

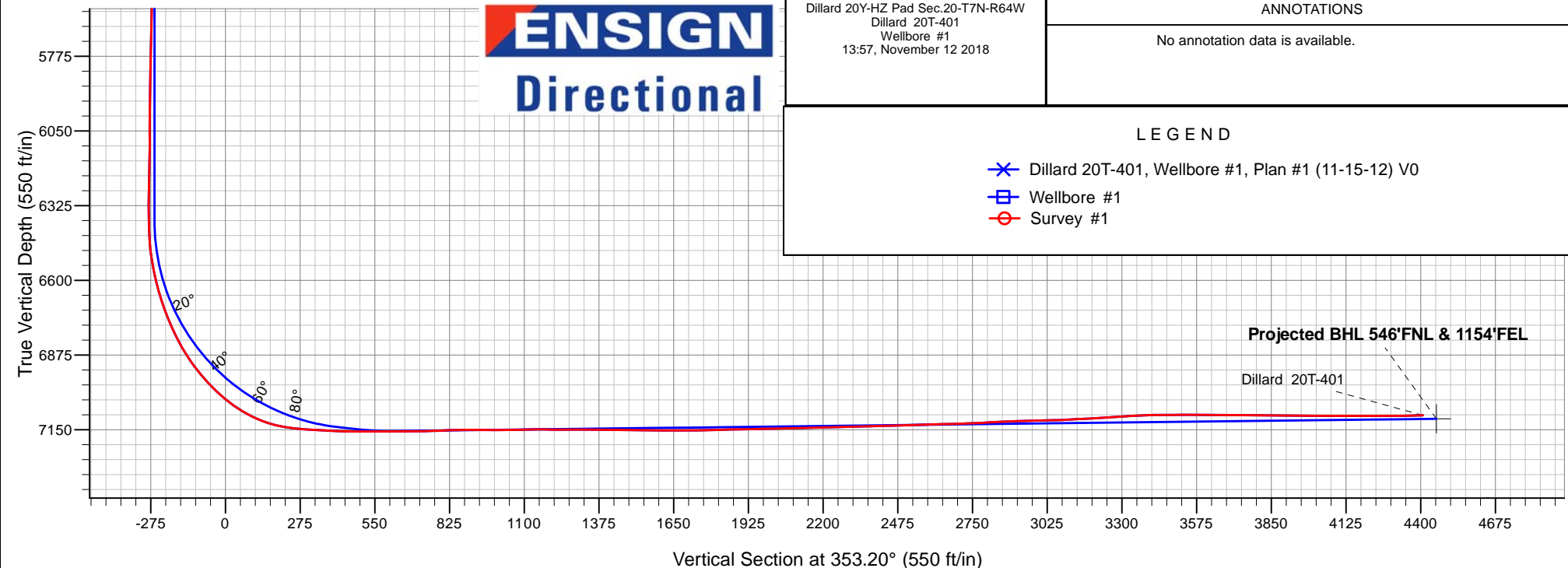
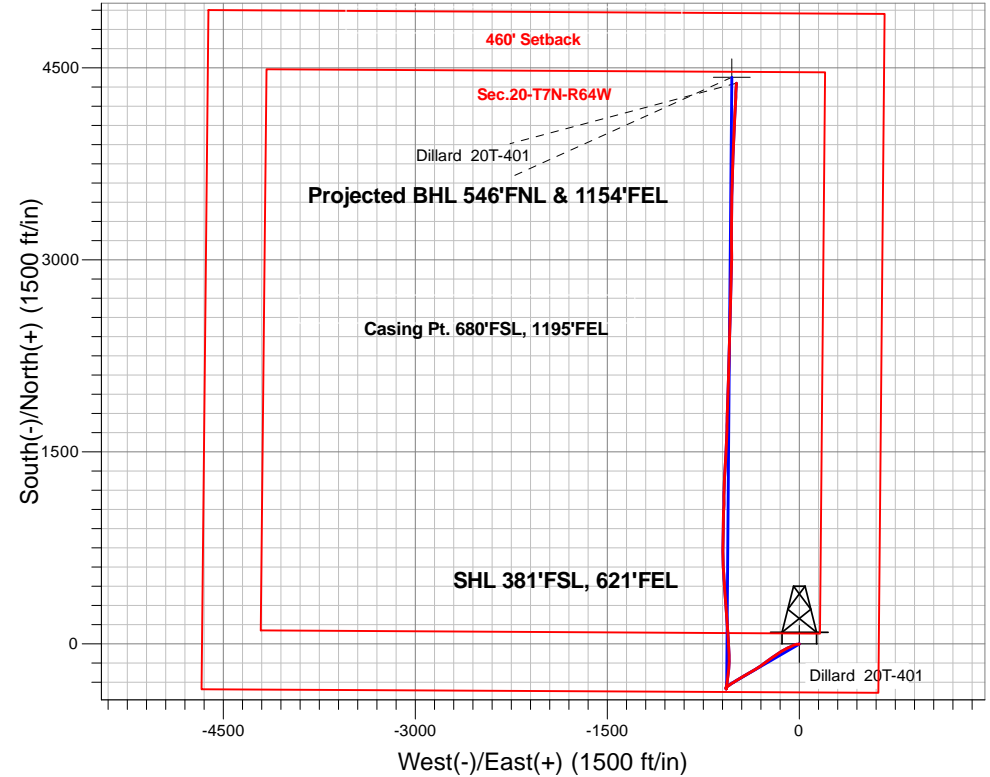
PDC Energy Inc. DJ Basin

Well Name: **Dillard 20T-401**

Surface Location: Dillard 20Y-HZ Pad Sec.20-T7N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4865.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1445347.72259445.65 40.552130 -104.566340
RKB - 15' WELL @ 4880.0ft (RKB - 15')

FINAL SURVEY

Projected Bottom Hole Location
11,650'MD 7098'TVD 4380'N & 492'W of SHL
90.90 degree Incl @ 2.5 degree AZM





PDC Energy Inc. DJ Basin

SEC.20-T7N-R64W

Dillard 20Y-HZ Pad Sec.20-T7N-R64W

Dillard 20T-401

Wellbore #1

Survey: Survey #1

Standard Survey Report

12 November, 2018

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Dillard 20T-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.20-T7N-R64W, 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		Dillard 20Y-HZ Pad Sec.20-T7N-R64W						
Site Position:		Northing:	1,445,348.38	usft	Latitude:	40.552130		
From:	Lat/Long	Easting:	3,259,506.79	usft	Longitude:	-104.566120		
Position Uncertainty:	0.0	ft	Slot Radius:	13-3/16	"	Grid Convergence:	0.60	°

Well	Dillard 20T-401					
Well Position	+N/-S	0.0 ft	Northing:	1,445,347.73 usft	Latitude:	40.552130
	+E/-W	0.0 ft	Easting:	3,259,445.65 usft	Longitude:	-104.566340
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,865.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/14/2013	8.46	67.12	52,985

Design	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	353.20	

Survey Program	Date	11/12/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
147.0	11,650.0	Survey #1 (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	
147.0	1.30	245.10	147.0	-0.7	-1.5	-0.5	0.88	0.88	0.00	
239.0	1.00	237.30	239.0	-1.6	-3.1	-1.2	0.37	-0.33	-8.48	
330.0	0.90	273.70	330.0	-2.0	-4.5	-1.4	0.66	-0.11	40.00	
422.0	1.00	255.10	421.9	-2.1	-6.0	-1.4	0.35	0.11	-20.22	
514.0	1.40	268.70	513.9	-2.3	-7.9	-1.4	0.53	0.43	14.78	
606.0	1.30	272.20	605.9	-2.3	-10.1	-1.1	0.14	-0.11	3.80	
698.0	1.30	258.00	697.9	-2.5	-12.1	-1.1	0.35	0.00	-15.43	
789.0	1.50	276.40	788.8	-2.6	-14.3	-0.9	0.54	0.22	20.22	
880.0	2.00	281.40	879.8	-2.1	-17.1	-0.1	0.57	0.55	5.49	

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Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
975.0	2.40	261.50	974.7	-2.1	-20.7	0.3	0.90	0.42	-20.95
1,066.0	3.70	256.20	1,065.6	-3.1	-25.4	-0.1	1.46	1.43	-5.82
1,158.0	5.50	253.00	1,157.3	-5.1	-32.5	-1.2	1.98	1.96	-3.48
1,253.0	6.90	245.60	1,251.8	-8.8	-42.1	-3.7	1.69	1.47	-7.79
1,348.0	8.70	241.50	1,345.9	-14.6	-53.6	-8.1	1.98	1.89	-4.32
1,443.0	9.50	246.40	1,439.7	-21.1	-67.1	-13.0	1.17	0.84	5.16
1,538.0	10.70	245.90	1,533.2	-27.9	-82.3	-17.9	1.27	1.26	-0.53
1,634.0	11.10	247.10	1,627.5	-35.1	-98.9	-23.1	0.48	0.42	1.25
1,729.0	11.60	239.10	1,720.6	-43.6	-115.6	-29.6	1.74	0.53	-8.42
1,824.0	11.40	239.40	1,813.7	-53.3	-131.8	-37.3	0.22	-0.21	0.32
1,919.0	11.10	237.90	1,906.9	-62.9	-147.7	-45.0	0.44	-0.32	-1.58
2,014.0	10.10	238.30	2,000.3	-72.1	-162.5	-52.4	1.06	-1.05	0.42
2,110.0	10.00	236.00	2,094.8	-81.2	-176.6	-59.7	0.43	-0.10	-2.40
2,205.0	9.90	234.50	2,188.4	-90.6	-190.1	-67.4	0.29	-0.11	-1.58
2,300.0	10.80	237.10	2,281.8	-100.2	-204.2	-75.3	1.07	0.95	2.74
2,395.0	10.50	234.30	2,375.2	-110.0	-218.7	-83.4	0.63	-0.32	-2.95
2,490.0	10.50	232.90	2,468.6	-120.3	-232.6	-91.9	0.27	0.00	-1.47
2,585.0	9.30	233.00	2,562.2	-130.2	-245.7	-100.1	1.26	-1.26	0.11
2,680.0	9.20	233.10	2,655.9	-139.3	-257.9	-107.8	0.11	-0.11	0.11
2,775.0	10.30	234.20	2,749.6	-148.9	-270.8	-115.7	1.17	1.16	1.16
2,870.0	9.80	233.50	2,843.1	-158.6	-284.2	-123.9	0.54	-0.53	-0.74
2,965.0	10.30	236.30	2,936.6	-168.2	-297.8	-131.7	0.74	0.53	2.95
3,061.0	10.00	237.60	3,031.1	-177.4	-312.0	-139.2	0.39	-0.31	1.35
3,156.0	10.70	238.50	3,124.6	-186.4	-326.4	-146.4	0.76	0.74	0.95
3,251.0	10.30	239.00	3,218.0	-195.4	-341.2	-153.6	0.43	-0.42	0.53
3,346.0	10.10	238.30	3,311.5	-204.1	-355.6	-160.6	0.25	-0.21	-0.74
3,441.0	9.80	237.30	3,405.1	-212.9	-369.5	-167.6	0.36	-0.32	-1.05
3,536.0	9.00	238.10	3,498.8	-221.2	-382.6	-174.3	0.85	-0.84	0.84
3,631.0	8.70	236.80	3,592.7	-229.0	-394.9	-180.7	0.38	-0.32	-1.37
3,726.0	9.10	243.20	3,686.5	-236.4	-407.7	-186.4	1.12	0.42	6.74
3,821.0	8.40	244.80	3,780.4	-242.7	-420.6	-191.2	0.78	-0.74	1.68
3,916.0	8.50	241.70	3,874.4	-249.0	-433.1	-196.0	0.49	0.11	-3.26
4,011.0	8.80	239.00	3,968.3	-256.1	-445.5	-201.5	0.53	0.32	-2.84
4,106.0	9.10	237.60	4,062.2	-263.8	-458.1	-207.7	0.39	0.32	-1.47
4,201.0	9.30	238.70	4,155.9	-271.8	-471.0	-214.2	0.28	0.21	1.16
4,296.0	8.70	236.40	4,249.8	-279.8	-483.5	-220.6	0.74	-0.63	-2.42
4,391.0	8.30	236.60	4,343.7	-287.6	-495.2	-226.9	0.42	-0.42	0.21
4,487.0	7.60	237.60	4,438.8	-294.8	-506.4	-232.7	0.74	-0.73	1.04
4,582.0	7.10	237.00	4,533.0	-301.3	-516.6	-238.0	0.53	-0.53	-0.63
4,677.0	6.40	238.20	4,627.4	-307.3	-526.0	-242.9	0.75	-0.74	1.26
4,771.0	6.10	236.30	4,720.8	-312.9	-534.6	-247.3	0.39	-0.32	-2.02
4,866.0	5.30	237.10	4,815.3	-318.0	-542.5	-251.6	0.85	-0.84	0.84
4,961.0	4.80	236.40	4,910.0	-322.6	-549.5	-255.3	0.53	-0.53	-0.74
5,054.0	4.40	232.80	5,002.7	-326.9	-555.6	-258.8	0.53	-0.43	-3.87

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Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
5,149.0	3.60	234.40	5,097.4	-330.9	-560.9	-262.1	0.85	-0.84	1.68
5,244.0	3.40	232.20	5,192.2	-334.3	-565.6	-265.0	0.25	-0.21	-2.32
5,340.0	2.20	242.20	5,288.1	-336.9	-569.5	-267.1	1.34	-1.25	10.42
5,435.0	1.80	233.80	5,383.1	-338.7	-572.3	-268.5	0.52	-0.42	-8.84
5,530.0	0.90	228.70	5,478.0	-340.0	-574.0	-269.7	0.95	-0.95	-5.37
5,625.0	1.10	187.30	5,573.0	-341.4	-574.7	-271.0	0.77	0.21	-43.58
5,719.0	1.10	160.40	5,667.0	-343.2	-574.5	-272.7	0.54	0.00	-28.62
5,814.0	1.50	146.50	5,762.0	-345.1	-573.5	-274.7	0.53	0.42	-14.63
5,909.0	0.90	171.00	5,857.0	-346.9	-572.7	-276.6	0.82	-0.63	25.79
6,004.0	0.60	188.80	5,952.0	-348.1	-572.7	-277.8	0.40	-0.32	18.74
6,099.0	0.70	165.10	6,047.0	-349.1	-572.6	-278.9	0.30	0.11	-24.95
6,194.0	0.50	159.90	6,142.0	-350.1	-572.3	-279.9	0.22	-0.21	-5.47
6,289.0	0.70	170.50	6,236.9	-351.1	-572.1	-280.8	0.24	0.21	11.16
6,352.0	0.50	171.40	6,299.9	-351.7	-572.0	-281.5	0.32	-0.32	1.43
6,383.0	0.70	153.70	6,330.9	-352.0	-571.9	-281.8	0.87	0.65	-57.10
6,415.0	0.40	147.80	6,362.9	-352.3	-571.7	-282.1	0.95	-0.94	-18.44
6,447.0	0.90	19.90	6,394.9	-352.1	-571.6	-282.0	3.71	1.56	-399.69
6,479.0	2.90	11.60	6,426.9	-351.1	-571.3	-281.0	6.29	6.25	-25.94
6,510.0	5.00	8.80	6,457.8	-349.0	-571.0	-278.9	6.80	6.77	-9.03
6,542.0	6.90	5.20	6,489.7	-345.7	-570.6	-275.7	6.05	5.94	-11.25
6,573.0	8.90	7.00	6,520.4	-341.5	-570.1	-271.6	6.50	6.45	5.81
6,605.0	11.00	7.20	6,551.9	-336.0	-569.4	-266.2	6.56	6.56	0.63
6,637.0	12.90	7.80	6,583.2	-329.4	-568.6	-259.8	5.95	5.94	1.88
6,669.0	14.50	8.50	6,614.3	-321.9	-567.5	-252.5	5.03	5.00	2.19
6,701.0	16.60	7.20	6,645.1	-313.4	-566.3	-244.2	6.65	6.56	-4.06
6,733.0	18.40	6.40	6,675.6	-303.9	-565.2	-234.8	5.67	5.63	-2.50
6,764.0	20.50	7.30	6,704.9	-293.6	-564.0	-224.8	6.84	6.77	2.90
6,796.0	22.50	7.10	6,734.6	-282.0	-562.5	-213.4	6.25	6.25	-0.63
6,827.0	24.20	8.20	6,763.1	-269.8	-560.9	-201.5	5.66	5.48	3.55
6,859.0	25.90	9.20	6,792.1	-256.4	-558.8	-188.4	5.47	5.31	3.13
6,890.0	28.10	8.20	6,819.7	-242.5	-556.7	-174.9	7.25	7.10	-3.23
6,922.0	30.70	6.50	6,847.6	-226.9	-554.7	-159.6	8.53	8.13	-5.31
6,954.0	33.00	5.40	6,874.8	-210.1	-552.9	-143.2	7.41	7.19	-3.44
6,986.0	35.40	4.60	6,901.2	-192.2	-551.4	-125.6	7.63	7.50	-2.50
7,017.0	38.00	3.50	6,926.1	-173.7	-550.1	-107.4	8.65	8.39	-3.55
7,049.0	40.80	2.00	6,950.8	-153.5	-549.1	-87.3	9.24	8.75	-4.69
7,081.0	43.30	1.00	6,974.6	-132.0	-548.5	-66.1	8.09	7.81	-3.13
7,113.0	45.10	359.00	6,997.5	-109.7	-548.5	-44.0	7.11	5.63	-6.25
7,144.0	47.60	358.30	7,018.9	-87.3	-549.1	-21.7	8.23	8.06	-2.26
7,176.0	50.70	357.40	7,039.8	-63.1	-550.0	2.5	9.92	9.69	-2.81
7,208.0	54.20	357.70	7,059.3	-37.8	-551.1	27.8	10.96	10.94	0.94
7,239.0	58.00	356.90	7,076.6	-12.1	-552.3	53.4	12.44	12.26	-2.58
7,271.0	61.70	356.10	7,092.7	15.5	-554.0	81.0	11.76	11.56	-2.50

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Design:	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)
7,303.0	65.30	356.10	7,107.0	44.1	-555.9	109.6	11.25	11.25	0.00
7,334.0	69.20	355.70	7,118.9	72.6	-558.0	138.2	12.64	12.58	-1.29
7,366.0	73.90	355.50	7,129.1	102.9	-560.3	168.5	14.70	14.69	-0.63
7,398.0	78.50	355.80	7,136.7	133.8	-562.7	199.5	14.40	14.38	0.94
7,429.0	81.80	356.10	7,142.0	164.3	-564.8	230.0	10.69	10.65	0.97
7,460.0	83.70	356.80	7,145.9	195.0	-566.7	260.7	6.53	6.13	2.26
7,489.0	85.50	356.70	7,148.6	223.8	-568.4	289.6	6.22	6.21	-0.34
7,564.0	87.70	355.40	7,153.1	298.5	-573.5	364.3	3.41	2.93	-1.73
7,594.0	87.60	354.60	7,154.3	328.4	-576.1	394.3	2.69	-0.33	-2.67
7,624.0	88.00	355.50	7,155.5	358.2	-578.7	424.2	3.28	1.33	3.00
7,655.0	88.50	355.60	7,156.4	389.1	-581.1	455.2	1.64	1.61	0.32
7,685.0	89.60	356.20	7,156.9	419.0	-583.3	485.2	4.18	3.67	2.00
7,716.0	90.30	356.40	7,156.9	450.0	-585.3	516.1	2.35	2.26	0.65
7,746.0	90.80	356.80	7,156.7	479.9	-587.0	546.1	2.13	1.67	1.33
7,777.0	90.70	356.20	7,156.3	510.9	-588.9	577.0	1.96	-0.32	-1.94
7,807.0	89.80	356.20	7,156.1	540.8	-590.9	607.0	3.00	-3.00	0.00
7,838.0	89.60	356.80	7,156.3	571.7	-592.8	637.9	2.04	-0.65	1.94
7,868.0	90.50	357.10	7,156.3	601.7	-594.4	667.9	3.16	3.00	1.00
7,899.0	90.60	357.30	7,156.0	632.7	-595.9	698.8	0.72	0.32	0.65
7,930.0	91.30	358.40	7,155.4	663.6	-597.1	729.7	4.21	2.26	3.55
7,960.0	91.50	359.10	7,154.7	693.6	-597.7	759.5	2.43	0.67	2.33
7,991.0	92.00	0.70	7,153.8	724.6	-597.8	790.3	5.41	1.61	5.16
8,022.0	92.40	1.00	7,152.6	755.6	-597.3	821.0	1.61	1.29	0.97
8,053.0	92.00	1.20	7,151.4	786.5	-596.7	851.7	1.44	-1.29	0.65
8,083.0	90.70	0.80	7,150.7	816.5	-596.2	881.4	4.53	-4.33	-1.33
8,114.0	89.70	1.20	7,150.6	847.5	-595.7	912.1	3.47	-3.23	1.29
8,145.0	89.30	1.10	7,150.8	878.5	-595.1	942.8	1.33	-1.29	-0.32
8,176.0	89.10	0.70	7,151.3	909.5	-594.6	973.5	1.44	-0.65	-1.29
8,206.0	90.10	1.20	7,151.5	939.5	-594.1	1,003.2	3.73	3.33	1.67
8,237.0	90.80	1.40	7,151.2	970.5	-593.4	1,033.9	2.35	2.26	0.65
8,267.0	91.40	1.50	7,150.7	1,000.5	-592.6	1,063.6	2.03	2.00	0.33
8,298.0	90.90	1.80	7,150.0	1,031.5	-591.7	1,094.3	1.88	-1.61	0.97
8,328.0	90.70	2.00	7,149.6	1,061.4	-590.7	1,123.9	0.94	-0.67	0.67
8,359.0	90.80	0.80	7,149.2	1,092.4	-590.0	1,154.6	3.88	0.32	-3.87
8,390.0	88.60	359.40	7,149.4	1,123.4	-589.9	1,185.4	8.41	-7.10	-4.52
8,420.0	89.20	0.00	7,150.0	1,153.4	-590.1	1,215.2	2.83	2.00	2.00
8,450.0	90.20	2.50	7,150.1	1,183.4	-589.4	1,244.9	8.98	3.33	8.33
8,481.0	90.40	2.70	7,149.9	1,214.4	-588.0	1,275.5	0.91	0.65	0.65
8,512.0	90.90	2.60	7,149.6	1,245.3	-586.6	1,306.0	1.64	1.61	-0.32
8,542.0	89.90	1.70	7,149.4	1,275.3	-585.4	1,335.7	4.48	-3.33	-3.00
8,573.0	89.10	2.20	7,149.7	1,306.3	-584.4	1,366.3	3.04	-2.58	1.61
8,603.0	88.80	3.60	7,150.2	1,336.3	-582.9	1,395.9	4.77	-1.00	4.67
8,634.0	89.10	3.70	7,150.8	1,367.2	-580.9	1,426.4	1.02	0.97	0.32

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Dillard 20T-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)
8,665.0	89.10	3.00	7,151.3	1,398.1	-579.1	1,456.9	2.26	0.00	-2.26
8,695.0	89.10	3.60	7,151.7	1,428.1	-577.4	1,486.4	2.00	0.00	2.00
8,726.0	89.50	3.30	7,152.1	1,459.0	-575.5	1,516.9	1.61	1.29	-0.97
8,756.0	89.30	3.20	7,152.4	1,489.0	-573.8	1,546.4	0.75	-0.67	-0.33
8,787.0	89.30	2.90	7,152.8	1,519.9	-572.1	1,577.0	0.97	0.00	-0.97
8,817.0	89.40	2.80	7,153.1	1,549.9	-570.7	1,606.6	0.47	0.33	-0.33
8,847.0	90.20	2.90	7,153.3	1,579.9	-569.2	1,636.1	2.69	2.67	0.33
8,879.0	90.70	2.30	7,153.0	1,611.8	-567.7	1,667.7	2.44	1.56	-1.88
8,911.0	90.60	1.80	7,152.6	1,643.8	-566.6	1,699.3	1.59	-0.31	-1.56
8,942.0	90.70	1.80	7,152.3	1,674.8	-565.6	1,730.0	0.32	0.32	0.00
8,974.0	90.80	0.80	7,151.9	1,706.8	-564.9	1,761.6	3.14	0.31	-3.13
9,006.0	91.40	1.30	7,151.3	1,738.8	-564.3	1,793.3	2.44	1.88	1.56
9,037.0	91.70	1.00	7,150.4	1,769.7	-563.7	1,824.0	1.37	0.97	-0.97
9,069.0	91.30	1.70	7,149.6	1,801.7	-562.9	1,855.7	2.52	-1.25	2.19
9,100.0	90.80	1.80	7,149.0	1,832.7	-562.0	1,886.3	1.64	-1.61	0.32
9,132.0	91.10	1.20	7,148.5	1,864.7	-561.1	1,918.0	2.10	0.94	-1.88
9,164.0	91.30	1.70	7,147.8	1,896.7	-560.3	1,949.7	1.68	0.63	1.56
9,195.0	91.60	1.70	7,147.0	1,927.6	-559.4	1,980.3	0.97	0.97	0.00
9,227.0	91.80	1.80	7,146.1	1,959.6	-558.4	2,011.9	0.70	0.63	0.31
9,259.0	90.80	1.80	7,145.3	1,991.6	-557.4	2,043.6	3.13	-3.13	0.00
9,290.0	90.80	1.50	7,144.9	2,022.6	-556.5	2,074.2	0.97	0.00	-0.97
9,322.0	91.00	1.80	7,144.4	2,054.6	-555.6	2,105.9	1.13	0.63	0.94
9,353.0	91.20	2.10	7,143.8	2,085.5	-554.5	2,136.5	1.16	0.65	0.97
9,385.0	91.30	1.90	7,143.1	2,117.5	-553.4	2,168.1	0.70	0.31	-0.63
9,417.0	91.50	1.90	7,142.3	2,149.5	-552.4	2,199.8	0.63	0.63	0.00
9,449.0	91.50	1.90	7,141.5	2,181.4	-551.3	2,231.4	0.00	0.00	0.00
9,480.0	91.70	2.00	7,140.6	2,212.4	-550.3	2,262.0	0.72	0.65	0.32
9,512.0	91.90	2.10	7,139.6	2,244.4	-549.1	2,293.6	0.70	0.63	0.31
9,544.0	92.00	2.00	7,138.5	2,276.3	-548.0	2,325.2	0.44	0.31	-0.31
9,575.0	91.30	2.40	7,137.6	2,307.3	-546.8	2,355.8	2.60	-2.26	1.29
9,607.0	91.20	2.20	7,136.9	2,339.3	-545.5	2,387.4	0.70	-0.31	-0.63
9,639.0	91.50	1.70	7,136.2	2,371.2	-544.4	2,419.0	1.82	0.94	-1.56
9,670.0	91.60	2.00	7,135.4	2,402.2	-543.4	2,449.7	1.02	0.32	0.97
9,702.0	91.80	1.70	7,134.4	2,434.2	-542.4	2,481.3	1.13	0.63	-0.94
9,734.0	91.80	1.30	7,133.4	2,466.2	-541.5	2,512.9	1.25	0.00	-1.25
9,765.0	91.60	0.90	7,132.5	2,497.1	-540.9	2,543.6	1.44	-0.65	-1.29
9,797.0	91.60	1.20	7,131.6	2,529.1	-540.4	2,575.3	0.94	0.00	0.94
9,829.0	91.50	1.10	7,130.7	2,561.1	-539.7	2,607.0	0.44	-0.31	-0.31
9,861.0	91.50	0.50	7,129.9	2,593.1	-539.3	2,638.7	1.87	0.00	-1.88
9,892.0	91.50	0.60	7,129.1	2,624.1	-539.0	2,669.4	0.32	0.00	0.32
9,924.0	91.70	0.30	7,128.2	2,656.1	-538.7	2,701.2	1.13	0.63	-0.94
9,956.0	92.20	0.80	7,127.1	2,688.0	-538.4	2,732.9	2.21	1.56	1.56
9,988.0	92.40	0.90	7,125.8	2,720.0	-537.9	2,764.6	0.70	0.63	0.31
10,020.0	92.80	0.80	7,124.4	2,752.0	-537.5	2,796.3	1.29	1.25	-0.31

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Dillard 20T-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)	
10,051.0	93.40	1.50	7,122.7	2,782.9	-536.8	2,826.9	2.97	1.94	2.26	
10,083.0	93.40	1.30	7,120.8	2,814.9	-536.1	2,858.5	0.62	0.00	-0.63	
10,115.0	92.30	1.80	7,119.2	2,846.8	-535.2	2,890.2	3.78	-3.44	1.56	
10,146.0	91.30	2.30	7,118.2	2,877.8	-534.1	2,920.8	3.61	-3.23	1.61	
10,178.0	91.30	2.00	7,117.5	2,909.7	-532.9	2,952.4	0.94	0.00	-0.94	
10,209.0	91.40	2.00	7,116.8	2,940.7	-531.8	2,983.0	0.32	0.32	0.00	
10,241.0	91.20	1.50	7,116.0	2,972.7	-530.8	3,014.6	1.68	-0.63	-1.56	
10,272.0	91.60	1.40	7,115.3	3,003.7	-530.0	3,045.3	1.33	1.29	-0.32	
10,304.0	92.20	0.50	7,114.2	3,035.6	-529.5	3,077.0	3.38	1.88	-2.81	
10,336.0	92.80	0.10	7,112.8	3,067.6	-529.3	3,108.7	2.25	1.88	-1.25	
10,368.0	93.10	0.10	7,111.2	3,099.6	-529.3	3,140.4	0.94	0.94	0.00	
10,399.0	93.60	0.50	7,109.4	3,130.5	-529.1	3,171.2	2.06	1.61	1.29	
10,431.0	92.90	359.50	7,107.5	3,162.5	-529.1	3,202.9	3.81	-2.19	-3.13	
10,463.0	93.00	0.10	7,105.9	3,194.4	-529.2	3,234.6	1.90	0.31	1.88	
10,495.0	93.40	359.40	7,104.1	3,226.4	-529.4	3,266.4	2.52	1.25	-2.19	
10,527.0	93.70	359.50	7,102.1	3,258.3	-529.7	3,298.1	0.99	0.94	0.31	
10,559.0	93.90	359.70	7,100.0	3,290.2	-529.9	3,329.8	0.88	0.63	0.63	
10,590.0	93.50	359.80	7,098.0	3,321.2	-530.0	3,360.6	1.33	-1.29	0.32	
10,622.0	92.20	0.40	7,096.4	3,353.1	-530.0	3,392.3	4.47	-4.06	1.88	
10,653.0	90.10	359.70	7,095.8	3,384.1	-530.0	3,423.1	7.14	-6.77	-2.26	
10,685.0	90.20	1.00	7,095.7	3,416.1	-529.8	3,454.8	4.07	0.31	4.06	
10,717.0	90.30	1.30	7,095.6	3,448.1	-529.1	3,486.5	0.99	0.31	0.94	
10,749.0	90.30	0.50	7,095.4	3,480.1	-528.6	3,518.2	2.50	0.00	-2.50	
10,780.0	90.10	1.20	7,095.3	3,511.1	-528.2	3,549.0	2.35	-0.65	2.26	
10,811.0	89.50	1.70	7,095.4	3,542.1	-527.4	3,579.6	2.52	-1.94	1.61	
10,843.0	89.60	1.50	7,095.7	3,574.1	-526.5	3,611.3	0.70	0.31	-0.63	
10,875.0	89.30	1.30	7,096.0	3,606.1	-525.7	3,643.0	1.13	-0.94	-0.63	
10,907.0	89.70	1.30	7,096.2	3,638.1	-525.0	3,674.6	1.25	1.25	0.00	
10,938.0	90.30	1.30	7,096.2	3,669.1	-524.3	3,705.3	1.94	1.94	0.00	
10,970.0	89.70	2.20	7,096.2	3,701.0	-523.3	3,737.0	3.38	-1.88	2.81	
11,002.0	89.50	2.70	7,096.5	3,733.0	-521.9	3,768.6	1.68	-0.63	1.56	
11,033.0	89.50	2.80	7,096.7	3,764.0	-520.4	3,799.1	0.32	0.00	0.32	
11,065.0	88.60	2.40	7,097.3	3,795.9	-519.0	3,830.7	3.08	-2.81	-1.25	
11,096.0	88.90	1.90	7,097.9	3,826.9	-517.8	3,861.3	1.88	0.97	-1.61	
11,127.0	89.30	2.30	7,098.4	3,857.9	-516.7	3,891.9	1.82	1.29	1.29	
11,159.0	89.30	2.50	7,098.8	3,889.9	-515.3	3,923.5	0.62	0.00	0.63	
11,191.0	89.60	2.70	7,099.1	3,921.8	-513.9	3,955.1	1.13	0.94	0.63	
11,223.0	90.10	2.90	7,099.2	3,953.8	-512.3	3,986.6	1.68	1.56	0.63	
11,254.0	90.20	3.20	7,099.1	3,984.7	-510.7	4,017.2	1.02	0.32	0.97	
11,286.0	90.10	2.80	7,099.1	4,016.7	-509.0	4,048.7	1.29	-0.31	-1.25	
11,318.0	90.00	2.80	7,099.0	4,048.7	-507.4	4,080.3	0.31	-0.31	0.00	
11,349.0	90.00	2.80	7,099.0	4,079.6	-505.9	4,110.8	0.00	0.00	0.00	
11,381.0	90.00	2.80	7,099.0	4,111.6	-504.4	4,142.4	0.00	0.00	0.00	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Dillard 20T-401
Project:	SEC.20-T7N-R64W	TVD Reference:	WELL @ 4880.0ft (RKB - 15')
Site:	Dillard 20Y-HZ Pad Sec.20-T7N-R64W	MD Reference:	WELL @ 4880.0ft (RKB - 15')
Well:	Dillard 20T-401	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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)	
11,412.0	90.00	2.90	7,099.0	4,142.5	-502.8	4,172.9	0.32	0.00	0.32	
11,444.0	89.90	2.80	7,099.1	4,174.5	-501.2	4,204.5	0.44	-0.31	-0.31	
11,476.0	89.80	2.20	7,099.1	4,206.5	-499.8	4,236.1	1.90	-0.31	-1.88	
11,507.0	90.00	2.60	7,099.2	4,237.4	-498.5	4,266.7	1.44	0.65	1.29	
11,539.0	90.40	2.30	7,099.1	4,269.4	-497.2	4,298.2	1.56	1.25	-0.94	
11,571.0	90.60	2.70	7,098.8	4,301.4	-495.8	4,329.8	1.40	0.63	1.25	
11,596.0	90.90	2.50	7,098.5	4,326.4	-494.6	4,354.5	1.44	1.20	-0.80	
11,650.0	90.90	2.50	7,097.6	4,380.3	-492.3	4,407.8	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 381'FSL, 621'FEL	0.00	0.00	1.0	0.0	0.0	1,445,347.73	3,259,445.65	40.552130		-104.566340
- hit/miss target										
- survey hits target center										
- Point										
BHL 500'FNL & 1190'FE	0.00	0.00	7,110.0	4,426.5	-527.9	1,449,768.31	3,258,871.19	40.564280		-104.568240
- survey misses target center by 59.7ft at 11650.0ft MD (7097.6 TVD, 4380.3 N, -492.3 E)										
- Point										

Checked By: _____	Approved By: _____	Date: _____
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