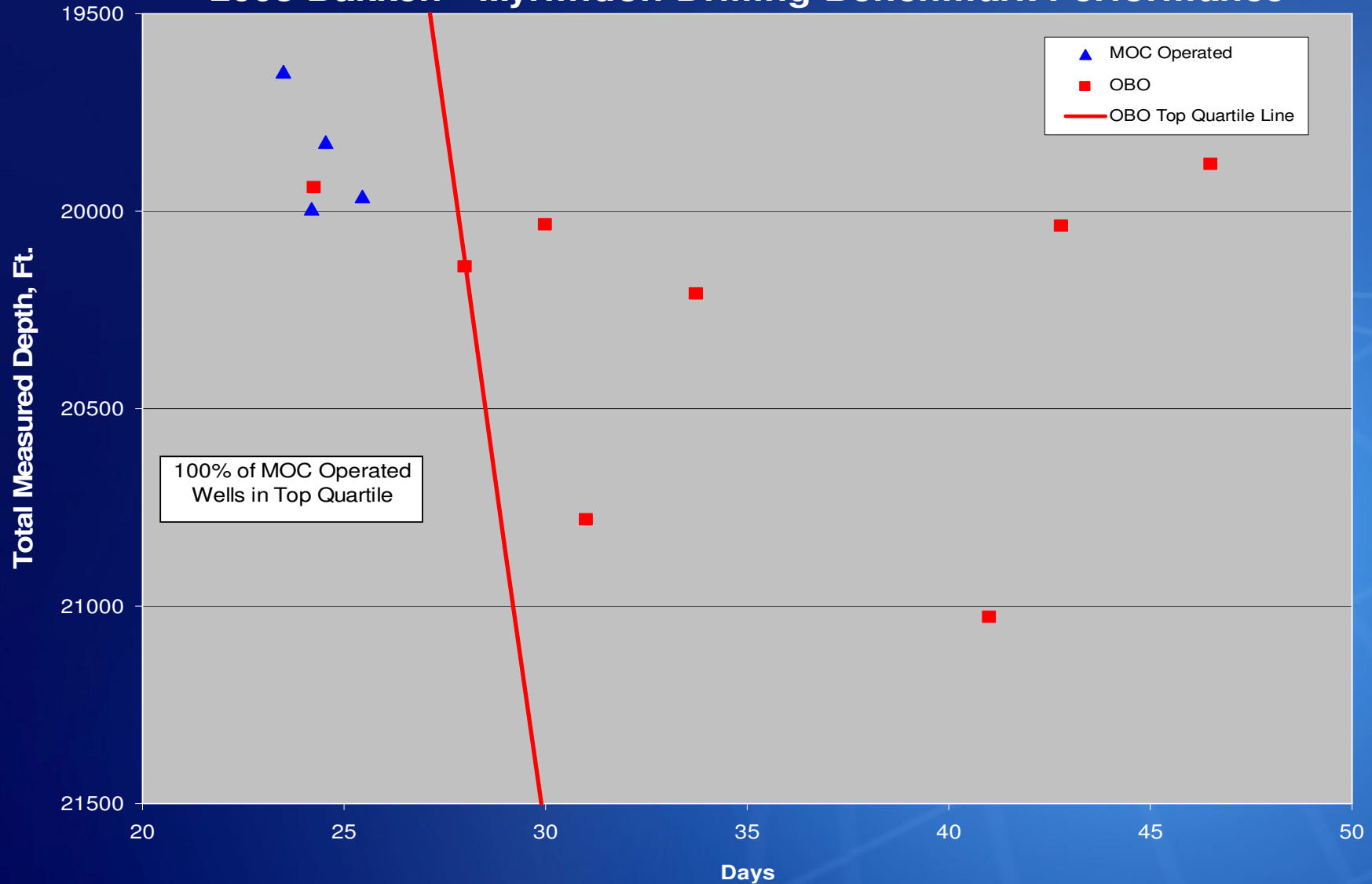
2008 Bakken - Hector/Ajax Drilling Benchmark Performance



MOC Performance Comparison



2008 Bakken - Myrmidon Drilling Benchmark Performance



Marathon Bakken Drilling Milestones



- ♦ Vertical hole section footage in any 24 hour drilling report time period – 4500’+
- ♦ Lateral hole section footage in any 24 hour drilling report time period – 3000’+
- ♦ Numerous single BHA lateral runs
- ♦ Drilling Benchmark of 19824’ in 17.3 days for 1145 ft/day all in avg. ROP
- ♦ Drilling benchmark Spud to KOP at 10182’ in less than 7 days
- ♦ Numerous wells drilled for under \$3MM
- ♦ Rig Move Benchmark – Rig Release to Spud of 2.3 days
- ♦ Technical Limit Curve of 14 days to 20,000’
- ♦ Improved Drilling Processes
 - 7” casing procedure proving very successful
 - Rigsite Teams in place with outstanding Teamwork
 - Solid/Sound Engineering

Bakken Challenges – Continuous Improvement

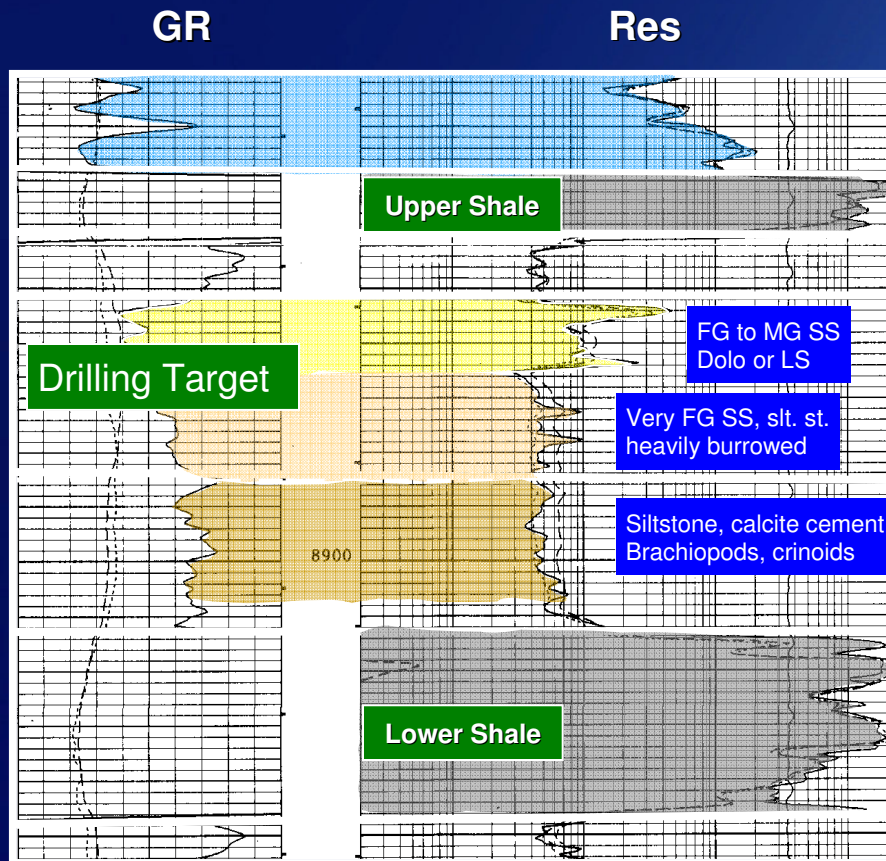


- ♦ **Top tier HES performance**
- ♦ **Drilling**
 - **Execution + step changes**
 - **ROP and flat time**
 - **Directional Tool reliability**
 - **Stay in zone – smoothly and while rotating**

North Dakota Middle Bakken Stratigraphy – Not Always the Same



Bakken Interval Type Log

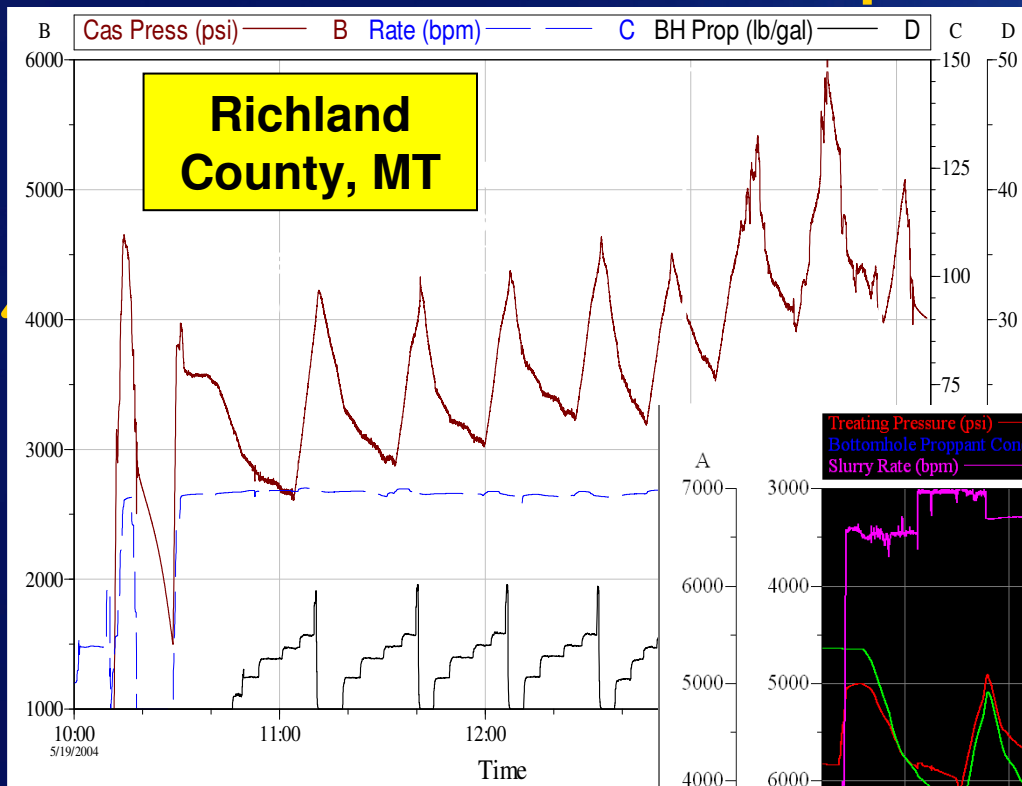


Middle Member

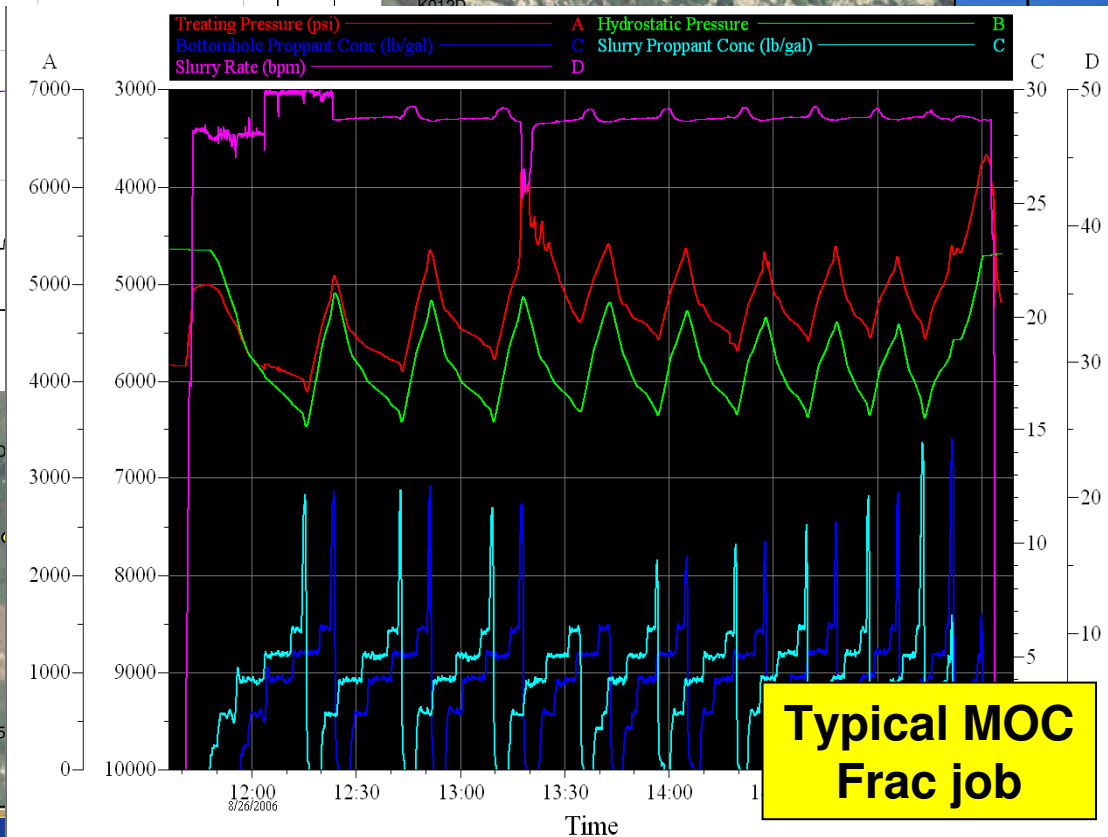
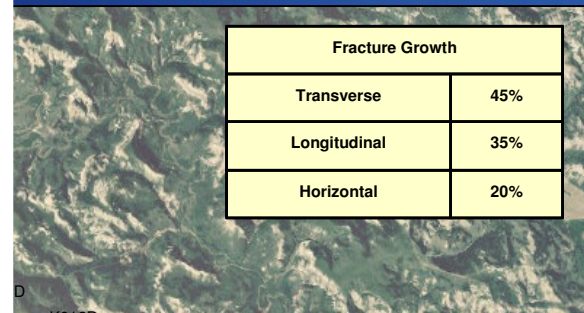
Bakken

- ♦ 50' to 90' in North Dakota
 - Middle Member 30' to 70'
- ♦ Consider the complete Bakken interval a hydrocarbon system (reservoir and source)
- ♦ Mixed lithology
- ♦ Oil saturated but very tight
- ♦ Drilling target ~14'

Initial Bakken Completions – Evaluation



Fractured Liner Completion Evaluation



**Typical MOC
Frac job**

Bakken Completions – Current Methodology



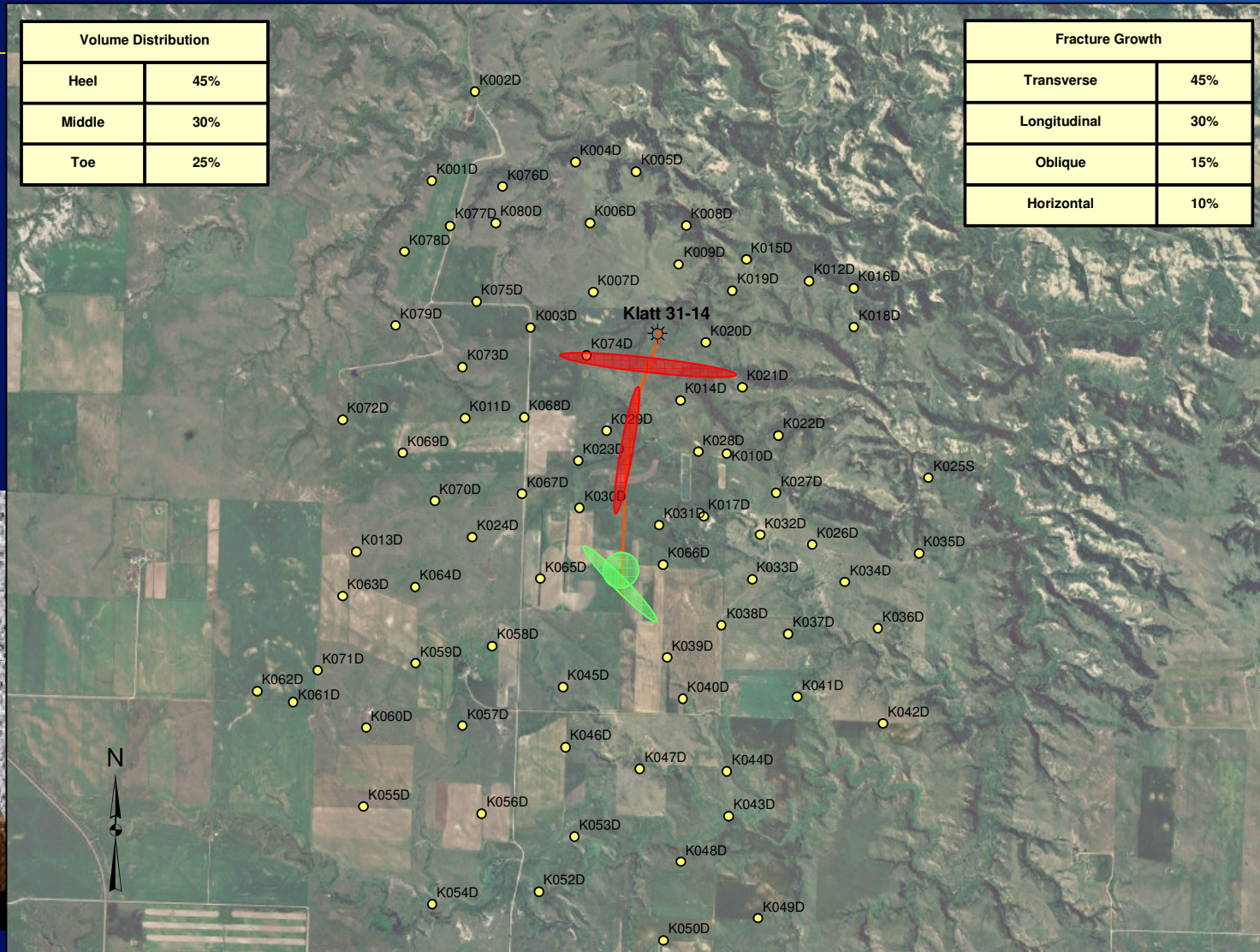
- Open Hole Linerless Water Frac Completions
 - 9000' Single Lateral Well Construction
 - Cost savings of +/- \$600M
 - Slick Water Frac Fluid at proppant conc. of .4-.8 ppg
 - Complex Frac Geometry along wellbore (Longitudinal and Transverse)
 - Completed 79 wells with this Methodology

Bakken Completions



| Volume Distribution | |
|---------------------|-----|
| Heel | 45% |
| Middle | 30% |
| Toe | 25% |

| Fracture Growth | |
|-----------------|-----|
| Transverse | 45% |
| Longitudinal | 30% |
| Oblique | 15% |
| Horizontal | 10% |



UBS

MBS

LBS

ing

shows
ore heel

9000'
6" Hole

Completions Challenges



- ♦ **Completions**
 - Effective wellbore length (optimized stimulation)
 - Refracs?
- ♦ **Technology application to evaluate current methodology**
 - Change if appropriate
- ♦ **Cycle time**



QUESTIONS?