

# **ConocoPhillips RBU Gold Data**

**Niobrara Central Zone**

**Grande**

**Grande 4-65 20-19 2BH**

**Grande 4-65 20-19 2BH**

**Plan: Design A**

## **Standard Planning Report**

**15 September, 2018**

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Grande 4-65 20-19 2BH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Site:</b>	Grande	<b>North Reference:</b>	True
<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

<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		Grande			
Site Position:		Northing:	1,679,554.079 usft	Latitude:	39° 41' 47.630 N
From:	Lat/Long	Easting:	3,220,569.758 usft	Longitude:	104° 42' 58.140 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.49 °

Well	Grande 4-65 20-19 2BH					
Well Position	+N/-S	-944.90 ft	Northing:	1,678,708.049 usft	Latitude:	39° 41' 38.267 N
	+E/-W	11,453.96 ft	Easting:	3,232,031.301 usft	Longitude:	104° 40' 31.613 W
Position Uncertainty		2.00 ft	Wellhead Elevation:	5,664.40 ft	Ground Level:	5,664.40 ft

<b>Wellbore</b>	Grande 4-65 20-19 2BH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2018	12/1/2018	8.14	66.28	51,851.31137737

Design	Design A			
Audit Notes:				
Version:	0	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	265.39

Plan Survey Tool Program		Date	9/15/2018		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	2,199.00	Design A (Grande 4-65 20-19 2BH)	Gyro-BM-MS	Gyro - bat/mem drop m/s
2	2,199.00	4,774.00	Design A (Grande 4-65 20-19 2BH)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
3	4,774.00	6,774.14	Design A (Grande 4-65 20-19 2BH)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
4	6,774.14	7,914.29	Design A (Grande 4-65 20-19 2BH)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
5	7,914.29	8,605.95	Design A (Grande 4-65 20-19 2BH)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic
6	8,605.95	18,438.85	Design A (Grande 4-65 20-19 2BH)	MWD+IFR_No SAG	MWD + IFR (No SAG) correctic

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<b>Site:</b>	Grande	<b>North Reference:</b>	True
<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

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	
4,774.00	0.00	0.00	4,774.00	0.00	0.00	0.00	0.00	0.00	0.00	
6,774.14	30.00	224.83	6,683.98	-362.96	-360.85	1.50	1.50	0.00	224.83	
7,914.29	30.00	224.83	7,671.36	-767.26	-762.81	0.00	0.00	0.00	0.00	
8,605.95	89.77	270.05	8,015.00	-906.98	-1,297.07	10.00	8.64	6.54	49.41	Grande 4-65 20-19 2BH
18,438.85	89.77	270.05	8,054.00	-898.40	-11,129.89	0.00	0.00	0.00	0.00	Grande 4-65 20-19 2BH

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<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Site:</b>	Grande	<b>North Reference:</b>	True
<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

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
SHL: 944' FNL, 835' FWL									
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
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
1,762.00	0.00	0.00	1,762.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Top									
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
1,999.00	0.00	0.00	1,999.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Top - Fox Hills Base									
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
2,199.00	0.00	0.00	2,199.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing - 9-5/8" Casing									
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00

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<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

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	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,774.00	0.00	0.00	4,774.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.39	224.83	4,800.00	-0.06	-0.06	0.07	1.50	1.50	0.00
4,900.00	1.89	224.83	4,899.98	-1.47	-1.47	1.58	1.50	1.50	0.00
5,000.00	3.39	224.83	4,999.87	-4.74	-4.71	5.08	1.50	1.50	0.00
5,100.00	4.89	224.83	5,099.60	-9.86	-9.80	10.56	1.50	1.50	0.00
5,200.00	6.39	224.83	5,199.12	-16.83	-16.73	18.03	1.50	1.50	0.00
5,300.00	7.89	224.83	5,298.34	-25.64	-25.49	27.47	1.50	1.50	0.00
5,400.00	9.39	224.83	5,397.20	-36.30	-36.09	38.89	1.50	1.50	0.00
5,500.00	10.89	224.83	5,495.64	-48.78	-48.50	52.27	1.50	1.50	0.00
5,600.00	12.39	224.83	5,593.58	-63.09	-62.72	67.60	1.50	1.50	0.00
5,700.00	13.89	224.83	5,690.96	-79.21	-78.75	84.87	1.50	1.50	0.00
5,800.00	15.39	224.83	5,787.71	-97.13	-96.57	104.07	1.50	1.50	0.00
5,900.00	16.89	224.83	5,883.76	-116.85	-116.17	125.19	1.50	1.50	0.00
6,000.00	18.39	224.83	5,979.06	-138.34	-137.53	148.22	1.50	1.50	0.00
6,100.00	19.89	224.83	6,073.53	-161.59	-160.65	173.13	1.50	1.50	0.00
6,200.00	21.39	224.83	6,167.11	-186.58	-185.50	199.91	1.50	1.50	0.00
6,300.00	22.89	224.83	6,259.73	-213.31	-212.07	228.55	1.50	1.50	0.00
6,400.00	24.39	224.83	6,351.34	-241.74	-240.34	259.01	1.50	1.50	0.00
6,500.00	25.89	224.83	6,441.86	-271.87	-270.29	291.29	1.50	1.50	0.00
6,600.00	27.39	224.83	6,531.24	-303.67	-301.91	325.36	1.50	1.50	0.00
6,700.00	28.89	224.83	6,619.42	-337.11	-335.16	361.19	1.50	1.50	0.00
6,774.14	30.00	224.83	6,683.98	-362.96	-360.85	388.89	1.50	1.50	0.00
<b>EOB: 1307' FNL, 474' FWL</b>									
6,800.00	30.00	224.83	6,706.38	-372.13	-369.97	398.71	0.00	0.00	0.00
6,900.00	30.00	224.83	6,792.98	-407.59	-405.23	436.70	0.00	0.00	0.00
7,000.00	30.00	224.83	6,879.58	-443.05	-440.48	474.70	0.00	0.00	0.00
7,100.00	30.00	224.83	6,966.18	-478.51	-475.73	512.69	0.00	0.00	0.00
7,200.00	30.00	224.83	7,052.78	-513.97	-510.99	550.68	0.00	0.00	0.00
7,300.00	30.00	224.83	7,139.38	-549.43	-546.24	588.68	0.00	0.00	0.00
7,400.00	30.00	224.83	7,225.98	-584.89	-581.50	626.67	0.00	0.00	0.00
7,500.00	30.00	224.83	7,312.58	-620.35	-616.75	664.66	0.00	0.00	0.00
7,600.00	30.00	224.83	7,399.18	-655.81	-652.01	702.66	0.00	0.00	0.00
7,700.00	30.00	224.83	7,485.78	-691.27	-687.26	740.65	0.00	0.00	0.00
7,800.00	30.00	224.83	7,572.38	-726.73	-722.52	778.64	0.00	0.00	0.00
7,900.00	30.00	224.83	7,658.98	-762.19	-757.77	816.64	0.00	0.00	0.00
7,914.29	30.00	224.83	7,671.36	-767.26	-762.81	822.07	0.00	0.00	0.00
<b>KOP: 1711' FNL, 72' FWL</b>									
7,950.00	32.43	229.89	7,701.90	-779.76	-776.43	836.65	10.00	6.79	14.17
8,000.00	36.11	235.90	7,743.23	-796.67	-798.90	860.41	10.00	7.37	12.02
8,050.00	40.05	240.91	7,782.58	-812.76	-825.18	887.89	10.00	7.87	10.01
8,100.00	44.17	245.14	7,819.68	-827.91	-855.06	918.90	10.00	8.24	8.47
8,115.97	45.51	246.36	7,831.00	-832.53	-865.33	929.50	10.00	8.43	7.64
<b>Niobrara Top</b>									
8,150.00	48.42	248.79	7,854.22	-842.01	-888.32	953.18	10.00	8.54	7.11
8,200.00	52.77	251.97	7,885.96	-854.95	-924.70	990.49	10.00	8.71	6.37
8,250.00	57.20	254.81	7,914.64	-866.62	-963.94	1,030.54	10.00	8.86	5.67
8,300.00	61.69	257.37	7,940.06	-876.95	-1,005.72	1,073.02	10.00	8.97	5.13
8,350.00	66.22	259.72	7,962.01	-885.85	-1,049.74	1,117.61	10.00	9.06	4.71
8,400.00	70.79	261.92	7,980.33	-893.26	-1,095.65	1,163.97	10.00	9.13	4.39
8,450.00	75.37	263.99	7,994.88	-899.11	-1,143.11	1,211.74	10.00	9.18	4.15
8,496.90	79.69	265.86	8,005.00	-903.15	-1,188.72	1,257.52	10.00	9.21	3.99
<b>D Chalk Top</b>									

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<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

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)
8,500.00	79.98	265.98	8,005.55	-903.37	-1,191.76	1,260.57	10.00	9.23	3.92
8,550.00	84.60	267.92	8,012.25	-906.00	-1,241.22	1,310.09	10.00	9.24	3.87
8,600.00	89.22	269.82	8,014.95	-906.98	-1,291.12	1,359.91	10.00	9.25	3.81
8,605.95	89.77	270.05	8,015.00	-906.98	-1,297.07	1,365.84	9.99	9.24	3.79
BPI/LP: 1848' FNL, 460' FEL									
8,700.00	89.77	270.05	8,015.37	-906.90	-1,391.12	1,459.57	0.00	0.00	0.00
8,800.00	89.77	270.05	8,015.77	-906.82	-1,491.12	1,559.24	0.00	0.00	0.00
8,900.00	89.77	270.05	8,016.17	-906.73	-1,591.12	1,658.91	0.00	0.00	0.00
9,000.00	89.77	270.05	8,016.56	-906.64	-1,691.12	1,758.58	0.00	0.00	0.00
9,100.00	89.77	270.05	8,016.96	-906.55	-1,791.12	1,858.25	0.00	0.00	0.00
9,200.00	89.77	270.05	8,017.36	-906.47	-1,891.12	1,957.91	0.00	0.00	0.00
9,300.00	89.77	270.05	8,017.75	-906.38	-1,991.12	2,057.58	0.00	0.00	0.00
9,400.00	89.77	270.05	8,018.15	-906.29	-2,091.11	2,157.25	0.00	0.00	0.00
9,500.00	89.77	270.05	8,018.55	-906.21	-2,191.11	2,256.92	0.00	0.00	0.00
9,600.00	89.77	270.05	8,018.94	-906.12	-2,291.11	2,356.59	0.00	0.00	0.00
9,700.00	89.77	270.05	8,019.34	-906.03	-2,391.11	2,456.25	0.00	0.00	0.00
9,800.00	89.77	270.05	8,019.74	-905.94	-2,491.11	2,555.92	0.00	0.00	0.00
9,900.00	89.77	270.05	8,020.13	-905.86	-2,591.11	2,655.59	0.00	0.00	0.00
10,000.00	89.77	270.05	8,020.53	-905.77	-2,691.11	2,755.26	0.00	0.00	0.00
10,100.00	89.77	270.05	8,020.93	-905.68	-2,791.11	2,854.93	0.00	0.00	0.00
10,200.00	89.77	270.05	8,021.32	-905.60	-2,891.11	2,954.59	0.00	0.00	0.00
10,300.00	89.77	270.05	8,021.72	-905.51	-2,991.11	3,054.26	0.00	0.00	0.00
10,400.00	89.77	270.05	8,022.12	-905.42	-3,091.11	3,153.93	0.00	0.00	0.00
10,500.00	89.77	270.05	8,022.51	-905.33	-3,191.11	3,253.60	0.00	0.00	0.00
10,600.00	89.77	270.05	8,022.91	-905.25	-3,291.10	3,353.27	0.00	0.00	0.00
10,700.00	89.77	270.05	8,023.31	-905.16	-3,391.10	3,452.93	0.00	0.00	0.00
10,800.00	89.77	270.05	8,023.70	-905.07	-3,491.10	3,552.60	0.00	0.00	0.00
10,900.00	89.77	270.05	8,024.10	-904.99	-3,591.10	3,652.27	0.00	0.00	0.00
11,000.00	89.77	270.05	8,024.50	-904.90	-3,691.10	3,751.94	0.00	0.00	0.00
11,100.00	89.77	270.05	8,024.89	-904.81	-3,791.10	3,851.61	0.00	0.00	0.00
11,200.00	89.77	270.05	8,025.29	-904.72	-3,891.10	3,951.27	0.00	0.00	0.00
11,300.00	89.77	270.05	8,025.69	-904.64	-3,991.10	4,050.94	0.00	0.00	0.00
11,400.00	89.77	270.05	8,026.08	-904.55	-4,091.10	4,150.61	0.00	0.00	0.00
11,500.00	89.77	270.05	8,026.48	-904.46	-4,191.10	4,250.28	0.00	0.00	0.00
11,600.00	89.77	270.05	8,026.88	-904.38	-4,291.10	4,349.95	0.00	0.00	0.00
11,700.00	89.77	270.05	8,027.27	-904.29	-4,391.10	4,449.61	0.00	0.00	0.00
11,800.00	89.77	270.05	8,027.67	-904.20	-4,491.09	4,549.28	0.00	0.00	0.00
11,900.00	89.77	270.05	8,028.07	-904.12	-4,591.09	4,648.95	0.00	0.00	0.00
12,000.00	89.77	270.05	8,028.46	-904.03	-4,691.09	4,748.62	0.00	0.00	0.00
12,100.00	89.77	270.05	8,028.86	-903.94	-4,791.09	4,848.29	0.00	0.00	0.00
12,200.00	89.77	270.05	8,029.26	-903.85	-4,891.09	4,947.95	0.00	0.00	0.00
12,300.00	89.77	270.05	8,029.65	-903.77	-4,991.09	5,047.62	0.00	0.00	0.00
12,400.00	89.77	270.05	8,030.05	-903.68	-5,091.09	5,147.29	0.00	0.00	0.00
12,500.00	89.77	270.05	8,030.45	-903.59	-5,191.09	5,246.96	0.00	0.00	0.00
12,600.00	89.77	270.05	8,030.84	-903.51	-5,291.09	5,346.63	0.00	0.00	0.00
12,700.00	89.77	270.05	8,031.24	-903.42	-5,391.09	5,446.29	0.00	0.00	0.00
12,800.00	89.77	270.05	8,031.63	-903.33	-5,491.09	5,545.96	0.00	0.00	0.00
12,900.00	89.77	270.05	8,032.03	-903.24	-5,591.09	5,645.63	0.00	0.00	0.00
13,000.00	89.77	270.05	8,032.43	-903.16	-5,691.08	5,745.30	0.00	0.00	0.00
13,100.00	89.77	270.05	8,032.82	-903.07	-5,791.08	5,844.97	0.00	0.00	0.00
13,200.00	89.77	270.05	8,033.22	-902.98	-5,891.08	5,944.63	0.00	0.00	0.00
13,300.00	89.77	270.05	8,033.62	-902.90	-5,991.08	6,044.30	0.00	0.00	0.00
13,400.00	89.77	270.05	8,034.01	-902.81	-6,091.08	6,143.97	0.00	0.00	0.00

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Grande 4-65 20-19 2BH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Site:</b>	Grande	<b>North Reference:</b>	True
<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

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	89.77	270.05	8,034.41	-902.72	-6,191.08	6,243.64	0.00	0.00	0.00
13,600.00	89.77	270.05	8,034.81	-902.63	-6,291.08	6,343.31	0.00	0.00	0.00
13,700.00	89.77	270.05	8,035.20	-902.55	-6,391.08	6,442.97	0.00	0.00	0.00
13,800.00	89.77	270.05	8,035.60	-902.46	-6,491.08	6,542.64	0.00	0.00	0.00
13,900.00	89.77	270.05	8,036.00	-902.37	-6,591.08	6,642.31	0.00	0.00	0.00
14,000.00	89.77	270.05	8,036.39	-902.29	-6,691.08	6,741.98	0.00	0.00	0.00
14,100.00	89.77	270.05	8,036.79	-902.20	-6,791.08	6,841.65	0.00	0.00	0.00
14,200.00	89.77	270.05	8,037.19	-902.11	-6,891.07	6,941.31	0.00	0.00	0.00
14,300.00	89.77	270.05	8,037.58	-902.02	-6,991.07	7,040.98	0.00	0.00	0.00
14,400.00	89.77	270.05	8,037.98	-901.94	-7,091.07	7,140.65	0.00	0.00	0.00
14,500.00	89.77	270.05	8,038.38	-901.85	-7,191.07	7,240.32	0.00	0.00	0.00
14,600.00	89.77	270.05	8,038.77	-901.76	-7,291.07	7,339.99	0.00	0.00	0.00
14,700.00	89.77	270.05	8,039.17	-901.68	-7,391.07	7,439.65	0.00	0.00	0.00
14,800.00	89.77	270.05	8,039.57	-901.59	-7,491.07	7,539.32	0.00	0.00	0.00
14,900.00	89.77	270.05	8,039.96	-901.50	-7,591.07	7,638.99	0.00	0.00	0.00
15,000.00	89.77	270.05	8,040.36	-901.42	-7,691.07	7,738.66	0.00	0.00	0.00
15,100.00	89.77	270.05	8,040.76	-901.33	-7,791.07	7,838.33	0.00	0.00	0.00
15,200.00	89.77	270.05	8,041.15	-901.24	-7,891.07	7,937.99	0.00	0.00	0.00
15,300.00	89.77	270.05	8,041.55	-901.15	-7,991.07	8,037.66	0.00	0.00	0.00
15,400.00	89.77	270.05	8,041.95	-901.07	-8,091.06	8,137.33	0.00	0.00	0.00
15,500.00	89.77	270.05	8,042.34	-900.98	-8,191.06	8,237.00	0.00	0.00	0.00
15,600.00	89.77	270.05	8,042.74	-900.89	-8,291.06	8,336.67	0.00	0.00	0.00
15,700.00	89.77	270.05	8,043.14	-900.81	-8,391.06	8,436.33	0.00	0.00	0.00
15,800.00	89.77	270.05	8,043.53	-900.72	-8,491.06	8,536.00	0.00	0.00	0.00
15,900.00	89.77	270.05	8,043.93	-900.63	-8,591.06	8,635.67	0.00	0.00	0.00
16,000.00	89.77	270.05	8,044.33	-900.54	-8,691.06	8,735.34	0.00	0.00	0.00
16,100.00	89.77	270.05	8,044.72	-900.46	-8,791.06	8,835.01	0.00	0.00	0.00
16,200.00	89.77	270.05	8,045.12	-900.37	-8,891.06	8,934.67	0.00	0.00	0.00
16,300.00	89.77	270.05	8,045.52	-900.28	-8,991.06	9,034.34	0.00	0.00	0.00
16,400.00	89.77	270.05	8,045.91	-900.20	-9,091.06	9,134.01	0.00	0.00	0.00
16,500.00	89.77	270.05	8,046.31	-900.11	-9,191.06	9,233.68	0.00	0.00	0.00
16,600.00	89.77	270.05	8,046.71	-900.02	-9,291.06	9,333.35	0.00	0.00	0.00
16,700.00	89.77	270.05	8,047.10	-899.93	-9,391.05	9,433.01	0.00	0.00	0.00
16,800.00	89.77	270.05	8,047.50	-899.85	-9,491.05	9,532.68	0.00	0.00	0.00
16,900.00	89.77	270.05	8,047.90	-899.76	-9,591.05	9,632.35	0.00	0.00	0.00
17,000.00	89.77	270.05	8,048.29	-899.67	-9,691.05	9,732.02	0.00	0.00	0.00
17,100.00	89.77	270.05	8,048.69	-899.59	-9,791.05	9,831.69	0.00	0.00	0.00
17,200.00	89.77	270.05	8,049.09	-899.50	-9,891.05	9,931.35	0.00	0.00	0.00
17,300.00	89.77	270.05	8,049.48	-899.41	-9,991.05	10,031.02	0.00	0.00	0.00
17,400.00	89.77	270.05	8,049.88	-899.32	-10,091.05	10,130.69	0.00	0.00	0.00
17,500.00	89.77	270.05	8,050.28	-899.24	-10,191.05	10,230.36	0.00	0.00	0.00
17,600.00	89.77	270.05	8,050.67	-899.15	-10,291.05	10,330.03	0.00	0.00	0.00
17,700.00	89.77	270.05	8,051.07	-899.06	-10,391.05	10,429.69	0.00	0.00	0.00
17,800.00	89.77	270.05	8,051.47	-898.98	-10,491.05	10,529.36	0.00	0.00	0.00
17,900.00	89.77	270.05	8,051.86	-898.89	-10,591.04	10,629.03	0.00	0.00	0.00
18,000.00	89.77	270.05	8,052.26	-898.80	-10,691.04	10,728.70	0.00	0.00	0.00
18,100.00	89.77	270.05	8,052.66	-898.72	-10,791.04	10,828.37	0.00	0.00	0.00
18,200.00	89.77	270.05	8,053.05	-898.63	-10,891.04	10,928.03	0.00	0.00	0.00
18,300.00	89.77	270.05	8,053.45	-898.54	-10,991.04	11,027.70	0.00	0.00	0.00
18,400.00	89.77	270.05	8,053.85	-898.45	-11,091.04	11,127.37	0.00	0.00	0.00
18,438.85	89.77	270.05	8,054.00	-898.40	-11,129.89	11,166.09	0.00	0.00	0.00
BHL: 1848' FNL, 325' FWL									

# ConocoPhillips

## Planning Report

<b>Database:</b>	EDT 14 Central Planning	<b>Local Co-ordinate Reference:</b>	Well Grande 4-65 20-19 2BH
<b>Company:</b>	ConocoPhillips RBU Gold Data	<b>TVD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Project:</b>	Niobrara Central Zone	<b>MD Reference:</b>	25' RKB @ 5689.40ft (25' RKB)
<b>Site:</b>	Grande	<b>North Reference:</b>	True
<b>Well:</b>	Grande 4-65 20-19 2BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Grande 4-65 20-19 2BH		
<b>Design:</b>	Design A		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
Grande 4-65 20-19 2BH	0.00	0.00	8,015.00	-906.98	-1,297.07	1,677,789.341	3,230,742.536	39° 41' 29.303 N	104° 40' 48.205 W
- plan hits target center									
- Point									
Grande 4-65 20-19 2BH	0.00	0.00	8,054.00	-898.40	-11,129.89	1,677,708.679	3,220,910.166	39° 41' 29.364 N	104° 42' 53.989 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
2,199.00	2,199.00	9-5/8" Casing		9-5/8	12-1/4
18,438.85	8,054.00	5-1/2" Casing		5-1/2	8-1/2

Formations					
Measured Depth	Vertical Depth	Name		Lithology	Dip
(ft)	(ft)				(°)
1,762.00	1,762.00	Fox Hills Top			0.00
1,999.00	1,999.00	Pierre Top - Fox Hills Base			0.00
2,199.00	2,199.00	Surface Casing			0.00
8,115.97	7,831.00	Niobrara Top			0.00
8,496.90	8,005.00	D Chalk Top			0.00

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
(ft)	(ft)	(ft)	(ft)	
100.00	100.00	0.00	0.00	SHL: 944' FNL, 835' FWL
6,774.14	6,683.98	-362.96	-360.85	EOB: 1307' FNL, 474' FWL
7,914.29	7,671.36	-767.26	-762.81	KOP: 1711' FNL, 72' FWL
8,605.95	8,015.00	-906.98	-1,297.07	BPI/LP: 1848' FNL, 460' FEL
18,438.85	8,054.00	-898.40	-11,129.89	BHL: 1848' FNL, 325' FWL