

Well Name: **Spaur 21-7**

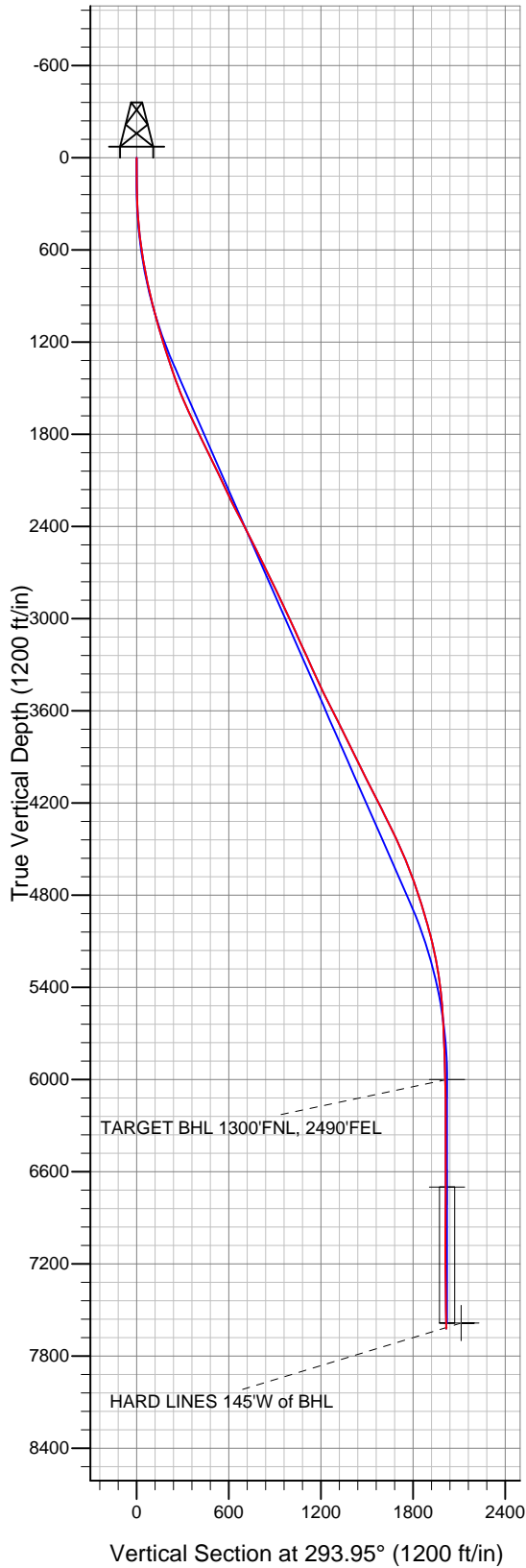
Surface Location: Spaur 8-7 Pad Sec.7-T4N-R67W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4837.0

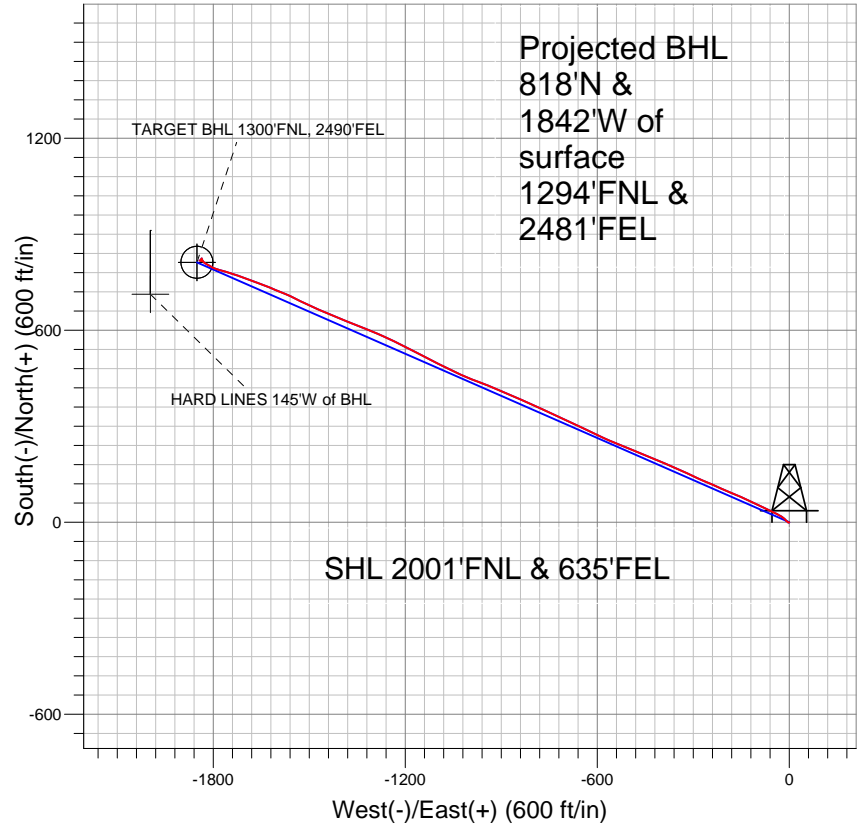
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1363368.20	3160019.94	40° 19' 45.930 N	104° 55' 33.733 W

Original Well Elev WELL @ 4851.0ft (Original Well Elev)

Slot



## Anadarko, Weld County CO



### LEGEND

- ◆ Spaur 21-7, Wellbore #1, Plan #1 (12-1-10) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
8030'MD & 7623'TVD @ 2016' VS  
0.9 deg Inc 289.9 deg AZ

Project: SEC.7-T4N-R67W  
Site: Spaur 8-7 Pad Sec.7-T4N-R67W  
Well: Spaur 21-7  
Plan: Wellbore #1



## **Anadarko, Weld County CO**

**SEC.7-T4N-R67W**

**Spaur 8-7 Pad Sec.7-T4N-R67W**

**Spaur 21-7**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**07 January, 2011**



<b>Company:</b>	Anadarko, Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Spaur 21-7
<b>Project:</b>	SEC.7-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Site:</b>	Spaur 8-7 Pad Sec.7-T4N-R67W	<b>MD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Well:</b>	Spaur 21-7	<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>	Landmark

<b>Project</b>	SEC.7-T4N-R67W		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Spaur 8-7 Pad Sec.7-T4N-R67W		
<b>Site Position:</b>		<b>Northing:</b>	1,363,379.94 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,160,030.73 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 19' 46.045 N
		<b>Longitude:</b>	104° 55' 33.593 W
		<b>Grid Convergence:</b>	0.37 °

<b>Well</b>	Spaur 21-7		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 19' 45.930 N
		<b>Longitude:</b>	104° 55' 33.733 W
		<b>Ground Level:</b>	4,837.0 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	12/8/2010	9.01	66.98	53,131

<b>Design</b>	Wellbore #1			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>
<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	293.95

<b>Survey Program</b>	<b>Date</b>	1/7/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
170.0	8,030.0	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 (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
170.0	0.80	221.40	170.0	-0.9	-0.8	0.4	0.47	0.47	0.00
263.0	1.50	293.90	263.0	-0.9	-2.3	1.8	1.58	0.75	77.96
358.0	3.90	311.30	357.9	1.8	-5.9	6.1	2.64	2.53	18.32
446.0	5.90	314.40	445.5	6.9	-11.4	13.2	2.29	2.27	3.52
535.0	7.30	309.70	534.0	13.7	-19.0	22.9	1.68	1.57	-5.28
624.0	8.70	300.40	622.1	20.7	-29.1	35.1	2.14	1.57	-10.45
712.0	11.30	294.10	708.7	27.6	-42.8	50.3	3.20	2.95	-7.16
809.0	11.30	296.90	803.9	35.8	-59.9	69.3	0.57	0.00	2.89
898.0	12.40	296.20	891.0	44.0	-76.3	87.5	1.25	1.24	-0.79
987.0	14.50	294.60	977.5	52.8	-95.0	108.2	2.40	2.36	-1.80
1,075.0	15.70	296.10	1,062.5	62.6	-115.7	131.1	1.43	1.36	1.70
1,164.0	16.40	294.40	1,148.0	73.1	-137.9	155.7	0.95	0.79	-1.91

<b>Company:</b>	Anadarko, Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Spaur 21-7
<b>Project:</b>	SEC.7-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Site:</b>	Spaur 8-7 Pad Sec.7-T4N-R67W	<b>MD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Well:</b>	Spaur 21-7	<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>	Landmark

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,253.0	17.50	291.80	1,233.1	83.3	-161.8	181.7	1.50	1.24	-2.92
1,341.0	18.00	294.00	1,317.0	93.7	-186.5	208.5	0.95	0.57	2.50
1,430.0	18.90	293.80	1,401.4	105.1	-212.3	236.7	1.01	1.01	-0.22
1,519.0	21.20	293.60	1,485.0	117.4	-240.2	267.2	2.59	2.58	-0.22
1,607.0	22.60	293.60	1,566.6	130.5	-270.3	300.0	1.59	1.59	0.00
1,696.0	24.10	294.80	1,648.3	145.0	-302.4	335.3	1.77	1.69	1.35
1,785.0	26.10	294.50	1,728.9	160.8	-336.8	373.0	2.25	2.25	-0.34
1,873.0	25.90	294.00	1,808.0	176.6	-371.9	411.6	0.34	-0.23	-0.57
1,962.0	25.20	291.50	1,888.3	191.5	-407.3	450.0	1.44	-0.79	-2.81
2,050.0	26.00	293.60	1,967.7	206.0	-442.4	488.0	1.37	0.91	2.39
2,139.0	25.60	291.80	2,047.8	221.0	-478.2	526.7	0.99	-0.45	-2.02
2,228.0	25.20	292.90	2,128.2	235.5	-513.5	564.9	0.70	-0.45	1.24
2,316.0	25.50	291.70	2,207.7	249.8	-548.3	602.5	0.68	0.34	-1.36
2,405.0	27.60	294.80	2,287.4	265.5	-584.8	642.3	2.83	2.36	3.48
2,494.0	27.90	295.40	2,366.1	283.1	-622.4	683.7	0.46	0.34	0.67
2,582.0	27.30	296.30	2,444.1	300.9	-659.1	724.5	0.83	-0.68	1.02
2,671.0	25.30	294.00	2,523.9	317.7	-694.7	763.9	2.52	-2.25	-2.58
2,760.0	26.10	295.80	2,604.1	333.9	-729.7	802.5	1.26	0.90	2.02
2,848.0	26.90	294.10	2,682.8	350.5	-765.3	841.7	1.25	0.91	-1.93
2,937.0	26.70	294.10	2,762.3	366.9	-802.0	881.8	0.22	-0.22	0.00
3,025.0	24.90	293.50	2,841.5	382.3	-837.0	920.1	2.07	-2.05	-0.68
3,114.0	25.30	292.80	2,922.1	397.2	-871.7	957.9	0.56	0.45	-0.79
3,203.0	25.00	294.40	3,002.7	412.3	-906.4	995.7	0.84	-0.34	1.80
3,291.0	24.70	291.00	3,082.5	426.6	-940.5	1,032.7	1.66	-0.34	-3.86
3,380.0	24.20	290.70	3,163.5	439.7	-974.9	1,069.4	0.58	-0.56	-0.34
3,469.0	24.00	293.20	3,244.8	453.3	-1,008.6	1,105.8	1.17	-0.22	2.81
3,557.0	24.70	295.60	3,325.0	468.3	-1,041.6	1,142.0	1.38	0.80	2.73
3,646.0	25.30	295.90	3,405.6	484.6	-1,075.5	1,179.6	0.69	0.67	0.34
3,735.0	25.90	297.00	3,485.9	501.7	-1,109.9	1,218.0	0.86	0.67	1.24
3,823.0	26.50	297.60	3,564.8	519.6	-1,144.5	1,256.8	0.75	0.68	0.68
3,912.0	27.40	297.10	3,644.2	538.1	-1,180.3	1,297.1	1.04	1.01	-0.56
4,001.0	26.10	295.70	3,723.6	555.9	-1,216.2	1,337.1	1.62	-1.46	-1.57
4,089.0	25.80	296.10	3,802.8	572.7	-1,250.8	1,375.6	0.39	-0.34	0.45
4,178.0	26.40	292.70	3,882.7	588.9	-1,286.4	1,414.7	1.81	0.67	-3.82
4,266.0	26.80	291.40	3,961.4	603.7	-1,323.0	1,454.1	0.80	0.45	-1.48
4,355.0	26.20	292.80	4,041.0	618.6	-1,359.8	1,493.8	0.97	-0.67	1.57
4,444.0	27.30	291.60	4,120.5	633.7	-1,396.9	1,533.8	1.38	1.24	-1.35
4,532.0	27.30	292.40	4,198.7	648.8	-1,434.3	1,574.2	0.42	0.00	0.91
4,621.0	25.50	293.50	4,278.4	664.3	-1,470.7	1,613.7	2.10	-2.02	1.24
4,710.0	26.50	297.20	4,358.4	681.0	-1,505.9	1,652.7	2.14	1.12	4.16
4,798.0	24.90	294.90	4,437.7	697.8	-1,540.2	1,690.8	2.14	-1.82	-2.61
4,887.0	23.90	292.80	4,518.8	712.6	-1,573.8	1,727.6	1.49	-1.12	-2.36
4,976.0	22.20	292.90	4,600.7	726.2	-1,605.9	1,762.4	1.91	-1.91	0.11
5,064.0	19.90	290.50	4,682.8	737.9	-1,635.3	1,794.0	2.79	-2.61	-2.73
5,153.0	18.10	291.10	4,766.9	748.2	-1,662.4	1,823.0	2.03	-2.02	0.67
5,241.0	17.60	290.10	4,850.7	757.7	-1,687.6	1,849.9	0.67	-0.57	-1.14
5,330.0	17.20	289.80	4,935.6	766.7	-1,712.6	1,876.4	0.46	-0.45	-0.34
5,419.0	15.00	288.40	5,021.1	774.8	-1,736.0	1,901.0	2.51	-2.47	-1.57
5,507.0	13.80	286.10	5,106.4	781.3	-1,756.8	1,922.8	1.51	-1.36	-2.61
5,596.0	12.10	286.80	5,193.1	787.0	-1,776.0	1,942.5	1.92	-1.91	0.79
5,685.0	9.40	288.20	5,280.5	791.9	-1,791.8	1,959.0	3.05	-3.03	1.57
5,773.0	7.60	298.30	5,367.6	796.9	-1,803.8	1,972.0	2.65	-2.05	11.48
5,862.0	6.00	301.40	5,455.9	802.2	-1,812.9	1,982.5	1.84	-1.80	3.48
5,951.0	4.00	299.00	5,544.6	806.1	-1,819.6	1,990.2	2.26	-2.25	-2.70

<b>Company:</b>	Anadarko, Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Spaur 21-7
<b>Project:</b>	SEC.7-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Site:</b>	Spaur 8-7 Pad Sec.7-T4N-R67W	<b>MD Reference:</b>	WELL @ 4851.0ft (Original Well Elev)
<b>Well:</b>	Spaur 21-7	<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>	Landmark

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,039.0	3.10	298.20	5,632.4	808.7	-1,824.4	1,995.6	1.02	-1.02	-0.91
6,172.0	2.60	315.40	5,765.3	812.6	-1,829.7	2,002.0	0.74	-0.38	12.93
6,305.0	1.80	326.80	5,898.2	816.4	-1,832.9	2,006.5	0.68	-0.60	8.57
6,406.9	1.34	333.87	6,000.1	818.9	-1,834.3	2,008.8	0.49	-0.46	6.94
<b>TARGET BHL 1300'FNL, 2490'FEL</b>									
6,438.0	1.20	337.10	6,031.1	819.5	-1,834.6	2,009.3	0.49	-0.44	10.39
6,571.0	0.90	347.80	6,164.1	821.8	-1,835.4	2,011.0	0.27	-0.23	8.05
6,704.0	0.70	0.20	6,297.1	823.6	-1,835.6	2,011.9	0.20	-0.15	9.32
6,837.0	0.30	248.10	6,430.1	824.3	-1,835.9	2,012.5	0.65	-0.30	-84.29
6,970.0	0.70	201.84	6,563.1	823.4	-1,836.5	2,012.7	0.40	0.30	-34.78
7,103.0	1.00	183.40	6,696.1	821.5	-1,836.9	2,012.2	0.30	0.23	-13.86
7,108.1	0.99	182.78	6,701.1	821.4	-1,836.9	2,012.2	0.24	-0.11	-12.24
<b>TARGET CIRCLE 1300'FNL &amp; 2490'FEL</b>									
7,236.0	0.90	165.10	6,829.0	819.3	-1,836.7	2,011.2	0.24	-0.07	-13.82
7,369.0	0.50	160.30	6,962.0	817.8	-1,836.3	2,010.1	0.30	-0.30	-3.61
7,502.0	0.40	199.80	7,095.0	816.8	-1,836.2	2,009.7	0.24	-0.08	29.70
7,635.0	0.60	269.70	7,228.0	816.4	-1,837.1	2,010.3	0.45	0.15	52.56
7,768.0	0.70	295.60	7,361.0	816.7	-1,838.5	2,011.7	0.23	0.08	19.47
7,901.0	0.90	289.90	7,494.0	817.4	-1,840.2	2,013.6	0.16	0.15	-4.29
7,994.7	0.90	289.90	7,587.7	817.9	-1,841.6	2,015.1	0.00	0.00	0.00
<b>HARD LINES 145'W of BHL</b>									
8,030.0	0.90	289.90	7,623.0	818.1	-1,842.1	2,015.6	0.00	0.00	0.00

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