

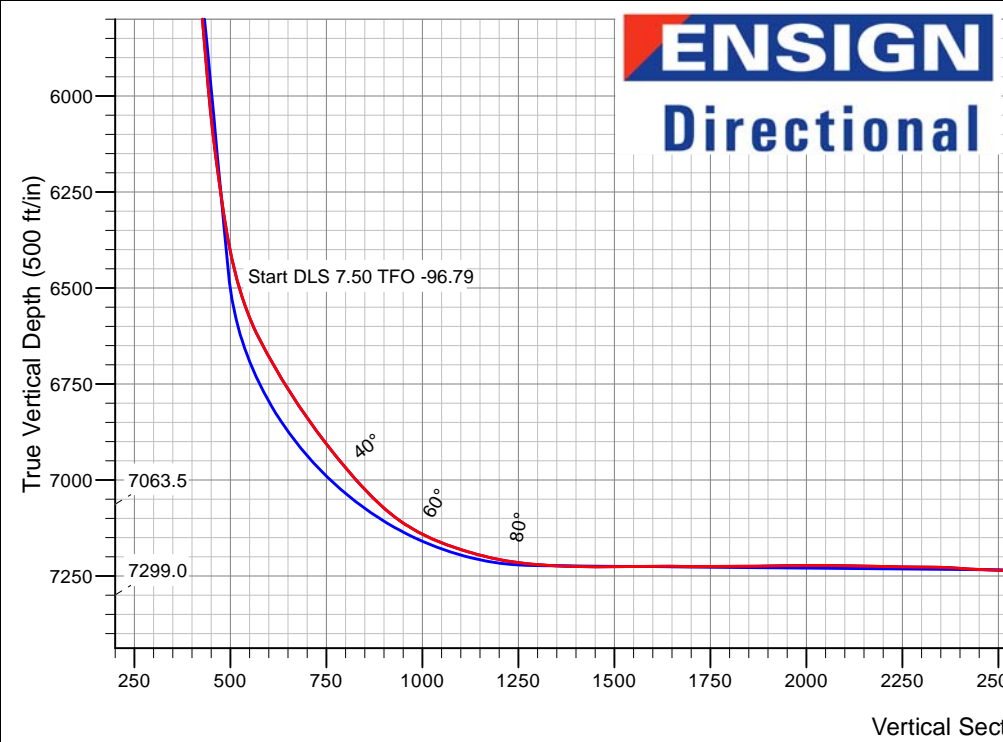
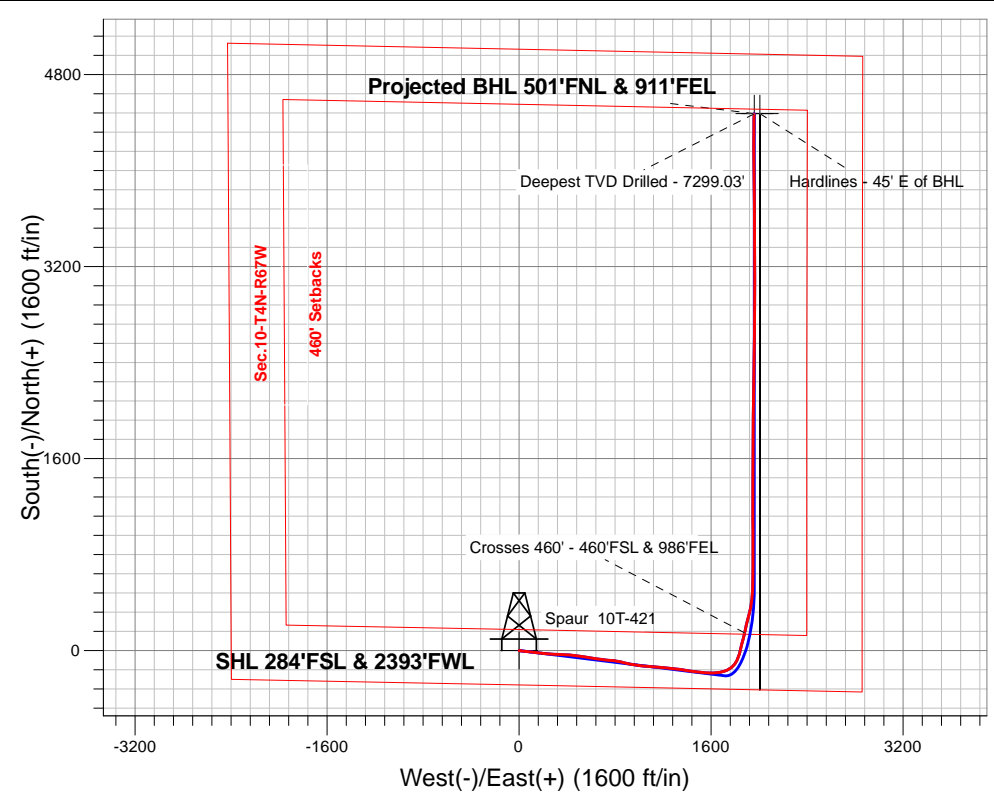
# PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Spaur 10T-421**

Surface Location: Spaur 4N67W10LQ Pad Sec.10-T4N-R67W  
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 4831.0  
 +N/-S+E/-W Northing Easting Longitude Slot  
 0.0 0.0 360156.40 3173452.25 40.320360 -104.877940  
 Ensign Rig #152 + RKB - 23'WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')

## FINAL SURVEY

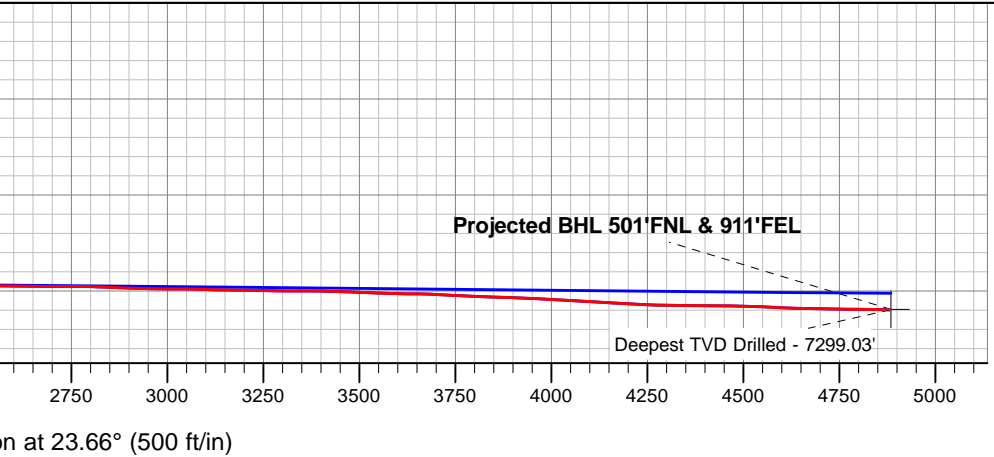
**Projected Bottom Hole Location**  
**11817'MD 7299'TVD 4473'N & 1957'E of SHL**  
**89.4 degree Incl @ 0.6 degree AZM**



Spaur 4N67W10LQ Pad Sec.10-T4N-R67W  
 Spaur 10T-421  
 Wellbore #1  
 11:28, March 03 2016

ANNOTATIONS		
TVD	MD	Annotation
7063.5	7446.7	Crosses 460' - 460'FSL & 986'FEL
7299.0	11817.0	Deepest TVD Drilled - 7299.03'

LEGEND	
	Spaur 10T-421, Wellbore #1, Plan #2 (1-26-16) V0
	Wellbore #1
	Survey #1





# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.10-T4N-R67W**

**Spaur 4N67W10LQ Pad Sec.10-T4N-R67W**

**Spaur 10T-421**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**03 March, 2016**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Spaur 10T-421
<b>Project:</b>	SEC.10-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Site:</b>	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Well:</b>	Spaur 10T-421	<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

<b>Site</b>	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W				
<b>Site Position:</b>		<b>Northing:</b>	1,360,218.33 usft	<b>Latitude:</b>	40.320530
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,173,449.03 usft	<b>Longitude:</b>	-104.877950
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.40 °

<b>Well</b>	Spaur 10T-421					
<b>Well Position</b>	<b>+N-S</b>	0.0 ft	<b>Northing:</b>	1,360,156.40 usft	<b>Latitude:</b>	40.320360
	<b>+E-W</b>	0.0 ft	<b>Easting:</b>	3,173,452.25 usft	<b>Longitude:</b>	-104.877940
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	4,831.0 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	1/26/2016	8.30	66.81	52,592

<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	23.66	

<b>Survey Program</b>	<b>Date</b>	3/3/2016			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
166.0	11,817.0	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	0.00	94.30	1.0	0.0	0.0	0.0	0.42	0.42	0.00	
<b>SHL 284'FSL &amp; 2393'FWL</b>										
11.2	0.05	94.30	11.2	0.0	0.0	0.0	0.42	0.42	0.00	
<b>Hardlines - 45' E of BHL</b>										
166.0	0.70	94.30	166.0	-0.1	1.0	0.3	0.42	0.42	0.00	
262.0	0.50	91.30	262.0	-0.1	2.0	0.7	0.21	-0.21	-3.13	
358.0	0.50	90.60	358.0	-0.1	2.9	1.0	0.01	0.00	-0.73	
453.0	0.30	103.70	453.0	-0.2	3.5	1.2	0.23	-0.21	13.79	
549.0	0.30	126.10	549.0	-0.4	4.0	1.2	0.12	0.00	23.33	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Spaur 10T-421
<b>Project:</b>	SEC.10-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Site:</b>	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Well:</b>	Spaur 10T-421	<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)	
645.0	1.70	105.30	645.0	-0.9	5.5	1.4	1.48	1.46	-21.67	
741.0	3.30	97.10	740.9	-1.7	9.6	2.4	1.70	1.67	-8.54	
837.0	4.70	93.40	836.6	-2.2	16.3	4.5	1.48	1.46	-3.85	
932.0	6.40	93.00	931.2	-2.7	25.5	7.7	1.79	1.79	-0.42	
1,028.0	8.20	97.40	1,026.4	-3.9	37.6	11.5	1.96	1.88	4.58	
1,124.0	10.00	98.80	1,121.2	-6.1	52.7	15.6	1.89	1.88	1.46	
1,220.0	11.80	98.80	1,215.5	-8.8	70.6	20.2	1.88	1.88	0.00	
1,292.0	12.30	100.10	1,285.9	-11.3	85.4	23.9	0.79	0.69	1.81	
1,412.0	12.50	97.20	1,403.1	-15.2	110.9	30.6	0.54	0.17	-2.42	
1,604.0	14.60	96.50	1,589.7	-20.5	155.5	43.6	1.10	1.09	-0.36	
1,795.0	16.90	93.90	1,773.5	-25.1	207.2	60.1	1.26	1.20	-1.36	
1,986.0	18.70	91.60	1,955.4	-27.9	265.5	81.0	1.01	0.94	-1.20	
2,179.0	19.80	95.30	2,137.6	-31.8	329.0	102.9	0.85	0.57	1.92	
2,370.0	17.60	90.20	2,318.5	-34.8	390.1	124.6	1.43	-1.15	-2.67	
2,561.0	20.50	99.40	2,499.1	-40.4	452.0	144.3	2.18	1.52	4.82	
2,752.0	20.20	97.20	2,678.2	-50.0	517.7	161.9	0.43	-0.16	-1.15	
2,944.0	19.80	99.70	2,858.6	-59.6	582.6	179.2	0.49	-0.21	1.30	
3,136.0	17.90	96.70	3,040.3	-68.6	644.0	195.6	1.11	-0.99	-1.56	
3,328.0	18.80	97.40	3,222.5	-76.0	704.0	212.9	0.48	0.47	0.36	
3,520.0	15.30	93.40	3,406.1	-81.5	759.9	230.3	1.92	-1.82	-2.08	
3,711.0	13.50	100.40	3,591.1	-87.0	807.0	244.2	1.31	-0.94	3.66	
3,904.0	16.40	103.60	3,777.5	-97.5	855.7	254.1	1.56	1.50	1.66	
4,096.0	17.90	102.50	3,961.0	-110.2	910.8	264.5	0.80	0.78	-0.57	
4,288.0	17.10	100.10	4,144.1	-121.6	967.4	276.9	0.56	-0.42	-1.25	
4,480.0	16.40	92.70	4,328.0	-127.8	1,022.3	293.2	1.17	-0.36	-3.85	
4,671.0	19.00	96.50	4,509.9	-132.6	1,080.2	312.0	1.49	1.36	1.99	
4,863.0	18.40	95.50	4,691.8	-139.0	1,141.4	330.7	0.35	-0.31	-0.52	
5,055.0	18.40	93.40	4,874.0	-143.7	1,201.8	350.6	0.35	0.00	-1.09	
5,246.0	17.80	95.50	5,055.5	-148.3	1,260.9	370.1	0.46	-0.31	1.10	
5,437.0	15.70	96.90	5,238.4	-154.2	1,315.7	386.7	1.12	-1.10	0.73	
5,629.0	14.40	99.20	5,423.8	-161.2	1,365.0	400.1	0.74	-0.68	1.20	
5,821.0	14.70	98.50	5,609.7	-168.6	1,412.7	412.5	0.18	0.16	-0.36	
6,012.0	16.50	96.50	5,793.6	-175.2	1,463.6	426.8	0.98	0.94	-1.05	
6,203.0	17.10	97.80	5,976.5	-182.1	1,518.4	442.5	0.37	0.31	0.68	
6,395.0	18.40	90.00	6,159.3	-186.0	1,576.6	462.4	1.41	0.68	-4.06	
6,586.0	20.20	89.30	6,339.6	-185.5	1,639.8	488.1	0.95	0.94	-0.37	
6,682.0	21.10	77.60	6,429.5	-181.6	1,673.2	505.1	4.39	0.94	-12.19	
6,777.0	25.20	71.40	6,516.8	-171.5	1,709.1	528.7	5.02	4.32	-6.53	
6,872.0	29.30	61.20	6,601.3	-153.8	1,748.7	560.8	6.53	4.32	-10.74	
6,968.0	31.60	42.20	6,684.2	-123.8	1,786.3	603.4	10.27	2.40	-19.79	
7,064.0	31.50	25.00	6,766.2	-82.4	1,813.8	652.4	9.35	-0.10	-17.92	
7,160.0	35.80	16.60	6,846.2	-32.7	1,832.5	705.4	6.59	4.48	-8.75	
7,255.0	38.70	14.30	6,921.8	22.7	1,847.7	762.3	3.39	3.05	-2.42	

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<b>Site:</b>	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Well:</b>	Spaur 10T-421	<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)
7,351.0	41.60	14.10	6,995.2	82.7	1,862.9	823.3	3.02	3.02	-0.21
7,446.7	47.28	12.01	7,063.5	148.0	1,878.0	889.2	6.13	5.94	-2.19
<b>Crosses 460' - 460'FSL &amp; 986'FEL</b>									
7,447.0	47.30	12.00	7,063.7	148.2	1,878.0	889.4	6.13	5.96	-1.98
7,543.0	58.50	14.30	7,121.5	222.6	1,895.5	964.6	11.82	11.67	2.40
7,638.0	69.40	14.10	7,163.1	305.2	1,916.4	1,048.6	11.48	11.47	-0.21
7,763.0	76.80	6.70	7,199.5	422.7	1,937.8	1,164.8	8.19	5.92	-5.92
7,859.0	83.40	2.30	7,216.0	516.9	1,945.2	1,254.1	8.22	6.88	-4.58
7,955.0	87.60	359.90	7,223.5	612.6	1,947.1	1,342.4	5.03	4.38	-2.50
8,051.0	89.40	0.40	7,226.0	708.6	1,947.3	1,430.4	1.95	1.88	0.52
8,147.0	90.90	0.40	7,225.8	804.5	1,948.0	1,518.6	1.56	1.56	0.00
8,243.0	89.60	0.40	7,225.4	900.5	1,948.6	1,606.8	1.35	-1.35	0.00
8,339.0	90.00	359.20	7,225.7	996.5	1,948.3	1,694.6	1.32	0.42	-1.25
8,435.0	90.40	358.60	7,225.4	1,092.5	1,946.5	1,781.8	0.75	0.42	-0.63
8,530.0	90.30	0.40	7,224.8	1,187.5	1,945.6	1,868.5	1.90	-0.11	1.89
8,626.0	91.70	359.90	7,223.1	1,283.5	1,945.9	1,956.5	1.55	1.46	-0.52
8,722.0	88.70	1.10	7,222.8	1,379.5	1,946.7	2,044.7	3.37	-3.13	1.25
8,817.0	89.60	0.00	7,224.2	1,474.5	1,947.6	2,132.1	1.50	0.95	-1.16
8,913.0	88.50	0.40	7,225.8	1,570.4	1,948.0	2,220.1	1.22	-1.15	0.42
9,009.0	90.00	0.00	7,227.0	1,666.4	1,948.3	2,308.2	1.62	1.56	-0.42
9,105.0	86.70	0.70	7,229.8	1,762.4	1,948.9	2,396.3	3.51	-3.44	0.73
9,201.0	87.60	0.40	7,234.6	1,858.3	1,949.8	2,484.5	0.99	0.94	-0.31
9,297.0	88.90	0.40	7,237.5	1,954.2	1,950.5	2,572.7	1.35	1.35	0.00
9,393.0	90.40	0.40	7,238.1	2,050.2	1,951.2	2,660.8	1.56	1.56	0.00
9,489.0	89.50	1.30	7,238.2	2,146.2	1,952.6	2,749.3	1.33	-0.94	0.94
9,584.0	87.70	1.10	7,240.5	2,241.1	1,954.6	2,837.1	1.91	-1.89	-0.21
9,679.0	88.60	0.70	7,243.6	2,336.1	1,956.1	2,924.7	1.04	0.95	-0.42
9,775.0	90.00	0.60	7,244.7	2,432.1	1,957.1	3,013.0	1.46	1.46	-0.10
9,871.0	88.00	1.10	7,246.4	2,528.0	1,958.6	3,101.5	2.15	-2.08	0.52
9,966.0	89.90	0.40	7,248.2	2,623.0	1,959.8	3,189.0	2.13	2.00	-0.74
10,063.0	88.50	0.60	7,249.5	2,720.0	1,960.7	3,278.2	1.46	-1.44	0.21
10,157.0	90.40	0.40	7,250.4	2,814.0	1,961.5	3,364.6	2.03	2.02	-0.21
10,254.0	87.70	0.00	7,252.0	2,910.9	1,961.8	3,453.5	2.81	-2.78	-0.41
10,349.0	88.30	359.70	7,255.3	3,005.9	1,961.6	3,540.4	0.71	0.63	-0.32
10,445.0	89.40	0.20	7,257.3	3,101.9	1,961.5	3,628.3	1.26	1.15	0.52
10,541.0	87.30	0.20	7,260.0	3,197.8	1,961.8	3,716.3	2.19	-2.19	0.00
10,637.0	87.50	0.00	7,264.4	3,293.7	1,962.0	3,804.2	0.29	0.21	-0.21
10,733.0	88.70	0.60	7,267.6	3,389.7	1,962.5	3,892.3	1.40	1.25	0.63
10,829.0	86.90	359.50	7,271.2	3,485.6	1,962.6	3,980.2	2.20	-1.88	-1.15
10,924.0	87.20	359.20	7,276.1	3,580.5	1,961.5	4,066.6	0.45	0.32	-0.32
11,021.0	86.90	358.80	7,281.1	3,677.3	1,959.8	4,154.7	0.52	-0.31	-0.41
11,116.0	87.50	359.50	7,285.8	3,772.2	1,958.4	4,241.0	0.97	0.63	0.74
11,212.0	89.80	359.50	7,288.0	3,868.1	1,957.6	4,328.6	2.40	2.40	0.00
11,308.0	89.90	359.20	7,288.3	3,964.1	1,956.5	4,416.1	0.33	0.10	-0.31

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<b>Site:</b>	Spaur 4N67W10LQ Pad Sec.10-T4N-R67W	<b>MD Reference:</b>	WELL @ 4854.0ft (Ensign Rig #152 + RKB - 23')
<b>Well:</b>	Spaur 10T-421	<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

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)
11,404.0	87.80	359.70	7,290.2	4,060.1	1,955.6	4,503.6	2.25	-2.19	0.52
11,500.0	87.90	359.30	7,293.8	4,156.0	1,954.7	4,591.1	0.43	0.10	-0.42
11,596.0	89.10	0.60	7,296.3	4,252.0	1,954.6	4,679.0	1.84	1.25	1.35
11,691.0	89.30	0.60	7,297.6	4,347.0	1,955.6	4,766.4	0.21	0.21	0.00
11,759.0	89.40	0.60	7,298.4	4,415.0	1,956.3	4,829.0	0.15	0.15	0.00
11,817.0	89.40	0.60	7,299.0	4,473.0	1,956.9	4,882.3	0.00	0.00	0.00

**Deepest TVD Drilled - 7299.03' - BHL 500'FNL & 908'FEL**

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Hardlines - 45' E of BHL - hit/miss target - Shape	0.00	0.00	1.0	4,473.8	2,005.0	1,364,643.97	3,175,425.73	40.332640	-104.870749
- survey misses target center by 4902.5ft at 1.7ft MD (1.7 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,364,643.97	3,175,425.73		
Point 2			1.0	-4,800.0	0.0	1,359,844.30	3,175,459.40		
SHL 284'FSL & 2393'FM - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,360,156.42	3,173,452.25	40.320360	-104.877940
BHL 500'FNL & 908'FEL - survey misses target center by 3.3ft at 11817.0ft MD (7299.0 TVD, 4473.0 N, 1956.9 E) - Point	0.00	0.00	7,298.0	4,473.8	1,960.0	1,364,643.64	3,175,380.70	40.332640	-104.870910

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,446.7	7,063.5	148.0	1,878.0	Crosses 460' - 460'FSL & 986'FEL
11,817.0	7,299.0	4,473.0	1,956.9	Deepest TVD Drilled - 7299.03'

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_