

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Spaur 10I-201**

Surface Location: Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone

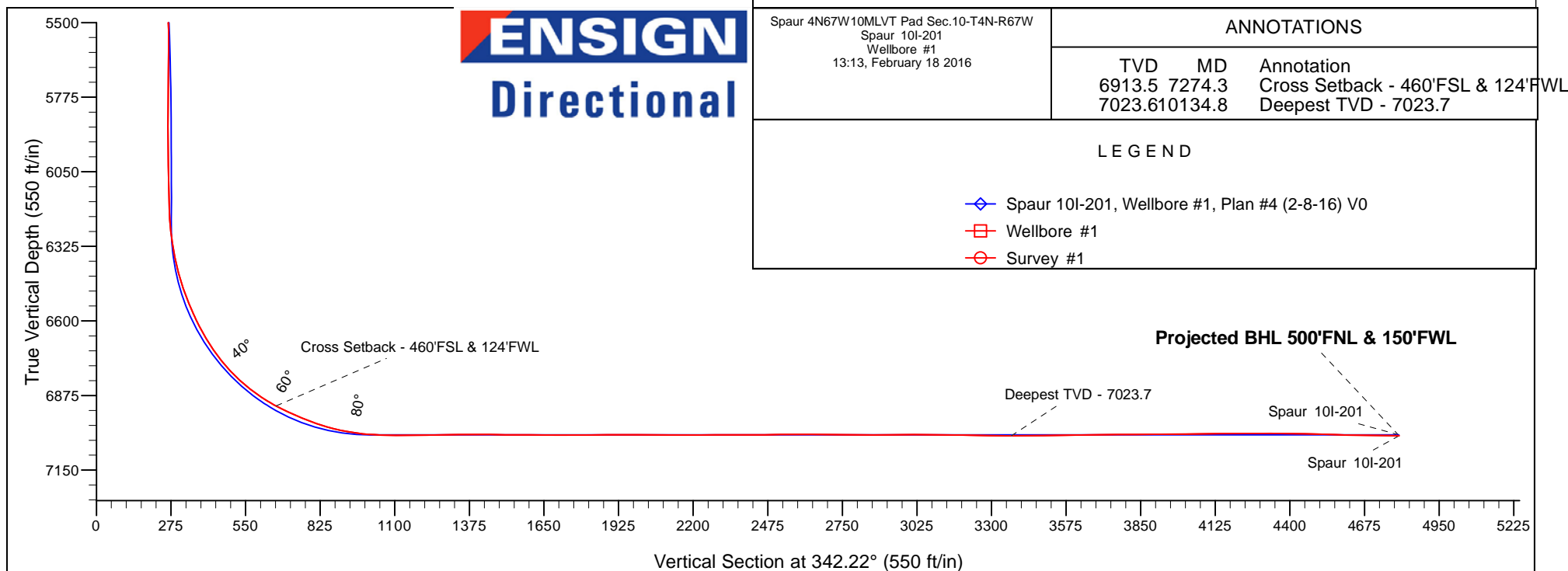
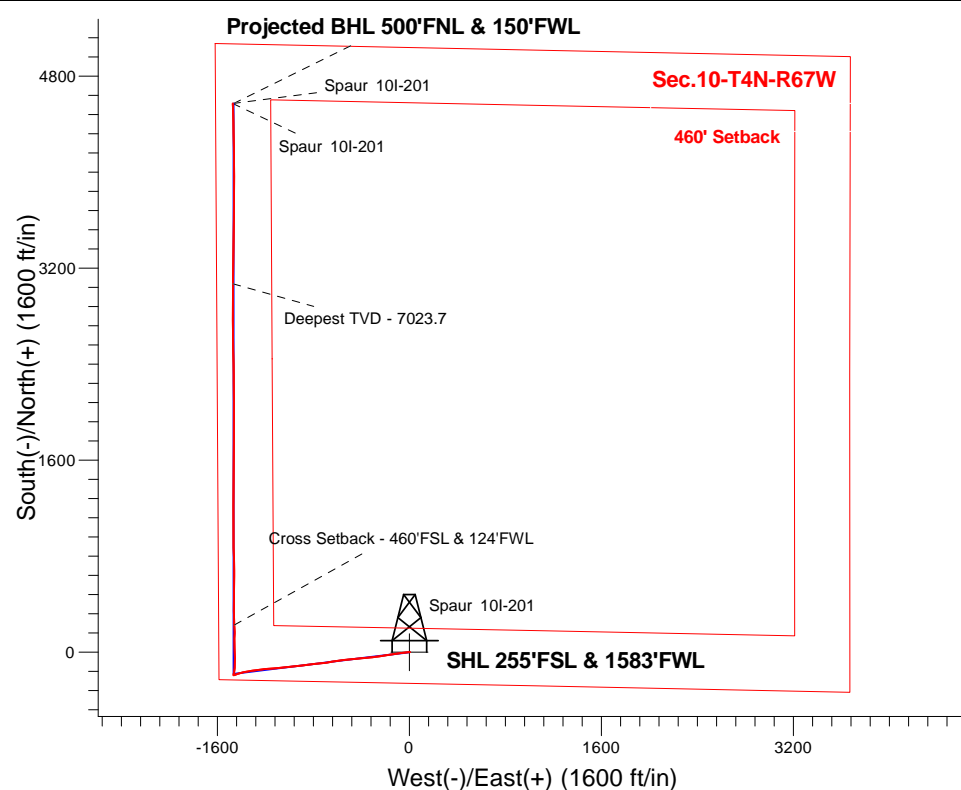
Ground Elevation: 4840.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1360139.79	3172640.93	40.320330	-104.880850	

RKB -13' WELL @ 4853.0ft (RKB -13')

FINAL SURVEY

Projected Bottom Hole Location
11637'MD 7023'TVD 4572'N & 1472'W of SHL
89.7 degree Incl @ 358.3 degree AZM





Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.10-T4N-R67W

Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W

Spaur 10I-201

Wellbore #1

Survey: Survey #1

Standard Survey Report

18 February, 2016

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Spaur 10I-201
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4853.0ft (RKB -13')
Site:	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4853.0ft (RKB -13')
Well:	Spaur 10I-201	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	US_EDM

Project	SEC.10-T4N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W				
Site Position:		Northing:	1,360,227.24 usft	Latitude:	40.320570
From:	Lat/Long	Easting:	3,172,640.32 usft	Longitude:	-104.880850
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.40 °

Well	Spaur 10I-201					
Well Position	+N/-S	0.0 ft	Northing:	1,360,139.79 usft	Latitude:	40.320330
	+E/-W	0.0 ft	Easting:	3,172,640.93 usft	Longitude:	-104.880850
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,840.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/1/2016	8.30	66.81	52,590

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	342.22	

Survey Program	Date	2/18/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
137.0	11,637.0	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	
137.0	0.40	69.60	137.0	0.2	0.4	0.0	0.29	0.29	0.00	
260.0	0.80	259.70	260.0	0.2	0.0	0.2	0.97	0.33	-138.13	
352.0	2.10	261.40	352.0	-0.2	-2.3	0.5	1.41	1.41	1.85	
444.0	3.00	269.00	443.9	-0.5	-6.4	1.5	1.04	0.98	8.26	
536.0	4.60	272.00	535.7	-0.4	-12.5	3.4	1.75	1.74	3.26	
628.0	5.90	266.90	627.3	-0.5	-20.9	5.9	1.50	1.41	-5.54	
720.0	7.30	263.00	718.7	-1.5	-31.4	8.2	1.60	1.52	-4.24	
816.0	8.60	259.70	813.7	-3.5	-44.5	10.2	1.43	1.35	-3.44	
912.0	10.20	260.50	908.5	-6.2	-60.0	12.4	1.67	1.67	0.83	

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Site:	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4853.0ft (RKB -13')
Well:	Spaur 10I-201	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)	
1,007.0	12.10	261.90	1,001.7	-9.0	-78.1	15.3	2.02	2.00	1.47	
1,103.0	13.40	262.50	1,095.3	-11.9	-99.1	19.0	1.36	1.35	0.63	
1,199.0	14.90	265.60	1,188.4	-14.3	-122.4	23.8	1.75	1.56	3.23	
1,295.0	15.50	261.60	1,281.0	-17.1	-147.4	28.7	1.26	0.63	-4.17	
1,345.0	14.90	258.10	1,329.3	-19.4	-160.3	30.5	2.19	-1.20	-7.00	
1,422.0	15.90	257.50	1,403.5	-23.7	-180.3	32.5	1.32	1.30	-0.78	
1,516.0	14.90	262.50	1,494.1	-28.1	-204.9	35.8	1.77	-1.06	5.32	
1,611.0	15.60	263.30	1,585.8	-31.2	-229.7	40.5	0.77	0.74	0.84	
1,707.0	16.40	261.40	1,678.1	-34.7	-255.9	45.1	1.00	0.83	-1.98	
1,802.0	16.40	262.10	1,769.2	-38.6	-282.4	49.5	0.21	0.00	0.74	
1,898.0	16.60	263.00	1,861.2	-42.1	-309.5	54.4	0.34	0.21	0.94	
1,994.0	17.90	266.30	1,952.9	-44.7	-337.8	60.6	1.69	1.35	3.44	
2,090.0	17.70	264.80	2,044.3	-47.0	-367.1	67.4	0.52	-0.21	-1.56	
2,186.0	16.90	262.10	2,136.0	-50.2	-395.4	72.9	1.18	-0.83	-2.81	
2,282.0	16.00	265.30	2,228.1	-53.2	-422.4	78.3	1.33	-0.94	3.33	
2,378.0	17.40	264.20	2,320.0	-55.8	-449.9	84.3	1.49	1.46	-1.15	
2,474.0	18.30	264.40	2,411.4	-58.7	-479.2	90.5	0.94	0.94	0.21	
2,570.0	19.40	265.60	2,502.2	-61.4	-510.1	97.3	1.21	1.15	1.25	
2,666.0	21.10	265.80	2,592.3	-63.9	-543.2	105.1	1.77	1.77	0.21	
2,762.0	20.80	260.90	2,682.0	-67.8	-577.3	111.7	1.85	-0.31	-5.10	
2,858.0	17.90	257.90	2,772.5	-73.6	-608.5	115.8	3.19	-3.02	-3.13	
2,954.0	17.80	260.00	2,863.9	-79.3	-637.4	119.2	0.68	-0.10	2.19	
3,049.0	17.10	261.60	2,954.5	-83.8	-665.5	123.4	0.89	-0.74	1.68	
3,145.0	15.70	263.20	3,046.6	-87.4	-692.4	128.2	1.53	-1.46	1.67	
3,241.0	15.70	265.10	3,139.1	-90.1	-718.2	133.6	0.54	0.00	1.98	
3,337.0	15.90	264.10	3,231.4	-92.5	-744.3	139.2	0.35	0.21	-1.04	
3,432.0	15.90	263.00	3,322.8	-95.5	-770.1	144.3	0.32	0.00	-1.16	
3,528.0	16.60	264.60	3,415.0	-98.4	-796.8	149.7	0.87	0.73	1.67	
3,624.0	15.60	260.90	3,507.2	-101.7	-823.2	154.6	1.49	-1.04	-3.85	
3,720.0	15.80	261.40	3,599.6	-105.7	-848.9	158.6	0.25	0.21	0.52	
3,816.0	18.10	263.50	3,691.4	-109.3	-876.6	163.6	2.48	2.40	2.19	
3,912.0	19.40	264.10	3,782.3	-112.6	-907.3	169.8	1.37	1.35	0.63	
4,008.0	20.00	264.90	3,872.7	-115.7	-939.5	176.7	0.69	0.63	0.83	
4,104.0	18.10	263.20	3,963.5	-119.0	-970.7	183.2	2.06	-1.98	-1.77	
4,200.0	15.60	262.50	4,055.3	-122.4	-998.3	188.3	2.61	-2.60	-0.73	
4,296.0	16.10	267.00	4,147.7	-124.8	-1,024.4	194.0	1.38	0.52	4.69	
4,392.0	17.00	263.30	4,239.7	-127.1	-1,051.6	200.1	1.44	0.94	-3.85	
4,487.0	17.40	262.50	4,330.5	-130.6	-1,079.5	205.3	0.49	0.42	-0.84	
4,583.0	18.00	266.20	4,421.9	-133.5	-1,108.5	211.5	1.33	0.63	3.85	
4,679.0	18.20	264.20	4,513.2	-136.0	-1,138.2	218.2	0.68	0.21	-2.08	
4,775.0	17.60	266.90	4,604.5	-138.3	-1,167.6	225.0	1.07	-0.63	2.81	
4,871.0	18.50	265.80	4,695.8	-140.2	-1,197.3	232.2	1.00	0.94	-1.15	
4,966.0	19.30	261.80	4,785.7	-143.5	-1,227.9	238.4	1.60	0.84	-4.21	
5,062.0	18.60	263.20	4,876.5	-147.6	-1,258.8	243.9	0.87	-0.73	1.46	

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5,158.0	16.30	260.00	4,968.1	-151.7	-1,287.3	248.7	2.60	-2.40	-3.33	
5,254.0	15.30	260.90	5,060.4	-156.1	-1,313.1	252.4	1.07	-1.04	0.94	
5,346.0	15.70	267.20	5,149.1	-158.6	-1,337.5	257.5	1.88	0.43	6.85	
5,437.0	14.40	254.60	5,237.0	-162.2	-1,360.7	261.1	3.86	-1.43	-13.85	
5,530.0	14.00	256.10	5,327.1	-168.0	-1,382.8	262.4	0.58	-0.43	1.61	
5,621.0	12.80	258.30	5,415.7	-172.7	-1,403.3	264.2	1.43	-1.32	2.42	
5,714.0	11.20	254.20	5,506.6	-177.2	-1,422.1	265.6	1.95	-1.72	-4.41	
5,805.0	7.50	250.50	5,596.4	-181.6	-1,436.2	265.7	4.12	-4.07	-4.07	
5,898.0	6.00	248.40	5,688.8	-185.4	-1,446.4	265.2	1.63	-1.61	-2.26	
6,021.0	4.30	243.30	5,811.3	-189.9	-1,456.5	264.1	1.43	-1.38	-4.15	
6,116.0	3.60	258.10	5,906.0	-192.1	-1,462.6	263.8	1.30	-0.74	15.58	
6,212.0	1.00	320.00	6,002.0	-192.1	-1,466.1	264.9	3.39	-2.71	64.48	
6,308.0	1.00	337.90	6,097.9	-190.7	-1,467.0	266.5	0.32	0.00	18.65	
6,404.0	1.80	352.60	6,193.9	-188.4	-1,467.5	268.8	0.91	0.83	15.31	
6,451.0	5.60	14.60	6,240.8	-185.4	-1,467.0	271.5	8.49	8.09	46.81	
6,500.0	9.10	14.30	6,289.4	-179.4	-1,465.4	276.8	7.14	7.14	-0.61	
6,547.0	11.60	13.90	6,335.6	-171.2	-1,463.4	284.0	5.32	5.32	-0.85	
6,595.0	14.30	15.50	6,382.4	-160.8	-1,460.7	293.0	5.67	5.63	3.33	
6,642.0	16.70	7.10	6,427.7	-148.5	-1,458.3	304.0	6.98	5.11	-17.87	
6,691.0	19.90	1.80	6,474.2	-133.1	-1,457.1	318.3	7.35	6.53	-10.82	
6,738.0	22.40	2.50	6,518.1	-116.2	-1,456.5	334.2	5.35	5.32	1.49	
6,787.0	24.50	1.10	6,563.0	-96.7	-1,455.9	352.6	4.43	4.29	-2.86	
6,834.0	27.90	0.40	6,605.2	-76.0	-1,455.6	372.2	7.26	7.23	-1.49	
6,883.0	30.20	359.70	6,648.0	-52.2	-1,455.6	394.9	4.74	4.69	-1.43	
6,930.0	33.90	358.60	6,687.8	-27.2	-1,456.0	418.7	7.97	7.87	-2.34	
6,978.0	37.50	357.60	6,726.8	0.7	-1,456.9	445.7	7.60	7.50	-2.08	
7,025.0	41.90	359.00	6,763.0	30.7	-1,457.8	474.5	9.55	9.36	2.98	
7,074.0	46.30	1.10	6,798.1	64.8	-1,457.7	507.0	9.46	8.98	4.29	
7,121.0	50.90	1.40	6,829.2	100.1	-1,457.0	540.3	9.80	9.79	0.64	
7,170.0	54.00	0.60	6,859.1	138.9	-1,456.3	577.1	6.46	6.33	-1.63	
7,217.0	58.10	358.40	6,885.3	177.9	-1,456.7	614.3	9.55	8.72	-4.68	
7,266.0	62.30	356.20	6,909.7	220.3	-1,458.7	655.3	9.41	8.57	-4.49	
7,274.3	62.76	356.22	6,913.5	227.7	-1,459.2	662.5	5.54	5.53	0.22	
Cross Setback - 460'FSL & 124'FWL										
7,313.0	64.90	356.30	6,930.6	262.3	-1,461.4	696.2	5.54	5.53	0.21	
7,361.0	67.40	357.70	6,950.0	306.2	-1,463.7	738.6	5.85	5.21	2.92	
7,408.0	69.50	359.50	6,967.2	349.9	-1,464.8	780.5	5.71	4.47	3.83	
7,457.0	72.80	1.10	6,983.1	396.2	-1,464.5	824.6	7.41	6.73	3.27	
7,504.0	76.30	1.30	6,995.6	441.5	-1,463.6	867.4	7.46	7.45	0.43	
7,552.0	79.80	0.70	7,005.5	488.5	-1,462.8	911.9	7.39	7.29	-1.25	
7,599.0	82.10	1.30	7,012.9	534.9	-1,462.0	955.8	5.05	4.89	1.28	
7,648.0	85.80	0.20	7,018.1	583.6	-1,461.3	1,002.0	7.87	7.55	-2.24	
7,744.0	89.60	359.30	7,021.9	679.5	-1,461.7	1,093.5	4.07	3.96	-0.94	

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7,840.0	91.00	358.30	7,021.4	775.5	-1,463.8	1,185.5	1.79	1.46	-1.04
7,935.0	90.50	359.10	7,020.2	870.4	-1,465.9	1,276.6	0.99	-0.53	0.84
8,032.0	90.80	0.20	7,019.1	967.4	-1,466.5	1,369.1	1.18	0.31	1.13
8,128.0	88.90	0.20	7,019.3	1,063.4	-1,466.2	1,460.4	1.98	-1.98	0.00
8,224.0	90.20	0.20	7,020.1	1,159.4	-1,465.8	1,551.7	1.35	1.35	0.00
8,319.0	89.20	359.50	7,020.6	1,254.4	-1,466.1	1,642.2	1.28	-1.05	-0.74
8,415.0	90.20	359.90	7,021.1	1,350.4	-1,466.6	1,733.8	1.12	1.04	0.42
8,511.0	90.50	359.50	7,020.5	1,446.4	-1,467.1	1,825.4	0.52	0.31	-0.42
8,607.0	90.40	0.40	7,019.7	1,542.4	-1,467.2	1,916.8	0.94	-0.10	0.94
8,703.0	89.30	0.90	7,020.0	1,638.4	-1,466.1	2,007.9	1.26	-1.15	0.52
8,799.0	90.00	0.90	7,020.6	1,734.4	-1,464.6	2,098.8	0.73	0.73	0.00
8,895.0	89.90	0.70	7,020.7	1,830.4	-1,463.2	2,189.8	0.23	-0.10	-0.21
8,991.0	90.70	359.90	7,020.2	1,926.4	-1,462.7	2,281.1	1.18	0.83	-0.83
9,087.0	89.50	0.20	7,020.0	2,022.4	-1,462.6	2,372.4	1.29	-1.25	0.31
9,183.0	90.90	359.00	7,019.7	2,118.4	-1,463.3	2,464.1	1.92	1.46	-1.25
9,279.0	90.00	0.20	7,018.9	2,214.3	-1,464.0	2,555.7	1.56	-0.94	1.25
9,375.0	90.10	359.00	7,018.8	2,310.3	-1,464.7	2,647.3	1.25	0.10	-1.25
9,470.0	89.00	359.10	7,019.6	2,405.3	-1,466.2	2,738.2	1.16	-1.16	0.11
9,566.0	90.00	359.00	7,020.4	2,501.3	-1,467.8	2,830.1	1.05	1.04	-0.10
9,662.0	90.70	358.60	7,019.8	2,597.3	-1,469.8	2,922.1	0.84	0.73	-0.42
9,758.0	89.90	359.30	7,019.3	2,693.3	-1,471.6	3,014.0	1.11	-0.83	0.73
9,854.0	89.50	0.00	7,019.8	2,789.3	-1,472.2	3,105.6	0.84	-0.42	0.73
9,950.0	89.10	359.70	7,021.0	2,885.3	-1,472.4	3,197.1	0.52	-0.42	-0.31
10,046.0	88.90	0.60	7,022.7	2,981.2	-1,472.2	3,288.4	0.96	-0.21	0.94
10,134.8	89.83	0.60	7,023.6	3,070.0	-1,471.3	3,372.7	1.05	1.05	0.00
Deepest TVD - 7023.7									
10,141.0	89.90	0.60	7,023.7	3,076.2	-1,471.2	3,378.6	1.05	1.05	0.00
10,237.0	91.30	0.40	7,022.7	3,172.2	-1,470.3	3,469.7	1.47	1.46	-0.21
10,333.0	90.20	1.10	7,021.4	3,268.2	-1,469.1	3,560.7	1.36	-1.15	0.73
10,429.0	90.60	0.20	7,020.7	3,364.2	-1,468.0	3,651.8	1.03	0.42	-0.94
10,525.0	91.10	2.10	7,019.3	3,460.1	-1,466.1	3,742.6	2.05	0.52	1.98
10,621.0	89.70	0.70	7,018.6	3,556.1	-1,463.7	3,833.2	2.06	-1.46	-1.46
10,717.0	91.50	0.00	7,017.6	3,652.1	-1,463.1	3,924.5	2.01	1.88	-0.73
10,813.0	89.30	0.40	7,017.0	3,748.1	-1,462.8	4,015.8	2.33	-2.29	0.42
10,908.0	91.60	1.10	7,016.2	3,843.1	-1,461.6	4,105.8	2.53	2.42	0.74
11,004.0	90.10	359.30	7,014.8	3,939.1	-1,461.2	4,197.1	2.44	-1.56	-1.88
11,100.0	89.50	358.60	7,015.1	4,035.0	-1,463.0	4,289.1	0.96	-0.63	-0.73
11,196.0	90.00	359.50	7,015.5	4,131.0	-1,464.6	4,380.9	1.07	0.52	0.94
11,292.0	88.90	359.30	7,016.5	4,227.0	-1,465.6	4,472.7	1.16	-1.15	-0.21
11,388.0	87.80	359.10	7,019.2	4,323.0	-1,466.9	4,564.4	1.16	-1.15	-0.21
11,483.0	89.10	359.00	7,021.8	4,417.9	-1,468.5	4,655.3	1.37	1.37	-0.11
11,592.0	89.70	358.30	7,022.9	4,526.9	-1,471.1	4,759.9	0.85	0.55	-0.64
11,637.0	89.70	358.30	7,023.2	4,571.9	-1,472.4	4,803.1	0.00	0.00	0.00

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Spaur 10I-201
Project:	SEC.10-T4N-R67W	TVD Reference:	WELL @ 4853.0ft (RKB -13')
Site:	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4853.0ft (RKB -13')
Well:	Spaur 10I-201	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	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 255'FSL & 1583'FW	0.00	0.00	1.0	0.0	0.0	1,360,139.82	3,172,640.93	40.320330	-104.880850
- survey hits target center									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
7,274.3	6,913.5	227.7	-1,459.2	Cross Setback - 460'FSL & 124'FWL
10,134.8	7,023.6	3,070.0	-1,471.3	Deepest TVD - 7023.7

Checked By: _____ Approved By: _____ Date: _____