

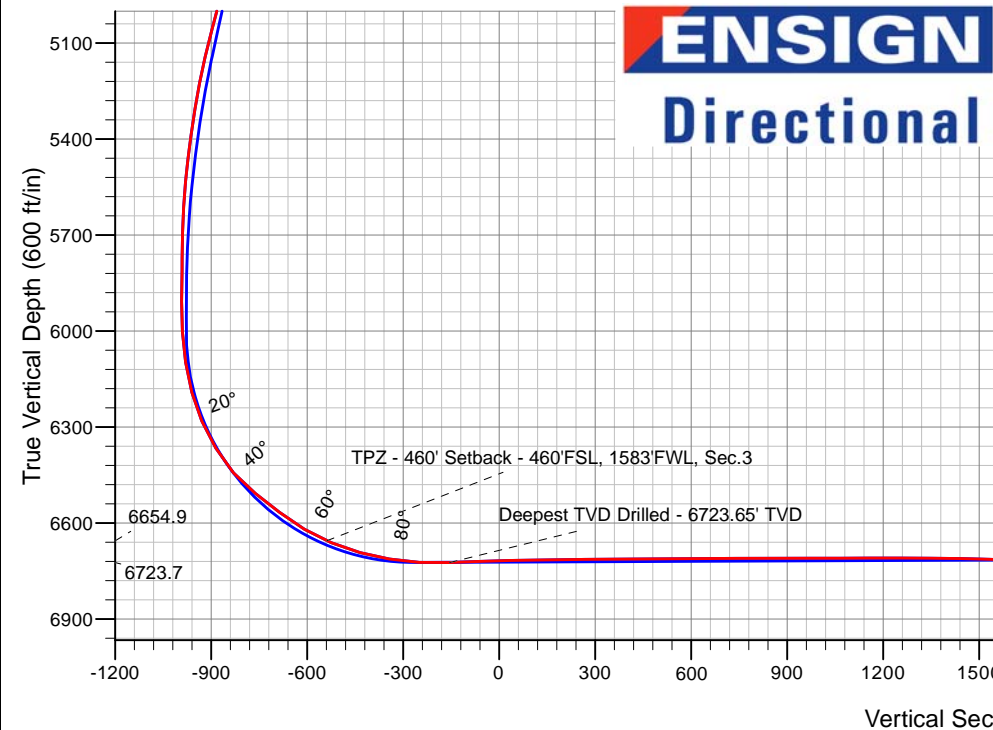
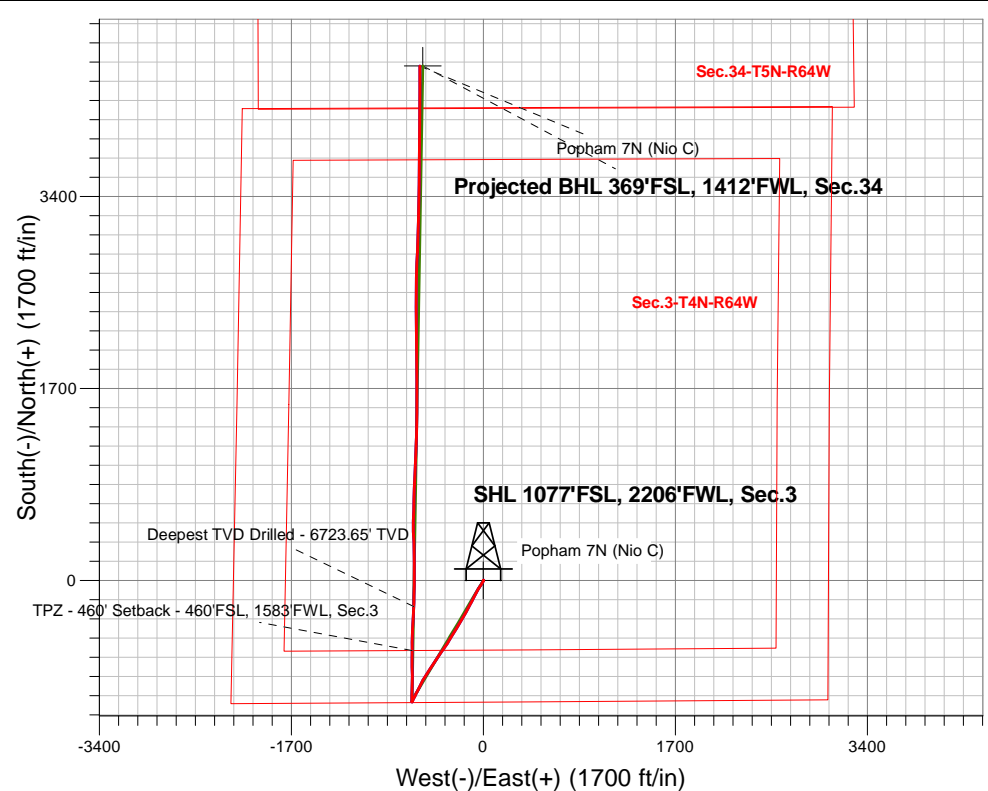
PDC Energy Inc. DJ Basin

Well Name: **Popham 7N (Nio C)**

Surface Location: Popham 4N64W03 Pad Sec.3-T4N-R64W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4662.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1367093.413268156.88 40.337080 -104.538048
 Original Well Elev WELL @ 4685.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location
12,191'MD 6706'TVD 4554'N & 562'W of SHL
89.8 degree Incl @ 359.86 degree AZM



Popham 4N64W03 Pad Sec.3-T4N-R64W
 Popham 7N (Nio C)
 Popham 7N Wellbore #1
 10:33, April 29 2019

ANNOTATIONS

TVD	MD	Annotation
6654.9	7004.7	TPZ - 460' Setback - 460'FSL, 1583'FWL, Sec.3
6723.7	7403.0	Deepest TVD Drilled - 6723.65' TVD

LEGEND

- ◆ Popham 7N (Nio C), Popham 7N Wellbore #1, Plan #1 (4-25-19) V0
- Popham 7N Wellbore #1
- Survey #1

Projected BHL 369'FSL, 1412'FWL, Sec.34

Popham 7N (Nio C)



PDC Energy Inc. DJ Basin

SEC.3-T4N-R64W

Popham 4N64W03 Pad Sec.3-T4N-R64W

Popham 7N (Nio C)

Popham 7N Wellbore #1

Survey: Survey #1

Standard Survey Report

29 April, 2019

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Popham 7N (Nio C)
Project:	SEC.3-T4N-R64W	TVD Reference:	WELL @ 4685.0ft (Original Well Elev)
Site:	Popham 4N64W03 Pad Sec.3-T4N-R64W	MD Reference:	WELL @ 4685.0ft (Original Well Elev)
Well:	Popham 7N (Nio C)	North Reference:	True
Wellbore:	Popham 7N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Popham 7N Wellbore #1	Database:	US_EDM

Project	SEC.3-T4N-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	Popham 4N64W03 Pad Sec.3-T4N-R64W				
Site Position:		Northing:	1,367,183.37 usft	Latitude:	40.337327
From:	Lat/Long	Easting:	3,268,156.99 usft	Longitude:	-104.538045
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.62 °

Well	Popham 7N (Nio C)					
Well Position	+N/-S	0.0 ft	Northing:	1,367,093.41 usft	Latitude:	40.337080
	+E/-W	0.0 ft	Easting:	3,268,156.88 usft	Longitude:	-104.538049
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,662.0 ft

Wellbore	Popham 7N Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/25/2019	8.13	66.85	52,158

Design	Popham 7N 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	352.96	

Survey Program	Date	4/29/2019			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
156.0	12,191.0	Survey #1 (Popham 7N 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	9.75	1.0	0.0	0.0	0.0	0.28	0.28	0.00	
SHL 1077'FSL, 2206'FWL, Sec.3										
156.0	0.44	9.75	156.0	0.6	0.1	0.6	0.28	0.28	0.00	
251.0	0.38	76.16	251.0	1.0	0.5	1.0	0.48	-0.06	69.91	
346.0	0.64	72.51	346.0	1.3	1.3	1.1	0.28	0.27	-3.84	
440.0	0.54	82.37	440.0	1.5	2.2	1.2	0.15	-0.11	10.49	
535.0	1.15	198.84	535.0	0.6	2.4	0.3	1.55	0.64	122.60	
630.0	3.51	199.04	629.9	-3.0	1.1	-3.1	2.48	2.48	0.21	
724.0	5.35	208.03	723.6	-9.6	-1.9	-9.3	2.09	1.96	9.56	
819.0	6.67	212.28	818.1	-18.2	-6.9	-17.2	1.47	1.39	4.47	

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Popham 7N (Nio C)
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Site:	Popham 4N64W03 Pad Sec.3-T4N-R64W	MD Reference:	WELL @ 4685.0ft (Original Well Elev)
Well:	Popham 7N (Nio C)	North Reference:	True
Wellbore:	Popham 7N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Popham 7N 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)
913.0	7.88	210.41	911.3	-28.4	-13.1	-26.5	1.31	1.29	-1.99
1,008.0	8.95	214.99	1,005.3	-40.0	-20.6	-37.2	1.33	1.13	4.82
1,103.0	10.34	215.42	1,099.0	-53.0	-29.8	-49.0	1.47	1.46	0.45
1,198.0	11.22	211.69	1,192.3	-67.8	-39.6	-62.5	1.18	0.93	-3.93
1,293.0	13.37	209.00	1,285.1	-85.3	-49.8	-78.6	2.34	2.26	-2.83
1,388.0	14.90	208.73	1,377.2	-105.6	-61.0	-97.4	1.61	1.61	-0.28
1,482.0	14.56	207.22	1,468.1	-126.7	-72.2	-116.9	0.55	-0.36	-1.61
1,577.0	14.87	205.99	1,560.0	-148.3	-83.0	-137.0	0.46	0.33	-1.29
1,630.0	15.32	207.14	1,611.2	-160.7	-89.2	-148.5	1.02	0.85	2.17
1,764.0	13.68	207.26	1,740.9	-190.5	-104.5	-176.3	1.22	-1.22	0.09
1,859.0	14.91	209.90	1,833.0	-211.1	-115.8	-195.3	1.47	1.29	2.78
1,953.0	14.27	208.42	1,923.9	-231.8	-127.3	-214.4	0.79	-0.68	-1.57
2,047.0	14.09	206.92	2,015.1	-252.1	-138.0	-233.3	0.44	-0.19	-1.60
2,143.0	13.69	206.04	2,108.3	-272.8	-148.3	-252.6	0.47	-0.42	-0.92
2,238.0	14.67	209.83	2,200.4	-293.3	-159.2	-271.6	1.42	1.03	3.99
2,333.0	15.21	212.85	2,292.2	-314.2	-171.9	-290.8	1.00	0.57	3.18
2,428.0	14.67	210.19	2,384.0	-335.1	-184.7	-309.9	0.92	-0.57	-2.80
2,546.0	14.67	208.50	2,498.1	-361.1	-199.4	-334.0	0.36	0.00	-1.43
2,641.0	16.26	212.07	2,589.7	-383.0	-212.2	-354.1	1.95	1.67	3.76
2,735.0	15.94	210.75	2,680.0	-405.2	-225.8	-374.5	0.52	-0.34	-1.40
2,830.0	15.78	210.11	2,771.4	-427.6	-238.9	-395.1	0.25	-0.17	-0.67
2,924.0	17.09	213.28	2,861.5	-450.2	-252.9	-415.8	1.69	1.39	3.37
3,018.0	16.39	211.97	2,951.5	-473.0	-267.5	-436.7	0.85	-0.74	-1.39
3,112.0	15.87	211.18	3,041.8	-495.2	-281.2	-457.1	0.60	-0.55	-0.84
3,207.0	14.98	210.30	3,133.4	-517.0	-294.1	-477.0	0.97	-0.94	-0.93
3,302.0	14.09	209.83	3,225.4	-537.6	-306.1	-496.1	0.95	-0.94	-0.49
3,396.0	13.19	211.58	3,316.7	-556.7	-317.4	-513.6	1.05	-0.96	1.86
3,491.0	14.31	216.61	3,409.0	-575.3	-330.0	-530.6	1.72	1.18	5.29
3,586.0	15.46	215.22	3,500.8	-595.1	-344.4	-548.4	1.27	1.21	-1.46
3,682.0	15.29	214.22	3,593.4	-616.0	-358.9	-567.4	0.33	-0.18	-1.04
3,776.0	17.23	214.64	3,683.6	-637.7	-373.7	-587.1	2.07	2.06	0.45
3,871.0	17.31	215.05	3,774.3	-660.9	-389.8	-608.1	0.15	0.08	0.43
3,967.0	16.76	214.83	3,866.1	-683.9	-406.0	-629.0	0.58	-0.57	-0.23
4,062.0	16.14	214.62	3,957.2	-706.0	-421.3	-649.1	0.66	-0.65	-0.22
4,157.0	15.79	213.70	4,048.6	-727.6	-436.0	-668.8	0.45	-0.37	-0.97
4,252.0	16.25	211.64	4,139.9	-749.7	-450.1	-688.9	0.77	0.48	-2.17
4,348.0	15.79	212.47	4,232.2	-772.2	-464.2	-709.5	0.54	-0.48	0.86
4,443.0	14.80	211.55	4,323.8	-793.4	-477.4	-728.9	1.07	-1.04	-0.97
4,538.0	15.28	214.10	4,415.5	-814.1	-490.8	-747.9	0.86	0.51	2.68
4,634.0	16.87	212.66	4,507.8	-836.3	-505.4	-768.1	1.71	1.66	-1.50
4,729.0	15.69	211.96	4,599.0	-858.8	-519.7	-788.7	1.26	-1.24	-0.74
4,825.0	14.79	212.07	4,691.6	-880.2	-533.0	-808.3	0.94	-0.94	0.11
4,920.0	16.46	205.54	4,783.1	-902.6	-545.3	-829.0	2.55	1.76	-6.87

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Site:	Popham 4N64W03 Pad Sec.3-T4N-R64W	MD Reference:	WELL @ 4685.0ft (Original Well Elev)
Well:	Popham 7N (Nio C)	North Reference:	True
Wellbore:	Popham 7N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Popham 7N 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)
5,015.0	15.65	204.99	4,874.4	-926.4	-556.5	-851.3	0.87	-0.85	-0.58
5,110.0	17.27	206.98	4,965.5	-950.6	-568.3	-873.8	1.81	1.71	2.09
5,206.0	16.96	207.54	5,057.2	-975.7	-581.2	-897.1	0.37	-0.32	0.58
5,302.0	15.62	205.58	5,149.4	-999.8	-593.3	-919.6	1.51	-1.40	-2.04
5,397.0	12.80	206.97	5,241.5	-1,020.7	-603.6	-939.1	2.99	-2.97	1.46
5,493.0	10.15	208.47	5,335.5	-1,037.6	-612.5	-954.8	2.78	-2.76	1.56
5,589.0	9.23	205.48	5,430.2	-1,052.0	-619.8	-968.1	1.09	-0.96	-3.11
5,685.0	6.81	210.10	5,525.2	-1,063.9	-626.0	-979.2	2.61	-2.52	4.81
5,780.0	3.51	202.78	5,619.8	-1,071.4	-629.9	-986.2	3.54	-3.47	-7.71
5,876.0	0.99	199.34	5,715.7	-1,074.9	-631.3	-989.5	2.63	-2.63	-3.58
5,971.0	0.73	189.67	5,810.7	-1,076.3	-631.7	-990.8	0.31	-0.27	-10.18
6,067.0	0.86	142.57	5,906.7	-1,077.5	-631.4	-992.0	0.67	0.14	-49.06
6,162.0	3.75	355.17	6,001.7	-1,074.9	-631.2	-989.5	4.74	3.04	-155.16
6,258.0	8.19	357.84	6,097.1	-1,065.0	-631.7	-979.6	4.63	4.63	2.78
6,354.0	14.81	354.58	6,191.1	-1,045.9	-633.1	-960.5	6.93	6.90	-3.40
6,449.0	24.00	1.12	6,280.7	-1,014.4	-633.9	-929.1	9.93	9.67	6.88
6,545.0	30.98	3.79	6,365.8	-970.2	-631.9	-885.5	7.38	7.27	2.78
6,640.0	41.26	1.80	6,442.4	-914.3	-629.3	-830.4	10.89	10.82	-2.09
6,735.0	52.50	359.22	6,507.2	-845.1	-628.8	-761.7	11.99	11.83	-2.72
6,831.0	51.95	357.86	6,566.0	-769.3	-630.7	-686.2	1.26	-0.57	-1.42
6,926.0	59.88	1.33	6,619.3	-690.7	-631.2	-608.1	8.88	8.35	3.65
7,004.7	66.20	0.56	6,654.9	-620.6	-630.0	-538.7	8.08	8.03	-0.98
TPZ - 460' Setback - 460'FSL, 1583'FWL, Sec.3									
7,021.0	67.51	0.41	6,661.3	-605.6	-629.9	-523.9	8.08	8.03	-0.92
7,117.0	74.88	0.71	6,692.3	-514.8	-629.0	-433.8	7.68	7.68	0.31
7,211.0	80.49	2.42	6,712.3	-423.0	-626.5	-343.1	6.23	5.97	1.82
7,291.4	85.86	3.39	6,721.8	-343.3	-622.5	-264.5	6.78	6.68	1.21
LPL 737'FSL, 1593'FWL, Sec.3									
7,307.0	86.90	3.58	6,722.8	-327.8	-621.5	-249.2	6.78	6.68	1.20
7,403.0	92.12	2.07	6,723.7	-231.9	-616.8	-154.6	5.66	5.44	-1.57
Deepest TVD Drilled - 6723.65' TVD									
7,497.0	92.52	1.58	6,719.8	-138.1	-613.8	-61.8	0.67	0.43	-0.52
7,592.0	91.00	0.73	6,716.9	-43.1	-611.9	32.2	1.83	-1.60	-0.89
7,686.0	90.86	359.97	6,715.4	50.9	-611.3	125.4	0.82	-0.15	-0.81
7,781.0	90.69	359.68	6,714.1	145.9	-611.6	219.7	0.35	-0.18	-0.31
7,876.0	90.59	358.88	6,713.1	240.8	-612.8	314.1	0.85	-0.11	-0.84
7,971.0	90.51	358.01	6,712.1	335.8	-615.4	408.7	0.92	-0.08	-0.92
8,066.0	90.24	357.82	6,711.5	430.7	-618.8	503.3	0.35	-0.28	-0.20
8,161.0	90.29	1.87	6,711.1	525.7	-619.1	597.6	4.26	0.05	4.26
8,257.0	90.29	1.25	6,710.6	621.7	-616.5	692.5	0.65	0.00	-0.65
8,352.0	90.15	0.61	6,710.2	716.7	-614.9	786.6	0.69	-0.15	-0.67
8,447.0	90.06	3.10	6,710.1	811.6	-611.8	880.4	2.62	-0.09	2.62
8,542.0	90.21	2.76	6,709.8	906.5	-607.0	974.0	0.39	0.16	-0.36
8,636.0	90.19	2.69	6,709.5	1,000.4	-602.5	1,066.6	0.08	-0.02	-0.07

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Design:	Popham 7N 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)
8,731.0	90.08	2.14	6,709.3	1,095.3	-598.5	1,160.4	0.59	-0.12	-0.58
8,826.0	89.82	1.64	6,709.4	1,190.2	-595.4	1,254.2	0.59	-0.27	-0.53
8,921.0	89.46	1.17	6,710.0	1,285.2	-593.1	1,348.2	0.62	-0.38	-0.49
9,017.0	89.15	0.95	6,711.1	1,381.2	-591.3	1,443.2	0.40	-0.32	-0.23
9,112.0	88.46	0.75	6,713.1	1,476.1	-589.9	1,537.3	0.76	-0.73	-0.21
9,208.0	88.02	359.77	6,716.1	1,572.1	-589.4	1,632.5	1.12	-0.46	-1.02
9,302.0	89.93	0.40	6,717.7	1,666.1	-589.3	1,725.7	2.14	2.03	0.67
9,398.0	90.48	0.83	6,717.4	1,762.1	-588.3	1,820.9	0.73	0.57	0.45
9,494.0	90.06	359.80	6,716.9	1,858.1	-587.7	1,916.1	1.16	-0.44	-1.07
9,590.0	89.69	359.23	6,717.2	1,954.1	-588.5	2,011.4	0.71	-0.39	-0.59
9,686.0	89.26	358.85	6,718.0	2,050.0	-590.2	2,106.9	0.60	-0.45	-0.40
9,781.0	89.02	358.26	6,719.5	2,145.0	-592.6	2,201.4	0.67	-0.25	-0.62
9,876.0	90.89	359.60	6,719.5	2,240.0	-594.3	2,295.9	2.42	1.97	1.41
9,972.0	91.64	0.11	6,717.4	2,336.0	-594.6	2,391.2	0.94	0.78	0.53
10,068.0	91.31	359.46	6,714.9	2,431.9	-594.9	2,486.5	0.76	-0.34	-0.68
10,164.0	91.66	1.12	6,712.5	2,527.9	-594.4	2,581.7	1.77	0.36	1.73
10,259.0	91.61	1.22	6,709.7	2,622.8	-592.5	2,675.7	0.12	-0.05	0.11
10,355.0	91.50	0.32	6,707.1	2,718.8	-591.2	2,770.7	0.94	-0.11	-0.94
10,451.0	91.27	2.42	6,704.8	2,814.7	-588.9	2,865.7	2.20	-0.24	2.19
10,546.0	90.90	2.84	6,703.0	2,909.6	-584.6	2,959.3	0.59	-0.39	0.44
10,641.0	90.83	2.37	6,701.6	3,004.5	-580.2	3,053.0	0.50	-0.07	-0.49
10,736.0	90.67	1.58	6,700.3	3,099.4	-577.0	3,146.8	0.85	-0.17	-0.83
10,832.0	90.39	1.05	6,699.5	3,195.4	-574.8	3,241.7	0.62	-0.29	-0.55
10,928.0	90.22	1.12	6,698.9	3,291.4	-573.0	3,336.8	0.19	-0.18	0.07
11,023.0	90.52	1.15	6,698.3	3,386.4	-571.1	3,430.8	0.32	0.32	0.03
11,119.0	90.32	1.47	6,697.6	3,482.3	-568.9	3,525.8	0.39	-0.21	0.33
11,214.0	89.67	0.01	6,697.6	3,577.3	-567.6	3,619.9	1.68	-0.68	-1.54
11,310.0	89.60	0.05	6,698.2	3,673.3	-567.6	3,715.2	0.08	-0.07	0.04
11,406.0	89.11	0.93	6,699.3	3,769.3	-566.8	3,810.4	1.05	-0.51	0.92
11,501.0	88.83	0.56	6,701.0	3,864.3	-565.5	3,904.5	0.49	-0.29	-0.39
11,597.0	88.52	359.28	6,703.3	3,960.3	-565.7	3,999.7	1.37	-0.32	-1.33
11,692.0	89.94	1.11	6,704.5	4,055.2	-565.4	4,094.0	2.44	1.49	1.93
11,787.0	90.20	1.36	6,704.4	4,150.2	-563.3	4,188.0	0.38	0.27	0.26
11,882.0	89.83	0.32	6,704.4	4,245.2	-561.9	4,282.1	1.16	-0.39	-1.09
11,977.0	89.71	359.82	6,704.8	4,340.2	-561.8	4,376.3	0.54	-0.13	-0.53
12,073.0	89.72	0.02	6,705.2	4,436.2	-561.9	4,471.6	0.21	0.01	0.21
12,131.0	89.80	359.86	6,705.5	4,494.2	-562.0	4,529.2	0.31	0.14	-0.28
12,191.0	89.80	359.86	6,705.7	4,554.2	-562.1	4,588.8	0.00	0.00	0.00
Projected BHL 369'FSL, 1412'FWL, Sec.34									

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Popham 7N (Nio C)
Project:	SEC.3-T4N-R64W	TVD Reference:	WELL @ 4685.0ft (Original Well Elev)
Site:	Popham 4N64W03 Pad Sec.3-T4N-R64W	MD Reference:	WELL @ 4685.0ft (Original Well Elev)
Well:	Popham 7N (Nio C)	North Reference:	True
Wellbore:	Popham 7N Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Popham 7N Wellbore #1	Database:	US_EDM

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
SHL 1077'FSL, 2206'FW	0.00	0.00	1.0	0.0	0.0	1,367,093.42	3,268,156.88	40.337080	-104.538049
- survey hits target center									
- Point									
Projected BHL 369'FSL,	0.00	0.00	6,703.0	4,555.2	-536.0	1,371,642.31	3,267,571.50	40.349583	-104.539972
- survey misses target center by 26.3ft at 12191.0ft MD (6705.7 TVD, 4554.2 N, -562.1 E)									
- Point									

Survey Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)	Comment	
7,004.7	6,654.9	-620.6	-630.0	TPZ - 460' Setback - 460'FSL, 1583'FWL, Sec.3	
7,403.0	6,723.7	-231.9	-616.8	Deepest TVD Drilled - 6723.65' TVD	

Checked By: _____	Approved By: _____	Date: _____
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