

ConocoPhillips RBU Gold Data

Niobrara Central Zone

Cottonwood Creek

Cottonwood Creek 4-65 27-28 4BH

Cottonwood Creek 4-65 27-28 4BH

Plan: Cottonwood Creek 4-65 27-28 4BH

Standard Planning Report

22 August, 2017

ConocoPhillips

Planning Report

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

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

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

Well Cottonwood Creek 4-65 27-28 4BH			
Well Position	+N/-S	-4,947.33 ft	Northing: 1,669,496.811 usft
	+E/-W	9,150.02 ft	Easting: 3,240,419.201 usft
Position Uncertainty		2.00 ft	Wellhead Elevation:
			Latitude: 39° 40' 6.470 N
			Longitude: 104° 38' 45.420 W
			Ground Level: 5,749.50 ft

Wellbore Cottonwood Creek 4-65 27-28 4BH					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2017	8/1/2018	8.17	66.29	51,875.37021165

Design Cottonwood Creek 4-65 27-28 4BH				
Audit Notes:				
Version:		Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	273.34

Plan Survey Tool Program		Date 8/22/2017			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	Cottonwood Creek 4-65 27-28 4B	Gyro-BM-MS	Gyro - bat/mem drop m/s	
2	2,220.00	Cottonwood Creek 4-65 27-28 4B	MWD+IFR1+MS_CoP	Fixed:v2:Eagleford, crustal dec	
3	7,479.28	Cottonwood Creek 4-65 27-28 4B	MWD+IFR1+MS_CoP	Fixed:v2:Eagleford, crustal dec	

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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	
2,320.00	0.00	0.00	2,320.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,662.42	20.14	73.89	3,634.96	64.80	224.30	1.50	1.50	0.00	73.89	
7,479.28	20.14	73.89	7,218.51	429.51	1,486.65	0.00	0.00	0.00	0.00	
8,567.47	89.51	270.07	7,977.00	506.96	950.87	10.00	6.38	-15.05	-162.88	Cottonwood Creek 4-f
18,394.81	89.51	270.07	8,061.00	518.60	-8,876.11	0.00	0.00	0.00	0.00	Cottonwood Creek 4-f

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Wellbore:	Cottonwood Creek 4-65 27-28 4BH		
Design:	Cottonwood Creek 4-65 27-28 4BH		

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 390' 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	
2,220.00	0.00	0.00	2,220.00	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	
2,320.00	0.00	0.00	2,320.00	0.00	0.00	0.00	0.00	0.00	0.00	
Start Build 1.50										
2,400.00	1.20	73.89	2,399.99	0.23	0.80	-0.79	1.50	1.50	0.00	
2,500.00	2.70	73.89	2,499.93	1.18	4.07	-4.00	1.50	1.50	0.00	
2,600.00	4.20	73.89	2,599.75	2.85	9.85	-9.67	1.50	1.50	0.00	
2,700.00	5.70	73.89	2,699.37	5.24	18.14	-17.81	1.50	1.50	0.00	
2,800.00	7.20	73.89	2,798.74	8.36	28.94	-28.40	1.50	1.50	0.00	
2,900.00	8.70	73.89	2,897.77	12.20	42.22	-41.44	1.50	1.50	0.00	
3,000.00	10.20	73.89	2,996.41	16.76	58.00	-56.92	1.50	1.50	0.00	
3,100.00	11.70	73.89	3,094.59	22.03	76.24	-74.83	1.50	1.50	0.00	
3,200.00	13.20	73.89	3,192.24	28.01	96.96	-95.16	1.50	1.50	0.00	
3,300.00	14.70	73.89	3,289.28	34.70	120.12	-117.89	1.50	1.50	0.00	
3,400.00	16.20	73.89	3,385.67	42.10	145.71	-143.00	1.50	1.50	0.00	
3,500.00	17.70	73.89	3,481.32	50.19	173.71	-170.49	1.50	1.50	0.00	
3,600.00	19.20	73.89	3,576.18	58.97	204.12	-200.33	1.50	1.50	0.00	
3,662.42	20.14	73.89	3,634.96	64.80	224.30	-220.14	1.50	1.50	0.00	
Start 3816.86 hold at 3662.42 MD										
3,700.00	20.14	73.89	3,670.24	68.39	236.73	-232.34	0.00	0.00	0.00	
3,800.00	20.14	73.89	3,764.13	77.95	269.80	-264.80	0.00	0.00	0.00	
3,900.00	20.14	73.89	3,858.01	87.51	302.88	-297.26	0.00	0.00	0.00	
4,000.00	20.14	73.89	3,951.90	97.06	335.95	-329.72	0.00	0.00	0.00	
4,100.00	20.14	73.89	4,045.79	106.62	369.02	-362.17	0.00	0.00	0.00	
4,200.00	20.14	73.89	4,139.68	116.17	402.09	-394.63	0.00	0.00	0.00	
4,300.00	20.14	73.89	4,233.56	125.73	435.17	-427.09	0.00	0.00	0.00	
4,400.00	20.14	73.89	4,327.45	135.28	468.24	-459.55	0.00	0.00	0.00	
4,500.00	20.14	73.89	4,421.34	144.84	501.31	-492.01	0.00	0.00	0.00	
4,600.00	20.14	73.89	4,515.23	154.39	534.39	-524.47	0.00	0.00	0.00	

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Wellbore:	Cottonwood Creek 4-65 27-28 4BH		
Design:	Cottonwood Creek 4-65 27-28 4BH		

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	20.14	73.89	4,609.11	163.95	567.46	-556.93	0.00	0.00	0.00
4,800.00	20.14	73.89	4,703.00	173.50	600.53	-589.39	0.00	0.00	0.00
4,900.00	20.14	73.89	4,796.89	183.06	633.60	-621.85	0.00	0.00	0.00
5,000.00	20.14	73.89	4,890.78	192.61	666.68	-654.31	0.00	0.00	0.00
5,100.00	20.14	73.89	4,984.67	202.17	699.75	-686.77	0.00	0.00	0.00
5,200.00	20.14	73.89	5,078.55	211.72	732.82	-719.23	0.00	0.00	0.00
5,300.00	20.14	73.89	5,172.44	221.28	765.90	-751.69	0.00	0.00	0.00
5,400.00	20.14	73.89	5,266.33	230.83	798.97	-784.14	0.00	0.00	0.00
5,500.00	20.14	73.89	5,360.22	240.39	832.04	-816.60	0.00	0.00	0.00
5,600.00	20.14	73.89	5,454.10	249.94	865.11	-849.06	0.00	0.00	0.00
5,700.00	20.14	73.89	5,547.99	259.50	898.19	-881.52	0.00	0.00	0.00
5,800.00	20.14	73.89	5,641.88	269.05	931.26	-913.98	0.00	0.00	0.00
5,900.00	20.14	73.89	5,735.77	278.61	964.33	-946.44	0.00	0.00	0.00
6,000.00	20.14	73.89	5,829.65	288.17	997.41	-978.90	0.00	0.00	0.00
6,100.00	20.14	73.89	5,923.54	297.72	1,030.48	-1,011.36	0.00	0.00	0.00
6,200.00	20.14	73.89	6,017.43	307.28	1,063.55	-1,043.82	0.00	0.00	0.00
6,300.00	20.14	73.89	6,111.32	316.83	1,096.62	-1,076.28	0.00	0.00	0.00
6,400.00	20.14	73.89	6,205.20	326.39	1,129.70	-1,108.74	0.00	0.00	0.00
6,500.00	20.14	73.89	6,299.09	335.94	1,162.77	-1,141.20	0.00	0.00	0.00
6,600.00	20.14	73.89	6,392.98	345.50	1,195.84	-1,173.66	0.00	0.00	0.00
6,700.00	20.14	73.89	6,486.87	355.05	1,228.92	-1,206.12	0.00	0.00	0.00
6,800.00	20.14	73.89	6,580.75	364.61	1,261.99	-1,238.57	0.00	0.00	0.00
6,900.00	20.14	73.89	6,674.64	374.16	1,295.06	-1,271.03	0.00	0.00	0.00
7,000.00	20.14	73.89	6,768.53	383.72	1,328.13	-1,303.49	0.00	0.00	0.00
7,100.00	20.14	73.89	6,862.42	393.27	1,361.21	-1,335.95	0.00	0.00	0.00
7,200.00	20.14	73.89	6,956.31	402.83	1,394.28	-1,368.41	0.00	0.00	0.00
7,300.00	20.14	73.89	7,050.19	412.38	1,427.35	-1,400.87	0.00	0.00	0.00
7,400.00	20.14	73.89	7,144.08	421.94	1,460.43	-1,433.33	0.00	0.00	0.00
7,479.00	20.14	73.89	7,218.25	429.49	1,486.55	-1,458.97	0.00	0.00	0.00
KOP 820' FSL 77' FWL									
7,479.28	20.14	73.89	7,218.51	429.51	1,486.65	-1,459.06	0.00	0.00	0.00
Start DLS 10.00 TFO -162.88									
7,500.00	18.17	71.93	7,238.09	431.51	1,493.14	-1,465.43	10.00	-9.51	-9.44
7,550.00	13.53	64.97	7,286.18	436.40	1,505.86	-1,477.84	10.00	-9.27	-13.91
7,600.00	9.28	51.43	7,335.19	441.39	1,514.32	-1,486.00	10.00	-8.51	-27.09
7,650.00	6.23	21.11	7,384.74	446.44	1,518.45	-1,489.83	10.00	-6.09	-60.63
7,700.00	6.44	334.57	7,434.47	451.51	1,518.22	-1,489.31	10.00	0.41	-93.08
7,750.00	9.69	306.66	7,483.99	456.55	1,513.64	-1,484.44	10.00	6.50	-55.83
7,800.00	14.00	294.13	7,532.92	461.54	1,504.74	-1,475.26	10.00	8.63	-25.06
7,850.00	18.66	287.58	7,580.89	466.43	1,491.59	-1,461.84	10.00	9.31	-13.10
7,900.00	23.45	283.60	7,627.54	471.19	1,474.28	-1,444.29	10.00	9.59	-7.96
7,950.00	28.32	280.92	7,672.51	475.78	1,452.95	-1,422.73	10.00	9.72	-5.36
8,000.00	33.22	278.97	7,715.46	480.16	1,427.76	-1,397.32	10.00	9.80	-3.90
8,050.00	38.14	277.47	7,756.07	484.31	1,398.91	-1,368.28	10.00	9.85	-2.99
8,100.00	43.08	276.27	7,794.01	488.19	1,366.61	-1,335.80	10.00	9.88	-2.40
8,150.00	48.03	275.28	7,829.02	491.76	1,331.10	-1,300.15	10.00	9.90	-1.99
8,200.00	52.98	274.42	7,860.81	495.01	1,292.67	-1,261.59	10.00	9.91	-1.71
8,250.00	57.95	273.68	7,889.14	497.91	1,251.59	-1,220.42	10.00	9.92	-1.50
8,300.00	62.91	273.00	7,913.81	500.44	1,208.19	-1,176.95	10.00	9.93	-1.34
8,350.00	67.88	272.39	7,934.62	502.57	1,162.80	-1,131.50	10.00	9.94	-1.23
8,400.00	72.85	271.82	7,951.41	504.30	1,115.75	-1,084.44	10.00	9.94	-1.14
8,450.00	77.82	271.28	7,964.07	505.60	1,067.41	-1,036.10	10.00	9.94	-1.08
8,500.00	82.80	270.76	7,972.48	506.48	1,018.15	-986.87	10.00	9.95	-1.04

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Design:	Cottonwood Creek 4-65 27-28 4BH		

Planned Survey										
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8,550.00	87.77	270.25	7,976.59	506.91	968.33	-937.12	10.00	9.95	-1.02	
8,567.00	89.46	270.07	7,977.00	506.96	951.34	-920.15	10.00	9.95	-1.01	
BPI 900' FSL 460' FEL										
8,567.47	89.51	270.07	7,977.00	506.96	950.87	-919.68	9.96	9.91	-1.01	
Start 9827.34 hold at 8567.47 MD										
8,600.00	89.51	270.07	7,977.28	507.00	918.34	-887.21	0.00	0.00	0.00	
8,700.00	89.51	270.07	7,978.13	507.12	818.35	-787.37	0.00	0.00	0.00	
8,800.00	89.51	270.07	7,978.99	507.23	718.35	-687.54	0.00	0.00	0.00	
8,900.00	89.51	270.07	7,979.84	507.35	618.35	-587.71	0.00	0.00	0.00	
9,000.00	89.51	270.07	7,980.70	507.47	518.36	-487.87	0.00	0.00	0.00	
9,100.00	89.51	270.07	7,981.55	507.59	418.36	-388.04	0.00	0.00	0.00	
9,200.00	89.51	270.07	7,982.41	507.71	318.36	-288.21	0.00	0.00	0.00	
9,300.00	89.51	270.07	7,983.26	507.83	218.37	-188.38	0.00	0.00	0.00	
9,400.00	89.51	270.07	7,984.12	507.95	118.37	-88.54	0.00	0.00	0.00	
9,500.00	89.51	270.07	7,984.97	508.06	18.38	11.29	0.00	0.00	0.00	
9,600.00	89.51	270.07	7,985.83	508.18	-81.62	111.12	0.00	0.00	0.00	
9,700.00	89.51	270.07	7,986.68	508.30	-181.62	210.96	0.00	0.00	0.00	
9,800.00	89.51	270.07	7,987.54	508.42	-281.61	310.79	0.00	0.00	0.00	
9,900.00	89.51	270.07	7,988.39	508.54	-381.61	410.62	0.00	0.00	0.00	
10,000.00	89.51	270.07	7,989.24	508.66	-481.61	510.45	0.00	0.00	0.00	
10,100.00	89.51	270.07	7,990.10	508.77	-581.60	610.29	0.00	0.00	0.00	
10,200.00	89.51	270.07	7,990.95	508.89	-681.60	710.12	0.00	0.00	0.00	
10,300.00	89.51	270.07	7,991.81	509.01	-781.60	809.95	0.00	0.00	0.00	
10,400.00	89.51	270.07	7,992.66	509.13	-881.59	909.79	0.00	0.00	0.00	
10,500.00	89.51	270.07	7,993.52	509.25	-981.59	1,009.62	0.00	0.00	0.00	
10,600.00	89.51	270.07	7,994.37	509.37	-1,081.58	1,109.45	0.00	0.00	0.00	
10,700.00	89.51	270.07	7,995.23	509.49	-1,181.58	1,209.29	0.00	0.00	0.00	
10,800.00	89.51	270.07	7,996.08	509.60	-1,281.58	1,309.12	0.00	0.00	0.00	
10,900.00	89.51	270.07	7,996.94	509.72	-1,381.57	1,408.95	0.00	0.00	0.00	
11,000.00	89.51	270.07	7,997.79	509.84	-1,481.57	1,508.78	0.00	0.00	0.00	
11,100.00	89.51	270.07	7,998.65	509.96	-1,581.57	1,608.62	0.00	0.00	0.00	
11,200.00	89.51	270.07	7,999.50	510.08	-1,681.56	1,708.45	0.00	0.00	0.00	
11,300.00	89.51	270.07	8,000.36	510.20	-1,781.56	1,808.28	0.00	0.00	0.00	
11,400.00	89.51	270.07	8,001.21	510.31	-1,881.55	1,908.12	0.00	0.00	0.00	
11,500.00	89.51	270.07	8,002.07	510.43	-1,981.55	2,007.95	0.00	0.00	0.00	
11,600.00	89.51	270.07	8,002.92	510.55	-2,081.55	2,107.78	0.00	0.00	0.00	
11,700.00	89.51	270.07	8,003.78	510.67	-2,181.54	2,207.61	0.00	0.00	0.00	
11,800.00	89.51	270.07	8,004.63	510.79	-2,281.54	2,307.45	0.00	0.00	0.00	
11,900.00	89.51	270.07	8,005.49	510.91	-2,381.54	2,407.28	0.00	0.00	0.00	
12,000.00	89.51	270.07	8,006.34	511.03	-2,481.53	2,507.11	0.00	0.00	0.00	
12,100.00	89.51	270.07	8,007.19	511.14	-2,581.53	2,606.95	0.00	0.00	0.00	
12,200.00	89.51	270.07	8,008.05	511.26	-2,681.52	2,706.78	0.00	0.00	0.00	
12,300.00	89.51	270.07	8,008.90	511.38	-2,781.52	2,806.61	0.00	0.00	0.00	
12,400.00	89.51	270.07	8,009.76	511.50	-2,881.52	2,906.45	0.00	0.00	0.00	
12,500.00	89.51	270.07	8,010.61	511.62	-2,981.51	3,006.28	0.00	0.00	0.00	
12,600.00	89.51	270.07	8,011.47	511.74	-3,081.51	3,106.11	0.00	0.00	0.00	
12,700.00	89.51	270.07	8,012.32	511.85	-3,181.51	3,205.94	0.00	0.00	0.00	
12,800.00	89.51	270.07	8,013.18	511.97	-3,281.50	3,305.78	0.00	0.00	0.00	
12,900.00	89.51	270.07	8,014.03	512.09	-3,381.50	3,405.61	0.00	0.00	0.00	
13,000.00	89.51	270.07	8,014.89	512.21	-3,481.49	3,505.44	0.00	0.00	0.00	
13,100.00	89.51	270.07	8,015.74	512.33	-3,581.49	3,605.28	0.00	0.00	0.00	
13,200.00	89.51	270.07	8,016.60	512.45	-3,681.49	3,705.11	0.00	0.00	0.00	
13,300.00	89.51	270.07	8,017.45	512.56	-3,781.48	3,804.94	0.00	0.00	0.00	
13,400.00	89.51	270.07	8,018.31	512.68	-3,881.48	3,904.77	0.00	0.00	0.00	

ConocoPhillips

Planning Report

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

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)
13,500.00	89.51	270.07	8,019.16	512.80	-3,981.48	4,004.61	0.00	0.00	0.00
13,600.00	89.51	270.07	8,020.02	512.92	-4,081.47	4,104.44	0.00	0.00	0.00
13,700.00	89.51	270.07	8,020.87	513.04	-4,181.47	4,204.27	0.00	0.00	0.00
13,800.00	89.51	270.07	8,021.73	513.16	-4,281.46	4,304.11	0.00	0.00	0.00
13,900.00	89.51	270.07	8,022.58	513.28	-4,381.46	4,403.94	0.00	0.00	0.00
14,000.00	89.51	270.07	8,023.44	513.39	-4,481.46	4,503.77	0.00	0.00	0.00
14,100.00	89.51	270.07	8,024.29	513.51	-4,581.45	4,603.61	0.00	0.00	0.00
14,200.00	89.51	270.07	8,025.14	513.63	-4,681.45	4,703.44	0.00	0.00	0.00
14,300.00	89.51	270.07	8,026.00	513.75	-4,781.45	4,803.27	0.00	0.00	0.00
14,400.00	89.51	270.07	8,026.85	513.87	-4,881.44	4,903.10	0.00	0.00	0.00
14,500.00	89.51	270.07	8,027.71	513.99	-4,981.44	5,002.94	0.00	0.00	0.00
14,600.00	89.51	270.07	8,028.56	514.10	-5,081.44	5,102.77	0.00	0.00	0.00
14,700.00	89.51	270.07	8,029.42	514.22	-5,181.43	5,202.60	0.00	0.00	0.00
14,800.00	89.51	270.07	8,030.27	514.34	-5,281.43	5,302.44	0.00	0.00	0.00
14,900.00	89.51	270.07	8,031.13	514.46	-5,381.42	5,402.27	0.00	0.00	0.00
15,000.00	89.51	270.07	8,031.98	514.58	-5,481.42	5,502.10	0.00	0.00	0.00
15,100.00	89.51	270.07	8,032.84	514.70	-5,581.42	5,601.94	0.00	0.00	0.00
15,200.00	89.51	270.07	8,033.69	514.82	-5,681.41	5,701.77	0.00	0.00	0.00
15,300.00	89.51	270.07	8,034.55	514.93	-5,781.41	5,801.60	0.00	0.00	0.00
15,400.00	89.51	270.07	8,035.40	515.05	-5,881.41	5,901.43	0.00	0.00	0.00
15,500.00	89.51	270.07	8,036.26	515.17	-5,981.40	6,001.27	0.00	0.00	0.00
15,600.00	89.51	270.07	8,037.11	515.29	-6,081.40	6,101.10	0.00	0.00	0.00
15,700.00	89.51	270.07	8,037.97	515.41	-6,181.39	6,200.93	0.00	0.00	0.00
15,800.00	89.51	270.07	8,038.82	515.53	-6,281.39	6,300.77	0.00	0.00	0.00
15,900.00	89.51	270.07	8,039.68	515.64	-6,381.39	6,400.60	0.00	0.00	0.00
16,000.00	89.51	270.07	8,040.53	515.76	-6,481.38	6,500.43	0.00	0.00	0.00
16,100.00	89.51	270.07	8,041.39	515.88	-6,581.38	6,600.26	0.00	0.00	0.00
16,200.00	89.51	270.07	8,042.24	516.00	-6,681.38	6,700.10	0.00	0.00	0.00
16,300.00	89.51	270.07	8,043.09	516.12	-6,781.37	6,799.93	0.00	0.00	0.00
16,400.00	89.51	270.07	8,043.95	516.24	-6,881.37	6,899.76	0.00	0.00	0.00
16,500.00	89.51	270.07	8,044.80	516.36	-6,981.36	6,999.60	0.00	0.00	0.00
16,600.00	89.51	270.07	8,045.66	516.47	-7,081.36	7,099.43	0.00	0.00	0.00
16,700.00	89.51	270.07	8,046.51	516.59	-7,181.36	7,199.26	0.00	0.00	0.00
16,800.00	89.51	270.07	8,047.37	516.71	-7,281.35	7,299.10	0.00	0.00	0.00
16,900.00	89.51	270.07	8,048.22	516.83	-7,381.35	7,398.93	0.00	0.00	0.00
17,000.00	89.51	270.07	8,049.08	516.95	-7,481.35	7,498.76	0.00	0.00	0.00
17,100.00	89.51	270.07	8,049.93	517.07	-7,581.34	7,598.59	0.00	0.00	0.00
17,200.00	89.51	270.07	8,050.79	517.18	-7,681.34	7,698.43	0.00	0.00	0.00
17,300.00	89.51	270.07	8,051.64	517.30	-7,781.33	7,798.26	0.00	0.00	0.00
17,400.00	89.51	270.07	8,052.50	517.42	-7,881.33	7,898.09	0.00	0.00	0.00
17,500.00	89.51	270.07	8,053.35	517.54	-7,981.33	7,997.93	0.00	0.00	0.00
17,600.00	89.51	270.07	8,054.21	517.66	-8,081.32	8,097.76	0.00	0.00	0.00
17,700.00	89.51	270.07	8,055.06	517.78	-8,181.32	8,197.59	0.00	0.00	0.00
17,800.00	89.51	270.07	8,055.92	517.90	-8,281.32	8,297.42	0.00	0.00	0.00
17,900.00	89.51	270.07	8,056.77	518.01	-8,381.31	8,397.26	0.00	0.00	0.00
18,000.00	89.51	270.07	8,057.63	518.13	-8,481.31	8,497.09	0.00	0.00	0.00
18,100.00	89.51	270.07	8,058.48	518.25	-8,581.30	8,596.92	0.00	0.00	0.00
18,200.00	89.51	270.07	8,059.34	518.37	-8,681.30	8,696.76	0.00	0.00	0.00
18,262.00	89.51	270.07	8,059.86	518.44	-8,743.30	8,758.65	0.00	0.00	0.00
EPI 900' FSL 460' FWL									
18,300.00	89.51	270.07	8,060.19	518.49	-8,781.30	8,796.59	0.00	0.00	0.00
18,394.00	89.51	270.07	8,060.99	518.60	-8,875.29	8,890.43	0.00	0.00	0.00
BHL 900' FSL 325' FWL									
18,394.81	89.51	270.07	8,061.00	518.60	-8,876.10	8,891.24	0.00	0.00	0.00

ConocoPhillips

Planning Report

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

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)
TD at 18394.81 - Production									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Cottonwood Creek 4-65 - hit/miss target - Shape - plan hits target center - Point	0.00	0.00	7,977.00	506.96	950.87	1,670,012.677	3,241,365.249	39° 40' 11.480 N	104° 38' 33.260 W
Cottonwood Creek 4-65 - plan hits target center - Point	0.00	0.00	8,061.00	518.60	-8,876.11	1,669,931.937	3,231,538.762	39° 40' 11.580 N	104° 40' 38.930 W

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
2,220.00	2,220.00	Surface	9-5/8	12-1/4	
18,394.81	8,061.00	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 390' FSL 1410' FEL
2,320.00	2,320.00	0.00	0.00	Start Build 1.50
3,662.42	3,634.96	64.80	224.30	Start 3816.86 hold at 3662.42 MD
7,479.00	7,218.25	429.49	1,486.55	KOP 820' FSL 77' FWL
7,479.28	7,218.51	429.51	1,486.65	Start DLS 10.00 TFO -162.88
8,567.00	7,977.00	506.96	951.34	BPI 900' FSL 460' FEL
8,567.47	7,977.00	506.96	950.87	Start 9827.34 hold at 8567.47 MD
18,262.00	8,059.86	518.44	-8,743.30	EPI 900' FSL 460' FWL
18,394.00	8,060.99	518.60	-8,875.29	BHL 900' FSL 325' FWL
18,394.81	8,061.00	518.60	-8,876.10	TD at 18394.81



ConocoPhillips

Arapahoe County, Colorado

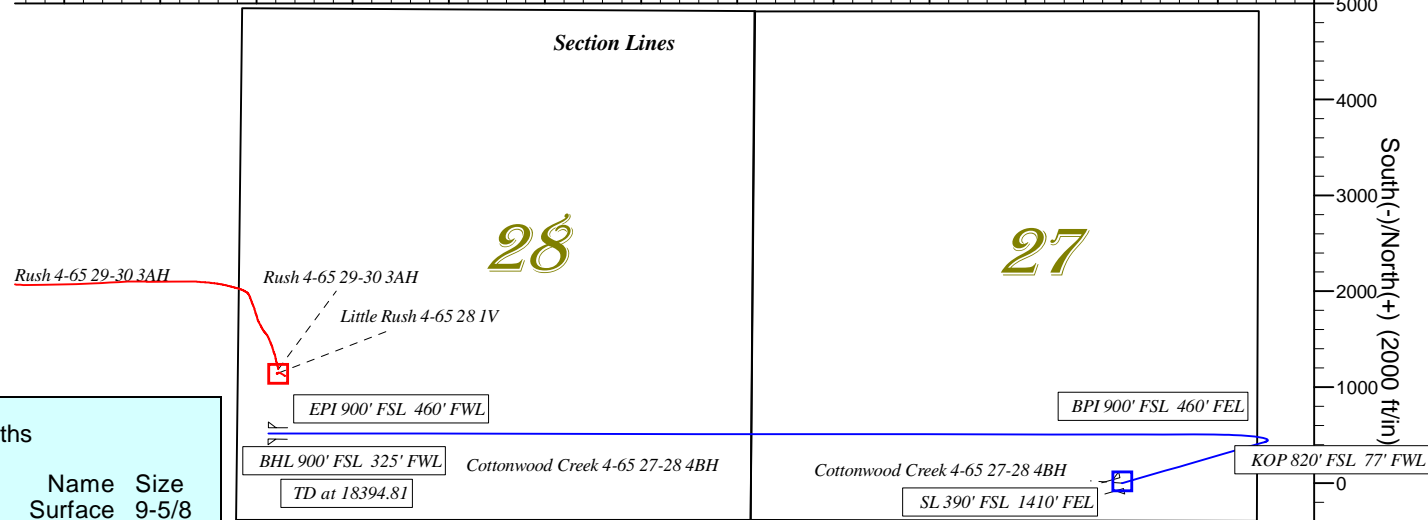
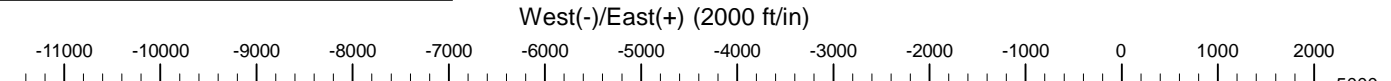
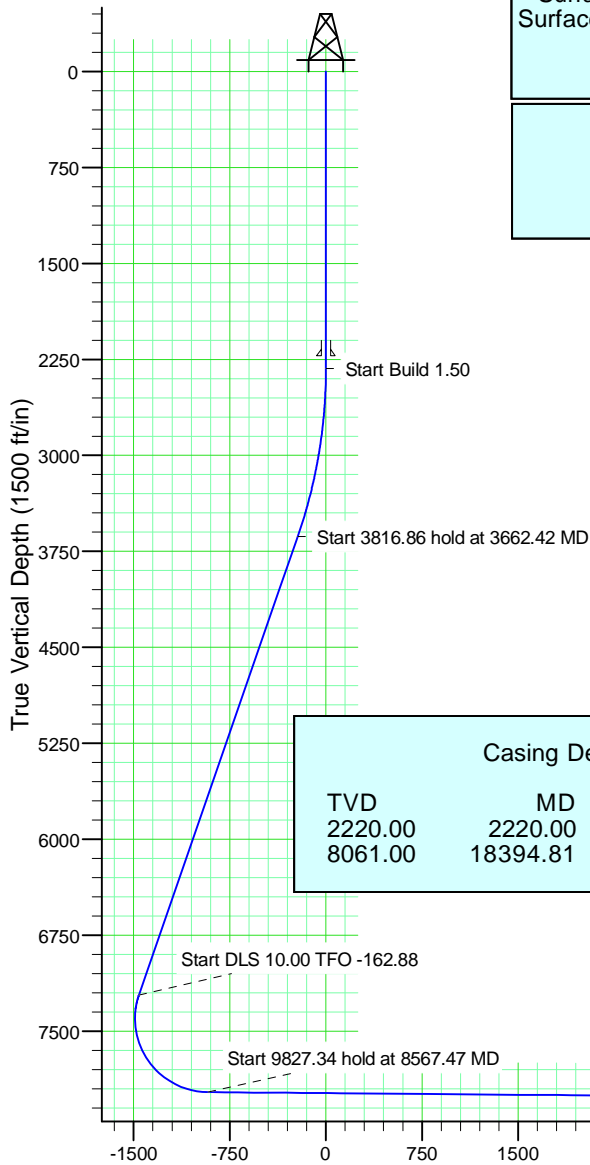
Cottonwood Creek 4-65 27-28 4BH

Ground Level: 5749.50
 Surface Location Latitude: 39° 40' 6.470 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
2320.00	0.00	0.00	2320.00	0.00	0.00	0.00	0.00
3662.42	20.14	73.89	3634.96	64.80	224.30	1.50	-220.14
7479.28	20.14	73.89	7218.51	429.51	1486.65	0.00	-1459.06
8567.47	89.51	270.07	7977.00	506.96	950.87	10.00	-919.68
18394.81	89.51	270.07	8061.00	518.60	-8876.11	0.00	8891.24

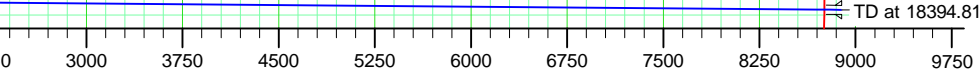


Casing Depths

TVD	MD	Name	Size
2220.00	2220.00	Surface	9-5/8
8061.00	18394.81	Production	5-1/2

Wellbore Targets

Name	TVD	Latitude	Longitude
Cottonwood Creek 4-65 27-28 4BH BPI	7977.00	39° 40' 11.480 N	104° 38' 33.260 W
Cottonwood Creek 4-65 27-28 4BH BHL	8061.00	39° 40' 11.580 N	104° 40' 38.930 W



Vertical Section at 273.34° (1500 ft/in)