

DRILLING PLAN - Pilot Hole / Niobrara

PROSPECT/FIELD OPERATOR WELL NAME / No. LOCATION	Niobrara (exploration) / D-J Basin				COUNTY/STATE	Arapahoe / Colorado	
	ConocoPhillips						
	State of Colorado 36-1H						
	NESE 36 T3S-R64W	Surface Location:	1980' FSL	250' FEL			
	NESE 36 T3S-R64W	Bottom Hole Location:	1980' FSL	250' FEL			
EST. T.D.	7,682' MD / TVD (pilot hole)				GROUND ELEVATION:	5,556' (est)	Finished Grade

PROGNOSIS:	Based on 5,580' RKB Elevation (est)		(H&P Rig 280)	LOGS:	Type	Interval
FORMATION	DEPTH TVD		DATUM	Open Hole:	Triple Combo / HNGS / RTScanner / SonicScanner	
Fox Hills Aquifer	1,482	Fresh Water	4,098	(pilot hole)	From 7,983' to 6,000'	
Pierre Shale	1,620		3,950	LWD-MWD:	GR & Sonic Scanner From 6,000' to Surface	
Surface Casing	1,820		3,760		MWD-GR From 1,820' to 7,682'	
Sharon Springs Shale	7,118		(1,538)	DEVIATION:		
Niobrara	7,154	Gas / Oil	(1,574)	Surf:	2.0° max., DLS 1' / 100'; survey every 500' (Gyro at TD)	
Niobrara B	7,236	Gas / Oil	(1,656)	Pilot:	2.0° max., DLS 0.6' / 100'; survey every 90' (MWD-GR)	
Niobrara C Chalk	7,291	Gas / Oil	(1,711)	DST'S:	None Planned	
Horizontal Target Zone	7,321	Gas / Oil	(1,741)			
Niobrara D Chalk	7,356	Gas / Oil	(1,776)	CORES:	None Planned	
Fort Hays Limestone	7,489	Gas / Oil	(1,909)	SAMPLES:		
Carlisle Shale	7,524	Gas / Oil	(1,944)	Mudlogging:	From 6,000' to TD	(Weatherford Logging)
Greenhorn	7,582	Gas / Oil	(2,002)	(Two-Man Unit)	Dry samples every 10'	
TD Pilot Hole	7,682		(2,102)		Wet samples every 30'	
				BOP:	11" x 5M psi (Rams & Annular) / Choke Manifold (two 2" wings) 5M psi	
				Stack Up Configuration:	Rotating Head	
					Annular	
					Pipe Rams	
					Blind Rams	
					Choke & Kill Valves / Lines	
					Pipe Rams	
				WELLHEAD:		
					SH2R Type "Multi-Bowl" Wellhead (GE Oil & Gas)	
					Upper Flange 11" x 5M psi (Drilling Spool)	
					Lower Flange 11" x 5M psi (Casing Head)	
Max. Anticipated BHP:	0.49 psi/ft	3,764 psi	9.4 ppg (EMW)	Estimated BH Static Temperature (°F):	225	

MUD:	Interval	Type	Hole	WT	Vis	LGS %	WL	Remarks
Surface:	0' - 1,820'	FW / Gel-Lime Sweeps	12-1/4"	8.4 - 9.0	28-45	< 6%	NC	Closed Loop
Intermediate (pilot hole):	1,820' - 7,682'	Oil Base Mud (Integrate)	8-3/4"	9.0 - 9.9	35-45	< 6%	< 6 (HpHt)	(rig steel pits only)
CASING:	Size	Wt ppf	Hole	Depth	Cement Top	Excess	WOC	Remarks
Surface:	9-5/8"	36 # J55 STC	12-1/4"	1,820'	To Surface	140%	8 hrs	500' Tail Cement

OH Whipstock (cement plug back): Top WS at 6,683' / Bottom WS at 6,698'. Top of Cement at 6,463' (with 2-7/8" cemented tail pipe 6,698' to 7,652')

CENTRALIZATION:

Surface Casing: 1/joint on bottom four joints; 1/4th joint to surface (bow-spring type)
Cementing baskets placed at 120' and 1,400'

DIRECTIONAL PLAN

	MD	TVD (RKB elev.)			AZ		
Surface:	0	0	1980' FSL	250' FEL	NESE 36 T3S-R64W	0	Survey Company: Halliburton Sperry
Pilot Hole TD (vertical)	7,682'	7,682'	1980' FSL	250' FEL	NESE 36 T3S-R64W	0.00	GyroData

Comments:

Surveys will be taken at 90' intervals below surface casing when drilling vertical hole with a steerable BHA (Bent Motor / MWD).

Surveys (inclination only) will be taken at 500' intervals in the surface hole while drilling with non-steerable BHA.

A gyro survey will be obtained at surface hole casing point

Prep By: Gary Hamilton Date: 7/26/12 Doc: REV 0

State of Colorado 35-1H
Surface Location:
N35E 34 T35 R34W
1980 FSL 240' FEL 1980 FSL 250' FEL

Drilling Network
User ID:
API #:
AF# #:

Permit
CO #:
API #:
Prod #:

Formation (Pilot Hole) DSD

For this Aquifer 1,482

Pierre Shale 1,620

Surface Casing 1,220

CASING HOLE SIZE
16" Conductor Pre-set at 80' BGL
1,820 12-1/4" Hole

9.4" x 1.45 STC Surface Cas.
(Cemented to Surface)

Casing Tested to 1,500 psi
Shoe Test (FT): 11.0 ppg EMW

Drilling Fluids

Surf. Hole:
FV of mud mud
8.4 - 9.0 ppg
w/ high vis sweeps

Cement

Reference: Halliburton Cement Program
For Additional Details, Refer to Appendix A only

Surface:
300 St. Lead
200 St. Tail
(140% excess)

12.0 ppg / "Sulfur-C" 13.0 ppg / "Sulfur-C"
Yield: Lead = 2.58 cu ft sack
Yield: Tail = 1.20 cu ft sack
Tail FG = 300 ft

Formation Analysis

Measurements
7.44 ALU
On at 6,000' to TD
307 WAF S
10 Dry Samples

Coding / DSTs:
None Planned

EMW Index:
Insert Oil Mud
8.4 - 9.0 ppg
-66 HHG
5535 OWR
250K CR

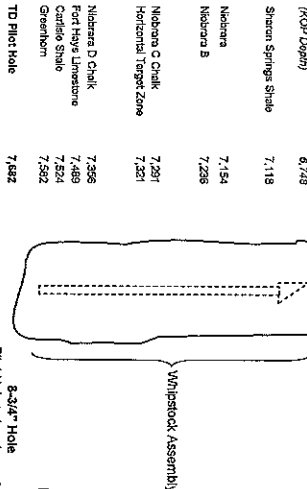
Mechanical OH Whipstock Cemented in place
With Top at 6,853' (65' above planned KOP)

OH Slotted Plug Base:
Top of Cement Plug at 6,483' (200' above whipstock)
Bottom of Plug at 7,682' (end of 2.7' plug)

354 SX 121 15.8 ppg "G" +35% SLICE 1.51 Yield
(based on 10% excess-normal hole size)

GR / Sonic Scanner
6,000' to Surface
WWD-GP
(1,500' to 7,682')

Open Hole:
Title Combo
FIDENSON Scanner
Sonic Scanner
6,000' to TD



8-3/4" Hole
Max. Anticipated BHP: 3,764 psi
9.4 ppg (EMW)

Estimated BH Static Temperature (°F): 225

Plug Hole to be plugged back to KOP depth following e-log evaluations
A mechanical OH sidetrack whipstock will be placed ~65' above KOP depth (cemented in place w/ 2-7/8" tail pipe anchor to ~7,953')

Notes for Well:

- 1) Refer to the drilling program for detailed casing, setting fluids, bits and operational procedures.
- 2) On 12-1/4" surface hole to 1,482 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 3) On 12-1/4" surface hole to 1,620 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 4) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 5) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 6) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 7) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 8) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 9) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
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- 15) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
- 16) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).
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- 23) On 12-1/4" surface hole to 1,220 with 11.0 ppg mud, GPO survey and run 5-5/8" casing and cement to surface (Closed loop mud system).