

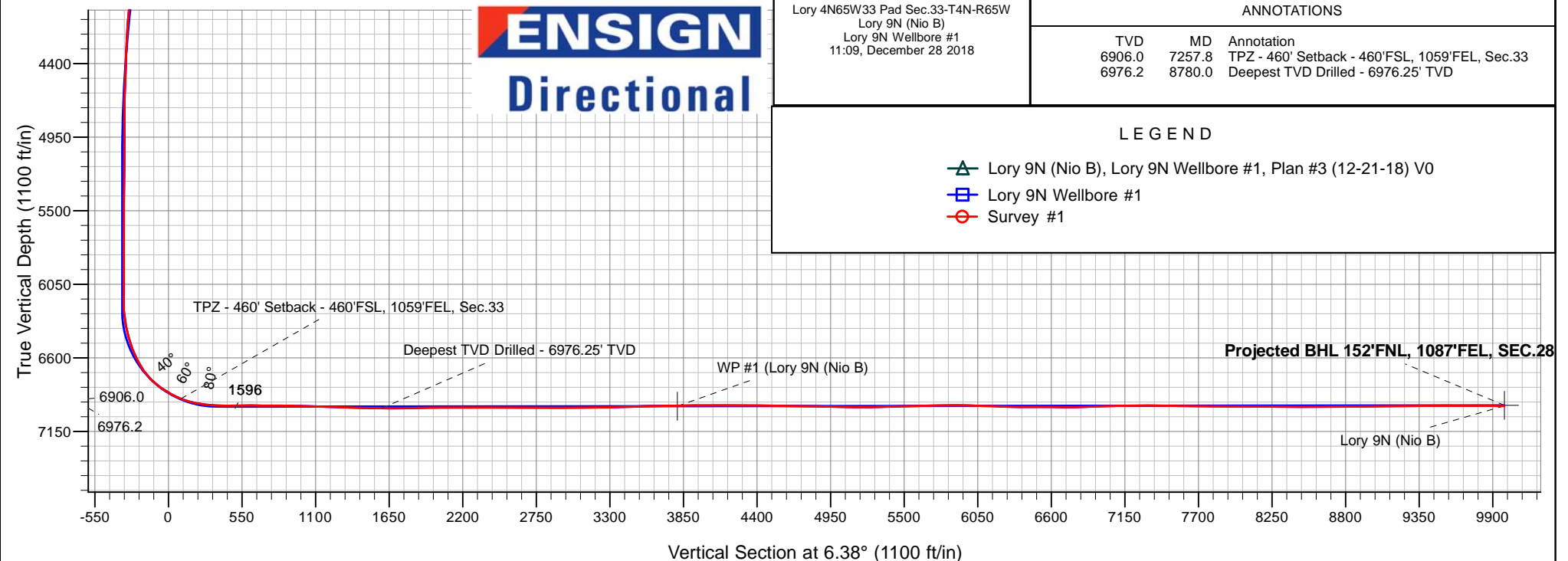
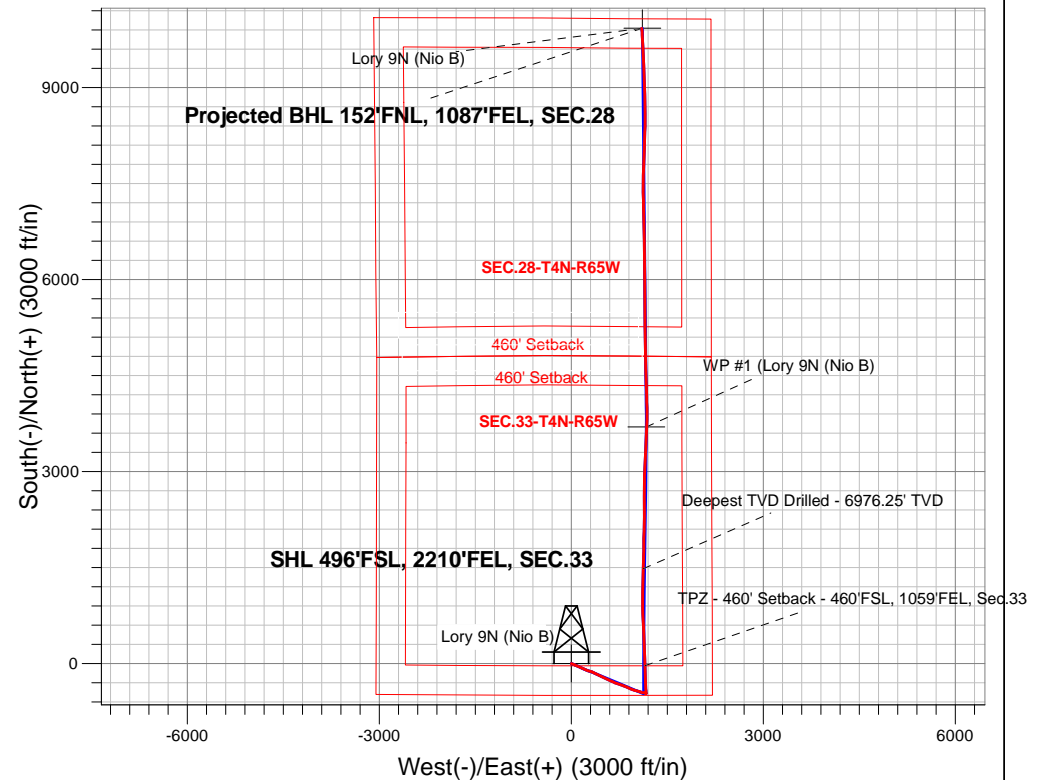
PDC Energy Inc. DJ Basin

Well Name: **Lory 9N (Nio B)**

Surface Location: Lory 4N65W33 Pad Sec.33-T4N-R65W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4818.0
+N/-S+E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1339735.133232520.58 40.262973 -104.666800
Original Well Elev WELL @ 4841.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
17,228'MD 6960'TVD 9923'N & 1102'E of SHL
89.41 degree Incl @ 356.76 degree AZM





PDC Energy Inc. DJ Basin

SEC.33-T4N-R65W

Lory 4N65W33 Pad Sec.33-T4N-R65W

Lory 9N (Nio B)

Lory 9N Wellbore #1

Survey: Survey #1

Standard Survey Report

28 December, 2018

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Lory 9N (Nio B)
Project:	SEC.33-T4N-R65W	TVD Reference:	WELL @ 4841.0ft (Original Well Elev)
Site:	Lory 4N65W33 Pad Sec.33-T4N-R65W	MD Reference:	WELL @ 4841.0ft (Original Well Elev)
Well:	Lory 9N (Nio B)	North Reference:	True
Wellbore:	Lory 9N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Lory 9N Wellbore #1	Database:	US_EDM

Project	SEC.33-T4N-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	Lory 4N65W33 Pad Sec.33-T4N-R65W				
Site Position:		Northing:	1,339,615.11 usft	Latitude:	40.262644
From:	Lat/Long	Easting:	3,232,521.77 usft	Longitude:	-104.666800
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.54 °

Well	Lory 9N (Nio B)					
Well Position	+N/-S	0.0 ft	Northing:	1,339,735.13 usft	Latitude:	40.262973
	+E/-W	0.0 ft	Easting:	3,232,520.58 usft	Longitude:	-104.666800
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,818.0 ft

Wellbore	Lory 9N Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/21/2018	8.23	66.70	52,162

Design	Lory 9N 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	6.38	

Survey Program	Date	12/28/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
144.0	17,228.0	Survey #1 (Lory 9N 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	50.10	1.0	0.0	0.0	0.0	0.28	0.28	0.00
SHL 496'FSL, 2210'FEL, SEC.33									
144.0	0.40	50.10	144.0	0.3	0.4	0.4	0.28	0.28	0.00
234.0	1.10	108.40	234.0	0.3	1.4	0.4	1.06	0.78	64.78
324.0	2.60	117.40	323.9	-1.0	4.1	-0.5	1.69	1.67	10.00
414.0	4.10	116.00	413.8	-3.3	8.8	-2.3	1.67	1.67	-1.56
503.0	5.50	115.30	502.5	-6.5	15.5	-4.8	1.57	1.57	-0.79
594.0	6.70	113.90	593.0	-10.5	24.3	-7.8	1.33	1.32	-1.54
683.0	7.50	114.10	681.3	-15.0	34.3	-11.1	0.90	0.90	0.22
773.0	9.00	112.50	770.3	-20.1	46.2	-14.8	1.69	1.67	-1.78

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Site:	Lory 4N65W33 Pad Sec.33-T4N-R65W	MD Reference:	WELL @ 4841.0ft (Original Well Elev)
Well:	Lory 9N (Nio B)	North Reference:	True
Wellbore:	Lory 9N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Lory 9N 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)
863.0	10.50	114.10	859.0	-26.2	60.2	-19.3	1.69	1.67	1.78
953.0	11.90	112.50	947.3	-33.1	76.3	-24.4	1.59	1.56	-1.78
1,042.0	12.40	112.30	1,034.3	-40.2	93.6	-29.5	0.56	0.56	-0.22
1,131.0	13.60	113.40	1,121.0	-48.0	112.0	-35.2	1.38	1.35	1.24
1,221.0	15.00	115.80	1,208.3	-57.2	132.2	-42.2	1.69	1.56	2.67
1,311.0	16.70	114.80	1,294.8	-67.7	154.4	-50.2	1.91	1.89	-1.11
1,401.0	18.10	114.60	1,380.7	-79.0	178.9	-58.6	1.56	1.56	-0.22
1,490.0	18.40	113.70	1,465.2	-90.4	204.3	-67.1	0.46	0.34	-1.01
1,580.0	17.90	114.10	1,550.8	-101.7	230.0	-75.5	0.57	-0.56	0.44
1,637.0	16.10	111.80	1,605.3	-108.3	245.3	-80.3	3.37	-3.16	-4.04
1,759.0	12.96	103.75	1,723.4	-117.8	274.3	-86.6	3.05	-2.57	-6.60
1,848.0	14.45	106.74	1,809.8	-123.4	294.6	-89.8	1.85	1.67	3.36
1,938.0	16.52	110.31	1,896.6	-131.0	317.4	-94.9	2.53	2.30	3.97
2,027.0	17.94	116.38	1,981.6	-141.5	341.5	-102.7	2.57	1.60	6.82
2,117.0	17.14	115.67	2,067.4	-153.4	365.9	-111.8	0.92	-0.89	-0.79
2,207.0	16.45	115.51	2,153.5	-164.7	389.4	-120.4	0.77	-0.77	-0.18
2,297.0	17.62	115.88	2,239.6	-176.1	413.1	-129.1	1.31	1.30	0.41
2,386.0	16.57	115.52	2,324.7	-187.4	436.7	-137.7	1.19	-1.18	-0.40
2,476.0	18.36	116.26	2,410.5	-199.2	461.0	-146.8	2.00	1.99	0.82
2,566.0	17.44	115.85	2,496.1	-211.4	485.8	-156.1	1.03	-1.02	-0.46
2,656.0	16.20	115.90	2,582.3	-222.8	509.3	-164.8	1.38	-1.38	0.06
2,745.0	19.04	116.74	2,667.1	-234.7	533.4	-174.0	3.20	3.19	0.94
2,835.0	19.01	115.70	2,752.2	-247.7	559.7	-183.9	0.38	-0.03	-1.16
2,925.0	18.68	114.91	2,837.4	-260.1	586.0	-193.4	0.46	-0.37	-0.88
3,015.0	18.50	113.80	2,922.7	-271.9	612.1	-202.2	0.44	-0.20	-1.23
3,105.0	17.47	113.31	3,008.3	-283.0	637.6	-210.4	1.16	-1.14	-0.54
3,194.0	16.09	112.86	3,093.5	-293.1	661.2	-217.8	1.56	-1.55	-0.51
3,284.0	18.72	111.44	3,179.4	-303.3	686.2	-225.1	2.96	2.92	-1.58
3,373.0	16.31	110.43	3,264.2	-312.8	711.2	-231.8	2.73	-2.71	-1.13
3,465.0	17.53	108.37	3,352.2	-321.7	736.5	-237.9	1.48	1.33	-2.24
3,555.0	18.94	109.11	3,437.7	-330.8	763.1	-243.9	1.59	1.57	0.82
3,644.0	15.85	108.21	3,522.6	-339.3	788.3	-249.6	3.48	-3.47	-1.01
3,734.0	16.85	111.05	3,609.0	-347.8	812.2	-255.4	1.42	1.11	3.16
3,824.0	18.42	113.60	3,694.8	-358.2	837.4	-262.9	1.94	1.74	2.83
3,914.0	18.52	113.20	3,780.1	-369.5	863.5	-271.2	0.18	0.11	-0.44
4,003.0	21.38	113.19	3,863.8	-381.5	891.5	-280.0	3.21	3.21	-0.01
4,093.0	21.28	112.35	3,947.6	-394.2	921.6	-289.3	0.36	-0.11	-0.93
4,183.0	20.60	112.07	4,031.7	-406.3	951.4	-298.0	0.76	-0.76	-0.31
4,273.0	18.61	108.45	4,116.5	-416.8	979.7	-305.3	2.59	-2.21	-4.02
4,363.0	16.47	106.22	4,202.3	-424.9	1,005.6	-310.5	2.49	-2.38	-2.48
4,453.0	15.43	104.44	4,288.8	-431.5	1,029.4	-314.4	1.28	-1.16	-1.98
4,543.0	13.52	101.08	4,375.9	-436.5	1,051.4	-316.9	2.32	-2.12	-3.73
4,633.0	12.48	111.25	4,463.6	-442.0	1,070.7	-320.3	2.79	-1.16	11.30

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Well:	Lory 9N (Nio B)	North Reference:	True
Wellbore:	Lory 9N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Lory 9N 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)
4,723.0	10.81	108.31	4,551.8	-448.2	1,087.8	-324.5	1.97	-1.86	-3.27
4,812.0	9.53	104.73	4,639.4	-452.7	1,102.9	-327.3	1.60	-1.44	-4.02
4,902.0	7.85	95.97	4,728.4	-455.2	1,116.2	-328.3	2.37	-1.87	-9.73
4,991.0	6.31	101.39	4,816.7	-456.8	1,127.0	-328.7	1.88	-1.73	6.09
5,081.0	5.54	94.86	4,906.2	-458.2	1,136.2	-329.0	1.14	-0.86	-7.26
5,171.0	5.29	94.33	4,995.8	-458.9	1,144.7	-328.8	0.28	-0.28	-0.59
5,260.0	4.15	112.56	5,084.5	-460.4	1,151.7	-329.5	2.10	-1.28	20.48
5,350.0	2.77	106.77	5,174.3	-462.3	1,156.8	-330.8	1.58	-1.53	-6.43
5,439.0	0.74	133.64	5,263.3	-463.3	1,159.3	-331.6	2.40	-2.28	30.19
5,529.0	0.67	128.36	5,353.3	-464.0	1,160.1	-332.2	0.11	-0.08	-5.87
5,619.0	0.78	125.63	5,443.3	-464.7	1,161.0	-332.8	0.13	0.12	-3.03
5,709.0	0.70	116.13	5,533.3	-465.3	1,162.0	-333.3	0.16	-0.09	-10.56
5,799.0	0.84	117.76	5,623.3	-465.8	1,163.1	-333.7	0.16	0.16	1.81
5,888.0	0.50	114.44	5,712.2	-466.3	1,164.0	-334.0	0.38	-0.38	-3.73
5,978.0	0.35	134.35	5,802.2	-466.7	1,164.6	-334.3	0.23	-0.17	22.12
6,067.0	0.09	141.01	5,891.2	-466.9	1,164.8	-334.5	0.29	-0.29	7.48
6,157.0	0.19	115.14	5,981.2	-467.0	1,165.0	-334.6	0.13	0.11	-28.74
6,246.0	0.27	160.06	6,070.2	-467.3	1,165.2	-334.9	0.21	0.09	50.47
6,335.0	0.42	161.54	6,159.2	-467.8	1,165.4	-335.4	0.17	0.17	1.66
6,425.0	3.18	357.90	6,249.2	-465.6	1,165.4	-333.2	3.98	3.07	-181.82
6,539.0	11.93	1.50	6,362.1	-450.6	1,165.6	-318.3	7.68	7.68	3.16
6,629.0	15.24	355.74	6,449.6	-429.5	1,165.0	-297.4	3.97	3.68	-6.40
6,719.0	21.71	357.66	6,534.9	-401.1	1,163.4	-269.3	7.22	7.19	2.13
6,809.0	27.05	357.09	6,616.8	-364.0	1,161.7	-232.6	5.94	5.93	-0.63
6,899.0	34.12	358.92	6,694.3	-318.3	1,160.2	-187.3	7.92	7.86	2.03
6,988.0	45.56	359.19	6,762.5	-261.3	1,159.3	-130.9	12.86	12.85	0.30
7,078.0	55.30	358.48	6,819.8	-192.1	1,157.8	-62.2	10.84	10.82	-0.79
7,168.0	60.72	358.12	6,867.4	-115.8	1,155.5	13.4	6.03	6.02	-0.40
7,257.0	68.33	354.13	6,905.7	-35.7	1,150.0	92.3	9.46	8.55	-4.48
7,257.8	68.41	354.16	6,906.0	-35.0	1,150.0	93.1	10.74	9.95	4.37
TPZ - 460' Setback - 460'FSL, 1059'FEL, Sec.33									
7,347.0	77.32	357.86	6,932.2	50.0	1,144.1	176.8	10.74	9.99	4.14
7,437.0	82.62	358.39	6,947.9	138.5	1,141.2	264.5	5.92	5.89	0.59
7,526.0	86.63	358.46	6,956.2	227.1	1,138.8	352.2	4.51	4.51	0.08
7,541.3	87.31	358.57	6,957.1	242.4	1,138.4	367.4	4.50	4.44	0.70
LPL 737'FSL, 1079'FEL, Sec.33									
7,616.0	90.63	359.09	6,958.4	317.0	1,136.8	441.4	4.50	4.44	0.70
7,705.0	91.56	358.98	6,956.7	406.0	1,135.3	529.6	1.05	1.04	-0.12
7,794.0	89.15	357.19	6,956.1	494.9	1,132.4	617.7	3.37	-2.71	-2.01
7,883.0	89.15	356.57	6,957.5	583.8	1,127.5	705.5	0.70	0.00	-0.70
7,973.0	90.37	356.48	6,957.8	673.6	1,122.1	794.1	1.36	1.36	-0.10
8,063.0	89.19	357.16	6,958.2	763.5	1,117.1	882.9	1.51	-1.31	0.76
8,153.0	89.06	359.23	6,959.6	853.4	1,114.2	972.0	2.30	-0.14	2.30
8,242.0	88.35	0.89	6,961.6	942.4	1,114.3	1,060.4	2.03	-0.80	1.87

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Design:	Lory 9N Wellbore #1	Database:	US_EDM

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8,332.0	88.00	0.22	6,964.4	1,032.3	1,115.2	1,149.9	0.84	-0.39	-0.74
8,421.0	87.99	1.33	6,967.6	1,121.3	1,116.4	1,238.4	1.25	-0.01	1.25
8,511.0	87.49	0.44	6,971.1	1,211.2	1,117.8	1,327.9	1.13	-0.56	-0.99
8,601.0	89.12	1.66	6,973.8	1,301.1	1,119.5	1,417.5	2.26	1.81	1.36
8,691.0	88.59	1.39	6,975.6	1,391.1	1,121.8	1,507.1	0.66	-0.59	-0.30
8,780.0	90.53	2.38	6,976.2	1,480.0	1,124.8	1,595.9	2.45	2.18	1.11
Deepest TVD Drilled - 6976.25' TVD									
8,871.0	90.22	1.68	6,975.7	1,570.9	1,128.0	1,686.6	0.84	-0.34	-0.77
8,961.0	90.90	1.67	6,974.8	1,660.9	1,130.6	1,776.3	0.76	0.76	-0.01
9,050.0	90.73	0.66	6,973.5	1,749.9	1,132.4	1,864.9	1.15	-0.19	-1.13
9,140.0	90.57	359.96	6,972.5	1,839.9	1,132.9	1,954.4	0.80	-0.18	-0.78
9,230.0	90.74	359.54	6,971.5	1,929.9	1,132.5	2,043.8	0.50	0.19	-0.47
9,319.0	89.72	2.44	6,971.1	2,018.8	1,134.1	2,132.4	3.45	-1.15	3.26
9,409.0	89.83	2.00	6,971.5	2,108.8	1,137.6	2,222.1	0.50	0.12	-0.49
9,498.0	89.95	2.50	6,971.6	2,197.7	1,141.1	2,310.9	0.58	0.13	0.56
9,588.0	89.95	0.56	6,971.7	2,287.7	1,143.5	2,400.6	2.16	0.00	-2.16
9,677.0	89.49	358.71	6,972.1	2,376.7	1,142.9	2,489.0	2.14	-0.52	-2.08
9,767.0	89.99	359.25	6,972.5	2,466.6	1,141.3	2,578.2	0.82	0.56	0.60
9,857.0	89.29	358.79	6,973.1	2,556.6	1,139.7	2,667.5	0.93	-0.78	-0.51
9,947.0	90.52	0.92	6,973.3	2,646.6	1,139.5	2,756.9	2.73	1.37	2.37
10,037.0	90.23	0.63	6,972.7	2,736.6	1,140.7	2,846.4	0.46	-0.32	-0.32
10,127.0	89.64	0.27	6,972.8	2,826.6	1,141.4	2,936.0	0.77	-0.66	-0.40
10,217.0	90.09	1.54	6,973.0	2,916.6	1,142.9	3,025.5	1.50	0.50	1.41
10,306.0	89.80	2.17	6,973.1	3,005.5	1,145.7	3,114.3	0.78	-0.33	0.71
10,396.0	91.58	3.64	6,972.0	3,095.4	1,150.3	3,204.1	2.56	1.98	1.63
10,485.0	91.15	2.99	6,969.9	3,184.2	1,155.5	3,292.9	0.88	-0.48	-0.73
10,574.0	91.49	2.77	6,967.8	3,273.1	1,159.9	3,381.7	0.45	0.38	-0.25
10,664.0	91.91	2.43	6,965.1	3,363.0	1,164.0	3,471.5	0.60	0.47	-0.38
10,753.0	92.18	2.21	6,962.0	3,451.8	1,167.6	3,560.2	0.39	0.30	-0.25
10,843.0	90.52	2.52	6,959.8	3,541.7	1,171.3	3,650.0	1.88	-1.84	0.34
10,933.0	90.84	2.53	6,958.8	3,631.6	1,175.3	3,739.8	0.36	0.36	0.01
10,997.3	90.95	2.36	6,957.8	3,695.9	1,178.0	3,803.9	0.31	0.17	-0.27
WP #1 (Lory 9N (Nio B))									
11,023.0	90.99	2.29	6,957.3	3,721.5	1,179.1	3,829.5	0.31	0.17	-0.27
11,113.0	90.06	0.28	6,956.5	3,811.5	1,181.1	3,919.2	2.46	-1.03	-2.23
11,203.0	90.60	359.74	6,956.0	3,901.5	1,181.1	4,008.6	0.85	0.60	-0.60
11,293.0	91.48	358.91	6,954.4	3,991.5	1,180.0	4,097.9	1.34	0.98	-0.92
11,383.0	89.40	359.41	6,953.7	4,081.5	1,178.7	4,187.2	2.38	-2.31	0.56
11,473.0	89.05	359.07	6,954.9	4,171.5	1,177.5	4,276.5	0.54	-0.39	-0.38
11,562.0	88.87	358.74	6,956.5	4,260.4	1,175.8	4,364.7	0.42	-0.20	-0.37
11,653.0	89.03	358.27	6,958.2	4,351.4	1,173.5	4,454.8	0.55	0.18	-0.52
11,743.0	89.21	358.03	6,959.6	4,441.3	1,170.5	4,543.9	0.33	0.20	-0.27
11,833.0	89.58	357.25	6,960.5	4,531.2	1,166.8	4,632.9	0.96	0.41	-0.87

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Lory 9N (Nio B)
Project:	SEC.33-T4N-R65W	TVD Reference:	WELL @ 4841.0ft (Original Well Elev)
Site:	Lory 4N65W33 Pad Sec.33-T4N-R65W	MD Reference:	WELL @ 4841.0ft (Original Well Elev)
Well:	Lory 9N (Nio B)	North Reference:	True
Wellbore:	Lory 9N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Lory 9N 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)
11,923.0	89.98	356.83	6,960.9	4,621.1	1,162.2	4,721.7	0.64	0.44	-0.47
12,013.0	89.03	357.96	6,961.6	4,711.0	1,158.1	4,810.6	1.64	-1.06	1.26
12,104.0	89.38	357.82	6,962.9	4,801.9	1,154.8	4,900.5	0.41	0.38	-0.15
12,194.0	88.23	0.21	6,964.8	4,891.9	1,153.2	4,989.8	2.95	-1.28	2.66
12,283.0	88.46	359.64	6,967.3	4,980.9	1,153.1	5,078.2	0.69	0.26	-0.64
12,373.0	89.82	0.01	6,968.7	5,070.9	1,152.8	5,167.6	1.57	1.51	0.41
12,463.0	90.74	0.05	6,968.3	5,160.9	1,152.9	5,257.0	1.02	1.02	0.04
12,553.0	91.25	359.83	6,966.7	5,250.8	1,152.8	5,346.4	0.62	0.57	-0.24
12,643.0	91.99	359.81	6,964.1	5,340.8	1,152.5	5,435.8	0.82	0.82	-0.02
12,732.0	92.44	359.54	6,960.7	5,429.7	1,152.0	5,524.1	0.59	0.51	-0.30
12,822.0	90.47	359.35	6,958.4	5,519.7	1,151.1	5,613.4	2.20	-2.19	-0.21
12,911.0	90.62	358.96	6,957.6	5,608.7	1,149.8	5,701.7	0.47	0.17	-0.44
13,001.0	91.16	358.61	6,956.2	5,698.7	1,147.9	5,790.9	0.71	0.60	-0.39
13,092.0	89.45	359.88	6,955.7	5,789.6	1,146.7	5,881.2	2.34	-1.88	1.40
13,182.0	89.21	359.70	6,956.7	5,879.6	1,146.4	5,970.6	0.33	-0.27	-0.20
13,271.0	88.70	0.01	6,958.4	5,968.6	1,146.1	6,059.0	0.67	-0.57	0.35
13,362.0	88.12	359.82	6,960.9	6,059.6	1,146.0	6,149.4	0.67	-0.64	-0.21
13,451.0	87.57	359.89	6,964.2	6,148.5	1,145.8	6,237.8	0.62	-0.62	0.08
13,541.0	88.76	0.47	6,967.1	6,238.5	1,146.1	6,327.2	1.47	1.32	0.64
13,630.0	90.38	359.24	6,967.8	6,327.5	1,145.8	6,415.6	2.29	1.82	-1.38
13,720.0	90.13	358.85	6,967.4	6,417.4	1,144.3	6,504.9	0.51	-0.28	-0.43
13,809.0	89.79	358.38	6,967.5	6,506.4	1,142.2	6,593.1	0.65	-0.38	-0.53
13,899.0	89.52	357.81	6,968.0	6,596.4	1,139.2	6,682.1	0.70	-0.30	-0.63
13,988.0	90.40	359.01	6,968.1	6,685.3	1,136.7	6,770.3	1.67	0.99	1.35
14,078.0	91.38	359.39	6,966.7	6,775.3	1,135.5	6,859.5	1.17	1.09	0.42
14,168.0	91.50	358.94	6,964.4	6,865.3	1,134.2	6,948.8	0.52	0.13	-0.50
14,258.0	91.73	358.65	6,961.9	6,955.2	1,132.3	7,038.0	0.41	0.26	-0.32
14,348.0	91.27	358.74	6,959.5	7,045.2	1,130.2	7,127.1	0.52	-0.51	0.10
14,438.0	90.97	358.74	6,957.7	7,135.1	1,128.2	7,216.3	0.33	-0.33	0.00
14,528.0	90.56	358.95	6,956.5	7,225.1	1,126.4	7,305.5	0.51	-0.46	0.23
14,618.0	89.87	358.96	6,956.2	7,315.1	1,124.8	7,394.8	0.77	-0.77	0.01
14,707.0	89.12	358.95	6,957.0	7,404.1	1,123.2	7,483.0	0.84	-0.84	-0.01
14,797.0	89.49	0.49	6,958.1	7,494.1	1,122.7	7,572.4	1.76	0.41	1.71
14,887.0	89.23	0.94	6,959.1	7,584.0	1,123.8	7,662.0	0.58	-0.29	0.50
14,977.0	88.75	1.54	6,960.7	7,674.0	1,125.8	7,751.6	0.85	-0.53	0.67
15,066.0	88.06	1.85	6,963.2	7,762.9	1,128.4	7,840.3	0.85	-0.78	0.35
15,155.0	90.41	2.37	6,964.3	7,851.9	1,131.7	7,929.0	2.70	2.64	0.58
15,245.0	90.04	2.54	6,964.0	7,941.8	1,135.5	8,018.8	0.45	-0.41	0.19
15,335.0	89.81	2.80	6,964.1	8,031.7	1,139.7	8,108.6	0.39	-0.26	0.29
15,425.0	89.75	3.22	6,964.4	8,121.5	1,144.5	8,198.4	0.47	-0.07	0.47
15,516.0	89.85	1.09	6,964.8	8,212.5	1,147.9	8,289.2	2.34	0.11	-2.34
15,606.0	89.56	1.09	6,965.2	8,302.5	1,149.6	8,378.8	0.32	-0.32	0.00
15,695.0	89.10	1.06	6,966.3	8,391.4	1,151.3	8,467.4	0.52	-0.52	-0.03
15,785.0	90.56	359.71	6,966.5	8,481.4	1,151.9	8,556.9	2.21	1.62	-1.50

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Lory 9N (Nio B)
Project:	SEC.33-T4N-R65W	TVD Reference:	WELL @ 4841.0ft (Original Well Elev)
Site:	Lory 4N65W33 Pad Sec.33-T4N-R65W	MD Reference:	WELL @ 4841.0ft (Original Well Elev)
Well:	Lory 9N (Nio B)	North Reference:	True
Wellbore:	Lory 9N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Lory 9N 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)
15,874.0	90.28	359.55	6,965.9	8,570.4	1,151.3	8,645.3	0.36	-0.31	-0.18
15,963.0	89.92	359.98	6,965.7	8,659.4	1,150.9	8,733.7	0.63	-0.40	0.48
16,053.0	90.94	359.06	6,965.1	8,749.4	1,150.2	8,823.0	1.53	1.13	-1.02
16,143.0	90.67	358.60	6,963.8	8,839.4	1,148.3	8,912.3	0.59	-0.30	-0.51
16,232.0	91.48	358.75	6,962.1	8,928.4	1,146.3	9,000.4	0.93	0.91	0.17
16,321.0	90.64	358.13	6,960.5	9,017.3	1,143.9	9,088.6	1.17	-0.94	-0.70
16,411.0	90.26	357.61	6,959.8	9,107.2	1,140.5	9,177.6	0.72	-0.42	-0.58
16,500.0	89.64	357.31	6,959.8	9,196.1	1,136.6	9,265.5	0.77	-0.70	-0.34
16,590.0	90.69	357.94	6,959.6	9,286.1	1,132.8	9,354.4	1.36	1.17	0.70
16,679.0	90.50	357.79	6,958.7	9,375.0	1,129.5	9,442.5	0.27	-0.21	-0.17
16,769.0	90.00	357.59	6,958.3	9,464.9	1,125.9	9,531.4	0.60	-0.56	-0.22
16,858.0	90.08	357.42	6,958.2	9,553.8	1,122.0	9,619.4	0.21	0.09	-0.19
16,948.0	89.88	356.80	6,958.2	9,643.7	1,117.5	9,708.2	0.72	-0.22	-0.69
17,037.0	89.76	356.79	6,958.5	9,732.6	1,112.5	9,795.9	0.14	-0.13	-0.01
17,126.0	89.64	356.78	6,959.0	9,821.4	1,107.5	9,883.7	0.14	-0.13	-0.01
17,168.0	89.41	356.76	6,959.3	9,863.4	1,105.2	9,925.1	0.55	-0.55	-0.05
17,228.0	89.41	356.76	6,959.9	9,923.3	1,101.8	9,984.3	0.00	0.00	0.00
Projected BHL 152°FNL, 1087°FEL, SEC.28									

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 496°FSL, 2210°FEL	0.00	0.00	1.0	0.0	0.0	1,339,735.13	3,232,520.58	40.262973	-104.666800
- survey hits target center									
- Point									
Projected BHL 152°FNL,	0.00	0.00	6,955.0	9,925.1	1,110.1	1,349,669.81	3,233,537.32	40.290217	-104.662821
- survey misses target center by 9.9ft at 17228.0ft MD (6959.9 TVD, 9923.3 N, 1101.8 E)									
- Point									
WP #1 (Lory 9N (Nio B))	0.00	0.00	6,961.4	3,696.2	1,173.0	1,343,441.97	3,233,658.75	40.273119	-104.662596
- survey misses target center by 6.2ft at 10997.3ft MD (6957.8 TVD, 3695.9 N, 1178.0 E)									
- Point									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,257.8	6,906.0	-35.0	1,150.0	TPZ - 460' Setback - 460°FSL, 1059°FEL, Sec.33
8,780.0	6,976.2	1,480.0	1,124.8	Deepest TVD Drilled - 6976.25' TVD

Checked By: _____	Approved By: _____	Date: _____
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