

PDC Energy Inc. DJ Basin

Well Name: **J Clark 15N (Nio C)**

Surface Location: Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W

North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

Ground Elevation: 4615.0

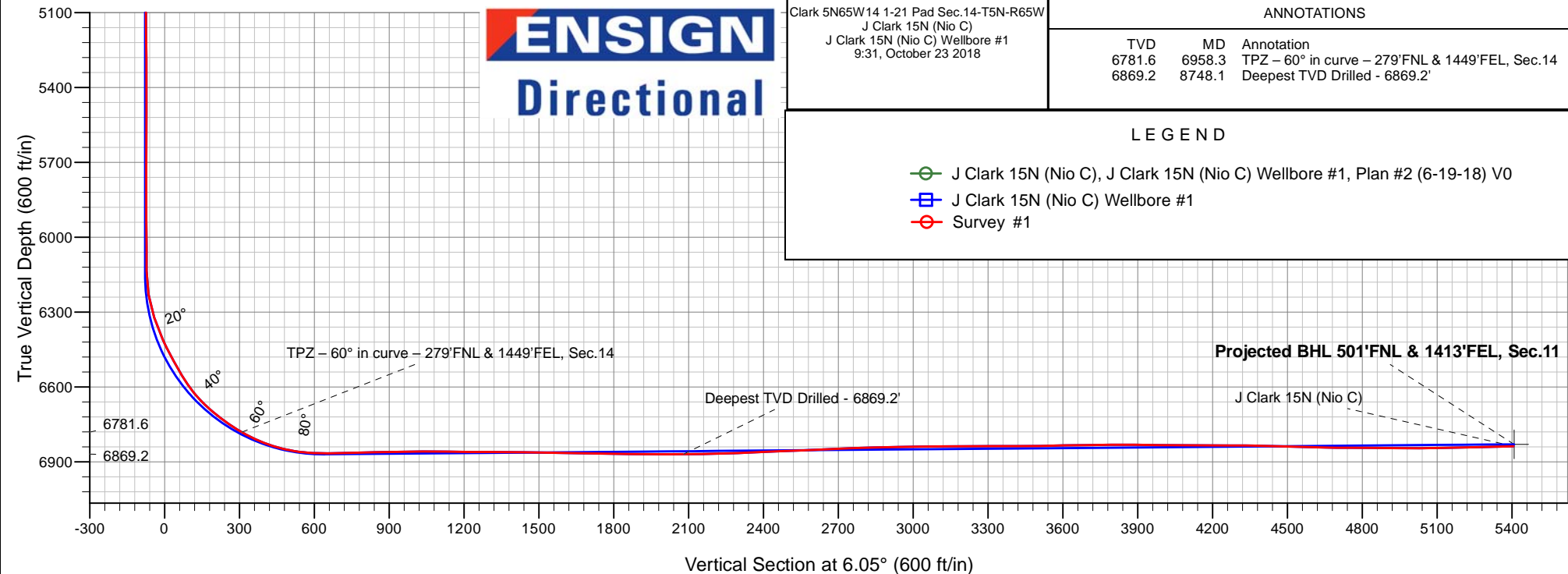
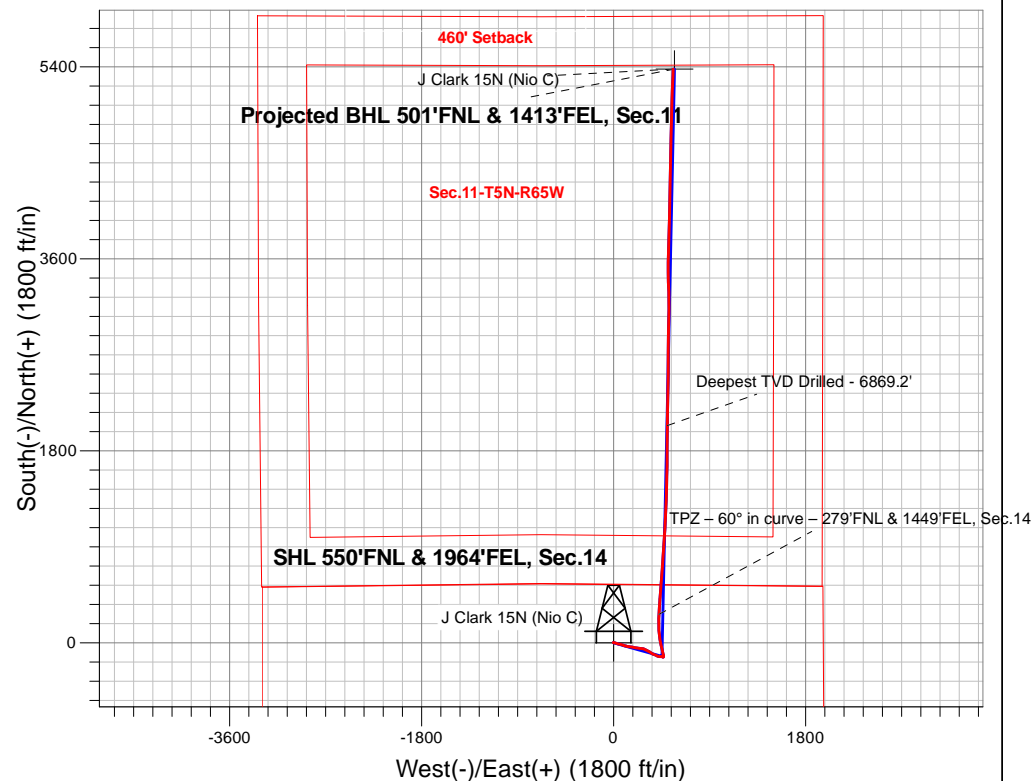
+N/-S+E/-W Northing Easting Latitude Longitude Slot

0.0 0.0 1391636.223242800.93 40.405167 -104.628135

Original Well Elev WELL @ 4638.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
12,089'MD 6838'TVD 5378'N & 557'E of SHL
91.2 degree Incl @ 1.8 degree AZM





PDC Energy Inc. DJ Basin

SEC.14-T5N-R65W

Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W

J Clark 15N (Nio C)

J Clark 15N (Nio C) Wellbore #1

Survey: Survey #1

Standard Survey Report

23 October, 2018

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well J Clark 15N (Nio C)
Project:	SEC.14-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	J Clark 15N (Nio C)	North Reference:	True
Wellbore:	J Clark 15N (Nio C) Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	J Clark 15N (Nio C) Wellbore #1	Database:	US_EDM

Project	SEC.14-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		Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W			
Site Position:		Northing:	1,391,636.42 usft	Latitude:	40.405168
From:	Lat/Long	Easting:	3,242,770.94 usft	Longitude:	-104.628243
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.56 °

Well	J Clark 15N (Nio C)					
Well Position	+N/-S	0.0 ft	Northing:	1,391,636.22 usft	Latitude:	40.405167
	+E/-W	0.0 ft	Easting:	3,242,800.93 usft	Longitude:	-104.628136
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,615.0 ft

Wellbore	J Clark 15N (Nio C) Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/19/2018	8.10	66.88	52,238

Design	J Clark 15N (Nio C) 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	6.05	

Survey Program	Date	10/23/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
152.0	12,089.0	Survey #1 (J Clark 15N (Nio C) Wellbore #	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	0.01	279.20	1.0	0.0	0.0	0.0	0.59	0.59	0.00	
SHL 550'FNL & 1964'FEL, Sec.14										
152.0	0.90	279.20	152.0	0.2	-1.2	0.1	0.59	0.59	0.00	
248.0	0.90	296.40	248.0	0.6	-2.6	0.4	0.28	0.00	17.92	
343.0	1.00	296.70	343.0	1.4	-4.0	0.9	0.11	0.11	0.32	
439.0	0.40	0.90	439.0	2.1	-4.8	1.6	0.94	-0.63	66.88	
534.0	0.50	29.00	534.0	2.8	-4.5	2.3	0.25	0.11	29.58	
629.0	0.40	33.20	629.0	3.4	-4.2	2.9	0.11	-0.11	4.42	
724.0	0.40	12.50	724.0	4.0	-3.9	3.6	0.15	0.00	-21.79	
820.0	1.10	96.00	819.9	4.2	-2.9	3.9	1.17	0.73	86.98	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well J Clark 15N (Nio C)
Project:	SEC.14-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	J Clark 15N (Nio C)	North Reference:	True
Wellbore:	J Clark 15N (Nio C) Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	J Clark 15N (Nio C) 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)
915.0	2.50	106.40	914.9	3.5	0.0	3.5	1.51	1.47	10.95
1,010.0	4.00	108.30	1,009.7	1.9	5.1	2.5	1.58	1.58	2.00
1,106.0	4.90	112.50	1,105.5	-0.7	12.1	0.6	1.00	0.94	4.38
1,201.0	6.20	106.70	1,200.0	-3.7	20.7	-1.5	1.49	1.37	-6.11
1,296.0	7.70	103.40	1,294.3	-6.7	31.8	-3.3	1.63	1.58	-3.47
1,392.0	8.40	103.00	1,389.4	-9.7	44.9	-5.0	0.73	0.73	-0.42
1,487.0	7.10	102.50	1,483.5	-12.6	57.4	-6.5	1.37	-1.37	-0.53
1,625.0	5.80	107.20	1,620.6	-16.5	72.4	-8.8	1.02	-0.94	3.41
1,775.0	7.00	112.30	1,769.7	-22.2	88.1	-12.8	0.88	0.80	3.40
1,871.0	8.70	106.50	1,864.8	-26.5	100.5	-15.7	1.95	1.77	-6.04
2,061.0	11.80	99.30	2,051.7	-33.7	133.4	-19.4	1.76	1.63	-3.79
2,156.0	10.90	100.40	2,144.9	-36.9	151.9	-20.7	0.97	-0.95	1.16
2,252.0	10.30	101.10	2,239.2	-40.2	169.2	-22.1	0.64	-0.63	0.73
2,443.0	9.80	97.70	2,427.3	-45.6	202.1	-24.1	0.41	-0.26	-1.78
2,539.0	9.30	97.90	2,522.0	-47.8	217.9	-24.6	0.52	-0.52	0.21
2,634.0	9.40	97.90	2,615.7	-49.9	233.1	-25.1	0.11	0.11	0.00
2,730.0	9.20	96.90	2,710.4	-51.9	248.5	-25.4	0.27	-0.21	-1.04
2,921.0	8.30	98.80	2,899.2	-55.9	277.3	-26.3	0.49	-0.47	0.99
3,017.0	9.90	114.80	2,994.0	-60.4	291.7	-29.3	3.10	1.67	16.67
3,113.0	9.10	118.10	3,088.7	-67.4	305.8	-34.8	1.01	-0.83	3.44
3,208.0	8.50	119.70	3,182.6	-74.4	318.6	-40.5	0.68	-0.63	1.68
3,304.0	7.80	121.10	3,277.6	-81.3	330.3	-46.1	0.76	-0.73	1.46
3,399.0	7.30	122.50	3,371.8	-87.9	340.9	-51.5	0.56	-0.53	1.47
3,494.0	6.40	126.00	3,466.1	-94.3	350.3	-56.8	1.04	-0.95	3.68
3,590.0	6.10	125.00	3,561.5	-100.3	358.8	-62.0	0.33	-0.31	-1.04
3,686.0	8.40	113.90	3,656.8	-106.1	369.4	-66.6	2.79	2.40	-11.56
3,781.0	8.50	113.60	3,750.7	-111.7	382.2	-70.8	0.12	0.11	-0.32
3,877.0	8.50	113.20	3,845.7	-117.4	395.2	-75.0	0.06	0.00	-0.42
3,972.0	8.20	114.40	3,939.7	-122.9	407.8	-79.2	0.37	-0.32	1.26
4,067.0	7.70	100.60	4,033.8	-126.9	420.2	-81.9	2.07	-0.53	-14.53
4,163.0	7.50	98.80	4,128.9	-129.0	432.8	-82.7	0.32	-0.21	-1.88
4,258.0	4.40	89.70	4,223.4	-130.0	442.5	-82.6	3.40	-3.26	-9.58
4,354.0	3.30	85.10	4,319.2	-129.7	449.0	-81.7	1.19	-1.15	-4.79
4,449.0	3.00	86.70	4,414.1	-129.3	454.2	-80.7	0.33	-0.32	1.68
4,545.0	4.10	140.10	4,509.9	-131.8	458.9	-82.7	3.48	1.15	55.63
4,641.0	1.50	75.40	4,605.8	-134.1	462.3	-84.7	3.87	-2.71	-67.40
4,736.0	1.60	30.10	4,700.8	-132.7	464.2	-83.0	1.26	0.11	-47.68
4,832.0	1.50	33.60	4,796.7	-130.5	465.5	-80.7	0.14	-0.10	3.65
4,928.0	1.60	41.50	4,892.7	-128.4	467.1	-78.5	0.25	0.10	8.23
5,024.0	1.20	1.90	4,988.7	-126.4	468.0	-76.4	1.06	-0.42	-41.25
5,119.0	0.90	320.30	5,083.6	-124.8	467.6	-74.9	0.84	-0.32	-43.79
5,215.0	0.80	306.00	5,179.6	-123.9	466.6	-74.0	0.24	-0.10	-14.90
5,310.0	1.10	298.80	5,274.6	-123.0	465.2	-73.3	0.34	0.32	-7.58

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well J Clark 15N (Nio C)
Project:	SEC.14-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	J Clark 15N (Nio C)	North Reference:	True
Wellbore:	J Clark 15N (Nio C) Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	J Clark 15N (Nio C) 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)
5,405.0	0.70	309.20	5,369.6	-122.2	464.0	-72.6	0.45	-0.42	10.95
5,501.0	0.40	242.40	5,465.6	-122.0	463.2	-72.5	0.68	-0.31	-69.58
5,597.0	0.30	217.80	5,561.6	-122.4	462.8	-72.9	0.19	-0.10	-25.63
5,693.0	0.60	108.50	5,657.6	-122.7	463.1	-73.2	0.79	0.31	-113.85
5,788.0	0.70	92.10	5,752.6	-122.9	464.2	-73.3	0.22	0.11	-17.26
5,884.0	0.50	88.10	5,848.6	-122.9	465.2	-73.2	0.21	-0.21	-4.17
5,979.0	0.50	63.60	5,943.6	-122.7	466.0	-72.9	0.22	0.00	-25.79
6,075.0	0.40	72.10	6,039.6	-122.4	466.6	-72.6	0.12	-0.10	8.85
6,170.0	0.40	68.60	6,134.6	-122.2	467.3	-72.3	0.03	0.00	-3.68
6,265.0	10.00	345.40	6,229.1	-114.1	465.5	-64.4	10.48	10.11	-87.58
6,361.0	18.90	347.40	6,322.0	-90.8	460.0	-41.8	9.28	9.27	2.08
6,456.0	25.80	348.40	6,409.8	-55.5	452.5	-7.5	7.27	7.26	1.05
6,552.0	29.80	348.40	6,494.7	-11.6	443.5	35.2	4.17	4.17	0.00
6,647.0	34.00	346.70	6,575.3	37.4	432.6	82.8	4.52	4.42	-1.79
6,743.0	43.60	355.80	6,650.1	96.7	424.0	140.8	11.61	10.00	9.48
6,839.0	52.10	0.00	6,714.5	167.7	421.6	211.2	9.43	8.85	4.38
6,934.0	57.80	2.70	6,769.0	245.4	423.4	288.7	6.43	6.00	2.84
6,958.3	60.00	2.83	6,781.6	266.2	424.5	309.5	9.07	9.06	0.55
TPZ - 60° in curve - 279°FNL & 1449°FEL, Sec.14									
7,030.0	66.50	3.20	6,813.8	330.1	427.8	373.4	9.07	9.06	0.51
7,126.0	75.30	5.10	6,845.2	420.5	434.4	463.9	9.36	9.17	1.98
7,221.0	84.20	3.70	6,862.1	513.6	441.6	557.3	9.48	9.37	-1.47
7,304.4	90.20	4.13	6,866.2	596.7	447.3	640.5	7.21	7.19	0.52
LPL 50°FSL & 1493°FEL, Sec.11									
7,317.0	91.10	4.20	6,866.0	609.2	448.2	653.1	7.21	7.19	0.52
7,412.0	91.20	4.10	6,864.1	704.0	455.1	748.0	0.15	0.11	-0.11
7,508.0	91.20	4.60	6,862.1	799.7	462.3	843.9	0.52	0.00	0.52
7,603.0	91.30	4.20	6,860.1	894.4	469.6	938.9	0.43	0.11	-0.42
7,699.0	89.90	3.40	6,859.0	990.2	476.0	1,034.8	1.68	-1.46	-0.83
7,794.0	89.30	2.70	6,859.7	1,085.0	481.0	1,129.7	0.97	-0.63	-0.74
7,890.0	89.50	2.50	6,860.7	1,180.9	485.4	1,225.5	0.29	0.21	-0.21
7,985.0	89.60	2.50	6,861.5	1,275.8	489.5	1,320.3	0.11	0.11	0.00
8,081.0	89.30	1.60	6,862.4	1,371.8	493.0	1,416.1	0.99	-0.31	-0.94
8,177.0	89.70	1.60	6,863.2	1,467.7	495.6	1,511.8	0.42	0.42	0.00
8,272.0	89.10	1.10	6,864.2	1,562.7	497.9	1,606.4	0.82	-0.63	-0.53
8,368.0	88.80	0.40	6,866.0	1,658.7	499.1	1,702.0	0.79	-0.31	-0.73
8,463.0	88.70	0.00	6,868.0	1,753.6	499.5	1,796.5	0.43	-0.11	-0.42
8,559.0	90.30	1.40	6,868.9	1,849.6	500.6	1,892.1	2.21	1.67	1.46
8,748.1	89.51	0.01	6,869.2	2,038.7	503.0	2,080.3	0.84	-0.42	-0.73
Deepest TVD Drilled - 6869.2'									
8,750.0	89.50	0.00	6,869.2	2,040.6	503.0	2,082.2	0.84	-0.42	-0.73
8,846.0	90.80	0.80	6,869.0	2,136.6	503.6	2,177.8	1.59	1.35	0.83
8,942.0	92.60	1.60	6,866.1	2,232.5	505.7	2,273.4	2.05	1.88	0.83
9,038.0	92.60	1.20	6,861.8	2,328.4	508.0	2,369.0	0.42	0.00	-0.42

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well J Clark 15N (Nio C)
Project:	SEC.14-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	J Clark 15N (Nio C)	North Reference:	True
Wellbore:	J Clark 15N (Nio C) Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	J Clark 15N (Nio C) 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)	
9,133.0	92.30	0.70	6,857.7	2,423.3	509.6	2,463.5	0.61	-0.32	-0.53	
9,229.0	92.20	0.40	6,853.9	2,519.2	510.5	2,559.0	0.33	-0.10	-0.31	
9,420.0	92.70	359.70	6,845.8	2,710.0	510.7	2,748.8	0.45	0.26	-0.37	
9,516.0	91.10	0.90	6,842.6	2,806.0	511.2	2,844.2	2.08	-1.67	1.25	
9,611.0	91.00	1.80	6,840.8	2,900.9	513.4	2,938.9	0.95	-0.11	0.95	
9,706.0	90.80	1.20	6,839.4	2,995.9	515.9	3,033.6	0.67	-0.21	-0.63	
9,802.0	90.50	0.70	6,838.3	3,091.9	517.5	3,129.2	0.61	-0.31	-0.52	
9,898.0	90.10	359.10	6,837.8	3,187.9	517.3	3,224.6	1.72	-0.42	-1.67	
9,993.0	90.10	358.60	6,837.6	3,282.8	515.4	3,318.9	0.53	0.00	-0.53	
10,089.0	90.20	357.40	6,837.3	3,378.8	512.1	3,413.9	1.25	0.10	-1.25	
10,184.0	90.90	0.70	6,836.4	3,473.8	510.5	3,508.2	3.55	0.74	3.47	
10,280.0	91.30	0.20	6,834.6	3,569.7	511.2	3,603.7	0.67	0.42	-0.52	
10,375.0	90.40	1.90	6,833.2	3,664.7	513.0	3,698.4	2.02	-0.95	1.79	
10,470.0	90.80	1.20	6,832.2	3,759.7	515.5	3,793.1	0.85	0.42	-0.74	
10,566.0	89.50	2.70	6,831.9	3,855.6	518.8	3,888.8	2.07	-1.35	1.56	
10,661.0	89.30	1.60	6,832.9	3,950.5	522.4	3,983.6	1.18	-0.21	-1.16	
10,756.0	89.50	1.20	6,833.9	4,045.5	524.7	4,078.3	0.47	0.21	-0.42	
10,852.0	89.70	0.70	6,834.6	4,141.5	526.3	4,173.9	0.56	0.21	-0.52	
10,948.0	90.10	0.20	6,834.8	4,237.5	527.0	4,269.4	0.67	0.42	-0.52	
11,043.0	89.00	2.10	6,835.5	4,332.4	528.9	4,364.1	2.31	-1.16	2.00	
11,138.0	88.30	1.40	6,837.7	4,427.4	531.8	4,458.8	1.04	-0.74	-0.74	
11,234.0	88.60	0.90	6,840.3	4,523.3	533.8	4,554.4	0.61	0.31	-0.52	
11,329.0	88.60	0.50	6,842.7	4,618.3	534.9	4,648.9	0.42	0.00	-0.42	
11,424.0	89.60	1.20	6,844.2	4,713.3	536.3	4,743.5	1.28	1.05	0.74	
11,520.0	89.80	1.90	6,844.7	4,809.2	538.9	4,839.2	0.76	0.21	0.73	
11,616.0	89.90	1.90	6,844.9	4,905.2	542.1	4,935.0	0.10	0.10	0.00	
11,711.0	89.30	1.20	6,845.6	5,000.1	544.7	5,029.7	0.97	-0.63	-0.74	
11,807.0	91.70	2.10	6,844.7	5,096.1	547.5	5,125.4	2.67	2.50	0.94	
11,902.0	91.50	1.90	6,842.1	5,191.0	550.8	5,220.1	0.30	-0.21	-0.21	
12,032.0	91.20	1.80	6,839.0	5,320.9	555.0	5,349.7	0.24	-0.23	-0.08	
12,089.0	91.20	1.80	6,837.8	5,377.8	556.8	5,406.6	0.00	0.00	0.00	
BHL 500'FNL & 1400'FEL, Sec.11										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude Longitude		
SHL 550'FNL & 1964'FE - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,391,636.24	3,242,800.93	40.405167 -104.628136		
BHL 500'FNL & 1400'FE - survey misses target center by 15.4ft at 12089.0ft MD (6837.8 TVD, 5377.8 N, 556.8 E) - Point	0.00	0.00	6,830.0	5,378.5	570.0	1,397,019.83	3,243,318.03	40.419930 -104.626088		

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well J Clark 15N (Nio C)
Project:	SEC.14-T5N-R65W	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Clark 5N65W14 1-21 Pad Sec.14-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	J Clark 15N (Nio C)	North Reference:	True
Wellbore:	J Clark 15N (Nio C) Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	J Clark 15N (Nio C) Wellbore #1	Database:	US_EDM

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
6,958.3	6,781.6	266.2	424.5	TPZ – 60° in curve – 279'FNL & 1449'FEL, Sec.14
8,748.1	6,869.2	2,038.7	503.0	Deepest TVD Drilled - 6869.2'

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------