

# Lessons Learned While Drilling the Cana Woodford

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## Forward-looking Statements



This presentation contains projections and other forward-looking statements within the meaning of Section 27A of the U.S. Securities Act of 1933 and Section 21E of the U.S. Securities Exchange Act of 1934. These projections and statements reflect the Company's current views with respect to future events and financial performance. No assurances can be given, however, that these events will occur or that these projections will be actual results could differ achieved, and materially from those projected as a result of certain factors. A discussion of these factors is included in the Company's periodic reports filed with U.S. and the Securities Exchange Commission.



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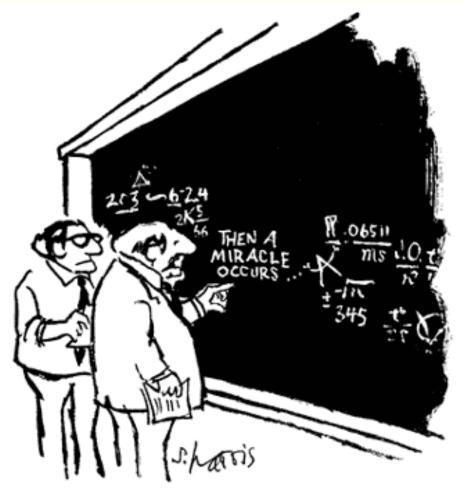


### Quote



 "A person who never made a mistake never tried anything new."

-Albert Einstein

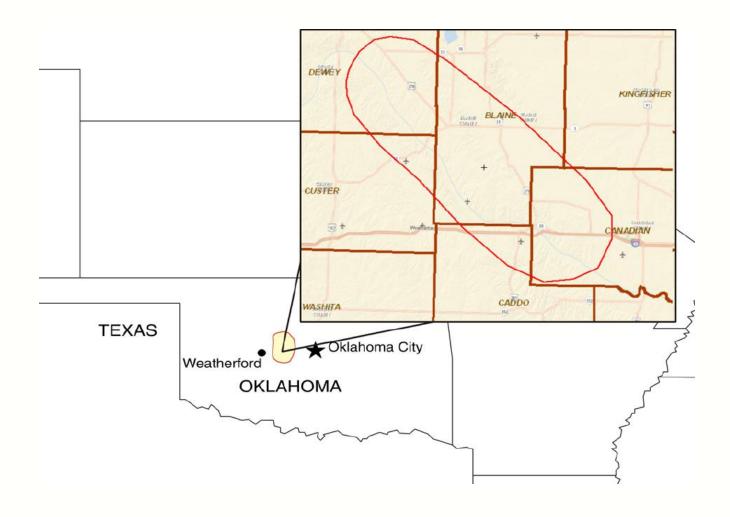


"I think you should be more explicit here in step two."



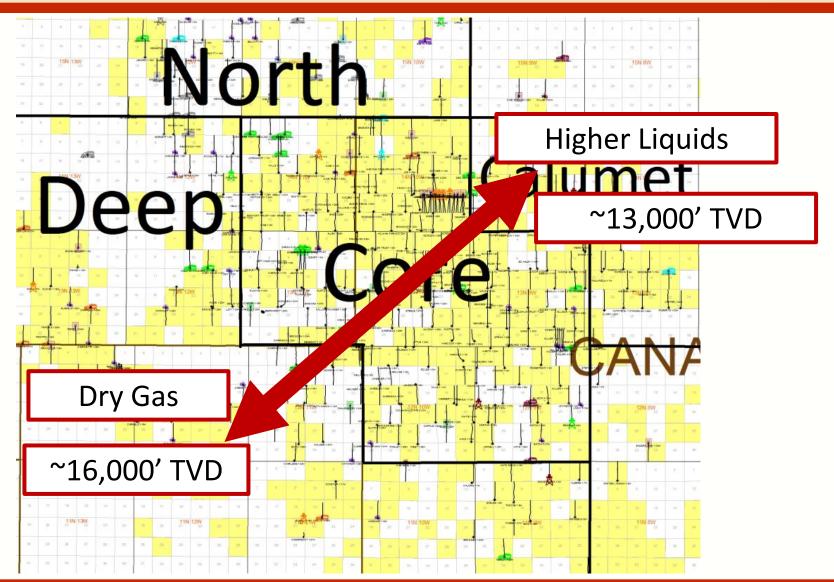
### Location





### Cimarex in Cana





#### Cimarex in Cana



- 120,000+ net acres (64,000 in the "Core")
- 2011 drilling program drilled and completed 150 gross (40 net) wells through end of third quarter.
  - Focus on holding acreage
- Operating rig count from 9 to 13 in 2011 (despite rig lost to Tornado).
- 2012 drilling program will focus on infill development in the Core area
  - Pad drilling
  - 4-5 Tcfe net resource potential in the "Core"
- \$5- \$6 billion in future drilling capital
- Production averaged 139.2 million cubic feet of natural gas equivalents per day during the third quarter of 2011. (66% year over year increase)
- Production was 61% natural gas and 39% liquid hydrocarbons.



Cactus 142 Drilling for Cimarex in Custer Country

### Pay zone: Woodford Shale



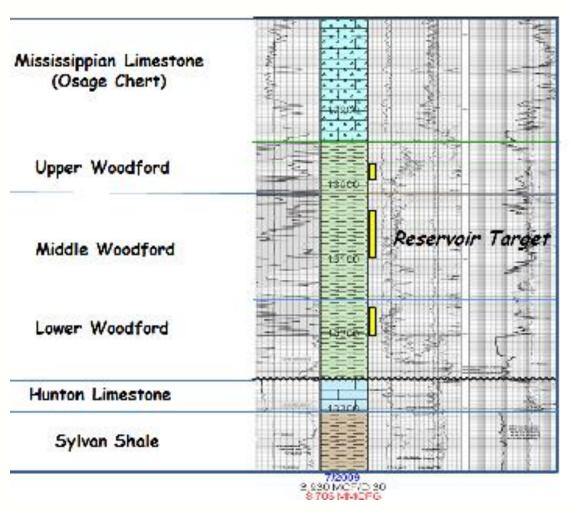
- Upper Devonian deposit containing abundant marine organic matter and large amounts of biogenic silica (SPE 143960)
- Between 120 and 300 ft. thick
- Roughly 11,000 to 16,500 TVD in our area of interest



**Woodford Shale Outcrop** 

## Woodford Lithology



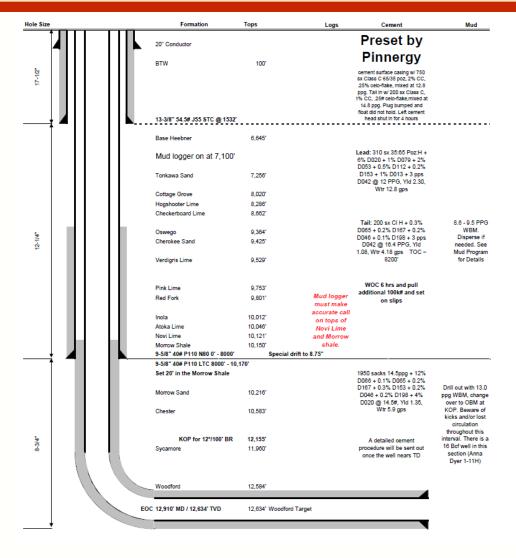


- Upper Woodford is high in silica (Cherty)
- Lower and Middle sections are much thinner in some sections of the field
- Completions concern: high clay content and fracture conductivity



#### Wellbore Schematic





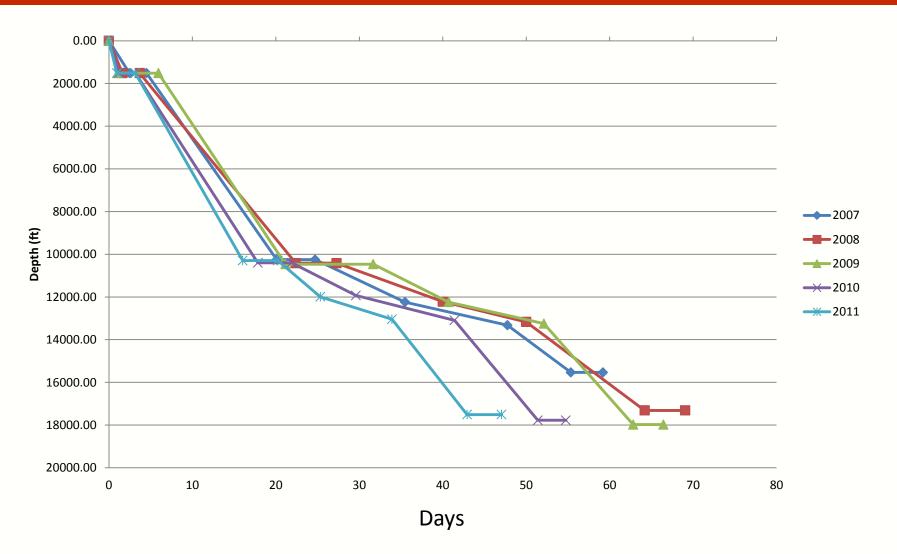
#### Typical Well design

- 17 ½" surface hole cased with 13 3/8" string
- 12 ¼" intermediate hole cased before Morrow sand with 9 5/8" string
- 8 ¾" curve and 8 ½" lateral cased with
   5 ½" string



# Overall Drilling Time Improvement in the Core area

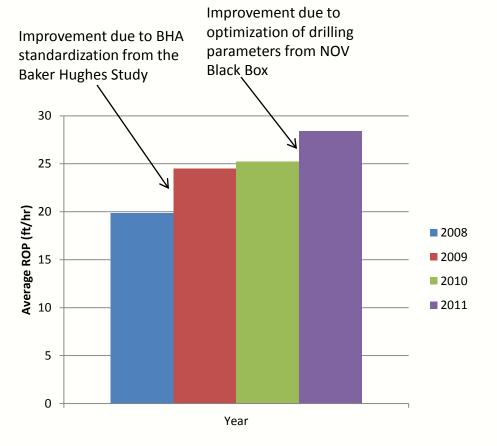






### Improvement in 12 1/4" Hole



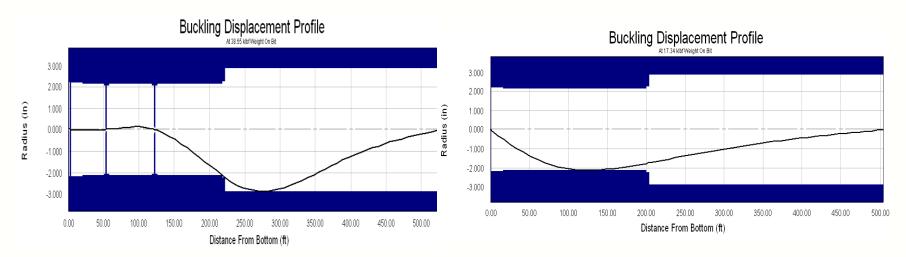


- Single toughest challenge drilling 12 ¼" hole is the hard formations below 7000'
  - Slow p-rates
  - Short bit runs
  - Stick slip problems
- Work done to combat this problem
  - Baker Hughes BHA study
  - Schlumberger drilling parameter study
  - NOV black box drilling parameter study
  - New bit technology



# Baker Hughes BHA study (03/09)





Buckling displacement profile for a packed BHA

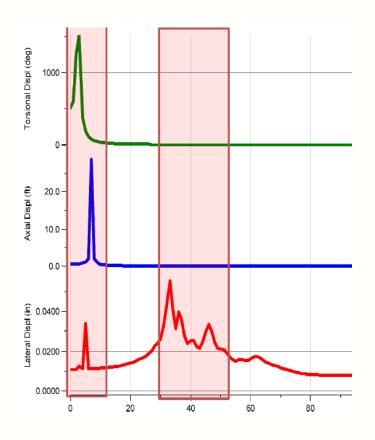
Buckling displacement profile for a slick BHA

- Compared different packed BHA configurations to a slick BHA configuration to determine which was best
- Led to the standardization of packed BHA



# Schlumberger BHA study (11/09) and NOV Black Box (10/10)





Vibrational Displacements of the packed BHA at different RPM values for the Schlumberger Study

- In hole sensors monitored drill string vibrations, downhole RPM, torsional vibration, and stick slip for different drilling parameters
  - Determined optimum drilling parameters
- NOV experiment in particular showed that turning at higher RPMs actually minimized vibration energies.
  - Led to higher RPMs in 12 ¼" and 8 ¾" hole

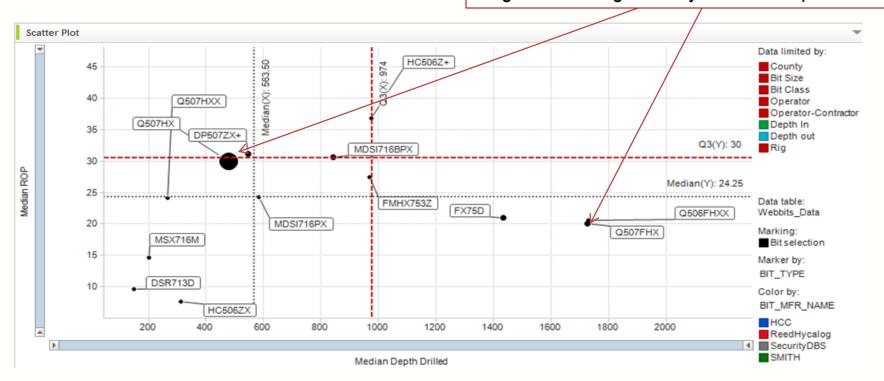


# New Bit Technology



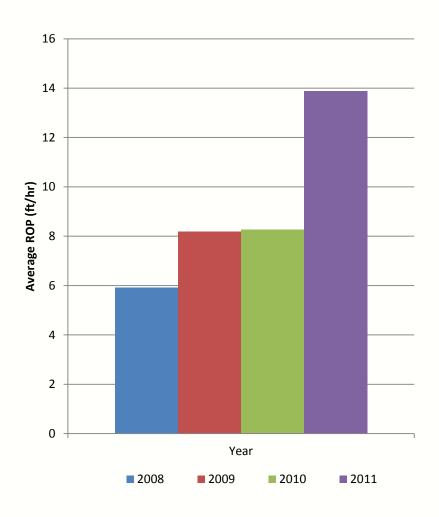
More efficient cutters

Same bit design except the bits with the new "Force" (Q507FHX) cutters lasted 3.5 times longer on average at only a little less p-rate



### Improvement in 8 ¾" vertical hole

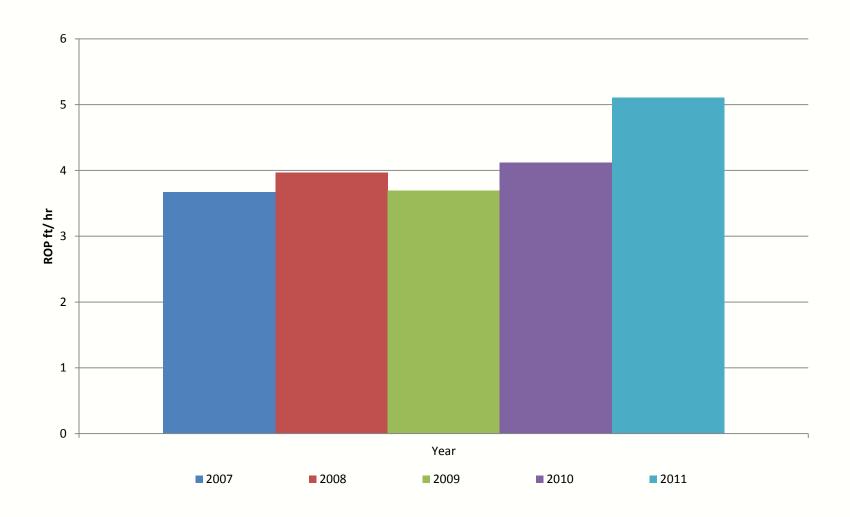




- Shows same major improvements in 2009 and 2011 as 12 ¼" hole
- Going forward: Is it economic to run a straight-hole mud motor in the lower 12 1/4" hole and/or the 8 3/4" vertical hole?

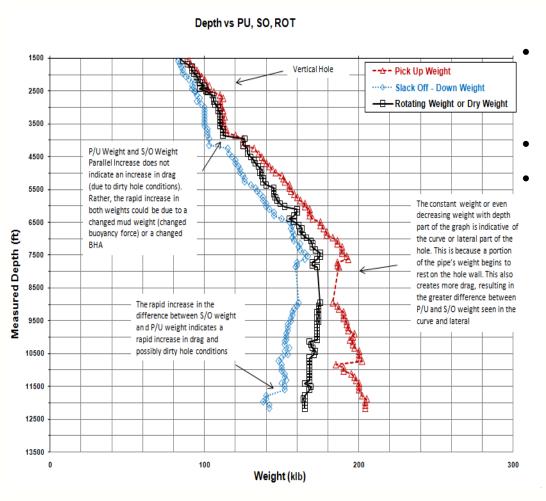
# 8 3/4" Curve





### Lateral: Horizontal Hole Cleaning





- Proper horizontal hole cleaning has lowered the number of stuck pipe situations
- Pipe rotation is extremely important
- Torque and drag sheets have proven effective and continually earn field buy-in



## Going Forward



- Bi-fuel energy
  - Installed on 4 rigs currently
  - Plan to install on 3 more rigs
  - Roughly 30%-50% of rig energy is provided by natural gas
- Infill Development Project
  - Two well pads
  - Utilizing walking and skidding capability
  - 8 additional wells per section
  - Currently in development
- 10,000 ft lateral
  - Anticipating ECDs and T&D
  - Completion Challenges

