

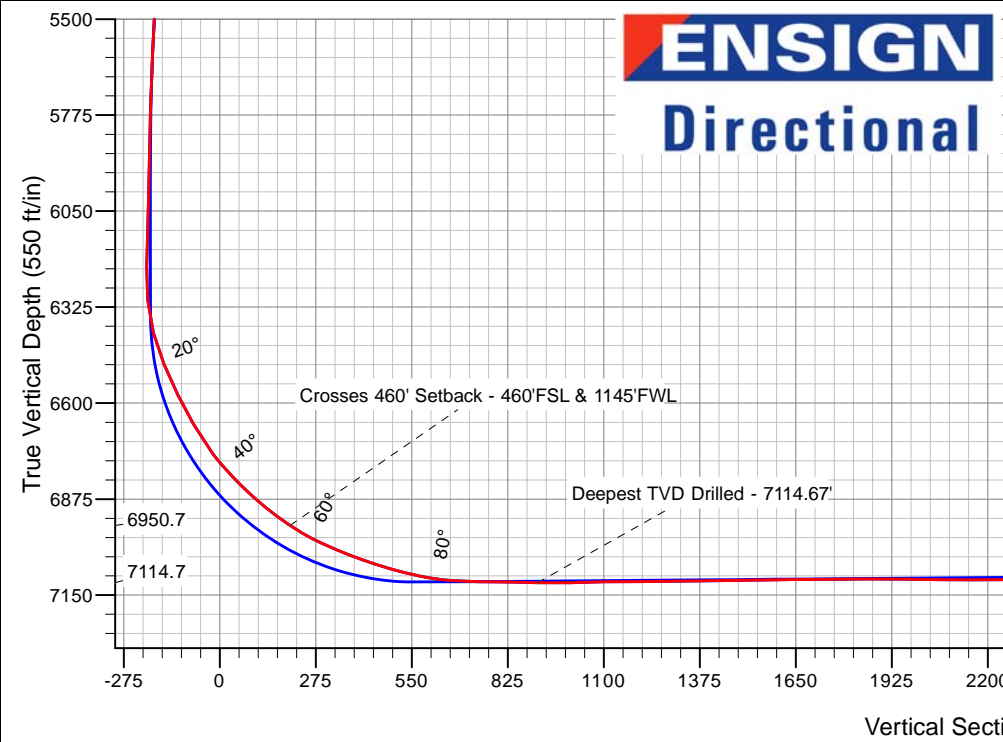
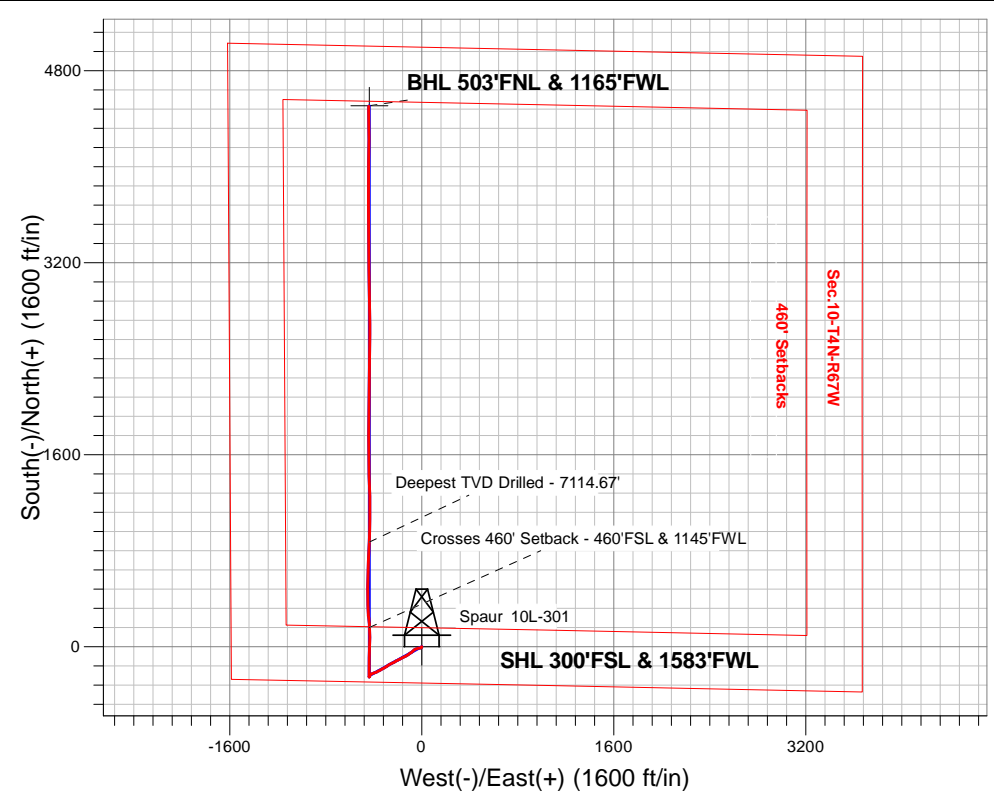
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Spaur 10L-301**

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 1360183.503172640.63 40.320450 -104.880850
 RKB - 13' WELL @ 4853.0ft (RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
11495'MD 7073'TVD 4503'N & 445'W of SHL
94.2 degree Incl @ 359.3 degree AZM



Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W
 Spaur 10L-301
 Wellbore #1
 6:54, March 07 2016

ANNOTATIONS		
TVD	MD	Annotation
6950.7	7119.5	Crosses 460' Setback - 460'FSL & 1145'FWL
7114.7	7862.0	Deepest TVD Drilled - 7114.67'

LEGEND	
	Spaur 10L-301, Wellbore #1, Plan #4 (2-29-16)R V0
	Wellbore #1
	Survey #1



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.10-T4N-R67W

Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W

Spaur 10L-301

Wellbore #1

Survey: Survey #1

Standard Survey Report

07 March, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Spaur 10L-301
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 10L-301	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 10L-301					
Well Position	+N/-S	0.0 ft	Northing:	1,360,183.50 usft	Latitude:	40.320450
	+E/-W	0.0 ft	Easting:	3,172,640.63 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	2/29/2016	8.29	66.80	52,582

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	354.45	

Survey Program	Date	3/7/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	11,495.0	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	
1.0	0.00	182.70	1.0	0.0	0.0	0.0	0.30	0.30	0.00	
SHL 300'FSL & 1583'FWL										
167.0	0.50	182.70	167.0	-0.7	0.0	-0.7	0.30	0.30	0.00	
259.0	0.40	180.90	259.0	-1.4	-0.1	-1.4	0.11	-0.11	-1.96	
351.0	0.70	222.90	351.0	-2.2	-0.4	-2.1	0.53	0.33	45.65	
443.0	1.10	213.60	443.0	-3.3	-1.3	-3.2	0.46	0.43	-10.11	
535.0	0.40	346.50	535.0	-3.8	-1.9	-3.6	1.53	-0.76	144.46	
627.0	1.40	211.10	627.0	-4.4	-2.5	-4.1	1.86	1.09	-147.17	
723.0	1.20	222.60	722.9	-6.1	-3.8	-5.7	0.34	-0.21	11.98	
819.0	1.50	225.60	818.9	-7.8	-5.4	-7.2	0.32	0.31	3.13	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Spaur 10L-301
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 10L-301	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)	
916.0	1.70	224.10	915.9	-9.7	-7.3	-8.9	0.21	0.21	-1.55	
1,011.0	2.10	260.70	1,010.8	-11.0	-10.0	-10.0	1.32	0.42	38.53	
1,107.0	2.50	258.60	1,106.8	-11.7	-13.8	-10.3	0.43	0.42	-2.19	
1,203.0	3.60	266.20	1,202.6	-12.3	-18.9	-10.4	1.22	1.15	7.92	
1,330.0	3.80	257.50	1,329.3	-13.5	-26.9	-10.8	0.47	0.16	-6.85	
1,417.0	3.40	259.30	1,416.2	-14.6	-32.3	-11.4	0.48	-0.46	2.07	
1,513.0	3.60	260.20	1,512.0	-15.6	-38.1	-11.9	0.22	0.21	0.94	
1,609.0	5.70	242.80	1,607.7	-18.3	-45.3	-13.8	2.61	2.19	-18.13	
1,705.0	5.20	246.10	1,703.2	-22.2	-53.5	-17.0	0.61	-0.52	3.44	
1,801.0	4.90	243.80	1,798.9	-25.8	-61.1	-19.8	0.38	-0.31	-2.40	
1,896.0	5.50	227.80	1,893.5	-30.7	-68.2	-23.9	1.65	0.63	-16.84	
1,992.0	5.20	222.60	1,989.1	-37.0	-74.5	-29.6	0.59	-0.31	-5.42	
2,088.0	6.20	232.40	2,084.6	-43.3	-81.6	-35.2	1.45	1.04	10.21	
2,184.0	5.50	230.60	2,180.1	-49.4	-89.2	-40.6	0.75	-0.73	-1.88	
2,280.0	6.70	237.30	2,275.6	-55.4	-97.5	-45.7	1.45	1.25	6.98	
2,375.0	6.20	237.70	2,370.0	-61.1	-106.5	-50.5	0.53	-0.53	0.42	
2,470.0	6.20	235.70	2,464.4	-66.7	-115.1	-55.3	0.23	0.00	-2.11	
2,566.0	6.20	234.30	2,559.8	-72.7	-123.6	-60.4	0.16	0.00	-1.46	
2,661.0	6.30	244.70	2,654.3	-77.9	-132.4	-64.7	1.19	0.11	10.95	
2,757.0	7.00	243.10	2,749.6	-82.8	-142.4	-68.6	0.75	0.73	-1.67	
2,853.0	6.70	242.20	2,844.9	-88.0	-152.6	-72.9	0.33	-0.31	-0.94	
2,949.0	6.30	241.00	2,940.3	-93.2	-162.1	-77.1	0.44	-0.42	-1.25	
3,044.0	6.90	246.80	3,034.7	-98.0	-172.0	-80.9	0.94	0.63	6.11	
3,140.0	6.10	241.50	3,130.1	-102.7	-181.7	-84.6	1.04	-0.83	-5.52	
3,235.0	7.10	244.20	3,224.4	-107.7	-191.5	-88.6	1.10	1.05	2.84	
3,331.0	7.20	240.80	3,319.7	-113.2	-202.1	-93.1	0.45	0.10	-3.54	
3,427.0	6.60	239.60	3,415.0	-118.9	-212.1	-97.8	0.64	-0.63	-1.25	
3,523.0	5.70	236.80	3,510.5	-124.3	-220.8	-102.4	0.99	-0.94	-2.92	
3,619.0	6.90	245.10	3,605.9	-129.3	-230.0	-106.5	1.57	1.25	8.65	
3,715.0	7.00	244.50	3,701.2	-134.3	-240.5	-110.4	0.13	0.10	-0.63	
3,811.0	6.90	242.60	3,796.5	-139.5	-250.9	-114.5	0.26	-0.10	-1.98	
3,907.0	6.70	241.70	3,891.8	-144.8	-261.0	-118.9	0.24	-0.21	-0.94	
4,002.0	6.10	242.40	3,986.2	-149.7	-270.3	-122.9	0.64	-0.63	0.74	
4,098.0	6.60	234.70	4,081.6	-155.3	-279.4	-127.6	1.03	0.52	-8.02	
4,194.0	6.00	233.80	4,177.0	-161.4	-287.9	-132.8	0.63	-0.63	-0.94	
4,290.0	7.00	241.70	4,272.4	-167.2	-297.1	-137.7	1.40	1.04	8.23	
4,386.0	6.50	239.60	4,367.7	-172.7	-307.0	-142.2	0.58	-0.52	-2.19	
4,482.0	6.30	238.90	4,463.1	-178.2	-316.2	-146.8	0.22	-0.21	-0.73	
4,578.0	7.70	241.00	4,558.4	-184.0	-326.3	-151.6	1.48	1.46	2.19	
4,673.0	6.90	242.60	4,652.7	-189.7	-336.9	-156.3	0.87	-0.84	1.68	
4,769.0	6.60	240.70	4,748.0	-195.1	-346.8	-160.6	0.39	-0.31	-1.98	
4,865.0	6.00	238.40	4,843.4	-200.4	-355.9	-165.1	0.68	-0.63	-2.40	
4,960.0	6.50	241.50	4,937.8	-205.6	-364.9	-169.3	0.63	0.53	3.26	

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Site:	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	MD Reference:	WELL @ 4853.0ft (RKB - 13')
Well:	Spaur 10L-301	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)	
5,056.0	5.50	241.40	5,033.3	-210.4	-373.7	-173.3	1.04	-1.04	-0.10	
5,152.0	6.60	247.30	5,128.8	-214.7	-382.8	-176.7	1.31	1.15	6.15	
5,248.0	6.70	260.70	5,224.1	-217.7	-393.5	-178.7	1.62	0.10	13.96	
5,343.0	7.40	248.90	5,318.4	-220.8	-404.6	-180.7	1.69	0.74	-12.42	
5,439.0	6.30	248.20	5,413.7	-225.0	-415.3	-183.8	1.15	-1.15	-0.73	
5,535.0	5.80	229.90	5,509.2	-230.1	-423.9	-188.0	2.07	-0.52	-19.06	
5,631.0	3.50	207.60	5,604.9	-235.8	-429.0	-193.2	3.00	-2.40	-23.23	
5,727.0	2.60	232.90	5,700.8	-239.7	-432.1	-196.8	1.66	-0.94	26.35	
5,823.0	2.20	217.30	5,796.7	-242.5	-434.9	-199.3	0.79	-0.42	-16.25	
5,918.0	1.60	203.20	5,891.6	-245.2	-436.5	-201.8	0.80	-0.63	-14.84	
6,014.0	1.50	203.40	5,987.6	-247.6	-437.6	-204.1	0.10	-0.10	0.21	
6,110.0	1.60	195.30	6,083.6	-250.0	-438.4	-206.5	0.25	0.10	-8.44	
6,235.0	1.50	185.80	6,208.5	-253.3	-439.0	-209.7	0.22	-0.08	-7.60	
6,331.0	5.20	1.80	6,304.4	-250.2	-439.0	-206.6	6.98	3.85	183.33	
6,427.0	14.60	2.00	6,398.9	-233.7	-438.5	-190.3	9.79	9.79	0.21	
6,522.0	22.80	358.80	6,488.8	-203.3	-438.4	-160.0	8.70	8.63	-3.37	
6,618.0	26.30	358.60	6,576.1	-163.4	-439.3	-120.2	3.65	3.65	-0.21	
6,714.0	29.80	2.10	6,660.8	-118.3	-439.0	-75.3	4.03	3.65	3.65	
6,810.0	36.80	0.70	6,741.0	-65.7	-437.8	-23.0	7.34	7.29	-1.46	
6,905.0	44.40	2.50	6,813.1	-3.9	-436.0	38.2	8.09	8.00	1.89	
7,001.0	49.10	0.50	6,878.8	65.9	-434.2	107.6	5.13	4.90	-2.08	
7,097.0	54.80	356.00	6,938.0	141.4	-436.6	183.0	6.99	5.94	-4.69	
7,119.5	56.56	355.78	6,950.7	160.0	-437.9	201.6	7.85	7.81	-1.00	
Crosses 460' Setback - 460'FSL & 1145'FWL										
7,193.0	62.30	355.10	6,988.1	223.0	-443.0	264.8	7.85	7.81	-0.92	
7,288.0	69.00	358.60	7,027.2	309.4	-447.7	351.2	7.81	7.05	3.68	
7,335.0	70.00	358.10	7,043.7	353.4	-448.9	395.1	2.35	2.13	-1.06	
7,384.0	71.30	358.30	7,059.9	399.6	-450.4	441.3	2.68	2.65	0.41	
7,431.0	73.70	358.80	7,074.0	444.4	-451.5	486.0	5.21	5.11	1.06	
7,480.0	76.40	359.80	7,086.7	491.7	-452.1	533.1	5.85	5.51	2.04	
7,527.0	79.00	0.40	7,096.7	537.7	-452.0	578.8	5.67	5.53	1.28	
7,576.0	82.70	2.10	7,104.5	586.0	-450.9	626.9	8.29	7.55	3.47	
7,623.0	86.70	3.20	7,108.8	632.7	-448.8	673.2	8.82	8.51	2.34	
7,671.0	88.50	3.00	7,110.8	680.6	-446.2	720.6	3.77	3.75	-0.42	
7,766.0	88.90	2.50	7,113.0	775.5	-441.6	814.6	0.67	0.42	-0.53	
7,862.0	89.10	1.80	7,114.7	871.4	-438.0	909.7	0.76	0.21	-0.73	
Deepest TVD Drilled - 7114.67'										
7,958.0	91.20	0.90	7,114.4	967.4	-435.8	1,005.0	2.38	2.19	-0.94	
8,054.0	91.70	0.40	7,112.0	1,063.3	-434.7	1,100.4	0.74	0.52	-0.52	
8,150.0	90.00	0.00	7,110.6	1,159.3	-434.3	1,195.9	1.82	-1.77	-0.42	
8,246.0	90.30	359.50	7,110.3	1,255.3	-434.8	1,291.5	0.61	0.31	-0.52	
8,342.0	90.40	359.10	7,109.7	1,351.3	-435.9	1,387.1	0.43	0.10	-0.42	
8,438.0	90.90	358.60	7,108.6	1,447.3	-437.9	1,482.8	0.74	0.52	-0.52	
8,534.0	91.30	358.10	7,106.8	1,543.2	-440.6	1,578.6	0.67	0.42	-0.52	

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Well:	Spaur 10L-301	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)
8,630.0	91.00	359.30	7,104.9	1,639.2	-442.8	1,674.3	1.29	-0.31	1.25
8,726.0	89.70	359.80	7,104.3	1,735.2	-443.6	1,769.9	1.45	-1.35	0.52
8,822.0	90.10	359.10	7,104.5	1,831.2	-444.5	1,865.6	0.84	0.42	-0.73
8,918.0	89.40	0.90	7,104.9	1,927.2	-444.5	1,961.1	2.01	-0.73	1.88
9,014.0	89.60	0.20	7,105.7	2,023.2	-443.6	2,056.6	0.76	0.21	-0.73
9,110.0	89.60	2.50	7,106.4	2,119.1	-441.3	2,151.9	2.40	0.00	2.40
9,206.0	91.30	1.60	7,105.6	2,215.1	-437.9	2,247.0	2.00	1.77	-0.94
9,302.0	91.60	1.20	7,103.2	2,311.0	-435.5	2,342.3	0.52	0.31	-0.42
9,398.0	90.70	0.70	7,101.3	2,407.0	-433.9	2,437.6	1.07	-0.94	-0.52
9,493.0	91.50	0.00	7,099.4	2,501.9	-433.3	2,532.1	1.12	0.84	-0.74
9,589.0	90.40	359.80	7,097.9	2,597.9	-433.5	2,627.7	1.16	-1.15	-0.21
9,685.0	91.10	359.10	7,096.6	2,693.9	-434.4	2,723.3	1.03	0.73	-0.73
9,780.0	89.50	359.70	7,096.1	2,788.9	-435.4	2,817.9	1.80	-1.68	0.63
9,877.0	90.20	359.70	7,096.4	2,885.9	-435.9	2,914.5	0.72	0.72	0.00
9,972.0	90.30	359.30	7,095.9	2,980.9	-436.8	3,009.2	0.43	0.11	-0.42
10,068.0	90.80	359.00	7,095.0	3,076.9	-438.2	3,104.8	0.61	0.52	-0.31
10,164.0	91.20	358.80	7,093.3	3,172.9	-440.0	3,200.5	0.47	0.42	-0.21
10,260.0	89.70	359.10	7,092.6	3,268.8	-441.8	3,296.2	1.59	-1.56	0.31
10,356.0	90.40	358.80	7,092.5	3,364.8	-443.6	3,391.9	0.79	0.73	-0.31
10,452.0	90.50	359.80	7,091.7	3,460.8	-444.7	3,487.6	1.05	0.10	1.04
10,548.0	90.30	359.10	7,091.1	3,556.8	-445.6	3,583.2	0.76	-0.21	-0.73
10,644.0	89.90	0.70	7,090.9	3,652.8	-445.8	3,678.8	1.72	-0.42	1.67
10,740.0	89.90	359.80	7,091.1	3,748.8	-445.4	3,774.3	0.94	0.00	-0.94
10,836.0	89.40	1.10	7,091.7	3,844.8	-444.6	3,869.8	1.45	-0.52	1.35
10,932.0	90.00	0.70	7,092.2	3,940.8	-443.1	3,965.1	0.75	0.63	-0.42
11,027.0	90.70	0.90	7,091.6	4,035.8	-441.8	4,059.6	0.77	0.74	0.21
11,123.0	91.20	0.00	7,090.0	4,131.7	-441.1	4,155.0	1.07	0.52	-0.94
11,219.0	91.50	359.50	7,087.7	4,227.7	-441.5	4,250.6	0.61	0.31	-0.52
11,315.0	92.50	359.30	7,084.4	4,323.6	-442.5	4,346.2	1.06	1.04	-0.21
11,445.0	94.20	359.30	7,076.8	4,453.4	-444.1	4,475.5	1.31	1.31	0.00
11,495.0	94.20	359.30	7,073.1	4,503.3	-444.7	4,525.2	0.00	0.00	0.00
BHL 500'FNL & 1172'FWL									

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Spaur 10L-301
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 10L-301	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 300'FSL & 1583'FM - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,360,183.53	3,172,640.63	40.320450	-104.880850
BHL 500'FNL & 1172'FV - survey misses target center by 11.0ft at 11495.0ft MD (7073.1 TVD, 4503.3 N, -444.7 E) - Point	0.00	0.00	7,081.0	4,506.5	-437.7	1,364,686.65	3,172,171.48	40.332820	-104.882420

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
7,119.5	6,950.7	160.0	-437.9	Crosses 460' Setback - 460'FSL & 1145'FWL
7,862.0	7,114.7	871.4	-438.0	Deepest TVD Drilled - 7114.67'

Checked By: _____ Approved By: _____ Date: _____