

# **ConocoPhillips RBU Gold Data**

**Niobrara Central Zone**

**Cottonwood Creek**

**Cottonwood Creek 4-65 27-28 3CH**

**Cottonwood Creek 4-65 27-28 3CH**

**Plan: Cottonwood Creek 4-65 27-28 3CH**

## **Standard Planning Report**

**22 August, 2017**

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Cottonwood Creek 4-65 27-28 3CH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Site:</b>	Cottonwood Creek	<b>North Reference:</b>	True
<b>Well:</b>	Cottonwood Creek 4-65 27-28 3CH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Cottonwood Creek 4-65 27-28 3CH		
<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

<b>Project</b>	Niobrara Central Zone, Colorado Central Zone, FIPS Zone: 0502		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		Using geodetic scale factor

Site		Cottonwood Creek			
Site Position:		Northing:	1,674,361.118 usft	Latitude:	39° 40' 55.380 N
From:	Lat/Long	Easting:	3,231,224.950 usft	Longitude:	104° 40' 42.431 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52

Well	Cottonwood Creek 4-65 27-28 3CH					
Well Position	+N/-S	-4,827.94 ft	Northing:	1,669,616.189 usft	Latitude:	39° 40' 7.650 N
	+E/-W	9,149.98 ft	Easting:	3,240,418.078 usft	Longitude:	104° 38' 45.420 W
Position Uncertainty		2.00 ft	Wellhead Elevation:		Ground Level:	5,749.50 ft

<b>Wellbore</b>	Cottonwood Creek 4-65 27-28 3CH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2017	8/18/2017	8.26	66.33	51,987.05364662

<b>Design</b>	Cottonwood Creek 4-65 27-28 3CH				
<b>Audit Notes:</b>	JM 8/22/2017 Rev C				
<b>Version:</b>		<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	278.64	

<b>Plan Survey Tool Program</b>	<b>Date</b>	8/22/2017			
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	2,222.00	Cottonwood Creek 4-65 27-28 3C	Gyro-BM-MS Gyro - bat/mem drop m/s	
2	2,222.00	7,652.84	Cottonwood Creek 4-65 27-28 3C	MWD+IFR1+MS_CoP Fixed:v2:Eagleford, crustal dec	
3	7,652.84	18,366.39	Cottonwood Creek 4-65 27-28 3C	MWD+IFR1+MS_CoP Fixed:v2:Eagleford, crustal dec	

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<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,322.00	0.00	0.00	2,322.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,898.25	23.64	50.19	3,853.89	205.28	246.31	1.50	1.50	0.00	50.19	
7,652.84	23.64	50.19	7,293.31	1,169.33	1,403.01	0.00	0.00	0.00	0.00	
8,547.17	89.37	270.06	7,895.00	1,336.69	953.96	12.00	7.35	-15.67	-137.82	Cottonwood Creek 4-f
18,366.56	89.37	270.06	8,003.00	1,347.32	-8,864.83	0.00	0.00	0.00	0.00	Cottonwood Creek 4-f

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<b>Wellbore:</b>	Cottonwood Creek 4-65 27-28 3CH		
<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

Planned Survey									
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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
SL 510' FSL 1410' FEL									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,222.00	0.00	0.00	2,222.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface									
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,322.00	0.00	0.00	2,322.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 1.50									
2,400.00	1.17	50.19	2,399.99	0.51	0.61	-0.53	1.50	1.50	0.00
2,500.00	2.67	50.19	2,499.94	2.65	3.19	-2.75	1.50	1.50	0.00
2,600.00	4.17	50.19	2,599.75	6.47	7.77	-6.71	1.50	1.50	0.00
2,700.00	5.67	50.19	2,699.38	11.96	14.36	-12.40	1.50	1.50	0.00
2,800.00	7.17	50.19	2,798.75	19.12	22.95	-19.81	1.50	1.50	0.00
2,900.00	8.67	50.19	2,897.80	27.95	33.53	-28.95	1.50	1.50	0.00
3,000.00	10.17	50.19	2,996.45	38.42	46.10	-39.81	1.50	1.50	0.00
3,100.00	11.67	50.19	3,094.63	50.55	60.65	-52.37	1.50	1.50	0.00
3,200.00	13.17	50.19	3,192.29	64.32	77.18	-66.63	1.50	1.50	0.00
3,300.00	14.67	50.19	3,289.35	79.72	95.65	-82.59	1.50	1.50	0.00
3,400.00	16.17	50.19	3,385.75	96.75	116.08	-100.22	1.50	1.50	0.00
3,500.00	17.67	50.19	3,481.42	115.38	138.44	-119.53	1.50	1.50	0.00
3,600.00	19.17	50.19	3,576.29	135.61	162.71	-140.48	1.50	1.50	0.00
3,700.00	20.67	50.19	3,670.30	157.42	188.88	-163.08	1.50	1.50	0.00
3,800.00	22.17	50.19	3,763.39	180.80	216.93	-187.30	1.50	1.50	0.00
3,898.25	23.64	50.19	3,853.89	205.28	246.31	-212.67	1.50	1.50	0.00
Start 3754.59 hold at 3898.25 MD									
3,900.00	23.64	50.19	3,855.50	205.73	246.85	-213.13	0.00	0.00	0.00
4,000.00	23.64	50.19	3,947.10	231.41	277.66	-239.73	0.00	0.00	0.00
4,100.00	23.64	50.19	4,038.71	257.09	308.46	-266.33	0.00	0.00	0.00
4,200.00	23.64	50.19	4,130.31	282.76	339.27	-292.93	0.00	0.00	0.00
4,300.00	23.64	50.19	4,221.92	308.44	370.08	-319.53	0.00	0.00	0.00
4,400.00	23.64	50.19	4,313.52	334.12	400.89	-346.13	0.00	0.00	0.00
4,500.00	23.64	50.19	4,405.13	359.79	431.69	-372.73	0.00	0.00	0.00
4,600.00	23.64	50.19	4,496.74	385.47	462.50	-399.33	0.00	0.00	0.00

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<b>Well:</b>	Cottonwood Creek 4-65 27-28 3CH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Cottonwood Creek 4-65 27-28 3CH		
<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

Planned Survey									
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)
4,700.00	23.64	50.19	4,588.34	411.15	493.31	-425.93	0.00	0.00	0.00
4,800.00	23.64	50.19	4,679.95	436.82	524.12	-452.53	0.00	0.00	0.00
4,900.00	23.64	50.19	4,771.55	462.50	554.92	-479.13	0.00	0.00	0.00
5,000.00	23.64	50.19	4,863.16	488.18	585.73	-505.73	0.00	0.00	0.00
5,100.00	23.64	50.19	4,954.76	513.85	616.54	-532.33	0.00	0.00	0.00
5,200.00	23.64	50.19	5,046.37	539.53	647.35	-558.93	0.00	0.00	0.00
5,300.00	23.64	50.19	5,137.98	565.21	678.15	-585.53	0.00	0.00	0.00
5,400.00	23.64	50.19	5,229.58	590.88	708.96	-612.13	0.00	0.00	0.00
5,500.00	23.64	50.19	5,321.19	616.56	739.77	-638.73	0.00	0.00	0.00
5,600.00	23.64	50.19	5,412.79	642.24	770.58	-665.33	0.00	0.00	0.00
5,700.00	23.64	50.19	5,504.40	667.91	801.39	-691.93	0.00	0.00	0.00
5,800.00	23.64	50.19	5,596.00	693.59	832.19	-718.53	0.00	0.00	0.00
5,900.00	23.64	50.19	5,687.61	719.27	863.00	-745.13	0.00	0.00	0.00
6,000.00	23.64	50.19	5,779.22	744.94	893.81	-771.73	0.00	0.00	0.00
6,100.00	23.64	50.19	5,870.82	770.62	924.62	-798.33	0.00	0.00	0.00
6,200.00	23.64	50.19	5,962.43	796.29	955.42	-824.93	0.00	0.00	0.00
6,300.00	23.64	50.19	6,054.03	821.97	986.23	-851.53	0.00	0.00	0.00
6,400.00	23.64	50.19	6,145.64	847.65	1,017.04	-878.13	0.00	0.00	0.00
6,500.00	23.64	50.19	6,237.24	873.32	1,047.85	-904.73	0.00	0.00	0.00
6,600.00	23.64	50.19	6,328.85	899.00	1,078.65	-931.33	0.00	0.00	0.00
6,700.00	23.64	50.19	6,420.46	924.68	1,109.46	-957.93	0.00	0.00	0.00
6,800.00	23.64	50.19	6,512.06	950.35	1,140.27	-984.53	0.00	0.00	0.00
6,900.00	23.64	50.19	6,603.67	976.03	1,171.08	-1,011.12	0.00	0.00	0.00
7,000.00	23.64	50.19	6,695.27	1,001.71	1,201.89	-1,037.72	0.00	0.00	0.00
7,100.00	23.64	50.19	6,786.88	1,027.38	1,232.69	-1,064.32	0.00	0.00	0.00
7,200.00	23.64	50.19	6,878.48	1,053.06	1,263.50	-1,090.92	0.00	0.00	0.00
7,300.00	23.64	50.19	6,970.09	1,078.74	1,294.31	-1,117.52	0.00	0.00	0.00
7,400.00	23.64	50.19	7,061.70	1,104.41	1,325.12	-1,144.12	0.00	0.00	0.00
7,500.00	23.64	50.19	7,153.30	1,130.09	1,355.92	-1,170.72	0.00	0.00	0.00
7,600.00	23.64	50.19	7,244.91	1,155.77	1,386.73	-1,197.32	0.00	0.00	0.00
7,652.00	23.64	50.19	7,292.54	1,169.12	1,402.75	-1,211.16	0.00	0.00	0.00
<b>KOP 1679' FSL 7' FEL</b>									
7,652.84	23.64	50.19	7,293.31	1,169.33	1,403.01	-1,211.38	0.00	0.00	0.00
<b>Start DLS 12.00 TFO -137.82</b>									
7,675.00	21.74	45.37	7,313.76	1,175.06	1,409.35	-1,216.78	12.00	-8.58	-21.77
7,700.00	19.80	38.92	7,337.13	1,181.61	1,415.30	-1,221.69	12.00	-7.78	-25.80
7,725.00	18.13	31.23	7,360.78	1,188.23	1,419.98	-1,225.31	12.00	-6.67	-30.74
7,750.00	16.82	22.22	7,384.63	1,194.91	1,423.36	-1,227.66	12.00	-5.23	-36.02
7,775.00	15.96	12.02	7,408.62	1,201.62	1,425.45	-1,228.71	12.00	-3.44	-40.81
7,800.00	15.63	1.05	7,432.68	1,208.35	1,426.23	-1,228.47	12.00	-1.34	-43.88
7,825.00	15.85	350.00	7,456.75	1,215.08	1,425.70	-1,226.93	12.00	0.88	-44.19
7,850.00	16.60	339.60	7,480.76	1,221.79	1,423.86	-1,224.11	12.00	3.02	-41.63
7,875.00	17.82	330.32	7,504.64	1,228.46	1,420.72	-1,220.00	12.00	4.88	-37.10
7,900.00	19.42	322.36	7,528.34	1,235.08	1,416.28	-1,214.62	12.00	6.40	-31.84
7,925.00	21.31	315.66	7,551.78	1,241.62	1,410.57	-1,207.99	12.00	7.57	-26.78
7,950.00	23.43	310.07	7,574.90	1,248.07	1,403.59	-1,200.12	12.00	8.46	-22.38
7,975.00	25.71	305.38	7,597.63	1,254.41	1,395.36	-1,191.03	12.00	9.13	-18.74
8,000.00	28.12	301.43	7,619.92	1,260.63	1,385.91	-1,180.75	12.00	9.64	-15.81
8,025.00	30.63	298.07	7,641.71	1,266.70	1,375.26	-1,169.31	12.00	10.03	-13.46
8,050.00	33.21	295.17	7,662.93	1,272.61	1,363.44	-1,156.74	12.00	10.32	-11.58
8,075.00	35.85	292.65	7,683.52	1,278.34	1,350.49	-1,143.07	12.00	10.56	-10.07
8,100.00	38.54	290.44	7,703.44	1,283.88	1,336.43	-1,128.34	12.00	10.74	-8.85
8,125.00	41.26	288.47	7,722.62	1,289.22	1,321.31	-1,112.59	12.00	10.89	-7.86

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8,150.00	44.01	286.71	7,741.01	1,294.33	1,305.17	-1,095.87	12.00	11.01	-7.05	
8,175.00	46.79	285.12	7,758.56	1,299.20	1,288.05	-1,078.21	12.00	11.11	-6.38	
8,200.00	49.58	283.66	7,775.23	1,303.82	1,270.01	-1,059.68	12.00	11.19	-5.82	
8,225.00	52.40	282.32	7,790.96	1,308.19	1,251.08	-1,040.31	12.00	11.26	-5.36	
8,250.00	55.23	281.08	7,805.72	1,312.27	1,231.32	-1,020.16	12.00	11.31	-4.96	
8,275.00	58.07	279.92	7,819.47	1,316.08	1,210.79	-999.29	12.00	11.36	-4.63	
8,300.00	60.92	278.83	7,832.16	1,319.58	1,189.54	-977.76	12.00	11.40	-4.36	
8,325.00	63.77	277.80	7,843.76	1,322.78	1,167.64	-955.62	12.00	11.43	-4.12	
8,350.00	66.64	276.82	7,854.24	1,325.67	1,145.13	-932.93	12.00	11.46	-3.92	
8,375.00	69.51	275.88	7,863.58	1,328.23	1,122.08	-909.76	12.00	11.48	-3.76	
8,400.00	72.38	274.98	7,871.74	1,330.47	1,098.56	-886.17	12.00	11.50	-3.62	
8,425.00	75.26	274.10	7,878.70	1,332.37	1,074.63	-862.23	12.00	11.52	-3.50	
8,450.00	78.15	273.25	7,884.45	1,333.93	1,050.35	-837.99	12.00	11.53	-3.41	
8,475.00	81.03	272.41	7,888.97	1,335.14	1,025.79	-813.53	12.00	11.54	-3.34	
8,500.00	83.92	271.59	7,892.24	1,336.01	1,001.03	-788.91	12.00	11.55	-3.29	
8,525.00	86.81	270.78	7,894.26	1,336.52	976.12	-764.21	12.00	11.55	-3.25	
8,547.00	89.35	270.07	7,895.00	1,336.69	954.13	-742.45	12.00	11.56	-3.24	
BPI 1849' FSL 460' FEL										
8,547.17	89.37	270.06	7,895.00	1,336.69	953.96	-742.28	11.78	11.35	-3.17	
Start 9819.39 hold at 8547.17 MD										
8,600.00	89.37	270.06	7,895.58	1,336.74	901.13	-690.05	0.00	0.00	0.00	
8,700.00	89.37	270.06	7,896.68	1,336.85	801.14	-591.17	0.00	0.00	0.00	
8,800.00	89.37	270.06	7,897.78	1,336.96	701.15	-492.30	0.00	0.00	0.00	
8,900.00	89.37	270.06	7,898.88	1,337.07	601.15	-393.42	0.00	0.00	0.00	
9,000.00	89.37	270.06	7,899.98	1,337.18	501.16	-294.55	0.00	0.00	0.00	
9,100.00	89.37	270.06	7,901.08	1,337.28	401.17	-195.67	0.00	0.00	0.00	
9,200.00	89.37	270.06	7,902.18	1,337.39	301.17	-96.80	0.00	0.00	0.00	
9,300.00	89.37	270.06	7,903.28	1,337.50	201.18	2.08	0.00	0.00	0.00	
9,400.00	89.37	270.06	7,904.38	1,337.61	101.18	100.95	0.00	0.00	0.00	
9,500.00	89.37	270.06	7,905.48	1,337.72	1.19	199.83	0.00	0.00	0.00	
9,600.00	89.37	270.06	7,906.58	1,337.83	-98.80	298.70	0.00	0.00	0.00	
9,700.00	89.37	270.06	7,907.68	1,337.93	-198.80	397.58	0.00	0.00	0.00	
9,800.00	89.37	270.06	7,908.78	1,338.04	-298.79	496.45	0.00	0.00	0.00	
9,900.00	89.37	270.06	7,909.88	1,338.15	-398.79	595.33	0.00	0.00	0.00	
10,000.00	89.37	270.06	7,910.98	1,338.26	-498.78	694.20	0.00	0.00	0.00	
10,100.00	89.37	270.06	7,912.08	1,338.37	-598.77	793.08	0.00	0.00	0.00	
10,200.00	89.37	270.06	7,913.18	1,338.47	-698.77	891.95	0.00	0.00	0.00	
10,300.00	89.37	270.06	7,914.28	1,338.58	-798.76	990.83	0.00	0.00	0.00	
10,400.00	89.37	270.06	7,915.38	1,338.69	-898.76	1,089.70	0.00	0.00	0.00	
10,500.00	89.37	270.06	7,916.48	1,338.80	-998.75	1,188.58	0.00	0.00	0.00	
10,600.00	89.37	270.06	7,917.58	1,338.91	-1,098.74	1,287.45	0.00	0.00	0.00	
10,700.00	89.37	270.06	7,918.68	1,339.02	-1,198.74	1,386.33	0.00	0.00	0.00	
10,800.00	89.37	270.06	7,919.78	1,339.12	-1,298.73	1,485.20	0.00	0.00	0.00	
10,900.00	89.37	270.06	7,920.88	1,339.23	-1,398.72	1,584.08	0.00	0.00	0.00	
11,000.00	89.37	270.06	7,921.98	1,339.34	-1,498.72	1,682.95	0.00	0.00	0.00	
11,100.00	89.37	270.06	7,923.08	1,339.45	-1,598.71	1,781.83	0.00	0.00	0.00	
11,200.00	89.37	270.06	7,924.18	1,339.56	-1,698.71	1,880.70	0.00	0.00	0.00	
11,300.00	89.37	270.06	7,925.28	1,339.67	-1,798.70	1,979.58	0.00	0.00	0.00	
11,400.00	89.37	270.06	7,926.38	1,339.77	-1,898.69	2,078.45	0.00	0.00	0.00	
11,500.00	89.37	270.06	7,927.48	1,339.88	-1,998.69	2,177.33	0.00	0.00	0.00	
11,600.00	89.37	270.06	7,928.58	1,339.99	-2,098.68	2,276.20	0.00	0.00	0.00	
11,700.00	89.37	270.06	7,929.68	1,340.10	-2,198.68	2,375.08	0.00	0.00	0.00	
11,800.00	89.37	270.06	7,930.78	1,340.21	-2,298.67	2,473.95	0.00	0.00	0.00	
11,900.00	89.37	270.06	7,931.88	1,340.32	-2,398.66	2,572.83	0.00	0.00	0.00	

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Cottonwood Creek 4-65 27-28 3CH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Site:</b>	Cottonwood Creek	<b>North Reference:</b>	True
<b>Well:</b>	Cottonwood Creek 4-65 27-28 3CH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Cottonwood Creek 4-65 27-28 3CH		
<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

Planned Survey									
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)
12,000.00	89.37	270.06	7,932.98	1,340.42	-2,498.66	2,671.70	0.00	0.00	0.00
12,100.00	89.37	270.06	7,934.08	1,340.53	-2,598.65	2,770.57	0.00	0.00	0.00
12,200.00	89.37	270.06	7,935.18	1,340.64	-2,698.65	2,869.45	0.00	0.00	0.00
12,300.00	89.37	270.06	7,936.28	1,340.75	-2,798.64	2,968.32	0.00	0.00	0.00
12,400.00	89.37	270.06	7,937.38	1,340.86	-2,898.63	3,067.20	0.00	0.00	0.00
12,500.00	89.37	270.06	7,938.48	1,340.96	-2,998.63	3,166.07	0.00	0.00	0.00
12,600.00	89.37	270.06	7,939.58	1,341.07	-3,098.62	3,264.95	0.00	0.00	0.00
12,700.00	89.37	270.06	7,940.68	1,341.18	-3,198.61	3,363.82	0.00	0.00	0.00
12,800.00	89.37	270.06	7,941.78	1,341.29	-3,298.61	3,462.70	0.00	0.00	0.00
12,900.00	89.37	270.06	7,942.88	1,341.40	-3,398.60	3,561.57	0.00	0.00	0.00
13,000.00	89.37	270.06	7,943.98	1,341.51	-3,498.60	3,660.45	0.00	0.00	0.00
13,100.00	89.37	270.06	7,945.08	1,341.61	-3,598.59	3,759.32	0.00	0.00	0.00
13,200.00	89.37	270.06	7,946.18	1,341.72	-3,698.58	3,858.20	0.00	0.00	0.00
13,300.00	89.37	270.06	7,947.27	1,341.83	-3,798.58	3,957.07	0.00	0.00	0.00
13,400.00	89.37	270.06	7,948.37	1,341.94	-3,898.57	4,055.95	0.00	0.00	0.00
13,500.00	89.37	270.06	7,949.47	1,342.05	-3,998.57	4,154.82	0.00	0.00	0.00
13,600.00	89.37	270.06	7,950.57	1,342.16	-4,098.56	4,253.70	0.00	0.00	0.00
13,700.00	89.37	270.06	7,951.67	1,342.26	-4,198.55	4,352.57	0.00	0.00	0.00
13,800.00	89.37	270.06	7,952.77	1,342.37	-4,298.55	4,451.45	0.00	0.00	0.00
13,900.00	89.37	270.06	7,953.87	1,342.48	-4,398.54	4,550.32	0.00	0.00	0.00
14,000.00	89.37	270.06	7,954.97	1,342.59	-4,498.54	4,649.20	0.00	0.00	0.00
14,100.00	89.37	270.06	7,956.07	1,342.70	-4,598.53	4,748.07	0.00	0.00	0.00
14,200.00	89.37	270.06	7,957.17	1,342.80	-4,698.52	4,846.95	0.00	0.00	0.00
14,300.00	89.37	270.06	7,958.27	1,342.91	-4,798.52	4,945.82	0.00	0.00	0.00
14,400.00	89.37	270.06	7,959.37	1,343.02	-4,898.51	5,044.70	0.00	0.00	0.00
14,500.00	89.37	270.06	7,960.47	1,343.13	-4,998.51	5,143.57	0.00	0.00	0.00
14,600.00	89.37	270.06	7,961.57	1,343.24	-5,098.50	5,242.45	0.00	0.00	0.00
14,700.00	89.37	270.06	7,962.67	1,343.35	-5,198.49	5,341.32	0.00	0.00	0.00
14,800.00	89.37	270.06	7,963.77	1,343.45	-5,298.49	5,440.20	0.00	0.00	0.00
14,900.00	89.37	270.06	7,964.87	1,343.56	-5,398.48	5,539.07	0.00	0.00	0.00
15,000.00	89.37	270.06	7,965.97	1,343.67	-5,498.47	5,637.95	0.00	0.00	0.00
15,100.00	89.37	270.06	7,967.07	1,343.78	-5,598.47	5,736.82	0.00	0.00	0.00
15,200.00	89.37	270.06	7,968.17	1,343.89	-5,698.46	5,835.70	0.00	0.00	0.00
15,300.00	89.37	270.06	7,969.27	1,344.00	-5,798.46	5,934.57	0.00	0.00	0.00
15,400.00	89.37	270.06	7,970.37	1,344.10	-5,898.45	6,033.45	0.00	0.00	0.00
15,500.00	89.37	270.06	7,971.47	1,344.21	-5,998.44	6,132.32	0.00	0.00	0.00
15,600.00	89.37	270.06	7,972.57	1,344.32	-6,098.44	6,231.20	0.00	0.00	0.00
15,700.00	89.37	270.06	7,973.67	1,344.43	-6,198.43	6,330.07	0.00	0.00	0.00
15,800.00	89.37	270.06	7,974.77	1,344.54	-6,298.43	6,428.95	0.00	0.00	0.00
15,900.00	89.37	270.06	7,975.87	1,344.65	-6,398.42	6,527.82	0.00	0.00	0.00
16,000.00	89.37	270.06	7,976.97	1,344.75	-6,498.41	6,626.70	0.00	0.00	0.00
16,100.00	89.37	270.06	7,978.07	1,344.86	-6,598.41	6,725.57	0.00	0.00	0.00
16,200.00	89.37	270.06	7,979.17	1,344.97	-6,698.40	6,824.45	0.00	0.00	0.00
16,300.00	89.37	270.06	7,980.27	1,345.08	-6,798.40	6,923.32	0.00	0.00	0.00
16,400.00	89.37	270.06	7,981.37	1,345.19	-6,898.39	7,022.20	0.00	0.00	0.00
16,500.00	89.37	270.06	7,982.47	1,345.29	-6,998.38	7,121.07	0.00	0.00	0.00
16,600.00	89.37	270.06	7,983.57	1,345.40	-7,098.38	7,219.95	0.00	0.00	0.00
16,700.00	89.37	270.06	7,984.67	1,345.51	-7,198.37	7,318.82	0.00	0.00	0.00
16,800.00	89.37	270.06	7,985.77	1,345.62	-7,298.36	7,417.70	0.00	0.00	0.00
16,900.00	89.37	270.06	7,986.87	1,345.73	-7,398.36	7,516.57	0.00	0.00	0.00
17,000.00	89.37	270.06	7,987.97	1,345.84	-7,498.35	7,615.45	0.00	0.00	0.00
17,100.00	89.37	270.06	7,989.07	1,345.94	-7,598.35	7,714.32	0.00	0.00	0.00
17,200.00	89.37	270.06	7,990.17	1,346.05	-7,698.34	7,813.19	0.00	0.00	0.00
17,300.00	89.37	270.06	7,991.27	1,346.16	-7,798.33	7,912.07	0.00	0.00	0.00

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Cottonwood Creek 4-65 27-28 3CH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	27' RKB @ 5776.50ft (27' RKB)
<b>Site:</b>	Cottonwood Creek	<b>North Reference:</b>	True
<b>Well:</b>	Cottonwood Creek 4-65 27-28 3CH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Cottonwood Creek 4-65 27-28 3CH		
<b>Design:</b>	Cottonwood Creek 4-65 27-28 3CH		

Planned Survey										
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)	
17,400.00	89.37	270.06	7,992.37	1,346.27	-7,898.33	8,010.94	0.00	0.00	0.00	
17,500.00	89.37	270.06	7,993.47	1,346.38	-7,998.32	8,109.82	0.00	0.00	0.00	
17,600.00	89.37	270.06	7,994.57	1,346.49	-8,098.32	8,208.69	0.00	0.00	0.00	
17,700.00	89.37	270.06	7,995.67	1,346.59	-8,198.31	8,307.57	0.00	0.00	0.00	
17,800.00	89.37	270.06	7,996.77	1,346.70	-8,298.30	8,406.44	0.00	0.00	0.00	
17,900.00	89.37	270.06	7,997.87	1,346.81	-8,398.30	8,505.32	0.00	0.00	0.00	
18,000.00	89.37	270.06	7,998.97	1,346.92	-8,498.29	8,604.19	0.00	0.00	0.00	
18,100.00	89.37	270.06	8,000.07	1,347.03	-8,598.29	8,703.07	0.00	0.00	0.00	
18,200.00	89.37	270.06	8,001.17	1,347.13	-8,698.28	8,801.94	0.00	0.00	0.00	
18,231.00	89.37	270.06	8,001.51	1,347.17	-8,729.28	8,832.60	0.00	0.00	0.00	
EPI 1849' FSL 460' FWL										
18,300.00	89.37	270.06	8,002.27	1,347.24	-8,798.27	8,900.82	0.00	0.00	0.00	
18,366.00	89.37	270.06	8,002.99	1,347.31	-8,864.27	8,966.08	0.00	0.00	0.00	
BHL 1849' FSL 325' FWL										
18,366.56	89.37	270.06	8,003.00	1,347.32	-8,864.83	8,966.63	0.00	0.00	0.00	
TD at 18366.56 - Production										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Cottonwood Creek 4-65	0.00	0.00	7,895.00	1,336.69	953.96	1,670,961.760	3,241,359.419	39° 40' 20.860 N	104° 38' 33.220 W	
- plan hits target center										
- Point										
Cottonwood Creek 4-65	0.00	0.00	8,003.00	1,347.32	-8,864.83	1,670,880.085	3,231,541.125	39° 40' 20.950 N	104° 40' 38.790 W	
- plan hits target center										
- Point										

Casing Points					
	Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
	2,222.00	2,222.00	Surface	9-5/8	12-1/4
	18,366.56	8,003.00	Production	5-1/2	8-1/2

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,000.00	1,000.00	0.00	0.00	SL 510' FSL 1410' FEL	
2,322.00	2,322.00	0.00	0.00	Start Build 1.50	
3,898.25	3,853.89	205.28	246.31	Start 3754.59 hold at 3898.25 MD	
7,652.00	7,292.54	1,169.12	1,402.75	KOP 1679' FSL 7' FEL	
7,652.84	7,293.31	1,169.33	1,403.01	Start DLS 12.00 TFO -137.82	
8,547.00	7,895.00	1,336.69	954.13	BPI 1849' FSL 460' FEL	
8,547.17	7,895.00	1,336.69	953.96	Start 9819.39 hold at 8547.17 MD	
18,231.00	8,001.51	1,347.17	-8,729.28	EPI 1849' FSL 460' FWL	
18,366.00	8,002.99	1,347.31	-8,864.27	BHL 1849' FSL 325' FWL	
18,366.56	8,003.00	1,347.32	-8,864.83	TD at 18366.56	





ConocoPhillips

Arapahoe County, Colorado

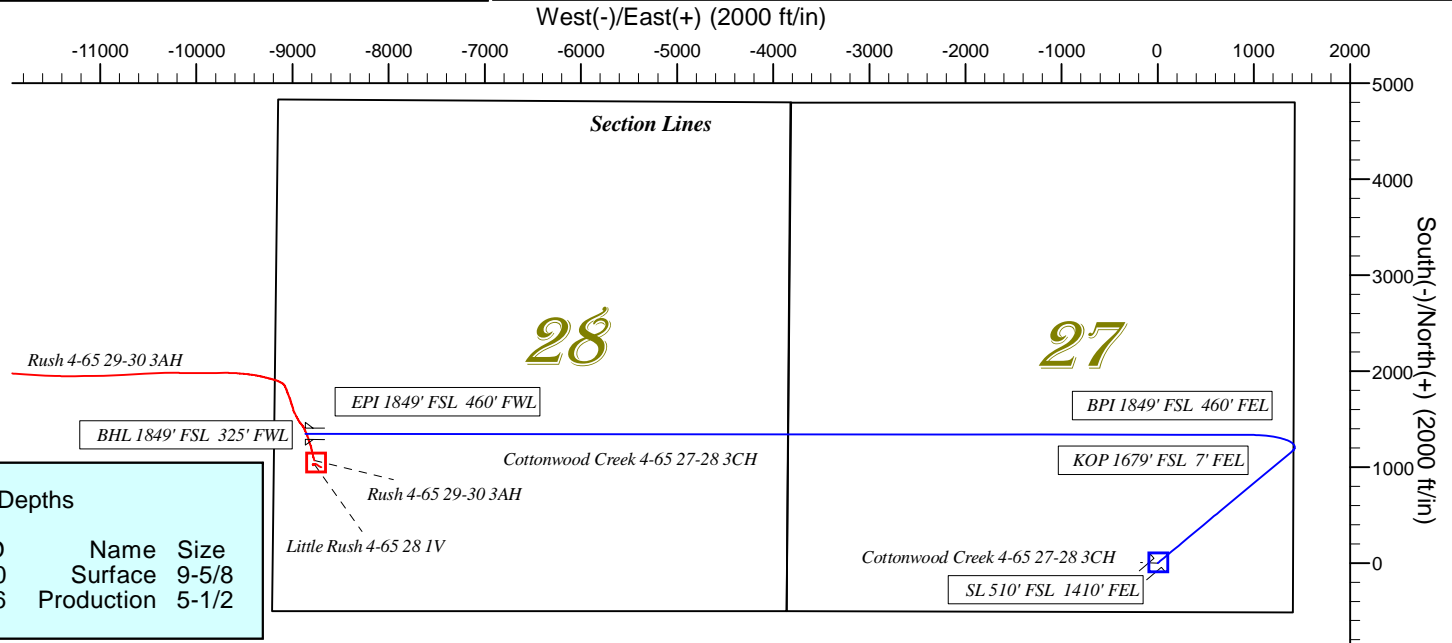
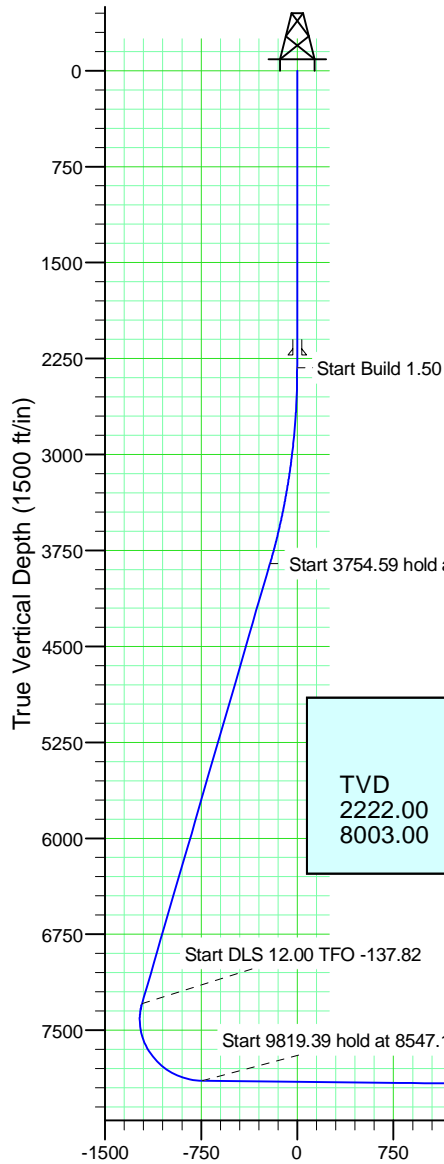
## Cottonwood Creek 4-65 27-28 3CH

Ground Level: 5749.50  
Surface Location Latitude: 39° 40' 7.650 N  
Surface Location Longitude: 104° 38' 45.420 W  
North Reference: True  
27' RKB @ 5776.50ft (27' RKB)

North American Datum 1983  
GRS 1980  
US State Plane 1983  
Colorado Central Zone

### Well Profile Data

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Vsect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2322.00	0.00	0.00	2322.00	0.00	0.00	0.00	0.00
3898.25	23.64	50.19	3853.89	205.28	246.31	1.50	-212.67
7652.84	23.64	50.19	7293.31	1169.33	1403.01	0.00	-1211.38
8547.17	89.37	270.06	7895.00	1336.69	953.96	12.00	-742.29
18366.56	89.37	270.06	8003.00	1347.32	-8864.83	0.00	8966.63



### Casing Depths

TVD	MD	Name	Size
2222.00	2222.00	Surface	9-5/8
8003.00	18366.56	Production	5-1/2

### Wellbore Targets

Name	TVD	Latitude	Longitude
Cottonwood Creek 4-65 27-28 3CH BPI_C	7895.00	39° 40' 20.860 N	104° 38' 33.220 W
Cottonwood Creek 4-65 27-28 3CH BHL_C	8003.00	39° 40' 20.950 N	104° 40' 38.790 W