

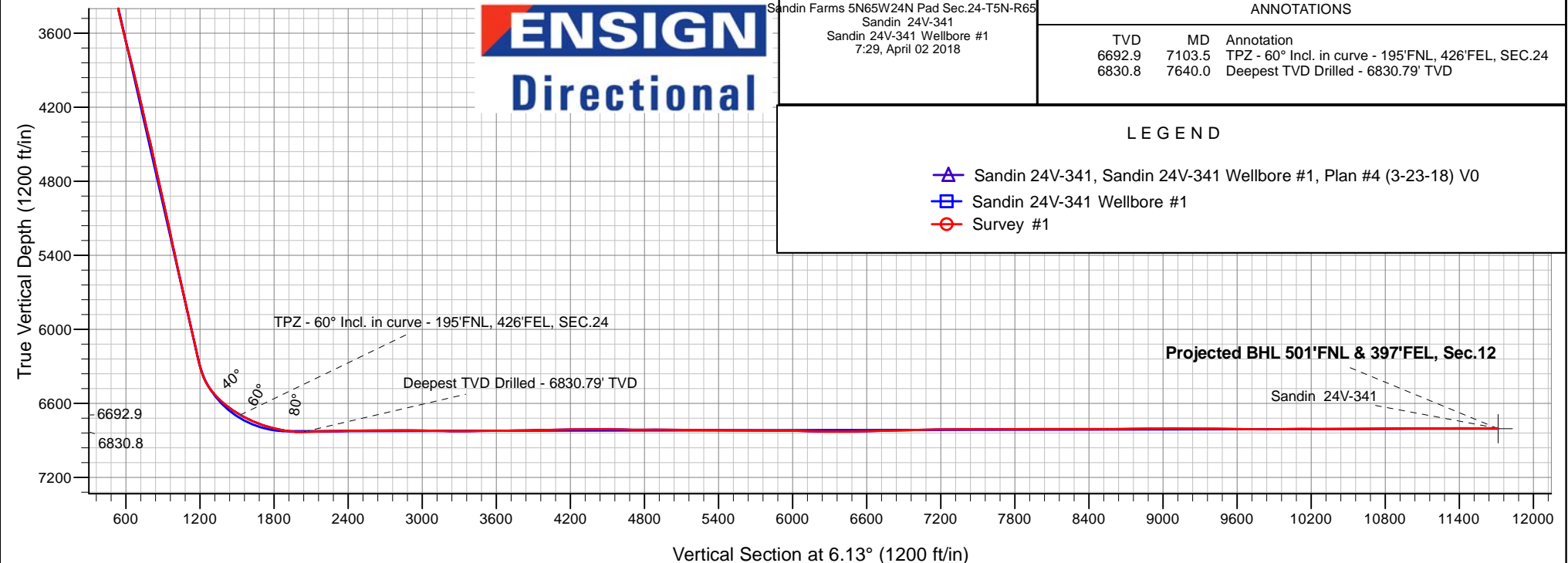
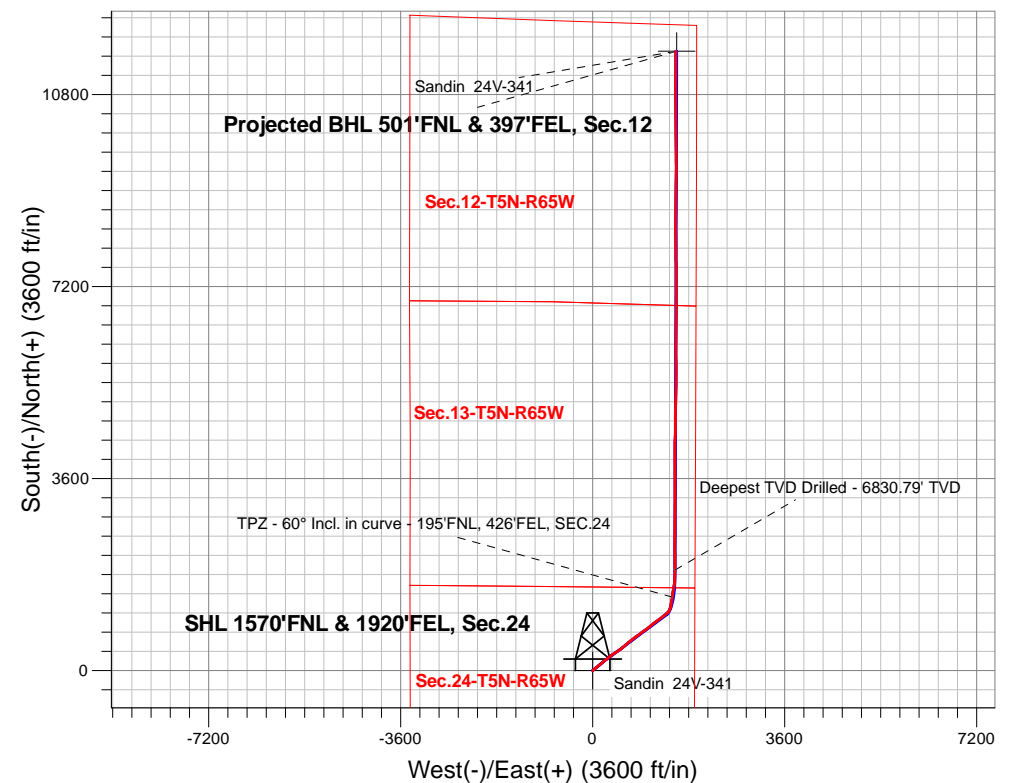
PDC Energy Inc. DJ Basin

Well Name: **Sandin 24V-341**

Surface Location: Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4634.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1385286.983248252.47 40.387590 -104.608790
RKB - 23' WELL @ 4657.0ft (RKB - 23')

FINAL SURVEY

Projected Bottom Hole Location
17,370'MD 6802'TVD 11,612'N & 1560'E of SHL
90.4 degree Incl @ 359.6 degree AZM





PDC Energy Inc. DJ Basin

SEC.24-T5N-R65W

Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W

Sandin 24V-341

Sandin 24V-341 Wellbore #1

Survey: Survey #1

Standard Survey Report

02 April, 2018

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Sandin 24V-341
Project:	SEC.24-T5N-R65W	TVD Reference:	WELL @ 4657.0ft (RKB - 23')
Site:	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	MD Reference:	WELL @ 4657.0ft (RKB - 23')
Well:	Sandin 24V-341	North Reference:	True
Wellbore:	Sandin 24V-341 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Sandin 24V-341 Wellbore #1	Database:	US_EDM

Project	SEC.24-T5N-R65W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W				
Site Position:		Northing:	1,385,287.16 usft	Latitude:	40.387590
From:	Lat/Long	Easting:	3,248,269.19 usft	Longitude:	-104.608730
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.58 °

Well	Sandin 24V-341					
Well Position	+N/-S	0.0 ft	Northing:	1,385,286.98 usft	Latitude:	40.387590
	+E/-W	0.0 ft	Easting:	3,248,252.47 usft	Longitude:	-104.608790
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,634.0 ft

Wellbore	Sandin 24V-341 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/23/2018	7.86	66.83	52,429

Design	Sandin 24V-341 Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	6.13	

Survey Program	Date	4/2/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.0	17,370.0	Survey #1 (Sandin 24V-341 Wellbore #1)	MWD	MWD - Standard	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	102.80	1.0	0.0	0.0	0.0	0.26	0.26	0.00	
SHL 1570'FNL & 1920'FEL, Sec.24										
156.0	0.40	102.80	156.0	-0.1	0.5	-0.1	0.26	0.26	0.00	
252.0	0.20	52.00	252.0	-0.1	1.0	0.0	0.33	-0.21	-52.92	
348.0	0.40	39.70	348.0	0.3	1.3	0.4	0.22	0.21	-12.81	
443.0	1.40	37.30	443.0	1.4	2.3	1.7	1.05	1.05	-2.53	
539.0	2.60	46.00	538.9	3.9	4.5	4.4	1.29	1.25	9.06	
634.0	4.30	49.20	633.7	7.7	8.8	8.6	1.80	1.79	3.37	
730.0	5.40	57.10	729.4	12.5	15.3	14.1	1.34	1.15	8.23	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Sandin 24V-341
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Site:	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	MD Reference:	WELL @ 4657.0ft (RKB - 23')
Well:	Sandin 24V-341	North Reference:	True
Wellbore:	Sandin 24V-341 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Sandin 24V-341 Wellbore #1	Database:	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)	
825.0	6.40	52.90	823.9	18.1	23.3	20.5	1.15	1.05	-4.42	
921.0	7.90	52.00	919.2	25.4	32.7	28.8	1.57	1.56	-0.94	
1,017.0	9.10	50.80	1,014.1	34.3	43.8	38.8	1.26	1.25	-1.25	
1,113.0	10.50	51.10	1,108.7	44.6	56.5	50.4	1.46	1.46	0.31	
1,208.0	11.70	53.60	1,201.9	55.7	71.0	63.0	1.36	1.26	2.63	
1,304.0	13.50	53.10	1,295.6	68.2	87.8	77.2	1.88	1.88	-0.52	
1,399.0	14.90	51.00	1,387.7	82.6	106.2	93.4	1.57	1.47	-2.21	
1,495.0	14.90	48.90	1,480.5	98.5	125.0	111.3	0.56	0.00	-2.19	
1,591.0	15.60	49.20	1,573.1	115.0	144.1	129.7	0.73	0.73	0.31	
1,635.0	15.40	49.20	1,615.5	122.7	153.0	138.3	0.45	-0.45	0.00	
1,777.0	15.20	46.70	1,752.5	147.8	180.8	166.2	0.49	-0.14	-1.76	
1,873.0	16.30	47.10	1,844.8	165.6	199.9	186.0	1.15	1.15	0.42	
1,970.0	18.30	51.10	1,937.5	184.4	221.7	207.0	2.40	2.06	4.12	
2,065.0	19.70	54.50	2,027.3	203.1	246.3	228.2	1.88	1.47	3.58	
2,160.0	18.80	53.60	2,117.0	221.5	271.7	249.2	1.00	-0.95	-0.95	
2,256.0	17.90	51.60	2,208.1	239.8	295.7	270.0	1.14	-0.94	-2.08	
2,351.0	18.50	53.60	2,298.3	257.8	319.3	290.4	0.91	0.63	2.11	
2,447.0	17.80	52.70	2,389.6	275.8	343.2	310.8	0.79	-0.73	-0.94	
2,542.0	18.70	55.30	2,479.8	293.2	367.3	330.8	1.28	0.95	2.74	
2,638.0	17.90	54.30	2,570.9	310.6	391.9	350.7	0.90	-0.83	-1.04	
2,734.0	20.70	57.50	2,661.5	328.3	418.2	371.1	3.12	2.92	3.33	
2,829.0	20.50	58.00	2,750.4	346.2	446.5	391.8	0.28	-0.21	0.53	
2,925.0	19.20	56.70	2,840.7	363.7	473.9	412.2	1.43	-1.35	-1.35	
3,020.0	18.10	56.70	2,930.8	380.4	499.3	431.5	1.16	-1.16	0.00	
3,116.0	19.70	51.80	3,021.6	398.6	524.5	452.3	2.35	1.67	-5.10	
3,211.0	17.10	48.80	3,111.7	417.7	547.6	473.8	2.91	-2.74	-3.16	
3,307.0	17.40	48.70	3,203.4	436.5	569.0	494.7	0.31	0.31	-0.10	
3,403.0	16.80	49.00	3,295.2	455.1	590.3	515.5	0.63	-0.63	0.31	
3,499.0	16.60	50.10	3,387.1	473.0	611.3	535.5	0.39	-0.21	1.15	
3,594.0	17.90	51.50	3,477.8	490.8	633.1	555.5	1.44	1.37	1.47	
3,690.0	17.90	50.20	3,569.2	509.4	656.0	576.5	0.42	0.00	-1.35	
3,785.0	18.40	49.70	3,659.5	528.4	678.6	597.8	0.55	0.53	-0.53	
3,881.0	20.80	52.70	3,749.9	548.6	703.7	620.5	2.71	2.50	3.13	
3,977.0	20.80	52.40	3,839.6	569.3	730.8	644.0	0.11	0.00	-0.31	
4,072.0	19.70	51.80	3,928.8	589.5	756.8	666.9	1.18	-1.16	-0.63	
4,168.0	18.80	50.60	4,019.4	609.3	781.4	689.2	1.02	-0.94	-1.25	
4,263.0	18.50	53.80	4,109.4	627.9	805.4	710.3	1.12	-0.32	3.37	
4,359.0	18.50	56.60	4,200.4	645.3	830.4	730.3	0.93	0.00	2.92	
4,455.0	19.60	55.30	4,291.2	662.9	856.4	750.5	1.23	1.15	-1.35	
4,550.0	19.30	53.20	4,380.8	681.3	882.1	771.6	0.80	-0.32	-2.21	
4,646.0	19.30	52.20	4,471.4	700.6	907.3	793.4	0.34	0.00	-1.04	
4,742.0	18.30	52.40	4,562.3	719.5	931.8	814.8	1.04	-1.04	0.21	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Sandin 24V-341
Project:	SEC.24-T5N-R65W	TVD Reference:	WELL @ 4657.0ft (RKB - 23')
Site:	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	MD Reference:	WELL @ 4657.0ft (RKB - 23')
Well:	Sandin 24V-341	North Reference:	True
Wellbore:	Sandin 24V-341 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Sandin 24V-341 Wellbore #1	Database:	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)
4,838.0	17.90	55.30	4,653.5	737.1	955.8	834.9	1.03	-0.42	3.02
4,933.0	18.30	55.00	4,743.8	753.9	980.1	854.2	0.43	0.42	-0.32
5,029.0	17.90	54.30	4,835.1	771.2	1,004.4	874.0	0.47	-0.42	-0.73
5,125.0	19.10	53.60	4,926.1	789.1	1,029.0	894.4	1.27	1.25	-0.73
5,220.0	18.70	53.90	5,016.0	807.3	1,053.8	915.2	0.43	-0.42	0.32
5,316.0	17.10	50.60	5,107.3	825.3	1,077.2	935.6	1.97	-1.67	-3.44
5,412.0	16.50	50.80	5,199.2	842.9	1,098.6	955.4	0.63	-0.63	0.21
5,507.0	16.10	50.80	5,290.4	859.8	1,119.3	974.3	0.42	-0.42	0.00
5,603.0	17.60	52.00	5,382.3	877.1	1,141.1	993.9	1.60	1.56	1.25
5,699.0	17.40	54.50	5,473.8	894.4	1,164.2	1,013.5	0.81	-0.21	2.60
5,794.0	17.70	48.50	5,564.4	912.2	1,186.6	1,033.6	1.93	0.32	-6.32
5,890.0	17.00	50.20	5,656.1	930.9	1,208.3	1,054.5	0.90	-0.73	1.77
5,985.0	18.60	52.50	5,746.5	949.0	1,231.0	1,074.9	1.84	1.68	2.42
6,081.0	19.00	58.30	5,837.4	966.5	1,256.4	1,095.1	1.99	0.42	6.04
6,177.0	19.80	55.00	5,927.9	984.1	1,283.0	1,115.4	1.41	0.83	-3.44
6,272.0	17.90	53.80	6,017.8	1,001.9	1,308.0	1,135.8	2.04	-2.00	-1.26
6,368.0	17.50	53.40	6,109.3	1,019.2	1,331.5	1,155.5	0.44	-0.42	-0.42
6,464.0	17.50	47.60	6,200.9	1,037.6	1,353.7	1,176.1	1.82	0.00	-6.04
6,560.0	19.70	49.50	6,291.8	1,057.8	1,376.7	1,198.7	2.38	2.29	1.98
6,656.0	27.40	48.70	6,379.8	1,082.9	1,405.6	1,226.8	8.03	8.02	-0.83
6,751.0	35.60	30.60	6,460.9	1,121.3	1,436.3	1,268.2	13.10	8.63	-19.05
6,846.0	43.00	13.90	6,534.6	1,176.8	1,458.2	1,325.7	13.53	7.79	-17.58
6,942.0	49.70	10.70	6,600.8	1,244.6	1,472.9	1,394.7	7.38	6.98	-3.33
7,037.0	56.40	8.20	6,657.9	1,319.5	1,485.3	1,470.5	7.36	7.05	-2.63
7,103.5	60.00	8.83	6,692.9	1,375.4	1,493.6	1,526.9	5.48	5.42	0.95
TPZ - 60° Incl. in curve - 195'FNL, 426'FEL, SEC.24									
7,133.0	61.60	9.10	6,707.3	1,400.8	1,497.7	1,552.6	5.48	5.42	0.90
7,229.0	67.00	8.80	6,748.9	1,486.2	1,511.1	1,639.0	5.63	5.63	-0.31
7,324.0	72.60	10.20	6,781.7	1,574.1	1,525.8	1,728.0	6.05	5.89	1.47
7,420.0	77.20	4.90	6,806.7	1,665.9	1,538.0	1,820.6	7.17	4.79	-5.52
7,509.3	81.76	2.48	6,823.0	1,753.5	1,543.6	1,908.2	5.76	5.10	-2.71
LPL 200'FSL & 378'FEL, Sec.13									
7,516.0	82.10	2.30	6,824.0	1,760.2	1,543.9	1,914.9	5.76	5.11	-2.67
7,640.0	91.60	0.00	6,830.8	1,883.8	1,546.3	2,038.1	7.88	7.66	-1.85
Deepest TVD Drilled - 6830.79' TVD									
7,735.0	91.50	359.80	6,828.2	1,978.8	1,546.2	2,132.5	0.24	-0.11	-0.21
7,831.0	91.50	358.70	6,825.7	2,074.7	1,544.9	2,227.8	1.15	0.00	-1.15
7,927.0	91.00	0.00	6,823.6	2,170.7	1,543.8	2,323.1	1.45	-0.52	1.35
8,023.0	91.10	358.90	6,821.9	2,266.7	1,542.9	2,418.4	1.15	0.10	-1.15
8,118.0	90.30	0.20	6,820.7	2,361.6	1,542.2	2,512.8	1.61	-0.84	1.37
8,214.0	90.80	359.40	6,819.8	2,457.6	1,541.8	2,608.2	0.98	0.52	-0.83
8,310.0	90.30	1.00	6,818.8	2,553.6	1,542.2	2,703.6	1.75	-0.52	1.67
8,405.0	90.70	0.50	6,818.0	2,648.6	1,543.4	2,798.2	0.67	0.42	-0.53

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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)
8,501.0	89.00	1.40	6,818.3	2,744.6	1,545.0	2,893.8	2.00	-1.77	0.94
8,597.0	89.30	0.70	6,819.7	2,840.6	1,546.8	2,989.4	0.79	0.31	-0.73
8,693.0	88.90	0.30	6,821.2	2,936.6	1,547.6	3,085.0	0.59	-0.42	-0.42
8,789.0	88.70	0.30	6,823.2	3,032.5	1,548.1	3,180.4	0.21	-0.21	0.00
8,884.0	90.30	359.60	6,824.0	3,127.5	1,548.0	3,274.9	1.84	1.68	-0.74
8,980.0	89.60	359.30	6,824.1	3,223.5	1,547.1	3,370.2	0.79	-0.73	-0.31
9,076.0	91.20	359.40	6,823.5	3,319.5	1,546.0	3,465.6	1.67	1.67	0.10
9,171.0	90.20	358.90	6,822.3	3,414.5	1,544.6	3,559.8	1.18	-1.05	-0.53
9,266.0	91.00	0.80	6,821.3	3,509.5	1,544.3	3,654.3	2.17	0.84	2.00
9,362.0	90.80	0.50	6,819.8	3,605.5	1,545.4	3,749.8	0.38	-0.21	-0.31
9,458.0	91.10	359.60	6,818.2	3,701.5	1,545.5	3,845.3	0.99	0.31	-0.94
9,553.0	91.40	358.70	6,816.1	3,796.4	1,544.1	3,939.5	1.00	0.32	-0.95
9,649.0	91.10	0.70	6,814.0	3,892.4	1,543.6	4,034.9	2.11	-0.31	2.08
9,745.0	90.70	0.50	6,812.5	3,988.4	1,544.6	4,130.4	0.47	-0.42	-0.21
9,841.0	91.00	359.80	6,811.1	4,084.4	1,544.9	4,225.9	0.79	0.31	-0.73
9,936.0	90.00	0.80	6,810.3	4,179.4	1,545.4	4,320.4	1.49	-1.05	1.05
10,032.0	91.00	0.80	6,809.4	4,275.3	1,546.7	4,416.0	1.04	1.04	0.00
10,128.0	89.90	1.70	6,808.7	4,371.3	1,548.8	4,511.6	1.48	-1.15	0.94
10,223.0	87.50	1.20	6,810.8	4,466.2	1,551.2	4,606.3	2.58	-2.53	-0.53
10,319.0	89.60	0.10	6,813.3	4,562.2	1,552.3	4,701.8	2.47	2.19	-1.15
10,415.0	90.00	0.00	6,813.6	4,658.2	1,552.4	4,797.3	0.43	0.42	-0.10
10,510.0	91.10	0.30	6,812.7	4,753.2	1,552.6	4,891.8	1.20	1.16	0.32
10,606.0	88.70	1.70	6,812.9	4,849.2	1,554.3	4,987.4	2.89	-2.50	1.46
10,701.0	89.20	1.40	6,814.6	4,944.1	1,556.9	5,082.0	0.61	0.53	-0.32
10,797.0	89.60	1.90	6,815.6	5,040.1	1,559.6	5,177.7	0.67	0.42	0.52
10,893.0	89.50	1.40	6,816.4	5,136.0	1,562.4	5,273.4	0.53	-0.10	-0.52
10,989.0	89.70	1.20	6,817.0	5,232.0	1,564.6	5,369.1	0.29	0.21	-0.21
11,085.0	89.80	1.00	6,817.4	5,328.0	1,566.4	5,464.7	0.23	0.10	-0.21
11,181.0	89.60	0.70	6,817.9	5,424.0	1,567.8	5,560.3	0.38	-0.21	-0.31
11,276.0	89.30	359.60	6,818.9	5,519.0	1,568.1	5,654.8	1.20	-0.32	-1.16
11,372.0	89.40	358.60	6,819.9	5,614.9	1,566.6	5,750.1	1.05	0.10	-1.04
11,468.0	89.30	358.10	6,821.0	5,710.9	1,563.8	5,845.2	0.53	-0.10	-0.52
11,564.0	90.00	0.50	6,821.6	5,806.9	1,562.6	5,940.5	2.60	0.73	2.50
11,660.0	89.30	359.80	6,822.2	5,902.9	1,562.9	6,036.0	1.03	-0.73	-0.73
11,756.0	88.60	359.60	6,824.0	5,998.9	1,562.4	6,131.4	0.76	-0.73	-0.21
11,851.0	88.50	1.00	6,826.4	6,093.8	1,562.9	6,225.8	1.48	-0.11	1.47
11,947.0	90.00	0.50	6,827.6	6,189.8	1,564.1	6,321.4	1.65	1.56	-0.52
12,043.0	89.60	0.50	6,828.0	6,285.8	1,565.0	6,416.9	0.42	-0.42	0.00
12,139.0	91.70	0.50	6,826.9	6,381.8	1,565.8	6,512.5	2.19	2.19	0.00
12,234.0	92.00	359.80	6,823.8	6,476.7	1,566.1	6,606.9	0.80	0.32	-0.74
12,330.0	90.80	1.00	6,821.5	6,572.7	1,566.7	6,702.4	1.77	-1.25	1.25
12,426.0	91.20	0.50	6,819.8	6,668.7	1,568.0	6,797.9	0.67	0.42	-0.52
12,521.0	91.40	359.80	6,817.6	6,763.7	1,568.2	6,892.4	0.77	0.21	-0.74

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Sandin 24V-341
Project:	SEC.24-T5N-R65W	TVD Reference:	WELL @ 4657.0ft (RKB - 23')
Site:	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	MD Reference:	WELL @ 4657.0ft (RKB - 23')
Well:	Sandin 24V-341	North Reference:	True
Wellbore:	Sandin 24V-341 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Sandin 24V-341 Wellbore #1	Database:	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)
12,616.0	91.80	359.40	6,815.0	6,858.6	1,567.6	6,986.7	0.60	0.42	-0.42
12,712.0	90.90	0.00	6,812.7	6,954.6	1,567.1	7,082.1	1.13	-0.94	0.63
12,808.0	91.10	359.40	6,811.0	7,050.6	1,566.6	7,177.5	0.66	0.21	-0.63
12,903.0	90.00	0.70	6,810.1	7,145.6	1,566.7	7,272.0	1.79	-1.16	1.37
12,999.0	90.70	359.80	6,809.5	7,241.6	1,567.1	7,367.5	1.19	0.73	-0.94
13,094.0	89.30	0.30	6,809.5	7,336.6	1,567.2	7,461.9	1.56	-1.47	0.53
13,189.0	89.80	0.00	6,810.3	7,431.6	1,567.4	7,556.4	0.61	0.53	-0.32
13,285.0	90.60	359.40	6,810.0	7,527.5	1,566.9	7,651.8	1.04	0.83	-0.63
13,381.0	91.50	358.90	6,808.2	7,623.5	1,565.5	7,747.1	1.07	0.94	-0.52
13,477.0	89.30	0.50	6,807.5	7,719.5	1,565.0	7,842.4	2.83	-2.29	1.67
13,573.0	89.80	359.60	6,808.3	7,815.5	1,565.1	7,937.9	1.07	0.52	-0.94
13,668.0	91.10	358.60	6,807.5	7,910.5	1,563.6	8,032.2	1.73	1.37	-1.05
13,764.0	89.10	359.60	6,807.4	8,006.5	1,562.1	8,127.5	2.33	-2.08	1.04
13,859.0	89.60	359.80	6,808.4	8,101.5	1,561.6	8,221.9	0.57	0.53	0.21
13,955.0	90.20	359.50	6,808.6	8,197.5	1,561.0	8,317.2	0.70	0.63	-0.31
14,051.0	91.00	358.70	6,807.6	8,293.4	1,559.5	8,412.5	1.18	0.83	-0.83
14,146.0	89.60	0.50	6,807.1	8,388.4	1,558.8	8,506.9	2.40	-1.47	1.89
14,242.0	90.20	359.80	6,807.3	8,484.4	1,559.1	8,602.4	0.96	0.63	-0.73
14,338.0	90.40	358.60	6,806.8	8,580.4	1,557.7	8,697.7	1.27	0.21	-1.25
14,433.0	90.70	0.50	6,805.9	8,675.4	1,557.0	8,792.0	2.02	0.32	2.00
14,529.0	90.00	1.60	6,805.3	8,771.4	1,558.7	8,887.6	1.36	-0.73	1.15
14,624.0	90.90	1.00	6,804.5	8,866.4	1,560.9	8,982.3	1.14	0.95	-0.63
14,720.0	89.30	2.10	6,804.4	8,962.3	1,563.5	9,078.0	2.02	-1.67	1.15
14,816.0	89.90	1.50	6,805.0	9,058.3	1,566.5	9,173.7	0.88	0.63	-0.63
14,912.0	90.30	0.80	6,804.9	9,154.2	1,568.4	9,269.4	0.84	0.42	-0.73
15,007.0	89.60	1.20	6,804.9	9,249.2	1,570.1	9,364.0	0.85	-0.74	0.42
15,104.0	89.30	0.10	6,805.9	9,346.2	1,571.2	9,460.5	1.18	-0.31	-1.13
15,199.0	89.70	359.40	6,806.7	9,441.2	1,570.8	9,554.9	0.85	0.42	-0.74
15,295.0	88.60	358.00	6,808.1	9,537.2	1,568.6	9,650.1	1.85	-1.15	-1.46
15,391.0	90.00	0.70	6,809.3	9,633.1	1,567.5	9,745.4	3.17	1.46	2.81
15,487.0	90.00	359.80	6,809.3	9,729.1	1,567.9	9,840.9	0.94	0.00	-0.94
15,583.0	90.70	359.20	6,808.7	9,825.1	1,567.1	9,936.3	0.96	0.73	-0.63
15,679.0	91.20	358.70	6,807.1	9,921.1	1,565.3	10,031.5	0.74	0.52	-0.52
15,774.0	89.30	359.90	6,806.7	10,016.1	1,564.2	10,125.8	2.37	-2.00	1.26
15,870.0	89.90	359.20	6,807.4	10,112.1	1,563.4	10,221.2	0.96	0.63	-0.73
15,966.0	90.30	358.90	6,807.2	10,208.1	1,561.8	10,316.5	0.52	0.42	-0.31
16,061.0	90.70	358.20	6,806.4	10,303.0	1,559.4	10,410.6	0.85	0.42	-0.74
16,157.0	90.10	0.30	6,805.7	10,399.0	1,558.2	10,505.9	2.27	-0.63	2.19
16,253.0	90.00	358.90	6,805.6	10,495.0	1,557.5	10,601.3	1.46	-0.10	-1.46
16,348.0	90.00	0.70	6,805.6	10,590.0	1,557.2	10,695.7	1.89	0.00	1.89
16,445.0	90.80	0.10	6,805.0	10,687.0	1,557.8	10,792.2	1.03	0.82	-0.62
16,540.0	91.30	359.80	6,803.2	10,782.0	1,557.8	10,886.7	0.61	0.53	-0.32

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Sandin 24V-341
Project:	SEC.24-T5N-R65W	TVD Reference:	WELL @ 4657.0ft (RKB - 23')
Site:	Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W	MD Reference:	WELL @ 4657.0ft (RKB - 23')
Well:	Sandin 24V-341	North Reference:	True
Wellbore:	Sandin 24V-341 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Sandin 24V-341 Wellbore #1	Database:	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)
16,636.0	89.70	1.40	6,802.4	10,878.0	1,558.8	10,982.2	2.36	-1.67	1.67
16,731.0	89.80	0.50	6,802.8	10,973.0	1,560.3	11,076.8	0.95	0.11	-0.95
16,827.0	90.10	0.30	6,802.9	11,069.0	1,561.0	11,172.3	0.38	0.31	-0.21
16,924.0	90.30	359.60	6,802.5	11,166.0	1,560.9	11,268.8	0.75	0.21	-0.72
17,020.0	90.70	359.20	6,801.7	11,261.9	1,559.9	11,364.1	0.59	0.42	-0.42
17,116.0	89.40	0.70	6,801.6	11,357.9	1,559.8	11,459.5	2.07	-1.35	1.56
17,211.0	89.90	0.30	6,802.2	11,452.9	1,560.7	11,554.1	0.67	0.53	-0.42
17,312.0	90.40	359.60	6,801.9	11,553.9	1,560.6	11,654.5	0.85	0.50	-0.69
17,370.0	90.40	359.60	6,801.5	11,611.9	1,560.2	11,712.1	0.00	0.00	0.00
BHL 2626'FSL & 378'FEL, Sec.1 - BHL 500'FNL & 378'FEL, Sec.12									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 1570'FNL & 1920'F	0.00	0.00	1.0	0.0	0.0	1,385,286.99	3,248,252.47	40.387590	-104.608790
- hit/miss target									
- Shape									
- survey hits target center									
- Point									
BHL 500'FNL & 378'FEL	0.00	0.00	6,805.0	11,612.5	1,578.7	1,396,914.27	3,249,714.36	40.419465	-104.603120
- survey misses target center by 18.9ft at 17370.0ft MD (6801.5 TVD, 11611.9 N, 1560.2 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,103.5	6,692.9	1,375.4	1,493.6	TPZ - 60° Incl. in curve - 195'FNL, 426'FEL, SEC.24
7,640.0	6,830.8	1,883.8	1,546.3	Deepest TVD Drilled - 6830.79' TVD

Checked By: _____	Approved By: _____	Date: _____
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