The Multilateral Future

A Partnership to Push the Envelope

John Michael Novinski & DJ Snyder

Overview

Multilateral Background

Well Construction Objectives

Challenges

First Gen Installation

Future Development

Conclusion

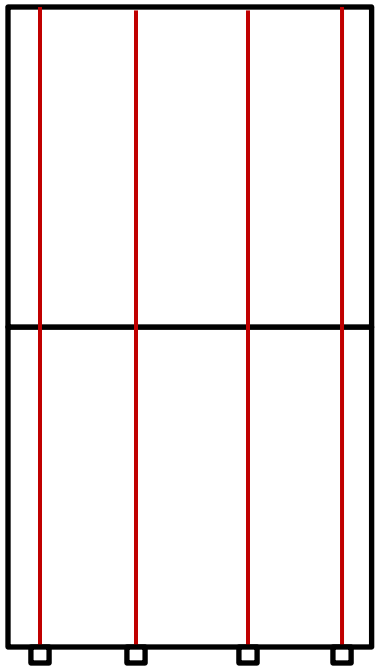
Q&A

Multilateral Background

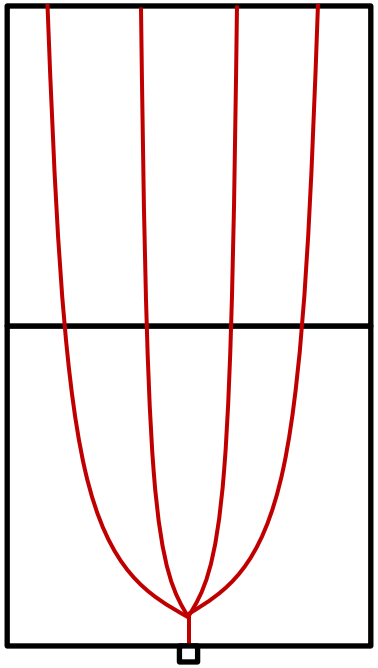
Why introduce multilateral complexity for full section development?

Economics

Drill multiple individual wells



Drill multiple laterals from single well

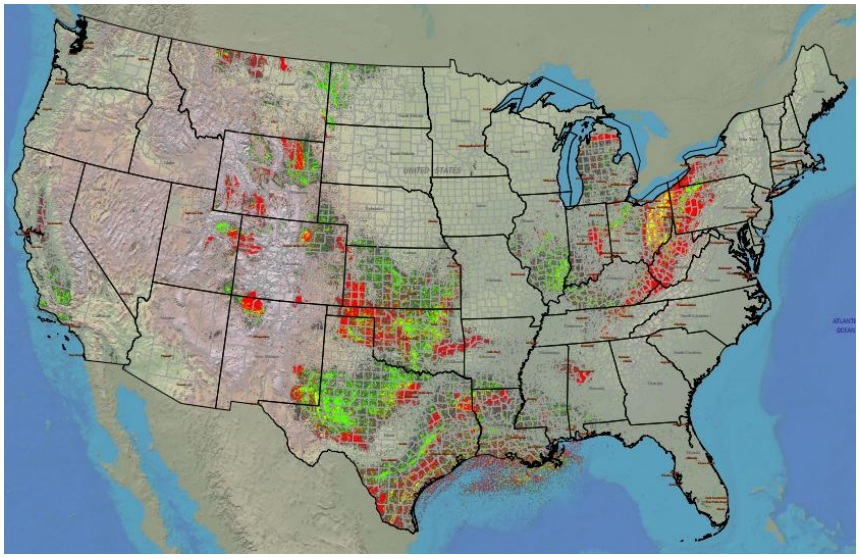


**separation loss, directional intricacy (multi-conductor pads), surface footprint, spacing, casing design*

Well Construction Objectives

1. Delivery across diverse asset lithology portfolio…

…rock competency dictates junction isolation needs



United States Geological Survey

2. Beat marginal cost of drilling second, third, fourth well(s)…

… scales for more laterals and *offshore* drilling market

Challenges

Design/Installation

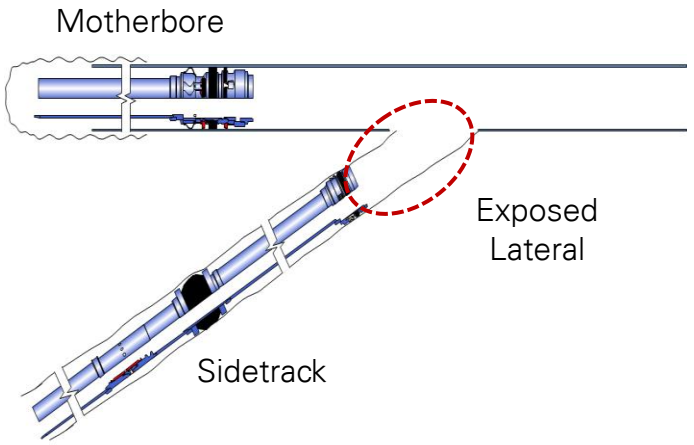
Problem

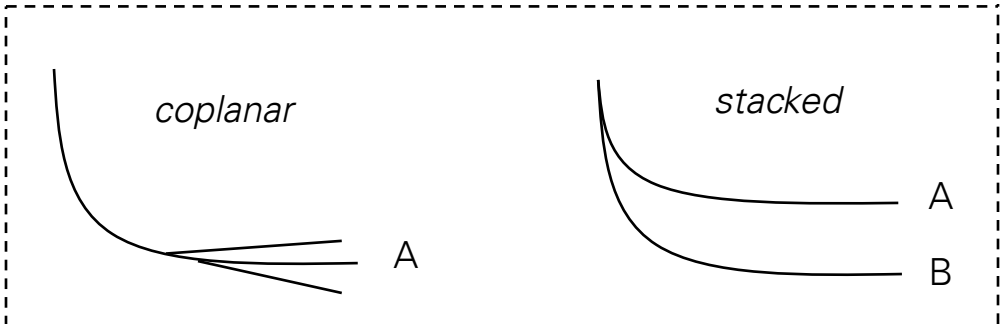
economic, repeatable

reliable – setting depth/orientation assurance

versatile – cased/cemented & port/packer completions

robust – resistant to repeated exit window re-entry

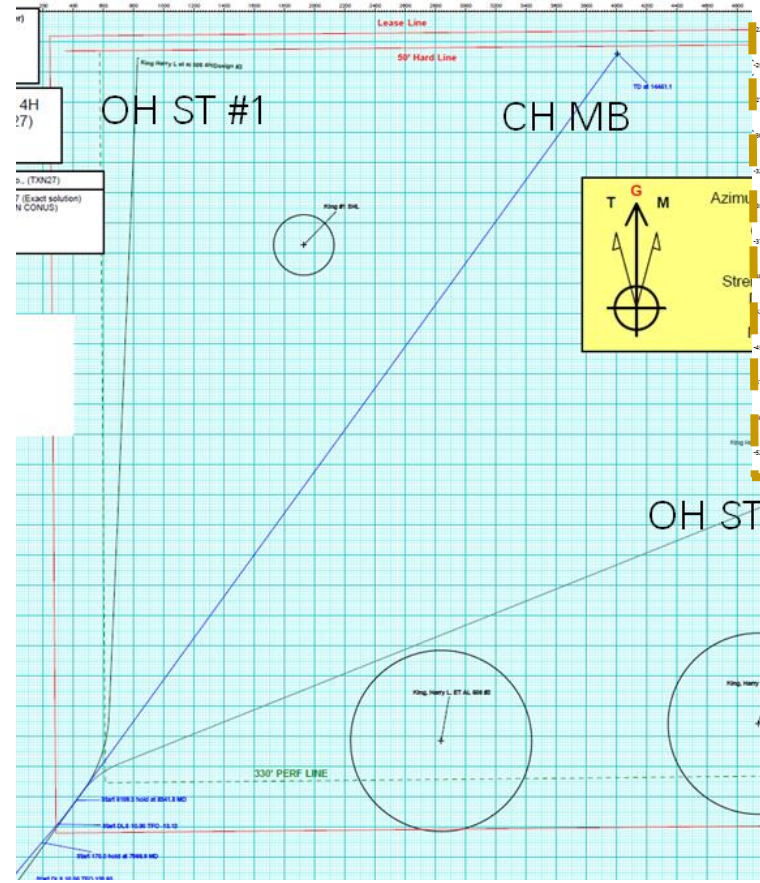


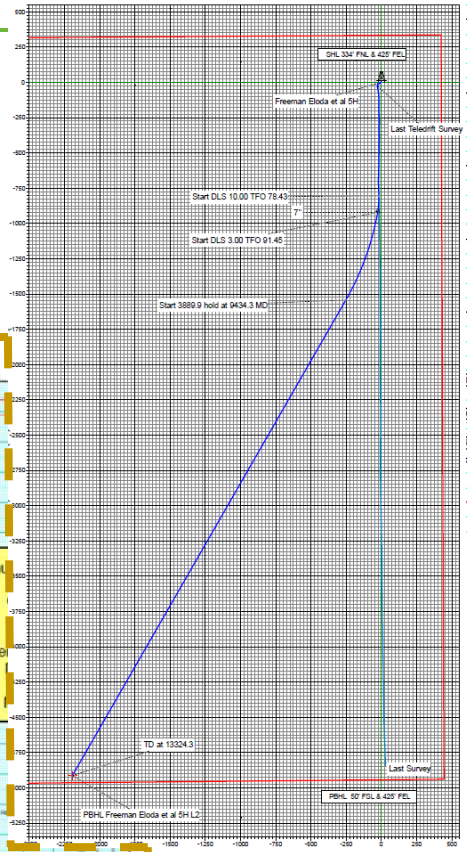


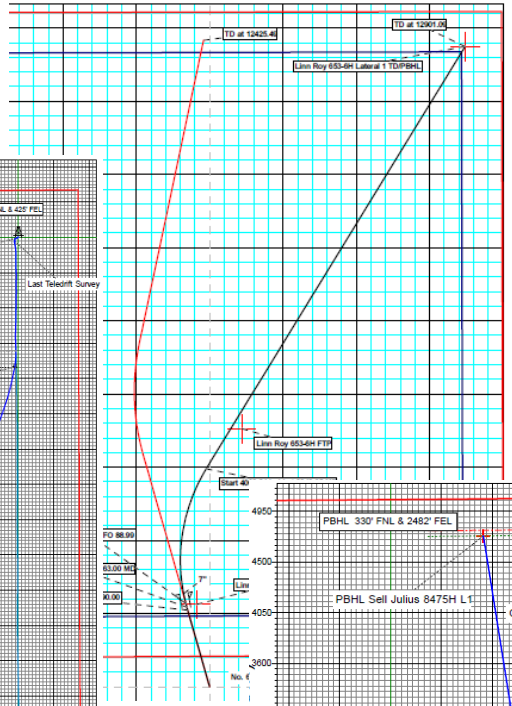
First Gen Installation

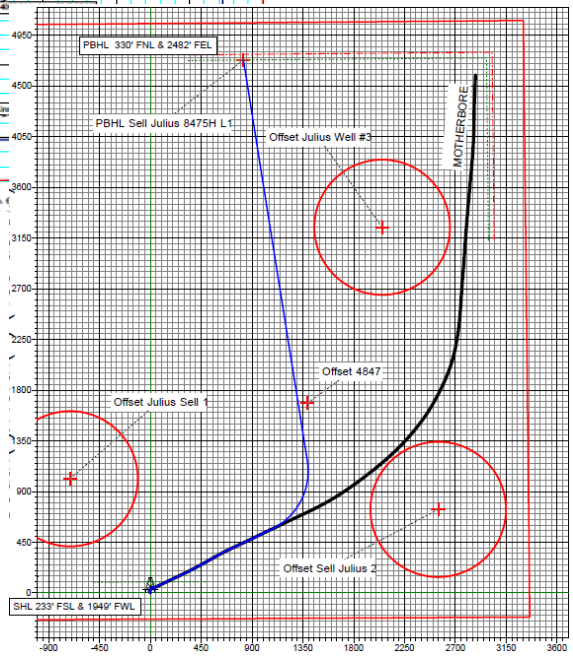
Preliminary unsupported junctions

Cleveland – TX Panhandle









First BP/PP junction isolation tool trial(s)

Cleveland – TX Panhandle

https://www.wsj.com/articles/too-big-to-frack-oil-giants-try-again-to-master-technology-that-revolutionized-drilling-1471362741

First Gen Installation

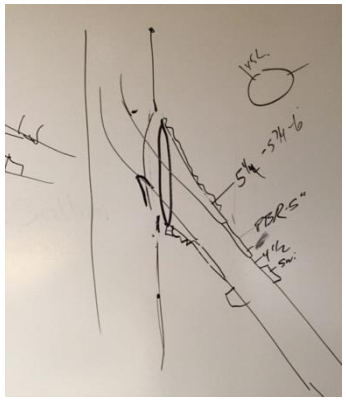
Mechanical integrity at junction no ID restriction

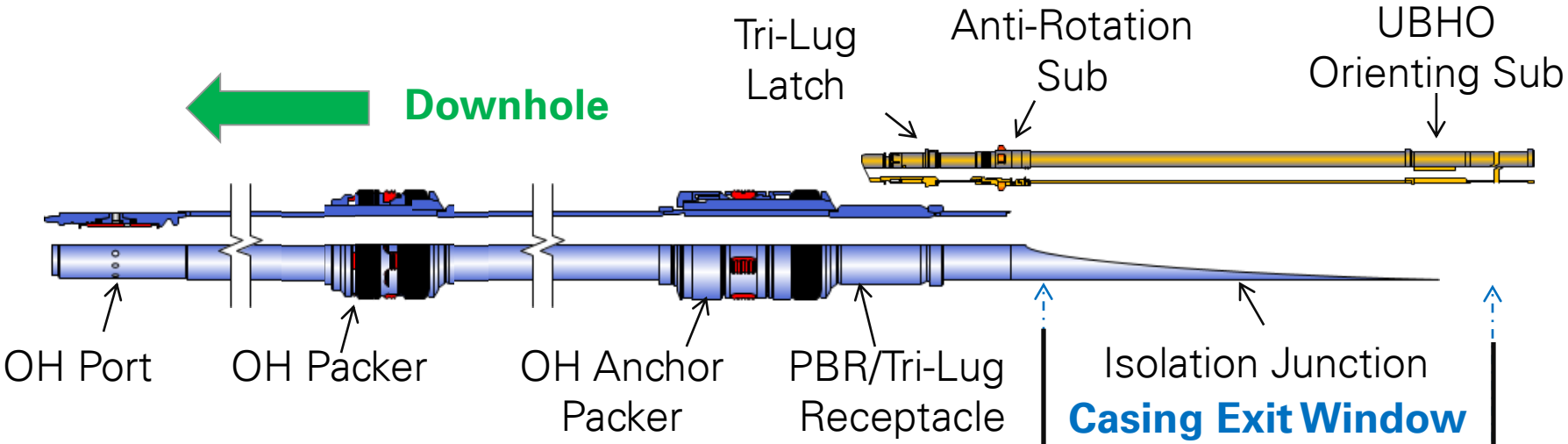
OH system, whip pulled, bent joint

Second lateral: semi-success, all ports/packers in OH

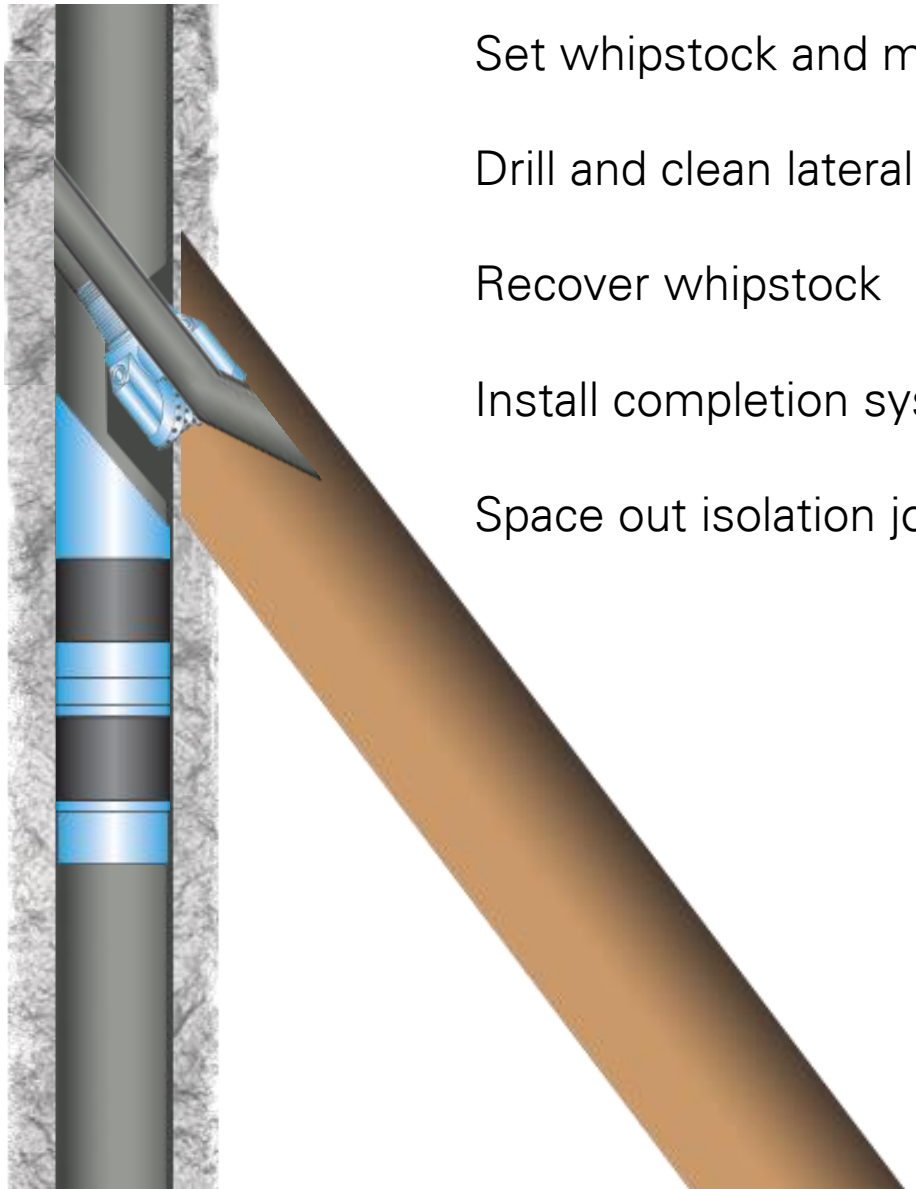
Changes made: remove stabilizer, lower packer, UBHO M/U

Third lateral: full placement/orientation success





First Gen Installation



Set whipstock and mill window

Drill and clean lateral

Recover whipstock

Install completion system

Space out isolation joint to mechanically support junction

First Gen Installation

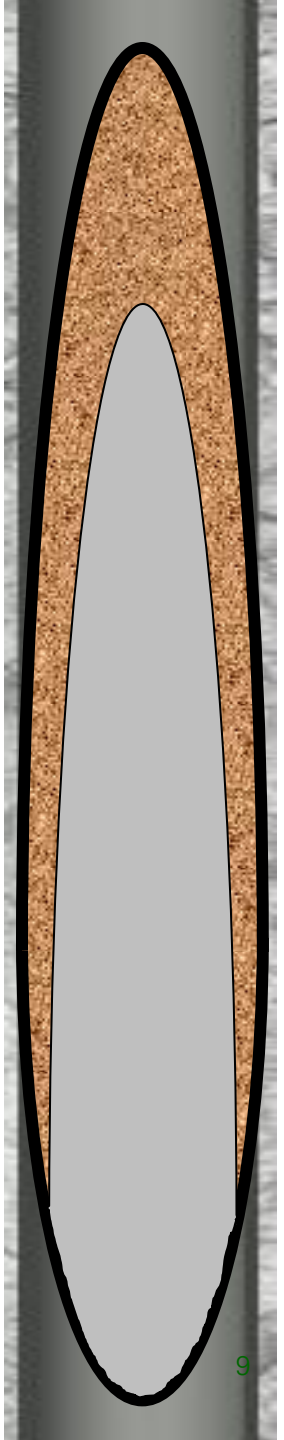
Verification

Side view camera rotating left to right

Left edge of window and JIT

Entire JIT in view

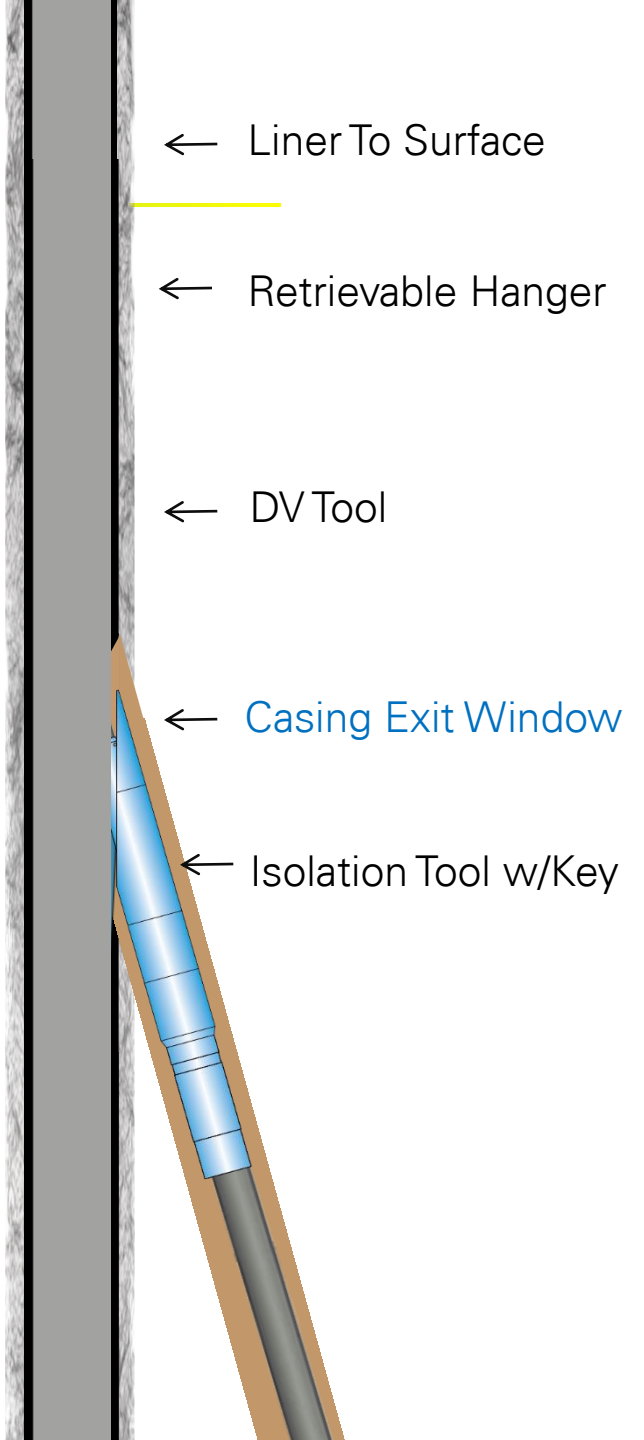
Right edge of window and JIT



Future Development

JIT Version IV

- Self landing/orienting
- Cementable
- Temporary tieback to motherbore
- Q1 2017 trial



Conclusion

Continuation: operator/supplier optimism

Innovation: new design approach to existing problem

Positioning: prototype developed as necessity in downturn market

John Michael Novinski
616.485.3948
johnmichael.novinski@bp.com

DJ Snyder
719.598.8657
dj.snyder@packersplus.com

Q&A

ENGINEER ADJUSTMENT AND RESET TOOL

INSTRUCTIONS FOR USE

A. Locate engineer that created situation.

B. Grasp hold on A-Side of tool firmly with both hands.

C. Initiate Extreme Contact of Engineer's head with B-side of tool, until one of three conditions become apparent:

   A. Engineer's line of thinking meets reality.

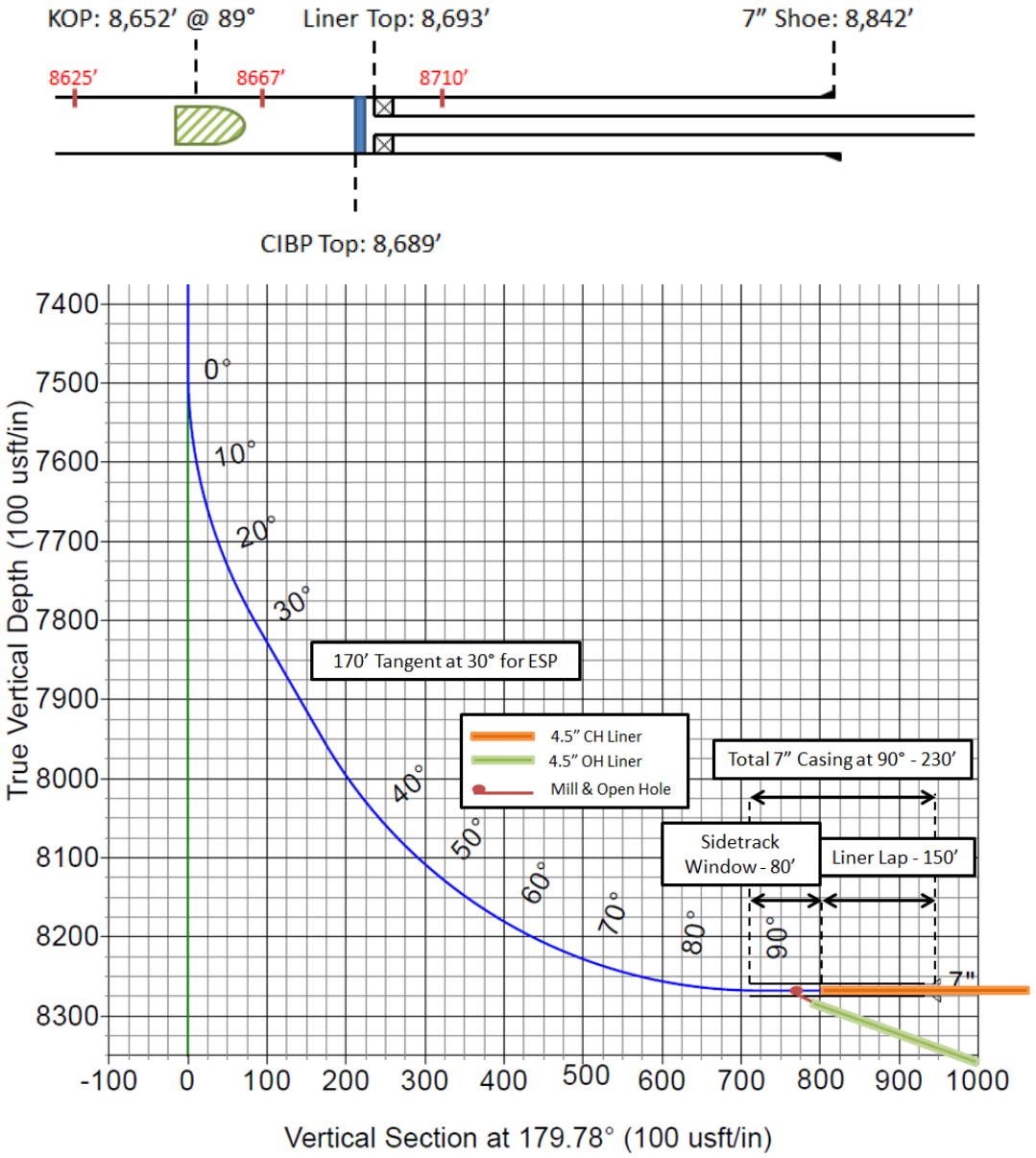
   B. Engineer admits that he or she has made a mistake.

   C. Engineer realizes that Non-engineering methods may work.

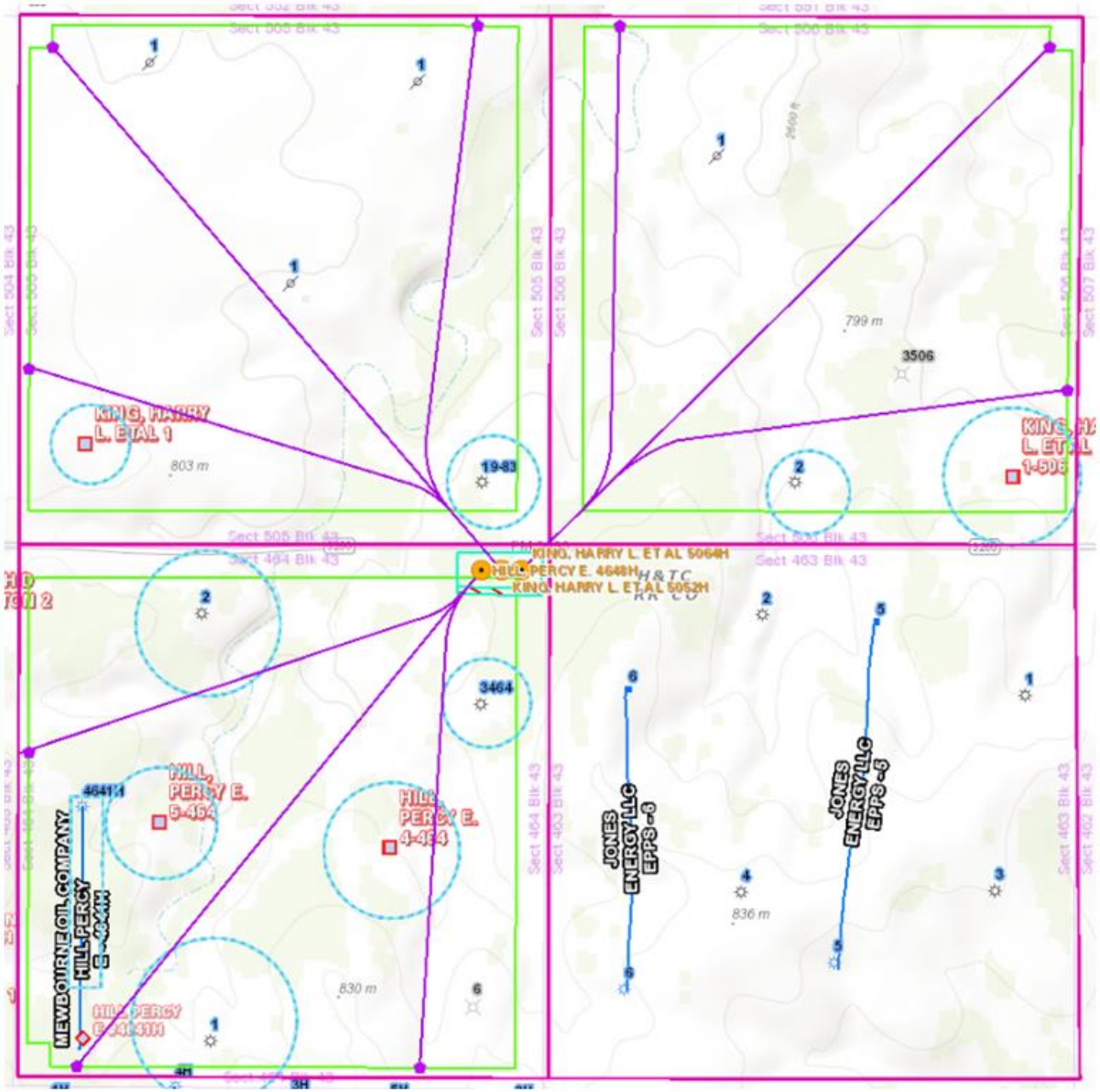
When any one of these conditions has been met; **STOP !!** ...**ENGINEER HAS BEEN RESET !**

Thoroughly clean the tool and place it back into its designated holder until needed again. Return Engineer to his or her work station and have them proceed as normal.

Backup


KOP: 8,652′ @ 89°
Liner Top: 8,693′
7″ Shoe: 8,842′
8625′
8667′
8710′
CIBP Top: 8,689′
True Vertical Depth (100 usft/in)
7400
7500
7600
7700
7800
7900
8000
8100
8200
8300
0°
10°
20°
30°
40°
50°
60°
70°
80°
90°
170′ Tangent at 30° for ESP
4.5″ CH Liner
4.5″ OH Liner
Mill & Open Hole
Total 7″ Casing at 90° - 230′
Sidetrack Window - 80′
Liner Lap - 150′
7"
-100
0
100
200
300
400
500
600
700
800
900
1000
Vertical Section at 179.78° (100 usft/in)

Backup


KING, HARRY L. ET AL 1
803 m
19-83
KING, HARRY L. ET AL 5064H
HILL, PERCY E. 4648H
KING, HARRY L. ET AL 5052H
H&TC
3506
799 m
3464
HILL, PERCY E. 5-464
HILL, PERCY E. 4-464
MEWBOURNE OIL COMPANY
HILL, PERCY E. 5-464H
HILL, PERCY E. 4-464H
830 m
JONES ENERGY LLC EPPS -6
JONES ENERGY LLC EPPS -5
836 m