

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 17-T4S-R64W

Zukowski 17-1H

Plan A

Plan: Plan A Rev 0 (Lateral)

Sperry Drilling Services

Proposal Report

14 February, 2013

Well Coordinates: 1,684,063.23 N, 3,262,874.90 E (39° 42' 28.24" N, 104° 33' 56.35" W)

Ground Level: 5,648.00 ft

Local Coordinate Origin:

Centered on Well Zukowski 17-1H

Viewing Datum:

RKB 24 ft @ 5672.00ft (H&P 280)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Version: 2003.16 Build: 431

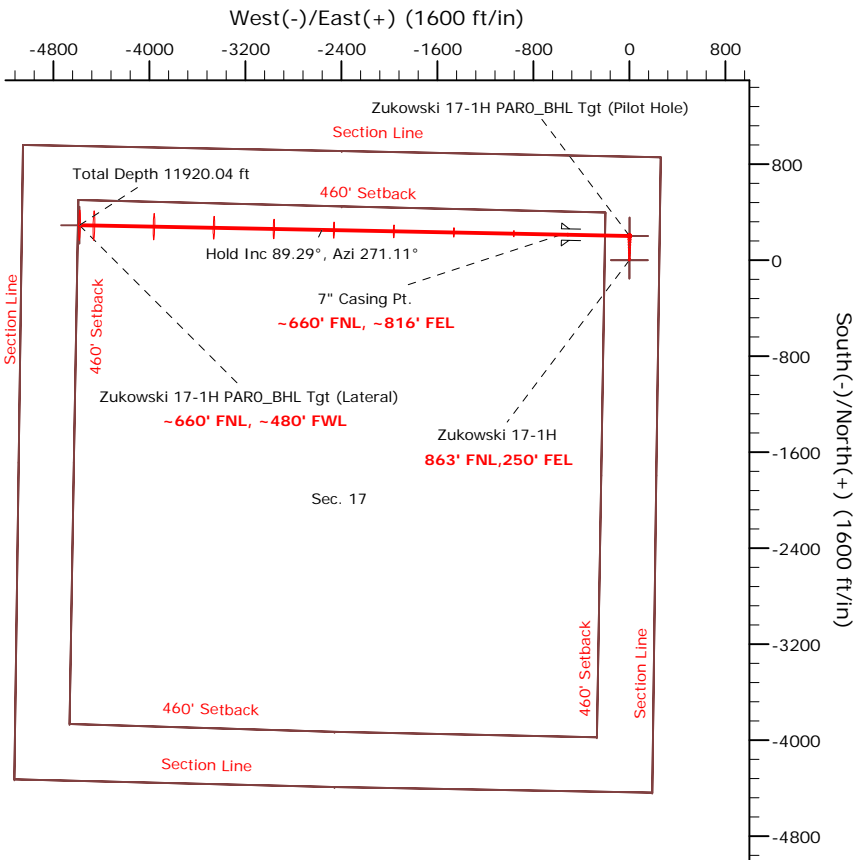
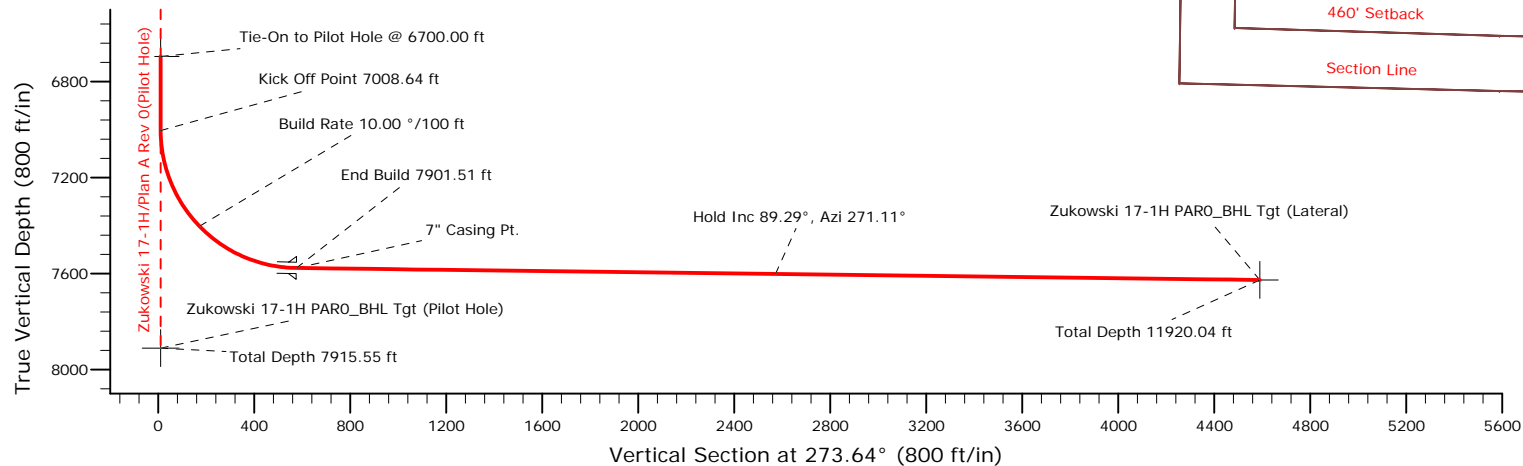
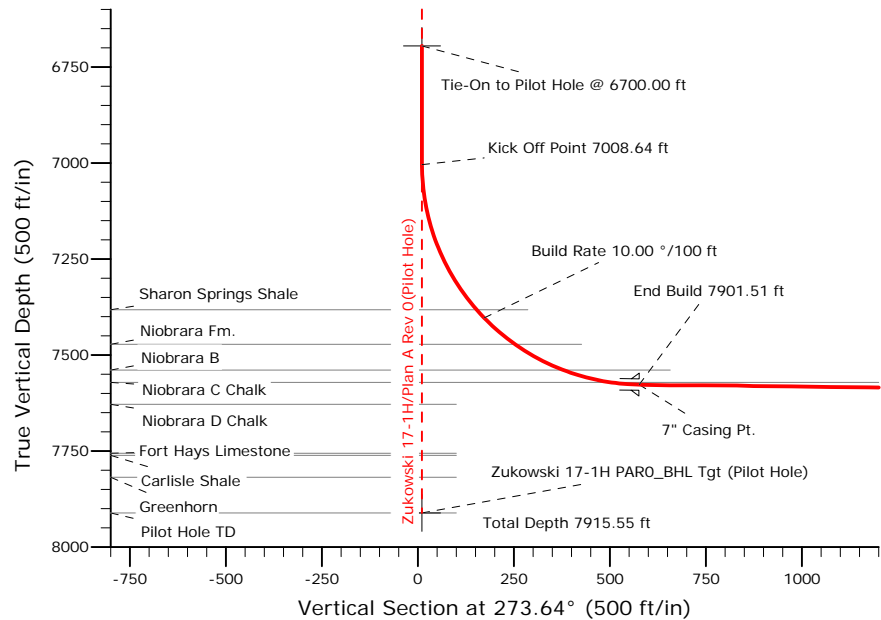
HALLIBURTON

Conoco Phillips Company



WELL DETAILS: Zukowski 17-1H											
<u>Ground Level:</u> 5648.00		<u>Northing:</u> 1684063.23		<u>Easting:</u> 3262874.90		<u>Latitude:</u> 39° 42' 28.238 N		<u>Longitude:</u> 104° 33' 56.351 W			
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target	
1	6700.00	0.00	0.00	6695.45	203.00	2.00	0.00	0.00	10.91		
2	7008.64	0.00	0.00	7004.09	203.00	2.00	0.00	0.00	10.91		
3	7901.51	89.29	271.11	7577.00	213.96	-563.72	10.00	271.11	576.19		
4	11920.04	89.29	271.11	7627.00	291.83	-4581.19	0.00	0.00	4590.47	Zukowski 17-1H PAR0_BHL Tgt (Lateral)	

Plan: Plan A Rev 0 (Lateral) (Zukowski 17-1H/Plan A)	
Created By: Matthew R. Epp	Date: 2-14-2013
Checked: _____	Date: _____
Reviewed: _____	Date: _____
Approved: _____	Date: _____



Plan Report for Zukowski 17-1H - Plan A Rev 0 (Lateral)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
6,700.00	0.00	0.00	6,695.45	203.00	2.00	10.91	0.00	0.00	0.00	0.00
Tie-On to Pilot Hole @ 6700.00 ft										
6,800.00	0.00	0.00	6,795.45	203.00	2.00	10.91	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,895.45	203.00	2.00	10.91	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,995.45	203.00	2.00	10.91	0.00	0.00	0.00	0.00
7,008.64	0.00	0.00	7,004.09	203.00	2.00	10.91	0.00	0.00	0.00	0.00
Kick Off Point 7008.64 ft										
7,100.00	9.14	271.11	7,095.06	203.14	-5.27	18.17	10.00	10.00	0.00	271.11
7,200.00	19.14	271.11	7,191.91	203.61	-29.65	42.54	10.00	10.00	0.00	0.00
7,300.00	29.14	271.11	7,283.05	204.40	-70.48	83.34	10.00	10.00	0.00	0.00
7,400.00	39.14	271.11	7,365.72	205.49	-126.52	139.33	10.00	10.00	0.00	0.00
7,421.32	41.27	271.11	7,382.00	205.76	-140.27	153.07	10.00	10.00	0.00	0.00
Sharon Springs Shale										
7,450.00	44.14	271.11	7,403.08	206.13	-159.72	172.50	10.00	10.00	0.00	0.00
Build Rate 10.00 °/100 ft										
7,500.00	49.14	271.11	7,437.40	206.84	-196.05	208.81	10.00	10.00	0.00	0.00
7,556.16	54.75	271.11	7,472.00	207.70	-240.24	252.96	10.00	10.00	0.00	0.00
Niobrara Fm.										
7,600.00	59.14	271.11	7,495.91	208.41	-276.98	289.67	10.00	10.00	0.00	0.00
7,698.66	69.00	271.11	7,539.00	210.12	-365.58	378.20	10.00	10.00	0.00	0.00
Niobrara B										
7,700.00	69.14	271.11	7,539.48	210.15	-366.83	379.45	10.00	10.00	0.00	0.00
7,800.00	79.14	271.11	7,566.78	212.01	-462.88	475.42	10.00	10.00	0.00	0.00
7,825.32	81.67	271.11	7,571.00	212.49	-487.84	500.36	10.00	10.00	0.00	0.00
Niobrara C Chalk										
7,900.00	89.14	271.11	7,576.98	213.94	-562.21	574.68	10.00	10.00	0.00	0.00
7,901.51	89.29	271.11	7,577.00	213.96	-563.72	576.19	10.00	10.00	0.00	0.00
End Build 7901.51 ft										
8,000.00	89.29	271.11	7,578.23	215.87	-662.19	674.57	0.00	0.00	0.00	0.00
8,100.00	89.29	271.11	7,579.47	217.81	-762.16	774.46	0.00	0.00	0.00	0.00
8,200.00	89.29	271.11	7,580.72	219.75	-862.13	874.36	0.00	0.00	0.00	0.00
8,300.00	89.29	271.11	7,581.96	221.69	-962.11	974.25	0.00	0.00	0.00	0.00
8,400.00	89.29	271.11	7,583.21	223.62	-1,062.08	1,074.15	0.00	0.00	0.00	0.00
8,500.00	89.29	271.11	7,584.45	225.56	-1,162.05	1,174.04	0.00	0.00	0.00	0.00
8,600.00	89.29	271.11	7,585.69	227.50	-1,262.03	1,273.94	0.00	0.00	0.00	0.00
8,700.00	89.29	271.11	7,586.94	229.44	-1,362.00	1,373.83	0.00	0.00	0.00	0.00
8,800.00	89.29	271.11	7,588.18	231.37	-1,461.97	1,473.73	0.00	0.00	0.00	0.00
8,900.00	89.29	271.11	7,589.43	233.31	-1,561.95	1,573.62	0.00	0.00	0.00	0.00
9,000.00	89.29	271.11	7,590.67	235.25	-1,661.92	1,673.51	0.00	0.00	0.00	0.00
9,100.00	89.29	271.11	7,591.91	237.19	-1,761.89	1,773.41	0.00	0.00	0.00	0.00
9,200.00	89.29	271.11	7,593.16	239.13	-1,861.87	1,873.30	0.00	0.00	0.00	0.00
9,300.00	89.29	271.11	7,594.40	241.06	-1,961.84	1,973.20	0.00	0.00	0.00	0.00
9,400.00	89.29	271.11	7,595.65	243.00	-2,061.81	2,073.09	0.00	0.00	0.00	0.00
9,500.00	89.29	271.11	7,596.89	244.94	-2,161.79	2,172.99	0.00	0.00	0.00	0.00
9,600.00	89.29	271.11	7,598.14	246.88	-2,261.76	2,272.88	0.00	0.00	0.00	0.00
9,700.00	89.29	271.11	7,599.38	248.81	-2,361.73	2,372.78	0.00	0.00	0.00	0.00
9,800.00	89.29	271.11	7,600.62	250.75	-2,461.71	2,472.67	0.00	0.00	0.00	0.00
9,900.00	89.29	271.11	7,601.87	252.69	-2,561.68	2,572.56	0.00	0.00	0.00	0.00
Hold Inc 89.29°, Azi 271.11°										
10,000.00	89.29	271.11	7,603.11	254.63	-2,661.66	2,672.46	0.00	0.00	0.00	0.00
10,100.00	89.29	271.11	7,604.36	256.56	-2,761.63	2,772.35	0.00	0.00	0.00	0.00
10,200.00	89.29	271.11	7,605.60	258.50	-2,861.60	2,872.25	0.00	0.00	0.00	0.00
10,300.00	89.29	271.11	7,606.84	260.44	-2,961.58	2,972.14	0.00	0.00	0.00	0.00
10,400.00	89.29	271.11	7,608.09	262.38	-3,061.55	3,072.04	0.00	0.00	0.00	0.00
10,500.00	89.29	271.11	7,609.33	264.32	-3,161.52	3,171.93	0.00	0.00	0.00	0.00
10,600.00	89.29	271.11	7,610.58	266.25	-3,261.50	3,271.83	0.00	0.00	0.00	0.00
10,700.00	89.29	271.11	7,611.82	268.19	-3,361.47	3,371.72	0.00	0.00	0.00	0.00
10,800.00	89.29	271.11	7,613.07	270.13	-3,461.44	3,471.61	0.00	0.00	0.00	0.00

Plan Report for Zukowski 17-1H - Plan A Rev 0 (Lateral)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
10,900.00	89.29	271.11	7,614.31	272.07	-3,561.42	3,571.51	0.00	0.00	0.00	0.00
11,000.00	89.29	271.11	7,615.55	274.00	-3,661.39	3,671.40	0.00	0.00	0.00	0.00
11,100.00	89.29	271.11	7,616.80	275.94	-3,761.36	3,771.30	0.00	0.00	0.00	0.00
11,200.00	89.29	271.11	7,618.04	277.88	-3,861.34	3,871.19	0.00	0.00	0.00	0.00
11,300.00	89.29	271.11	7,619.29	279.82	-3,961.31	3,971.09	0.00	0.00	0.00	0.00
11,400.00	89.29	271.11	7,620.53	281.75	-4,061.28	4,070.98	0.00	0.00	0.00	0.00
11,500.00	89.29	271.11	7,621.77	283.69	-4,161.26	4,170.88	0.00	0.00	0.00	0.00
11,600.00	89.29	271.11	7,623.02	285.63	-4,261.23	4,270.77	0.00	0.00	0.00	0.00
11,700.00	89.29	271.11	7,624.26	287.57	-4,361.20	4,370.66	0.00	0.00	0.00	0.00
11,800.00	89.29	271.11	7,625.51	289.51	-4,461.18	4,470.56	0.00	0.00	0.00	0.00
11,900.00	89.29	271.11	7,626.75	291.44	-4,561.15	4,570.45	0.00	0.00	0.00	0.00
11,920.04	89.29	271.11	7,627.00	291.83	-4,581.19	4,590.47	0.00	0.00	0.00	0.00
Total Depth 11920.04 ft - Zukowski 17-1H PAR0_BHL Tgt (Lateral)										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,700.00	6,695.45	203.00	2.00	Tie-On to Pilot Hole @ 6700.00 ft
7,008.64	7,004.09	203.00	2.00	Kick Off Point 7008.64 ft
7,450.00	7,403.08	206.13	-159.72	Build Rate 10.00 °/100 ft
7,901.51	7,577.00	213.96	-563.72	End Build 7901.51 ft
9,900.00	7,601.87	252.69	-2,561.68	Hold Inc 89.29°, Azi 271.11°
11,920.04	7,627.00	291.83	-4,581.19	Total Depth 11920.04 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Zukowski 17-1H PAR0_BHL Tgt (Lateral)	273.64	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
6,700.00	11,920.04	Plan A Rev 0 (Lateral)	MWD

Plan Report for Zukowski 17-1H - Plan A Rev 0 (Lateral)

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	1,646.00	Fox Hills Aquifer		0.00	
	1,769.00	Pierre Shale (Base Fox Hills)			
	1,970.00	Surface Casing Point			
	7,628.00	Niobrara D Chalk			
	7,756.00	Fort Hays Limestone			
	7,761.00	Carlisle Shale			
	7,818.00	Greenhorn			
	7,911.00	Pilot Hole TD			
7,421.32	7,382.00	Sharon Springs Shale			
7,556.16	7,472.00	Niobrara Fm.			
7,698.66	7,539.00	Niobrara B			
7,825.32	7,571.00	Niobrara C Chalk			

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Interp @ 6695.45 (Zukowski 17-1H Plan A Plan A Rev	6,695.45	203.00	2.00	Point
Zukowski 17-1H PAR0_BHL Tgt (Pilot Hole)	7,911.00	203.00	2.00	Point
Sec. 17-T4S-R64W SL	0.00	0.01	0.00	Polygon
Sec. 17-T4S-R64W SB	0.00	0.01	0.00	Polygon
Zukowski 17-1H PAR0_BHL Tgt (Lateral)	7,627.00	291.83	-4,581.19	Point

North Reference Sheet for Sec. 17-T4S-R64W - Zukowski 17-1H - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 24 ft @ 5672.00ft (H&P 280). Northing and Easting are relative to Zukowski 17-1H

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99999193

Grid Coordinates of Well: 1,684,063.23 ft N, 3,262,874.90 ft E

Geographical Coordinates of Well: 39° 42' 28.24" N, 104° 33' 56.35" W

Grid Convergence at Surface is: 0.59°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,920.04ft
the Bottom Hole Displacement is 4,590.47ft in the Direction of 273.64° (True).

Magnetic Convergence at surface is: -7.94° (28 February 2013, , BGGM2012)

