

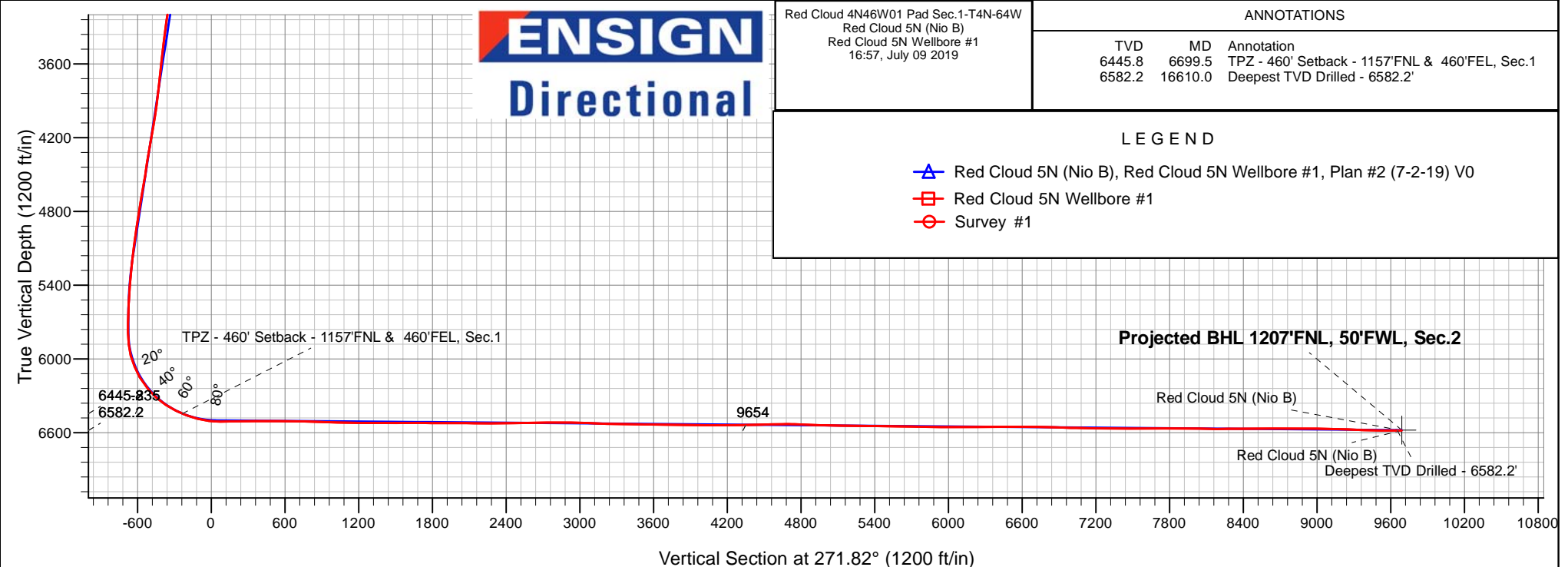
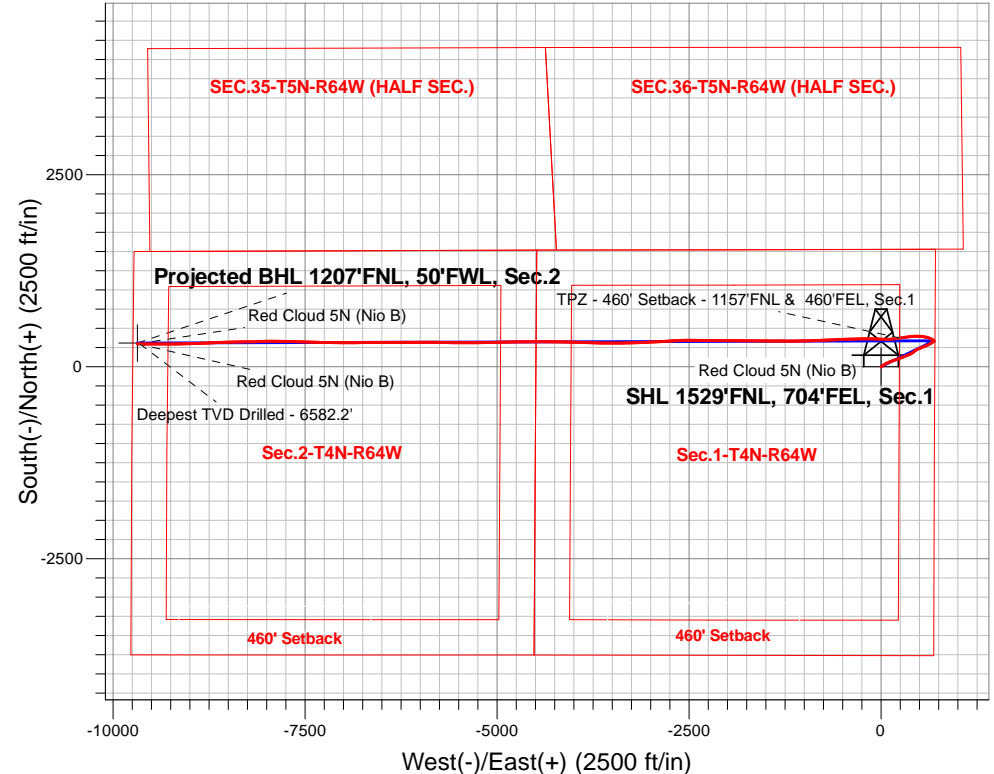
# PDC Energy Inc. DJ Basin

Well Name: **Red Cloud 5N (Nio B)**

Surface Location: Red Cloud 4N46W01 Pad Sec.1-T4N-64W  
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 4602.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1369932.56 3280945.26 40.344483 -104.492061  
 Original Well Elev WELL @ 4625.0ft (Original Well Elev)

## FINAL SURVEY

**Projected Bottom Hole Location**  
**16,645'MD 6582'TVD 295'N & 9685'W of SHL**  
**89.97 degree Incl @ 270.09 degree AZM**



**ENSIGN**  
**Directional**

Red Cloud 4N46W01 Pad Sec.1-T4N-64W  
 Red Cloud 5N (Nio B)  
 Red Cloud 5N Wellbore #1  
 16:57, July 09 2019

### ANNOTATIONS

TVD	MD	Annotation
6445.8	6699.5	TPZ - 460' Setback - 1157'FNL & 460'FEL, Sec.1
6582.2	16610.0	Deepest TVD Drilled - 6582.2'

### LEGEND

- Red Cloud 5N (Nio B), Red Cloud 5N Wellbore #1, Plan #2 (7-2-19) V0
- Red Cloud 5N Wellbore #1
- Survey #1



## **PDC Energy Inc. DJ Basin**

**SEC.1-T4N-R64W**

**Red Cloud 4N46W01 Pad Sec.1-T4N-64W**

**Red Cloud 5N (Nio B)**

**Red Cloud 5N Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**09 July, 2019**

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Red Cloud 5N (Nio B)
<b>Project:</b>	SEC.1-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

<b>Project</b>	SEC.1-T4N-R64W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site	Red Cloud 4N46W01 Pad Sec.1-T4N-64W				
Site Position:		Northing:	1,369,932.80 usft	Latitude:	40.344481
From:	Lat/Long	Easting:	3,281,020.19 usft	Longitude:	-104.491793
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.65 °

Well	Red Cloud 5N (Nio B)					
Well Position	+N/-S	0.0 ft	Northing:	1,369,932.56 usft	Latitude:	40.344483
	+E/-W	0.0 ft	Easting:	3,280,945.26 usft	Longitude:	-104.492061
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,602.0 ft

<b>Wellbore</b>	Red Cloud 5N Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	7/2/2019	8.08	66.88	52,140

<b>Design</b>	Red Cloud 5N Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	271.82	

<b>Survey Program</b>	<b>Date</b>	7/9/2019			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
155.0	16,645.0	Survey #1 (Red Cloud 5N Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
155.0	0.14	167.10	155.0	-0.2	0.0	0.0	0.09	0.09	0.00	
250.0	0.37	166.89	250.0	-0.6	0.1	-0.2	0.24	0.24	-0.22	
346.0	0.45	155.34	346.0	-1.2	0.4	-0.4	0.12	0.08	-12.03	
441.0	0.59	134.98	441.0	-1.9	0.9	-0.9	0.24	0.15	-21.43	
536.0	0.50	156.61	536.0	-2.7	1.4	-1.5	0.23	-0.09	22.77	
631.0	0.62	162.86	631.0	-3.5	1.7	-1.8	0.14	0.13	6.58	
725.0	1.83	70.49	725.0	-3.5	3.3	-3.4	2.08	1.29	-98.27	
821.0	3.45	56.22	820.9	-1.4	7.1	-7.1	1.81	1.69	-14.86	
915.0	4.83	44.01	914.6	3.0	12.2	-12.1	1.73	1.47	-12.99	

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Red Cloud 5N (Nio B)
<b>Project:</b>	SEC.1-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,010.0	6.06	45.33	1,009.2	9.4	18.6	-18.2	1.30	1.29	1.39	
1,106.0	6.06	45.14	1,104.6	16.6	25.7	-25.2	0.02	0.00	-0.20	
1,201.0	7.16	52.82	1,199.0	23.7	34.0	-33.3	1.48	1.16	8.08	
1,296.0	7.86	61.50	1,293.2	30.4	44.4	-43.5	1.40	0.74	9.14	
1,392.0	9.53	65.24	1,388.1	36.8	57.4	-56.2	1.84	1.74	3.90	
1,487.0	9.71	68.26	1,481.8	43.1	72.0	-70.6	0.56	0.19	3.18	
1,581.0	8.70	67.37	1,574.6	48.8	85.9	-84.4	1.09	-1.07	-0.95	
1,633.0	8.57	66.64	1,626.0	51.8	93.1	-91.4	0.33	-0.25	-1.40	
1,771.0	8.00	60.92	1,762.5	60.5	111.0	-109.0	0.73	-0.41	-4.14	
1,865.0	9.98	69.86	1,855.4	66.5	124.3	-122.2	2.57	2.11	9.51	
1,960.0	9.50	71.19	1,949.0	71.9	139.5	-137.1	0.56	-0.51	1.40	
2,056.0	11.08	71.92	2,043.5	77.3	155.7	-153.2	1.65	1.65	0.76	
2,151.0	10.78	71.88	2,136.7	82.9	172.9	-170.2	0.32	-0.32	-0.04	
2,245.0	10.21	73.60	2,229.2	88.0	189.2	-186.3	0.69	-0.61	1.83	
2,340.0	9.17	70.15	2,322.8	92.9	204.4	-201.4	1.25	-1.09	-3.63	
2,434.0	11.78	69.86	2,415.2	98.8	220.5	-217.2	2.78	2.78	-0.31	
2,529.0	11.48	67.90	2,508.3	105.7	238.3	-234.9	0.52	-0.32	-2.06	
2,623.0	11.22	67.67	2,600.4	112.7	255.5	-251.8	0.28	-0.28	-0.24	
2,718.0	11.09	68.09	2,693.6	119.6	272.5	-268.6	0.16	-0.14	0.44	
2,812.0	10.41	66.86	2,786.0	126.3	288.7	-284.5	0.76	-0.72	-1.31	
2,907.0	9.76	69.23	2,879.5	132.5	304.1	-299.7	0.81	-0.68	2.49	
3,001.0	11.76	69.59	2,971.9	138.7	320.5	-316.0	2.13	2.13	0.38	
3,095.0	11.28	70.02	3,064.0	145.2	338.1	-333.4	0.52	-0.51	0.46	
3,189.0	9.94	68.59	3,156.4	151.3	354.3	-349.4	1.45	-1.43	-1.52	
3,285.0	9.40	66.23	3,251.0	157.5	369.2	-364.1	0.70	-0.56	-2.46	
3,379.0	8.51	61.03	3,343.9	163.9	382.3	-377.0	1.28	-0.95	-5.53	
3,474.0	8.08	58.15	3,437.9	170.9	394.2	-388.5	0.63	-0.45	-3.03	
3,570.0	7.96	56.26	3,532.9	178.1	405.4	-399.6	0.30	-0.13	-1.97	
3,665.0	7.85	52.85	3,627.0	185.7	416.1	-410.0	0.51	-0.12	-3.59	
3,760.0	7.57	50.41	3,721.2	193.6	426.1	-419.7	0.45	-0.29	-2.57	
3,855.0	9.21	52.73	3,815.1	202.2	436.9	-430.3	1.76	1.73	2.44	
3,950.0	9.67	48.95	3,908.9	212.0	449.0	-442.1	0.81	0.48	-3.98	
4,045.0	9.93	64.78	4,002.5	220.8	462.4	-455.2	2.84	0.27	16.66	
4,140.0	9.58	65.17	4,096.1	227.6	477.0	-469.6	0.37	-0.37	0.41	
4,235.0	11.34	68.73	4,189.5	234.3	492.9	-485.2	1.97	1.85	3.75	
4,330.0	11.17	69.03	4,282.7	241.0	510.2	-502.3	0.19	-0.18	0.32	
4,425.0	10.20	68.96	4,376.1	247.3	526.6	-518.5	1.02	-1.02	-0.07	
4,520.0	8.34	63.85	4,469.8	253.3	540.7	-532.4	2.14	-1.96	-5.38	
4,615.0	11.23	70.10	4,563.4	259.5	555.6	-547.0	3.24	3.04	6.58	
4,711.0	10.68	67.21	4,657.7	266.1	572.5	-563.8	0.81	-0.57	-3.01	
4,806.0	10.08	63.64	4,751.1	273.3	588.1	-579.2	0.93	-0.63	-3.76	
4,901.0	10.20	65.89	4,844.6	280.4	603.2	-594.0	0.44	0.13	2.37	
4,996.0	9.07	66.62	4,938.3	286.8	617.8	-608.4	1.20	-1.19	0.77	
5,090.0	10.11	59.79	5,031.0	293.9	631.7	-622.1	1.64	1.11	-7.27	

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<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,186.0	8.42	58.74	5,125.7	301.8	645.0	-635.1	1.77	-1.76	-1.09
5,280.0	7.47	57.26	5,218.8	308.6	656.0	-645.9	1.03	-1.01	-1.57
5,375.0	6.05	57.85	5,313.2	314.6	665.5	-655.2	1.50	-1.49	0.62
5,564.0	3.96	55.86	5,501.4	323.6	679.3	-668.7	1.11	-1.11	-1.05
5,659.0	3.25	59.44	5,596.2	326.8	684.3	-673.6	0.78	-0.75	3.77
5,755.0	2.34	37.79	5,692.1	329.8	687.9	-677.1	1.44	-0.95	-22.55
5,850.0	2.64	351.82	5,787.1	333.5	688.8	-677.8	2.07	0.32	-48.39
5,945.0	8.44	309.84	5,881.6	340.1	683.1	-672.0	7.07	6.11	-44.19
6,040.0	16.83	301.00	5,974.2	351.7	665.9	-654.4	9.04	8.83	-9.31
6,136.0	24.24	295.96	6,064.1	367.5	636.2	-624.3	7.93	7.72	-5.25
6,231.0	31.17	284.70	6,148.2	382.3	594.8	-582.4	9.11	7.29	-11.85
6,355.0	40.28	273.69	6,248.8	393.0	523.6	-510.9	8.97	7.35	-8.88
6,450.0	47.88	269.37	6,317.1	394.6	457.6	-444.9	8.60	8.00	-4.55
6,545.0	57.94	264.14	6,374.3	390.1	382.1	-369.5	11.46	10.59	-5.51
6,640.0	63.22	262.15	6,420.9	380.2	300.0	-287.8	5.85	5.56	-2.09
6,699.5	67.43	260.76	6,445.8	372.2	246.5	-234.6	7.38	7.07	-2.33
TPZ - 460' Setback - 1157'FNL & 460'FEL, Sec.1									
6,734.0	69.87	260.00	6,458.3	366.8	214.8	-203.1	7.38	7.08	-2.22
6,829.0	75.59	267.15	6,486.6	356.7	124.8	-113.4	9.37	6.02	7.53
6,924.0	82.70	271.14	6,504.5	355.4	31.6	-20.3	8.54	7.48	4.20
7,020.0	90.21	273.20	6,510.4	359.0	-64.1	75.4	8.11	7.82	2.15
7,115.0	91.34	270.99	6,509.1	362.5	-159.0	170.4	2.61	1.19	-2.33
7,211.0	90.68	268.56	6,507.4	362.1	-255.0	266.3	2.62	-0.69	-2.53
7,306.0	90.36	267.98	6,506.5	359.2	-349.9	361.2	0.70	-0.34	-0.61
7,402.0	90.21	267.76	6,506.1	355.7	-445.9	456.9	0.28	-0.16	-0.23
7,497.0	89.55	268.21	6,506.3	352.3	-540.8	551.7	0.84	-0.69	0.47
7,688.0	88.94	267.49	6,508.8	345.2	-731.7	742.2	0.49	-0.32	-0.38
7,784.0	88.15	267.15	6,511.2	340.7	-827.5	837.9	0.90	-0.82	-0.35
7,880.0	87.54	266.58	6,514.8	335.4	-923.3	933.5	0.87	-0.64	-0.59
7,975.0	88.92	269.62	6,517.8	332.3	-1,018.2	1,028.2	3.51	1.45	3.20
8,071.0	88.51	269.96	6,519.9	331.9	-1,114.2	1,124.1	0.55	-0.43	0.35
8,167.0	90.24	270.74	6,521.0	332.5	-1,210.2	1,220.1	1.98	1.80	0.81
8,262.0	89.77	270.59	6,521.0	333.6	-1,305.2	1,315.1	0.52	-0.49	-0.16
8,358.0	89.36	270.17	6,521.7	334.3	-1,401.2	1,411.0	0.61	-0.43	-0.44
8,453.0	90.67	270.44	6,521.7	334.8	-1,496.2	1,506.0	1.41	1.38	0.28
8,548.0	90.26	270.47	6,520.9	335.5	-1,591.1	1,601.0	0.43	-0.43	0.03
8,644.0	89.69	270.33	6,520.9	336.2	-1,687.1	1,696.9	0.61	-0.59	-0.15
8,739.0	89.03	269.93	6,522.0	336.4	-1,782.1	1,791.9	0.81	-0.69	-0.42
8,835.0	90.52	270.37	6,522.4	336.7	-1,878.1	1,887.9	1.62	1.55	0.46
8,930.0	90.34	270.76	6,521.7	337.6	-1,973.1	1,982.8	0.45	-0.19	0.41
9,025.0	89.63	270.45	6,521.7	338.6	-2,068.1	2,077.8	0.82	-0.75	-0.33
9,121.0	88.78	270.24	6,523.0	339.2	-2,164.1	2,173.8	0.91	-0.89	-0.22
9,216.0	90.47	270.90	6,523.6	340.1	-2,259.1	2,268.7	1.91	1.78	0.69

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<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,311.0	90.27	270.95	6,523.0	341.7	-2,354.1	2,363.7	0.22	-0.21	0.05
9,406.0	89.41	270.94	6,523.3	343.2	-2,449.1	2,458.7	0.91	-0.91	-0.01
9,502.0	91.34	268.43	6,522.7	342.7	-2,545.1	2,554.6	3.30	2.01	-2.61
9,598.0	91.59	267.08	6,520.2	338.9	-2,640.9	2,650.4	1.43	0.26	-1.41
9,693.0	91.16	266.74	6,517.9	333.8	-2,735.8	2,745.0	0.58	-0.45	-0.36
9,789.0	89.68	266.59	6,517.2	328.2	-2,831.6	2,840.6	1.55	-1.54	-0.16
9,884.0	89.22	266.59	6,518.1	322.6	-2,926.4	2,935.2	0.48	-0.48	0.00
9,980.0	88.38	267.72	6,520.1	317.8	-3,022.3	3,030.8	1.47	-0.88	1.18
10,075.0	86.63	268.00	6,524.3	314.3	-3,117.1	3,125.5	1.87	-1.84	0.29
10,170.0	88.48	267.30	6,528.3	310.4	-3,212.0	3,220.2	2.08	1.95	-0.74
10,266.0	88.85	267.89	6,530.6	306.4	-3,307.9	3,315.9	0.73	0.39	0.61
10,361.0	89.69	270.16	6,531.8	304.7	-3,402.8	3,410.8	2.55	0.88	2.39
10,552.0	89.01	271.51	6,534.0	307.5	-3,593.8	3,601.7	0.79	-0.36	0.71
10,648.0	88.66	271.14	6,535.9	309.7	-3,689.7	3,697.7	0.53	-0.36	-0.39
10,744.0	89.71	271.65	6,537.3	312.1	-3,785.7	3,793.7	1.22	1.09	0.53
10,935.0	89.55	271.50	6,538.5	317.3	-3,976.6	3,984.7	0.11	-0.08	-0.08
11,031.0	89.04	271.62	6,539.7	319.9	-4,072.6	4,080.7	0.55	-0.53	0.13
11,126.0	90.29	270.88	6,540.2	322.0	-4,167.6	4,175.7	1.53	1.32	-0.78
11,317.0	91.54	270.18	6,537.2	323.8	-4,358.5	4,366.6	0.75	0.65	-0.37
11,413.0	91.22	269.96	6,534.9	323.9	-4,454.5	4,462.5	0.40	-0.33	-0.23
11,508.0	90.80	269.56	6,533.2	323.5	-4,549.5	4,557.4	0.61	-0.44	-0.42
11,604.0	91.21	269.79	6,531.5	323.0	-4,645.5	4,653.4	0.49	0.43	0.24
11,699.0	88.03	268.35	6,532.1	321.4	-4,740.4	4,748.2	3.67	-3.35	-1.52
11,795.0	87.52	268.12	6,535.9	318.5	-4,836.3	4,844.0	0.58	-0.53	-0.24
11,890.0	88.61	268.68	6,539.1	315.8	-4,931.2	4,938.7	1.29	1.15	0.59
11,986.0	88.85	269.57	6,541.2	314.3	-5,027.2	5,034.6	0.96	0.25	0.93
12,081.0	88.44	268.89	6,543.5	313.1	-5,122.1	5,129.5	0.84	-0.43	-0.72
12,177.0	89.80	270.12	6,544.9	312.2	-5,218.1	5,225.4	1.91	1.42	1.28
12,272.0	89.81	270.26	6,545.3	312.6	-5,313.1	5,320.4	0.15	0.01	0.15
12,368.0	89.13	269.62	6,546.1	312.5	-5,409.1	5,416.3	0.97	-0.71	-0.67
12,463.0	88.49	269.30	6,548.1	311.6	-5,504.1	5,511.2	0.75	-0.67	-0.34
12,559.0	89.70	271.18	6,549.6	312.0	-5,600.1	5,607.1	2.33	1.26	1.96
12,654.0	89.22	270.75	6,550.5	313.6	-5,695.1	5,702.1	0.68	-0.51	-0.45
12,750.0	88.69	270.55	6,552.3	314.7	-5,791.0	5,798.1	0.59	-0.55	-0.21
12,846.0	88.32	270.11	6,554.8	315.2	-5,887.0	5,894.0	0.60	-0.39	-0.46
12,941.0	90.79	270.37	6,555.5	315.6	-5,982.0	5,989.0	2.61	2.60	0.27
13,037.0	90.84	270.14	6,554.2	316.0	-6,078.0	6,084.9	0.25	0.05	-0.24
13,133.0	90.17	269.57	6,553.3	315.8	-6,174.0	6,180.9	0.92	-0.70	-0.59
13,228.0	90.15	269.41	6,553.0	314.9	-6,269.0	6,275.8	0.17	-0.02	-0.17
13,324.0	90.22	269.40	6,552.7	313.9	-6,365.0	6,371.7	0.07	0.07	-0.01
13,420.0	90.22	270.34	6,552.4	313.7	-6,461.0	6,467.7	0.98	0.00	0.98
13,515.0	89.79	270.54	6,552.4	314.5	-6,556.0	6,562.6	0.50	-0.45	0.21
13,611.0	89.17	269.67	6,553.2	314.6	-6,652.0	6,658.6	1.11	-0.65	-0.91
13,802.0	88.58	269.03	6,557.0	312.5	-6,842.9	6,849.4	0.46	-0.31	-0.34

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Red Cloud 5N (Nio B)
<b>Project:</b>	SEC.1-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,898.0	88.02	268.63	6,559.8	310.5	-6,938.8	6,945.2	0.72	-0.58	-0.42
13,994.0	89.27	271.55	6,562.1	310.7	-7,034.8	7,041.1	3.31	1.30	3.04
14,090.0	88.96	271.00	6,563.6	312.8	-7,130.8	7,137.1	0.66	-0.32	-0.57
14,280.0	88.55	270.84	6,567.7	315.8	-7,320.7	7,327.0	0.23	-0.22	-0.08
14,376.0	90.64	272.35	6,568.4	318.5	-7,416.6	7,423.0	2.69	2.18	1.57
14,472.0	90.87	272.19	6,567.1	322.3	-7,512.6	7,519.0	0.29	0.24	-0.17
14,567.0	90.26	271.36	6,566.2	325.3	-7,607.5	7,614.0	1.08	-0.64	-0.87
14,663.0	90.03	270.93	6,565.9	327.2	-7,703.5	7,710.0	0.51	-0.24	-0.45
14,758.0	89.99	270.39	6,565.9	328.3	-7,798.5	7,805.0	0.57	-0.04	-0.57
14,853.0	89.52	269.72	6,566.3	328.4	-7,893.5	7,899.9	0.86	-0.49	-0.71
15,044.0	88.57	268.63	6,569.5	325.6	-8,084.4	8,090.7	0.76	-0.50	-0.57
15,140.0	90.50	270.04	6,570.3	324.5	-8,180.4	8,186.6	2.49	2.01	1.47
15,235.0	90.57	269.27	6,569.4	323.9	-8,275.4	8,281.5	0.81	0.07	-0.81
15,330.0	90.27	268.58	6,568.7	322.1	-8,370.4	8,376.4	0.79	-0.32	-0.73
15,425.0	89.85	268.27	6,568.6	319.5	-8,465.4	8,471.2	0.55	-0.44	-0.33
15,521.0	89.90	267.93	6,568.8	316.4	-8,561.3	8,567.0	0.36	0.05	-0.35
15,616.0	90.83	267.55	6,568.2	312.6	-8,656.2	8,661.8	1.06	0.98	-0.40
15,712.0	91.46	267.38	6,566.3	308.4	-8,752.1	8,757.5	0.68	0.66	-0.18
15,807.0	89.66	267.49	6,565.4	304.1	-8,847.0	8,852.2	1.90	-1.89	0.12
15,902.0	89.26	267.05	6,566.3	299.6	-8,941.9	8,946.9	0.63	-0.42	-0.46
15,997.0	87.94	269.38	6,568.6	296.6	-9,036.8	9,041.7	2.82	-1.39	2.45
16,093.0	88.16	270.07	6,571.9	296.2	-9,132.8	9,137.5	0.75	0.23	0.72
16,189.0	87.92	269.44	6,575.1	295.8	-9,228.7	9,233.4	0.70	-0.25	-0.66
16,285.0	87.69	269.36	6,578.8	294.8	-9,324.6	9,329.3	0.25	-0.24	-0.08
16,380.0	89.29	270.20	6,581.3	294.4	-9,419.6	9,424.2	1.90	1.68	0.88
16,475.0	89.85	270.40	6,582.0	294.9	-9,514.6	9,519.1	0.63	0.59	0.21
16,571.0	89.97	270.09	6,582.2	295.3	-9,610.6	9,615.1	0.35	0.13	-0.32
16,610.0	89.97	270.09	6,582.2	295.4	-9,649.6	9,654.1	0.00	0.00	0.00
Deepest TVD Drilled - 6582.2'									
16,645.0	89.97	270.09	6,582.2	295.4	-9,684.6	9,689.1	0.00	0.00	0.00

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									
SHL 1529'FNL, 704'FEL	0.00	0.00	1.0	0.0	0.0	1,369,932.57	3,280,945.26	40.344483	-104.492061
- survey hits target center									
- Point									
Target BHL 1195'FNL, 51	0.00	0.00	6,580.0	307.0	-9,685.0	1,370,129.46	3,271,257.86	40.345321	-104.526806
- survey misses target center by 11.8ft at 16645.0ft MD (6582.2 TVD, 295.4 N, -9684.6 E)									
- Point									

<b>Company:</b>	PDC Energy Inc. DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Red Cloud 5N (Nio B)
<b>Project:</b>	SEC.1-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Site:</b>	Red Cloud 4N46W01 Pad Sec.1-T4N-64W	<b>MD Reference:</b>	WELL @ 4625.0ft (Original Well Elev)
<b>Well:</b>	Red Cloud 5N (Nio B)	<b>North Reference:</b>	True
<b>Wellbore:</b>	Red Cloud 5N Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Red Cloud 5N Wellbore #1	<b>Database:</b>	US_EDM

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,699.5	6,445.8	372.2	246.5	TPZ - 460' Setback - 1157'FNL & 460'FEL, Sec.1
16,610.0	6,582.2	295.4	-9,649.6	Deepest TVD Drilled - 6582.2'

Checked By: _____	Approved By: _____	Date: _____
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