

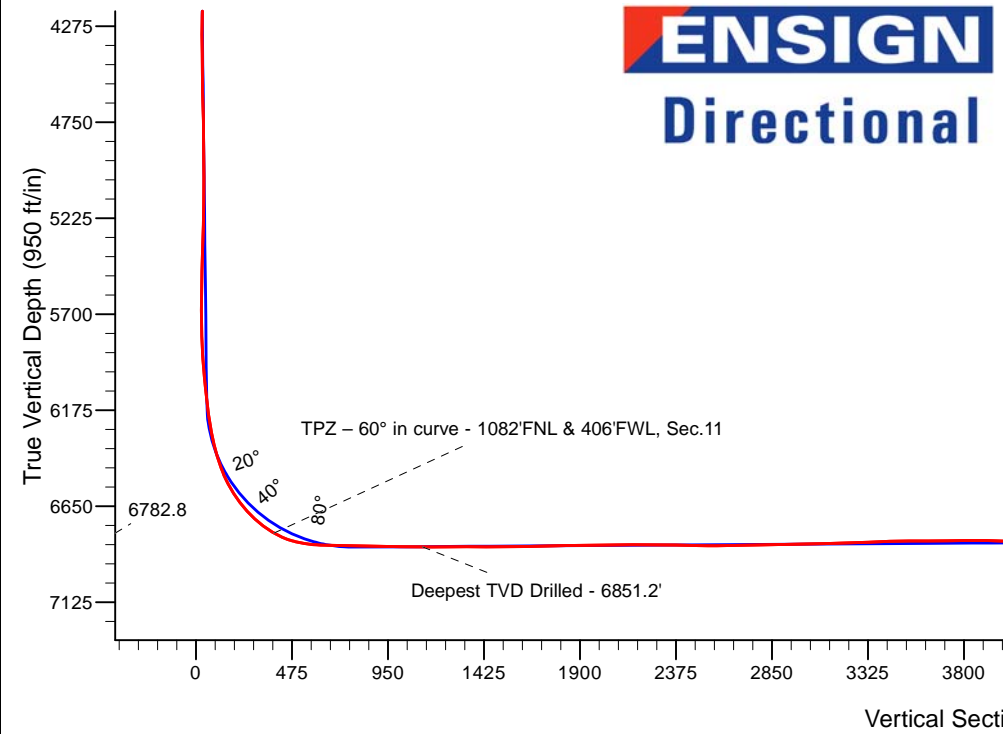
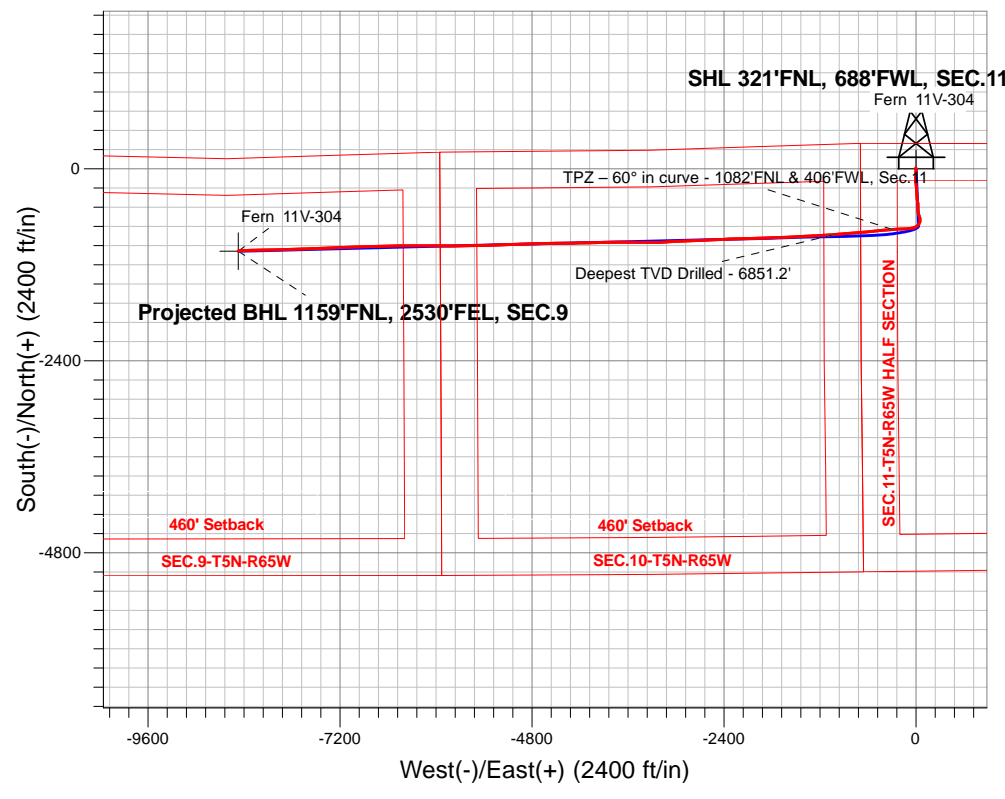
PDC Energy Inc. DJ Basin

Well Name: **Fern 11V-304**

Surface Location: Fern 5N65W11EJ Pad Sec.11-T5N-R65W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4619.0
 +N/-S+E/-W Northing Easting Longitude Slot
 0.0 0.0 1397169.053240103.66 40.420426 -104.637627
 Original Well Elev WELL @ 4642.0ft (Original Well Elev)

FINAL SURVEY

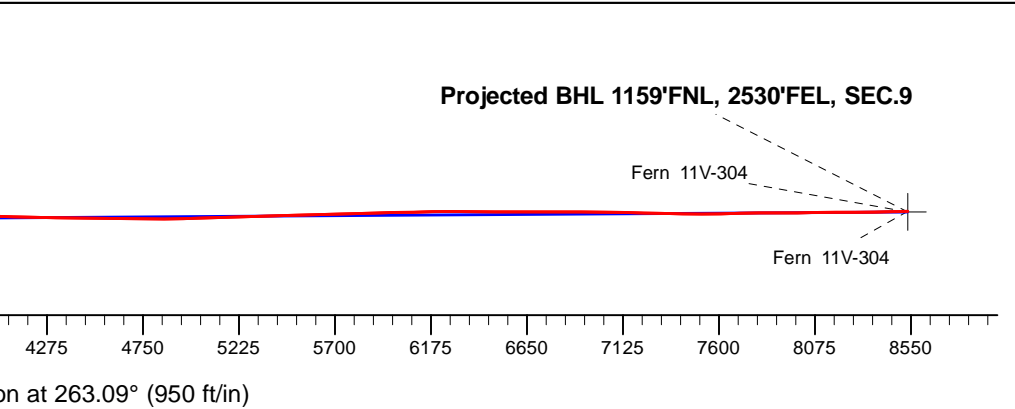
Projected Bottom Hole Location
15,142'MD 6799'TVD 1026'S & 8472'W of SHL
91.6 degree Incl @ 267.0 degree AZM



Fern 5N65W11EJ Pad Sec.11-T5N-R65W
 Fern 11V-304
 Fern 11V-304 Wellbore #1
 14:12, March 12 2018

ANNOTATIONS			
TVD	MD	Annotation	
6782.8	6948.6	TPZ - 60° in curve - 1082'FNL & 406'FWL, Sec.11	
6851.2	7693.7	Deepest TVD Drilled - 6851.2'	

LEGEND	
	Fern 11V-304, Fern 11V-304 Wellbore #1, Plan #3 (3-05-18)R V0
	Fern 11V-304 Wellbore #1
	Survey #1





PDC Energy Inc. DJ Basin

SEC.11-T5N-R65W

Fern 5N65W11EJ Pad Sec.11-T5N-R65W

Fern 11V-304

Fern 11V-304 Wellbore #1

Survey: Survey #1

Standard Survey Report

12 March, 2018



Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Fern 11V-304
Project:	SEC.11-T5N-R65W	TVD Reference:	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	MD Reference:	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-304	North Reference:	True
Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 Wellbore #1	Database:	US_EDM

Project	SEC.11-T5N-R65W, Weld County, CO		
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	Fern 5N65W11EJ Pad Sec.11-T5N-R65W				
Site Position:		Northing:	1,397,139.19 usft	Latitude:	40.420344
From:	Lat/Long	Easting:	3,240,103.68 usft	Longitude:	-104.637628
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.56 °

Well	Fern 11V-304					
Well Position	+N/-S	0.0 ft	Northing:	1,397,169.05 usft	Latitude:	40.420426
	+E/-W	0.0 ft	Easting:	3,240,103.66 usft	Longitude:	-104.637627
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,619.0 ft

Wellbore	Fern 11V-304 Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/5/2018	7.90	66.85	52,457

Design	Fern 11V-304 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		263.09

Survey Program	Date	3/12/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
153.0	15,142.0	Survey #1 (Fern 11V-304 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	
153.0	0.80	309.40	153.0	0.7	-0.8	0.7	0.52	0.52	0.00	
248.0	0.80	311.60	248.0	1.5	-1.8	1.6	0.03	0.00	2.32	
343.0	0.70	319.70	343.0	2.4	-2.7	2.4	0.15	-0.11	8.53	
434.0	0.60	326.40	434.0	3.2	-3.3	2.9	0.14	-0.11	7.36	
534.0	0.50	332.60	534.0	4.1	-3.8	3.3	0.12	-0.10	6.20	
629.0	0.80	327.50	629.0	5.0	-4.4	3.7	0.32	0.32	-5.37	
725.0	0.40	359.80	725.0	5.9	-4.7	4.0	0.53	-0.42	33.65	
820.0	0.60	358.90	820.0	6.7	-4.7	3.9	0.21	0.21	-0.95	
916.0	0.70	12.30	915.9	7.8	-4.6	3.7	0.19	0.10	13.96	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Fern 11V-304
Project:	SEC.11-T5N-R65W	TVD Reference:	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	MD Reference:	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-304	North Reference:	True
Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 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)	
1,011.0	0.80	9.80	1,010.9	9.0	-4.4	3.3	0.11	0.11	-2.63	
1,106.0	0.40	153.80	1,105.9	9.4	-4.1	3.0	1.21	-0.42	151.58	
1,201.0	0.80	165.90	1,200.9	8.4	-3.8	2.8	0.44	0.42	12.74	
1,297.0	1.90	176.50	1,296.9	6.2	-3.6	2.8	1.17	1.15	11.04	
1,392.0	3.10	175.90	1,391.8	2.1	-3.3	3.0	1.26	1.26	-0.63	
1,488.0	4.50	175.10	1,487.6	-4.3	-2.8	3.3	1.46	1.46	-0.83	
1,583.0	4.90	177.20	1,582.3	-12.0	-2.3	3.7	0.46	0.42	2.21	
1,678.0	4.80	178.80	1,676.9	-20.1	-2.0	4.4	0.18	-0.11	1.68	
1,774.0	6.10	180.20	1,772.5	-29.2	-1.9	5.4	1.36	1.35	1.46	
1,868.0	8.10	181.00	1,865.8	-40.8	-2.0	6.9	2.13	2.13	0.85	
1,964.0	9.50	185.60	1,960.6	-55.5	-2.9	9.6	1.63	1.46	4.79	
2,060.0	9.50	185.10	2,055.3	-71.2	-4.4	12.9	0.09	0.00	-0.52	
2,155.0	9.40	183.00	2,149.0	-86.8	-5.5	15.9	0.38	-0.11	-2.21	
2,250.0	9.10	182.80	2,242.8	-102.0	-6.3	18.5	0.32	-0.32	-0.21	
2,346.0	9.10	179.50	2,337.6	-117.2	-6.6	20.6	0.54	0.00	-3.44	
2,441.0	8.60	180.00	2,431.5	-131.8	-6.5	22.3	0.53	-0.53	0.53	
2,536.0	9.70	175.20	2,525.3	-146.9	-5.9	23.5	1.41	1.16	-5.05	
2,631.0	9.10	176.30	2,619.0	-162.4	-4.7	24.2	0.66	-0.63	1.16	
2,727.0	9.10	174.40	2,713.8	-177.5	-3.5	24.8	0.31	0.00	-1.98	
2,822.0	9.10	175.60	2,807.6	-192.5	-2.2	25.3	0.20	0.00	1.26	
2,918.0	8.70	172.30	2,902.4	-207.2	-0.6	25.5	0.68	-0.42	-3.44	
3,014.0	8.80	170.70	2,997.3	-221.7	1.6	25.1	0.27	0.10	-1.67	
3,109.0	8.30	167.70	3,091.2	-235.6	4.2	24.2	0.71	-0.53	-3.16	
3,204.0	9.10	180.90	3,185.2	-249.8	5.5	24.5	2.26	0.84	13.89	
3,300.0	9.00	180.90	3,280.0	-264.9	5.3	26.6	0.10	-0.10	0.00	
3,394.0	8.00	178.20	3,372.9	-278.8	5.4	28.2	1.15	-1.06	-2.87	
3,490.0	7.70	172.30	3,468.0	-291.8	6.5	28.7	0.90	-0.31	-6.15	
3,586.0	9.80	175.20	3,562.9	-306.3	8.0	28.9	2.23	2.19	3.02	
3,681.0	9.80	175.20	3,656.5	-322.4	9.4	29.5	0.00	0.00	0.00	
3,776.0	9.50	175.10	3,750.2	-338.3	10.7	30.1	0.32	-0.32	-0.11	
3,872.0	9.50	175.10	3,844.9	-354.1	12.1	30.6	0.00	0.00	0.00	
3,967.0	9.50	176.30	3,938.6	-369.7	13.2	31.3	0.21	0.00	1.26	
4,063.0	8.90	173.50	4,033.3	-385.0	14.6	31.8	0.78	-0.63	-2.92	
4,158.0	8.40	170.50	4,127.2	-399.2	16.6	31.6	0.71	-0.53	-3.16	
4,253.0	8.20	168.60	4,221.3	-412.6	19.0	30.7	0.36	-0.21	-2.00	
4,349.0	9.10	172.60	4,316.2	-426.9	21.4	30.1	1.13	0.94	4.17	
4,445.0	9.40	178.90	4,410.9	-442.2	22.5	30.8	1.10	0.31	6.56	
4,541.0	8.60	177.20	4,505.7	-457.3	23.0	32.2	0.88	-0.83	-1.77	
4,636.0	8.00	177.00	4,599.7	-470.9	23.7	33.1	0.63	-0.63	-0.21	
4,732.0	9.60	184.90	4,694.6	-485.6	23.4	35.2	2.09	1.67	8.23	
4,828.0	9.60	179.80	4,789.3	-501.6	22.7	37.8	0.89	0.00	-5.31	
4,923.0	9.00	177.20	4,883.0	-516.9	23.1	39.2	0.77	-0.63	-2.74	
5,019.0	8.40	173.50	4,977.9	-531.4	24.3	39.8	0.85	-0.63	-3.85	
5,114.0	7.40	166.80	5,072.0	-544.2	26.4	39.2	1.43	-1.05	-7.05	

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Well:	Fern 11V-304	North Reference:	True
Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 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)	
5,210.0	8.60	170.10	5,167.1	-557.3	29.1	38.1	1.34	1.25	3.44	
5,305.0	9.30	162.90	5,260.9	-571.7	32.6	36.4	1.39	0.74	-7.58	
5,401.0	7.90	158.00	5,355.8	-585.2	37.3	33.3	1.64	-1.46	-5.10	
5,496.0	8.70	164.70	5,449.8	-598.2	41.7	30.6	1.32	0.84	7.05	
5,592.0	8.30	160.30	5,544.8	-611.7	45.9	28.0	0.80	-0.42	-4.58	
5,688.0	9.30	177.20	5,639.7	-626.0	48.6	27.0	2.87	1.04	17.60	
5,783.0	8.70	176.50	5,733.5	-640.8	49.4	28.0	0.64	-0.63	-0.74	
5,878.0	6.80	184.40	5,827.6	-653.6	49.4	29.5	2.29	-2.00	8.32	
5,973.0	9.30	203.20	5,921.7	-666.3	46.0	34.5	3.79	2.63	19.79	
6,069.0	8.40	204.20	6,016.6	-679.8	40.1	42.0	0.95	-0.94	1.04	
6,164.0	11.30	211.50	6,110.2	-694.1	32.4	51.4	3.32	3.05	7.68	
6,260.0	10.60	222.90	6,204.4	-708.6	21.4	63.9	2.37	-0.73	11.88	
6,355.0	12.10	237.60	6,297.6	-720.3	7.1	79.6	3.42	1.58	15.47	
6,450.0	16.20	247.10	6,389.7	-730.8	-13.6	101.3	4.95	4.32	10.00	
6,545.0	21.80	255.90	6,479.5	-740.3	-42.9	131.6	6.61	5.89	9.26	
6,642.0	30.80	265.80	6,566.4	-746.5	-85.2	174.4	10.29	9.28	10.21	
6,737.0	38.30	267.20	6,644.6	-749.7	-139.0	228.1	7.94	7.89	1.47	
6,833.0	48.00	267.50	6,714.6	-752.7	-204.5	293.5	10.11	10.10	0.31	
6,929.0	57.50	265.90	6,772.6	-757.2	-280.7	369.7	9.98	9.90	-1.67	
6,948.6	60.00	266.38	6,782.8	-758.3	-297.4	386.4	12.93	12.76	2.44	
TPZ - 60° in curve - 1082'FNL & 406'FWL, Sec.11										
6,958.0	61.20	266.60	6,787.4	-758.8	-305.6	394.6	12.93	12.76	2.35	
7,054.0	75.30	264.00	6,822.9	-766.2	-394.2	483.5	14.90	14.69	-2.71	
7,150.0	84.90	264.70	6,839.4	-775.5	-488.2	577.9	10.03	10.00	0.73	
7,245.0	89.70	264.50	6,843.8	-784.4	-582.6	672.8	5.06	5.05	-0.21	
7,341.0	89.00	265.10	6,844.9	-793.1	-678.2	768.7	0.96	-0.73	0.63	
7,436.0	88.30	265.20	6,847.2	-801.1	-772.9	863.6	0.74	-0.74	0.11	
7,532.0	89.00	264.90	6,849.4	-809.4	-868.5	959.5	0.79	0.73	-0.31	
7,627.0	89.40	264.70	6,850.7	-818.0	-963.1	1,054.5	0.47	0.42	-0.21	
7,693.7	89.82	265.82	6,851.2	-823.5	-1,029.6	1,121.1	1.80	0.63	1.68	
Deepest TVD Drilled - 6851.2'										
7,722.0	90.00	266.30	6,851.2	-825.5	-1,057.8	1,149.4	1.80	0.63	1.68	
7,818.0	90.40	267.40	6,850.9	-830.8	-1,153.6	1,245.2	1.22	0.42	1.15	
7,913.0	90.10	267.40	6,850.5	-835.1	-1,248.6	1,339.9	0.32	-0.32	0.00	
8,009.0	89.70	266.50	6,850.7	-840.2	-1,344.4	1,435.7	1.03	-0.42	-0.94	
8,104.0	90.60	267.40	6,850.4	-845.2	-1,439.3	1,530.5	1.34	0.95	0.95	
8,200.0	90.50	267.20	6,849.5	-849.8	-1,535.2	1,626.2	0.23	-0.10	-0.21	
8,296.0	91.00	266.10	6,848.2	-855.4	-1,631.0	1,722.0	1.26	0.52	-1.15	
8,390.0	91.70	267.70	6,846.0	-860.4	-1,724.8	1,815.8	1.86	0.74	1.70	
8,486.0	92.20	268.90	6,842.8	-863.3	-1,820.7	1,911.3	1.35	0.52	1.25	
8,582.0	90.40	268.80	6,840.6	-865.2	-1,916.7	2,006.8	1.88	-1.88	-0.10	
8,678.0	89.90	268.20	6,840.3	-867.7	-2,012.6	2,102.4	0.81	-0.52	-0.63	
8,773.0	89.80	268.80	6,840.6	-870.2	-2,107.6	2,197.0	0.64	-0.11	0.63	

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Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 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)
8,869.0	89.50	268.20	6,841.2	-872.7	-2,203.6	2,292.5	0.70	-0.31	-0.63
8,965.0	89.30	267.90	6,842.2	-876.0	-2,299.5	2,388.2	0.38	-0.21	-0.31
9,060.0	88.40	266.80	6,844.1	-880.4	-2,394.4	2,482.9	1.50	-0.95	-1.16
9,156.0	90.30	267.00	6,845.2	-885.6	-2,490.2	2,578.7	1.99	1.98	0.21
9,251.0	91.50	267.70	6,843.7	-890.0	-2,585.1	2,673.4	1.46	1.26	0.74
9,347.0	91.00	267.90	6,841.6	-893.7	-2,681.0	2,769.0	0.56	-0.52	0.21
9,442.0	90.80	266.80	6,840.1	-898.0	-2,775.9	2,863.8	1.18	-0.21	-1.16
9,537.0	91.50	267.50	6,838.2	-902.8	-2,870.8	2,958.5	1.04	0.74	0.74
9,632.0	91.10	268.40	6,836.0	-906.2	-2,965.7	3,053.1	1.04	-0.42	0.95
9,728.0	91.50	267.40	6,833.8	-909.7	-3,061.6	3,148.8	1.12	0.42	-1.04
9,823.0	91.90	265.60	6,831.0	-915.5	-3,156.4	3,243.6	1.94	0.42	-1.89
9,919.0	92.40	269.60	6,827.4	-919.5	-3,252.2	3,339.2	4.20	0.52	4.17
10,014.0	92.60	270.00	6,823.3	-919.8	-3,347.1	3,433.4	0.47	0.21	0.42
10,110.0	90.00	271.60	6,821.1	-918.5	-3,443.1	3,528.5	3.18	-2.71	1.67
10,205.0	89.70	270.70	6,821.3	-916.6	-3,538.0	3,622.6	1.00	-0.32	-0.95
10,300.0	90.80	270.00	6,820.9	-916.0	-3,633.0	3,716.8	1.37	1.16	-0.74
10,396.0	91.30	269.50	6,819.2	-916.4	-3,729.0	3,812.2	0.74	0.52	-0.52
10,491.0	88.70	269.80	6,819.2	-917.0	-3,824.0	3,906.5	2.76	-2.74	0.32
10,586.0	87.80	267.90	6,822.1	-918.9	-3,918.9	4,001.0	2.21	-0.95	-2.00
10,681.0	88.10	267.00	6,825.5	-923.1	-4,013.8	4,095.7	1.00	0.32	-0.95
10,777.0	88.80	269.50	6,828.1	-926.1	-4,109.7	4,191.2	2.70	0.73	2.60
10,872.0	88.90	269.50	6,830.0	-926.9	-4,204.7	4,285.6	0.11	0.11	0.00
10,968.0	89.30	268.90	6,831.5	-928.2	-4,300.7	4,381.1	0.75	0.42	-0.63
11,063.0	89.30	269.30	6,832.6	-929.7	-4,395.6	4,475.5	0.42	0.00	0.42
11,159.0	89.40	269.50	6,833.7	-930.7	-4,491.6	4,571.0	0.23	0.10	0.21
11,255.0	89.40	268.90	6,834.7	-932.1	-4,587.6	4,666.4	0.62	0.00	-0.63
11,350.0	89.00	269.10	6,836.1	-933.7	-4,682.6	4,760.9	0.47	-0.42	0.21
11,445.0	90.60	268.80	6,836.4	-935.5	-4,777.6	4,855.4	1.71	1.68	-0.32
11,541.0	91.30	268.20	6,834.8	-938.0	-4,873.5	4,951.0	0.96	0.73	-0.63
11,636.0	91.60	267.00	6,832.4	-942.0	-4,968.4	5,045.6	1.30	0.32	-1.26
11,731.0	91.90	266.60	6,829.5	-947.3	-5,063.2	5,140.4	0.53	0.32	-0.42
11,827.0	91.50	269.80	6,826.7	-950.3	-5,159.1	5,235.9	3.36	-0.42	3.33
11,921.0	92.10	268.40	6,823.7	-951.7	-5,253.0	5,329.4	1.62	0.64	-1.49
12,017.0	92.30	267.50	6,820.0	-955.2	-5,348.9	5,425.0	0.96	0.21	-0.94
12,112.0	90.70	269.30	6,817.5	-957.8	-5,443.8	5,519.5	2.53	-1.68	1.89
12,207.0	91.30	268.60	6,815.9	-959.6	-5,538.8	5,614.0	0.97	0.63	-0.74
12,303.0	92.40	268.40	6,812.8	-962.1	-5,634.7	5,709.5	1.16	1.15	-0.21
12,398.0	91.20	269.80	6,809.8	-963.6	-5,729.7	5,804.0	1.94	-1.26	1.47
12,494.0	92.20	269.50	6,806.9	-964.2	-5,825.6	5,899.3	1.09	1.04	-0.31
12,589.0	90.30	270.90	6,804.9	-963.8	-5,920.6	5,993.5	2.48	-2.00	1.47
12,684.0	91.00	270.50	6,803.8	-962.7	-6,015.6	6,087.7	0.85	0.74	-0.42
12,780.0	92.30	270.00	6,801.0	-962.2	-6,111.5	6,182.9	1.45	1.35	-0.52
12,875.0	89.20	270.50	6,799.8	-961.8	-6,206.5	6,277.1	3.31	-3.26	0.53
12,971.0	89.30	270.00	6,801.0	-961.4	-6,302.5	6,372.4	0.53	0.10	-0.52

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Fern 11V-304
Project:	SEC.11-T5N-R65W	TVD Reference:	WELL @ 4642.0ft (Original Well Elev)
Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	MD Reference:	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-304	North Reference:	True
Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 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)	
13,067.0	90.40	269.30	6,801.3	-962.0	-6,398.5	6,467.7	1.36	1.15	-0.73	
13,163.0	89.90	270.20	6,801.0	-962.4	-6,494.5	6,563.1	1.07	-0.52	0.94	
13,258.0	89.40	269.30	6,801.6	-962.8	-6,589.5	6,657.5	1.08	-0.53	-0.95	
13,354.0	90.00	268.10	6,802.1	-965.0	-6,685.5	6,753.0	1.40	0.63	-1.25	
13,449.0	90.90	268.10	6,801.4	-968.2	-6,780.4	6,847.6	0.95	0.95	0.00	
13,544.0	89.30	268.40	6,801.2	-971.1	-6,875.4	6,942.2	1.71	-1.68	0.32	
13,641.0	88.80	266.60	6,802.8	-975.3	-6,972.2	7,038.9	1.93	-0.52	-1.86	
13,736.0	89.10	266.30	6,804.6	-981.2	-7,067.0	7,133.8	0.45	0.32	-0.32	
13,832.0	88.20	268.60	6,806.8	-985.4	-7,162.9	7,229.4	2.57	-0.94	2.40	
13,927.0	88.70	268.20	6,809.4	-988.1	-7,257.8	7,324.0	0.67	0.53	-0.42	
14,023.0	89.30	268.80	6,811.1	-990.6	-7,353.8	7,419.6	0.88	0.63	0.63	
14,118.0	90.00	268.20	6,811.6	-993.1	-7,448.8	7,514.1	0.97	0.74	-0.63	
14,214.0	91.00	267.70	6,810.8	-996.5	-7,544.7	7,609.8	1.16	1.04	-0.52	
14,310.0	92.00	267.50	6,808.3	-1,000.5	-7,640.6	7,705.5	1.06	1.04	-0.21	
14,405.0	90.10	268.90	6,806.6	-1,003.5	-7,735.5	7,800.1	2.48	-2.00	1.47	
14,501.0	89.80	269.10	6,806.6	-1,005.2	-7,831.5	7,895.5	0.38	-0.31	0.21	
14,596.0	90.70	268.80	6,806.2	-1,006.9	-7,926.5	7,990.0	1.00	0.95	-0.32	
14,692.0	91.50	268.60	6,804.4	-1,009.1	-8,022.4	8,085.6	0.86	0.83	-0.21	
14,788.0	89.70	268.20	6,803.4	-1,011.8	-8,118.4	8,181.1	1.92	-1.88	-0.42	
14,883.0	90.00	268.20	6,803.6	-1,014.8	-8,213.3	8,275.8	0.32	0.32	0.00	
14,978.0	90.80	267.50	6,803.0	-1,018.3	-8,308.3	8,370.4	1.12	0.84	-0.74	
15,074.0	91.50	267.20	6,801.0	-1,022.8	-8,404.1	8,466.2	0.79	0.73	-0.31	
15,086.0	91.60	267.00	6,800.7	-1,023.4	-8,416.1	8,478.1	1.86	0.83	-1.67	
15,142.0	91.60	267.00	6,799.1	-1,026.3	-8,472.0	8,534.0	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	
SHL 321'FNL, 688'FWL, - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,397,169.06	3,240,103.66	40.420426	-104.637627	
BHL 1162'FNL, 2530'FEI - survey misses target center by 4.1ft at 15142.0ft MD (6799.1 TVD, -1026.3 N, -8472.0 E) - Point	0.00	0.00	6,802.0	-1,029.2	-8,472.5	1,396,057.54	3,231,641.95	40.417597	-104.668055	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
6,948.6	6,782.8	-758.3	-297.4	TPZ - 60° in curve - 1082'FNL & 406'FWL, Sec.11	
7,693.7	6,851.2	-823.5	-1,029.6	Deepest TVD Drilled - 6851.2'	

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Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	MD Reference:	WELL @ 4642.0ft (Original Well Elev)
Well:	Fern 11V-304	North Reference:	True
Wellbore:	Fern 11V-304 Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Fern 11V-304 Wellbore #1	Database:	US_EDM

Checked By: _____ Approved By: _____ Date: _____