

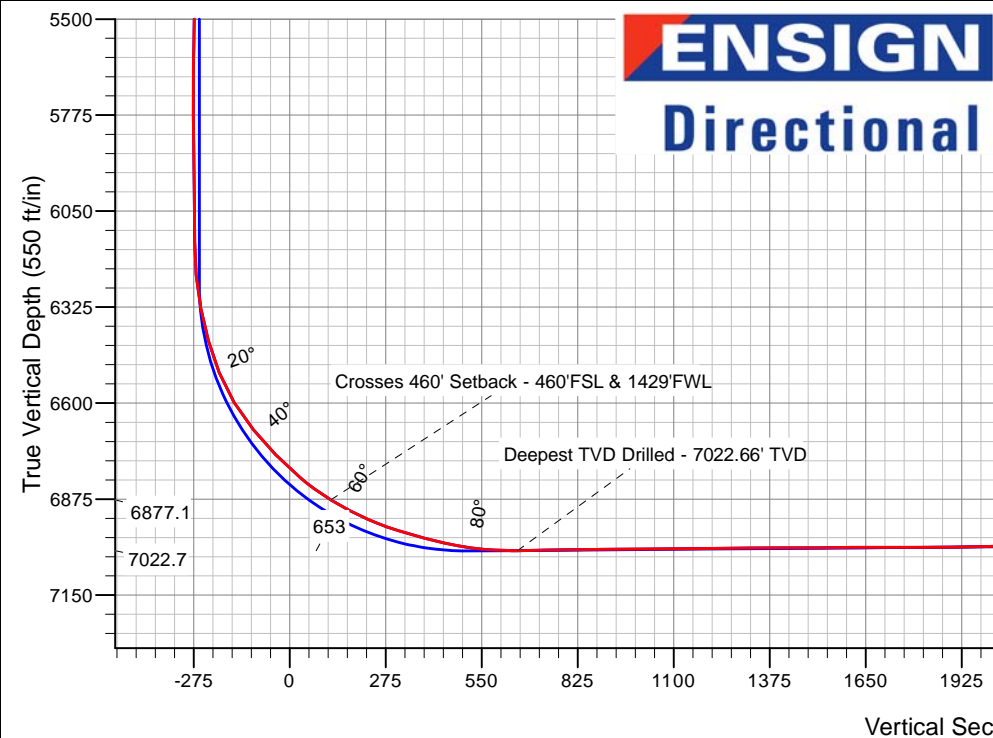
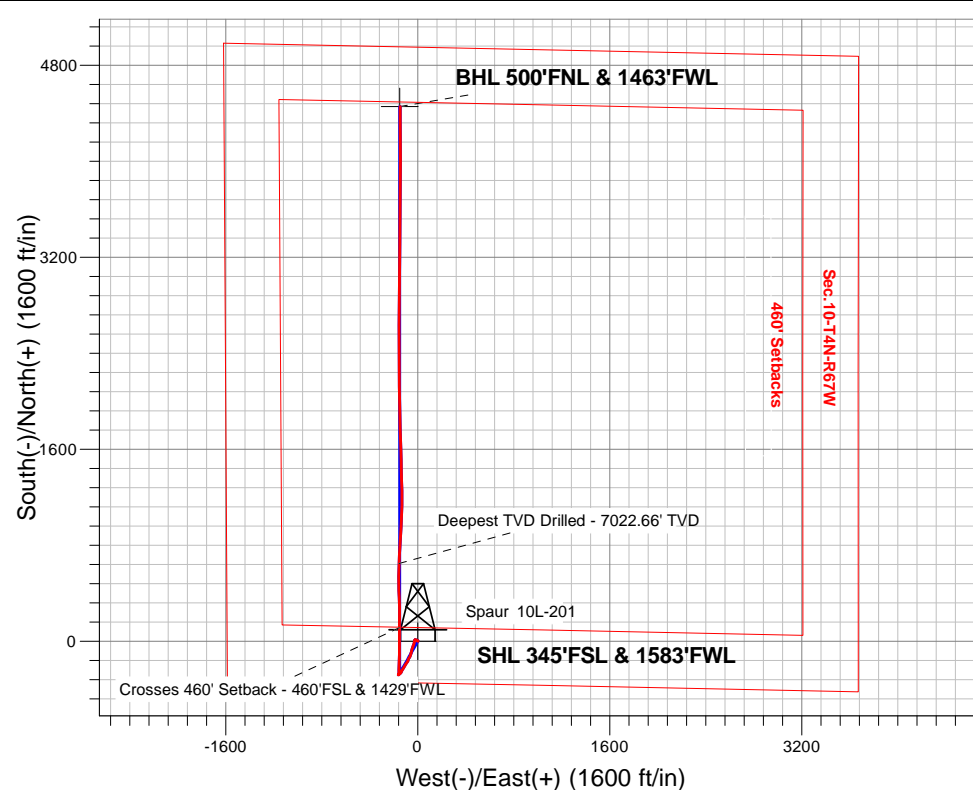
# PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Spaur 10L-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 1360227.223172640.32 40.320570 -104.880850  
 RKB - 13' WELL @ 4853.0ft (RKB - 13')

## FINAL SURVEY

**Projected Bottom Hole Location**  
**11402'MD 6990'TVD 4455'N & 148'W of SHL**  
**92.4 degree Incl @ 359.7 degree AZM**



Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W  
 Spaur 10L-201  
 Wellbore #1  
 11:44, March 22 2016

### ANNOTATIONS

TVD	MD	Annotation
6877.1	7032.0	Crosses 460' Setback - 460'FSL & 1429'FWL
7022.7	7593.0	Deepest TVD Drilled - 7022.66' TVD

### LEGEND

- △ Spaur 10L-201, Wellbore #1, Plan #4 (3-17-16)R V0
- Wellbore #1
- Survey #1



# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.10-T4N-R67W**

**Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W**

**Spaur 10L-201**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**22 March, 2016**

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

<b>Project</b>	SEC.10-T4N-R67W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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-201					
Well Position	+N/-S	0.0 ft	Northing:	1,360,227.22 usft	Latitude:	40.320570
	+E/-W	0.0 ft	Easting:	3,172,640.32 usft	Longitude:	-104.880850
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,840.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	3/17/2016	8.28	66.80	52,577

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	358.09	

<b>Survey Program</b>	<b>Date</b>	3/22/2016			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
167.0	11,402.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.01	72.40	1.0	0.0	0.0	0.0	0.78	0.78	0.00	
<b>SHL 345'FSL &amp; 1583'FWL</b>										
167.0	1.30	72.40	167.0	0.6	1.8	0.5	0.78	0.78	0.00	
259.0	0.60	0.50	259.0	1.4	2.8	1.3	1.36	-0.76	-78.15	
350.0	1.80	311.50	350.0	2.8	1.7	2.7	1.62	1.32	-53.85	
443.0	2.20	311.50	442.9	4.9	-0.7	5.0	0.43	0.43	0.00	
534.0	3.30	289.40	533.8	7.0	-4.5	7.1	1.66	1.21	-24.29	
627.0	3.70	284.60	626.6	8.6	-9.9	8.9	0.53	0.43	-5.16	
723.0	2.50	293.20	722.5	10.2	-14.8	10.7	1.34	-1.25	8.96	
819.0	1.20	297.80	818.4	11.5	-17.6	12.1	1.36	-1.35	4.79	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Spaur 10L-201
<b>Project:</b>	SEC.10-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4853.0ft (RKB - 13')
<b>Site:</b>	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4853.0ft (RKB - 13')
<b>Well:</b>	Spaur 10L-201	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
915.0	1.10	290.10	914.4	12.3	-19.4	12.9	0.19	-0.10	-8.02
1,011.0	0.30	282.10	1,010.4	12.7	-20.5	13.3	0.84	-0.83	-8.33
1,106.0	0.40	195.00	1,105.4	12.4	-20.8	13.1	0.51	0.11	-91.68
1,203.0	0.10	180.50	1,202.4	12.0	-20.9	12.7	0.31	-0.31	-14.95
1,299.0	0.50	251.40	1,298.4	11.8	-21.3	12.5	0.50	0.42	73.85
1,345.0	0.50	261.20	1,344.4	11.7	-21.7	12.4	0.19	0.00	21.30
1,417.0	0.60	244.90	1,416.4	11.5	-22.4	12.2	0.26	0.14	-22.64
1,513.0	0.60	222.00	1,512.4	10.9	-23.1	11.6	0.25	0.00	-23.85
1,609.0	0.40	238.00	1,608.4	10.3	-23.8	11.1	0.25	-0.21	16.67
1,705.0	0.30	247.90	1,704.4	10.1	-24.3	10.9	0.12	-0.10	10.31
1,801.0	1.20	216.80	1,800.4	9.2	-25.1	10.0	1.00	0.94	-32.40
1,896.0	1.30	218.50	1,895.3	7.5	-26.4	8.4	0.11	0.11	1.79
1,992.0	1.80	190.00	1,991.3	5.2	-27.3	6.1	0.94	0.52	-29.69
2,088.0	3.50	190.90	2,087.2	0.8	-28.1	1.8	1.77	1.77	0.94
2,184.0	4.10	184.10	2,183.0	-5.5	-28.9	-4.5	0.78	0.63	-7.08
2,280.0	5.50	196.50	2,278.7	-13.3	-30.5	-12.3	1.81	1.46	12.92
2,375.0	6.50	197.60	2,373.1	-22.8	-33.4	-21.7	1.06	1.05	1.16
2,470.0	8.10	199.70	2,467.4	-34.2	-37.3	-33.0	1.71	1.68	2.21
2,565.0	8.30	199.50	2,561.4	-47.0	-41.8	-45.6	0.21	0.21	-0.21
2,661.0	8.30	197.20	2,656.4	-60.1	-46.2	-58.6	0.35	0.00	-2.40
2,757.0	7.70	195.70	2,751.5	-73.0	-50.0	-71.3	0.66	-0.63	-1.56
2,853.0	7.40	197.60	2,846.6	-85.0	-53.6	-83.2	0.41	-0.31	1.98
2,949.0	6.90	192.30	2,941.9	-96.6	-56.7	-94.6	0.86	-0.52	-5.52
3,044.0	6.60	192.30	3,036.2	-107.5	-59.1	-105.5	0.32	-0.32	0.00
3,140.0	6.50	201.50	3,131.6	-117.9	-62.2	-115.8	1.10	-0.10	9.58
3,235.0	7.10	202.50	3,225.9	-128.4	-66.5	-126.1	0.64	0.63	1.05
3,331.0	7.80	211.80	3,321.1	-139.4	-72.2	-136.9	1.45	0.73	9.69
3,473.0	6.60	204.80	3,462.0	-155.0	-80.7	-152.2	1.05	-0.85	-4.93
3,569.0	5.50	198.80	3,557.5	-164.3	-84.5	-161.4	1.32	-1.15	-6.25
3,665.0	7.20	215.70	3,652.9	-173.6	-89.5	-170.5	2.61	1.77	17.60
3,761.0	7.40	213.80	3,748.1	-183.6	-96.4	-180.3	0.33	0.21	-1.98
3,857.0	7.70	212.70	3,843.3	-194.1	-103.3	-190.6	0.35	0.31	-1.15
3,953.0	6.80	208.80	3,938.5	-204.5	-109.5	-200.8	1.07	-0.94	-4.06
4,049.0	5.90	211.70	4,033.9	-213.7	-114.9	-209.8	0.99	-0.94	3.02
4,144.0	6.00	212.40	4,128.4	-222.1	-120.1	-217.9	0.13	0.11	0.74
4,240.0	6.80	209.90	4,223.8	-231.2	-125.6	-226.9	0.88	0.83	-2.60
4,336.0	5.50	206.60	4,319.2	-240.3	-130.5	-235.8	1.40	-1.35	-3.44
4,432.0	5.20	209.20	4,414.8	-248.2	-134.7	-243.6	0.40	-0.31	2.71
4,528.0	4.70	206.00	4,510.5	-255.5	-138.5	-250.8	0.59	-0.52	-3.33
4,624.0	3.80	216.60	4,606.2	-261.6	-142.2	-256.7	1.24	-0.94	11.04
4,720.0	1.70	237.00	4,702.1	-264.9	-145.2	-260.0	2.38	-2.19	21.25
4,815.0	1.60	223.30	4,797.1	-266.7	-147.3	-261.6	0.43	-0.11	-14.42
4,911.0	1.30	220.10	4,893.0	-268.5	-149.0	-263.4	0.32	-0.31	-3.33

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<b>Site:</b>	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4853.0ft (RKB - 13')
<b>Well:</b>	Spaur 10L-201	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
5,006.0	1.40	229.80	4,988.0	-270.0	-150.5	-264.9	0.26	0.11	10.21
5,103.0	1.50	233.30	5,085.0	-271.6	-152.5	-266.3	0.14	0.10	3.61
5,198.0	1.40	227.30	5,179.9	-273.1	-154.3	-267.8	0.19	-0.11	-6.32
5,294.0	1.10	213.10	5,275.9	-274.7	-155.7	-269.3	0.45	-0.31	-14.79
5,390.0	1.30	223.10	5,371.9	-276.2	-156.9	-270.9	0.30	0.21	10.42
5,485.0	1.60	229.20	5,466.9	-277.9	-158.7	-272.5	0.35	0.32	6.42
5,581.0	2.00	235.70	5,562.8	-279.7	-161.1	-274.2	0.47	0.42	6.77
5,677.0	1.80	246.50	5,658.8	-281.3	-163.8	-275.6	0.43	-0.21	11.25
5,773.0	1.20	63.10	5,754.7	-281.4	-164.3	-275.8	3.12	-0.63	183.96
5,869.0	1.10	61.00	5,850.7	-280.5	-162.6	-274.9	0.11	-0.10	-2.19
5,965.0	1.10	46.60	5,946.7	-279.4	-161.1	-273.9	0.29	0.00	-15.00
6,061.0	0.70	41.90	6,042.7	-278.3	-160.1	-272.9	0.42	-0.42	-4.90
6,156.0	0.70	60.00	6,137.7	-277.6	-159.2	-272.2	0.23	0.00	19.05
6,252.0	5.20	4.80	6,233.5	-273.0	-158.3	-267.6	5.04	4.69	-57.50
6,348.0	10.80	358.10	6,328.6	-259.7	-158.2	-254.3	5.90	5.83	-6.98
6,444.0	15.90	4.40	6,422.0	-237.5	-157.5	-232.2	5.52	5.31	6.56
6,540.0	21.70	4.10	6,512.8	-206.7	-155.3	-201.4	6.04	6.04	-0.31
6,635.0	31.00	359.30	6,597.8	-164.6	-154.3	-159.4	10.04	9.79	-5.05
6,731.0	39.70	0.20	6,676.1	-109.1	-154.5	-103.9	9.08	9.06	0.94
6,827.0	43.80	359.50	6,747.7	-45.2	-154.7	-40.1	4.30	4.27	-0.73
6,922.0	49.80	0.00	6,812.7	24.0	-155.0	29.1	6.33	6.32	0.53
7,018.0	57.40	1.60	6,869.6	101.2	-153.8	106.3	8.03	7.92	1.67
7,032.0	58.32	1.38	6,877.1	113.0	-153.5	118.1	6.68	6.56	-1.54
<b>Crosses 460' Setback - 460'FSL &amp; 1429'FWL</b>									
7,114.0	63.70	0.20	6,916.8	184.7	-152.6	189.7	6.68	6.56	-1.44
7,210.0	70.30	358.80	6,954.3	273.0	-153.4	278.0	7.00	6.88	-1.46
7,257.0	73.10	358.80	6,969.0	317.7	-154.3	322.6	5.96	5.96	0.00
7,305.0	75.50	358.10	6,982.0	363.8	-155.5	368.8	5.19	5.00	-1.46
7,352.0	76.40	358.30	6,993.4	409.4	-157.0	414.4	1.96	1.91	0.43
7,401.0	77.50	358.30	7,004.5	457.1	-158.4	462.1	2.24	2.24	0.00
7,448.0	81.00	358.60	7,013.3	503.3	-159.6	508.3	7.47	7.45	0.64
7,497.0	85.60	0.50	7,019.0	551.9	-160.0	556.9	10.15	9.39	3.88
7,593.0	90.00	3.40	7,022.7	647.8	-156.7	652.6	5.49	4.58	3.02
<b>Deepest TVD Drilled - 7022.66' TVD</b>									
7,688.0	91.90	4.10	7,021.1	742.5	-150.5	747.1	2.13	2.00	0.74
7,784.0	90.30	3.40	7,019.2	838.3	-144.3	842.7	1.82	-1.67	-0.73
7,880.0	90.20	1.80	7,018.8	934.2	-139.9	938.4	1.67	-0.10	-1.67
7,975.0	91.00	1.40	7,017.8	1,029.2	-137.2	1,033.2	0.94	0.84	-0.42
8,071.0	90.00	1.40	7,017.0	1,125.1	-134.9	1,129.0	1.04	-1.04	0.00
8,167.0	90.90	359.70	7,016.2	1,221.1	-134.0	1,224.9	2.00	0.94	-1.77
8,263.0	90.80	358.40	7,014.8	1,317.1	-135.6	1,320.9	1.36	-0.10	-1.35
8,359.0	89.60	358.80	7,014.5	1,413.1	-137.9	1,416.9	1.32	-1.25	0.42
8,455.0	90.60	358.60	7,014.3	1,509.0	-140.1	1,512.9	1.06	1.04	-0.21
8,551.0	90.40	359.00	7,013.5	1,605.0	-142.1	1,608.9	0.47	-0.21	0.42

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<b>Site:</b>	Spaur 4N67W10MLVT Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4853.0ft (RKB - 13')
<b>Well:</b>	Spaur 10L-201	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
8,647.0	89.70	358.80	7,013.4	1,701.0	-143.9	1,704.8	0.76	-0.73	-0.21
8,743.0	90.60	358.60	7,013.1	1,797.0	-146.1	1,800.8	0.96	0.94	-0.21
8,839.0	90.00	357.90	7,012.6	1,892.9	-149.1	1,896.8	0.96	-0.63	-0.73
8,935.0	92.00	357.70	7,011.0	1,988.8	-152.7	1,992.8	2.09	2.08	-0.21
9,031.0	90.80	359.50	7,008.6	2,084.8	-155.1	2,088.8	2.25	-1.25	1.88
9,127.0	89.20	0.00	7,008.6	2,180.8	-155.5	2,184.7	1.75	-1.67	0.52
9,223.0	90.30	0.00	7,009.0	2,276.8	-155.5	2,280.7	1.15	1.15	0.00
9,319.0	91.40	0.00	7,007.6	2,372.8	-155.5	2,376.6	1.15	1.15	0.00
9,415.0	88.80	359.30	7,007.4	2,468.7	-156.1	2,472.6	2.80	-2.71	-0.73
9,510.0	90.00	359.30	7,008.4	2,563.7	-157.3	2,567.5	1.26	1.26	0.00
9,606.0	89.80	0.40	7,008.6	2,659.7	-157.5	2,663.5	1.16	-0.21	1.15
9,702.0	90.60	0.50	7,008.3	2,755.7	-156.8	2,759.4	0.84	0.83	0.10
9,797.0	89.80	0.90	7,007.9	2,850.7	-155.6	2,854.3	0.94	-0.84	0.42
9,894.0	90.60	1.10	7,007.6	2,947.7	-153.9	2,951.2	0.85	0.82	0.21
9,989.0	90.40	0.90	7,006.8	3,042.7	-152.2	3,046.1	0.30	-0.21	-0.21
10,085.0	92.10	0.70	7,004.7	3,138.6	-150.9	3,141.9	1.78	1.77	-0.21
10,181.0	91.20	0.50	7,001.9	3,234.6	-149.9	3,237.8	0.96	-0.94	-0.21
10,277.0	90.20	0.50	7,000.7	3,330.6	-149.1	3,333.7	1.04	-1.04	0.00
10,373.0	91.40	0.70	6,999.4	3,426.6	-148.1	3,429.6	1.27	1.25	0.21
10,469.0	90.20	0.00	6,998.1	3,522.6	-147.5	3,525.5	1.45	-1.25	-0.73
10,565.0	89.70	359.70	6,998.1	3,618.6	-147.7	3,621.5	0.61	-0.52	-0.31
10,661.0	90.60	359.50	6,997.9	3,714.6	-148.4	3,717.4	0.96	0.94	-0.21
10,757.0	90.00	0.20	6,997.4	3,810.5	-148.6	3,813.4	0.96	-0.63	0.73
10,853.0	90.10	0.00	6,997.3	3,906.5	-148.5	3,909.3	0.23	0.10	-0.21
10,949.0	89.80	0.00	6,997.4	4,002.5	-148.5	4,005.3	0.31	-0.31	0.00
11,044.0	90.70	0.20	6,997.0	4,097.5	-148.3	4,100.2	0.97	0.95	0.21
11,140.0	89.90	0.00	6,996.5	4,193.5	-148.1	4,196.2	0.86	-0.83	-0.21
11,236.0	91.20	0.20	6,995.5	4,289.5	-148.0	4,292.1	1.37	1.35	0.21
11,352.0	92.40	359.70	6,991.9	4,405.5	-148.1	4,408.0	1.12	1.03	-0.43
11,402.0	92.40	359.70	6,989.8	4,455.4	-148.3	4,457.9	0.00	0.00	0.00
BHL 500'FNL & 1461'FWL									

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 345'FSL & 1583'FW	0.00	0.00	1.0	0.0	0.0	1,360,227.24	3,172,640.32	40.320570	-104.880850
- survey hits target center									
- Point									
BHL 500'FNL & 1461'FW	0.00	0.00	6,993.0	4,455.5	-150.6	1,364,681.37	3,172,458.67	40.332800	-104.881390
- survey misses target center by 3.9ft at 11402.0ft MD (6989.8 TVD, 4455.4 N, -148.3 E)									
- Point									

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

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,032.0	6,877.1	113.0	-153.5	Crosses 460' Setback - 460'FSL & 1429'FWL
7,593.0	7,022.7	647.8	-156.7	Deepest TVD Drilled - 7022.66' TVD

Checked By: _____	Approved By: _____	Date: _____
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