

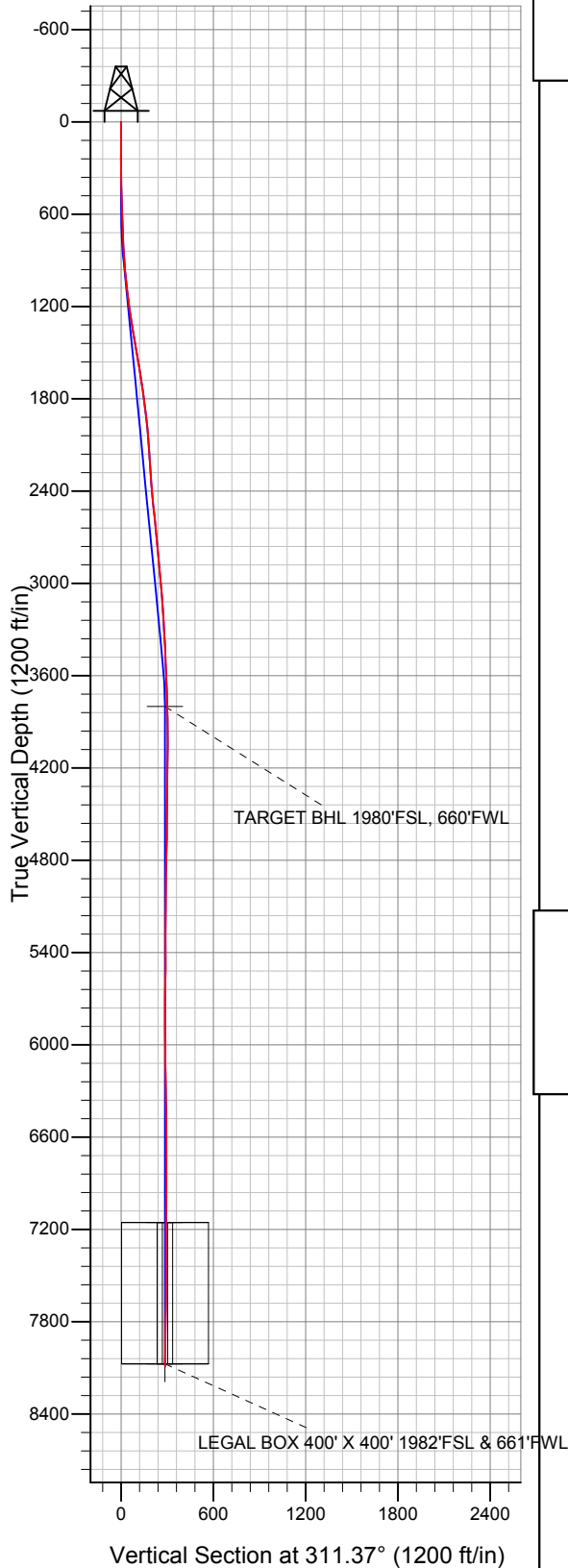
Well Name: **Cottonwood 12-33**

Surface Location: Cottonwood 12-33 Pad Sec. 33-T2N-R66W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4949.0

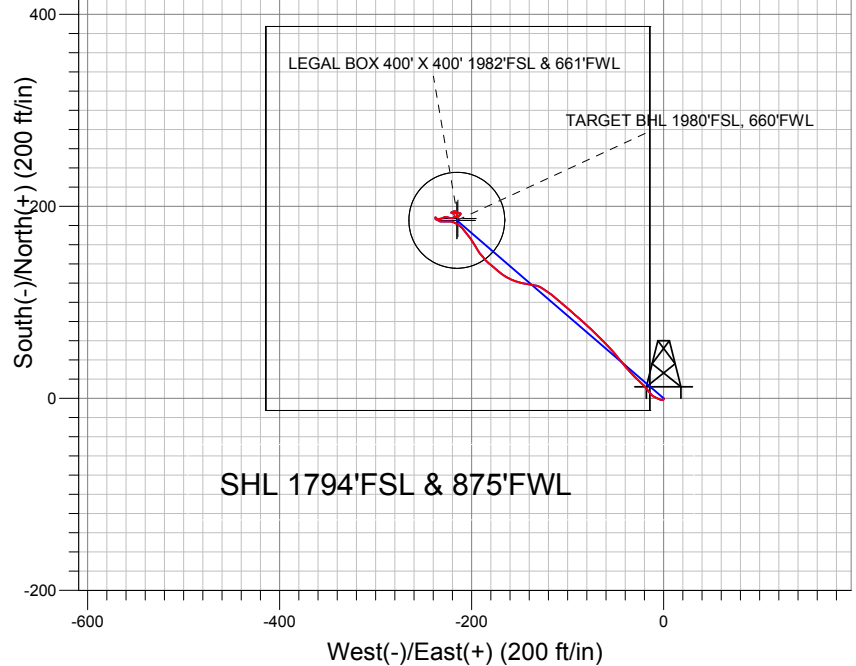
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1277263.74	3199064.12	40° 5' 32.237 N	104° 47' 18.514 W
		Original Well Elev WELL @ 4964.0ft (Original Well Elev)			

Slot



Anadarko, Weld County CO

Projected BHL 188'N & 214'W of
surface 1983'FSL & 661'FWL



LEGEND

- Cottonwood 12-33, Wellbore #1, Plan #1 (11-08-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
8108'MD & 8091'TVD @ 285' VS
1.0 deg Inc 159.3 deg AZ

Project: SEC.33-T2N-R66W
Site: Cottonwood 12-33 Pad Sec. 33-T2N-R66W
Well: Cottonwood 12-33
Plan: Wellbore #1



Directional

Anadarko, Weld County CO

SEC.33-T2N-R66W

Cottonwood 12-33 Pad Sec. 33-T2N-R66W

Cottonwood 12-33

Wellbore #1

Survey: Survey #1

Standard Survey Report

06 January, 2011



Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Site Cottonwood 12-33 Pad Sec. 33-T2N-R66W
Project:	SEC.33-T2N-R66W	TVD Reference:	WELL @ 4964.0ft (Original Well Elev)
Site:	Cottonwood 12-33 Pad Sec. 33-T2N-R66W	MD Reference:	WELL @ 4964.0ft (Original Well Elev)
Well:	Cottonwood 12-33	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.33-T2N-R66W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Cottonwood 12-33 Pad Sec. 33-T2N-R66W		
Site Position:		Northing:	1,277,263.75 ft
From:	Lat/Long	Easting:	3,199,064.12 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 5' 32.237 N
		Longitude:	104° 47' 18.514 W
		Grid Convergence:	0.46 °

Well	Cottonwood 12-33		
Well Position	+N/-S	0.0 ft	Northing: 1,277,263.74 ft
	+E/-W	0.0 ft	Easting: 3,199,064.12 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40° 5' 32.237 N
		Longitude:	104° 47' 18.514 W
		Ground Level:	4,949.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/8/2010	8.93	66.82	53,029

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	311.37	

Survey Program	Date	1/6/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
146.0	8,108.0	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 (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
146.0	0.50	161.10	146.0	-0.6	0.2	-0.6	0.34	0.34	0.00	
235.0	0.50	228.60	235.0	-1.2	0.0	-0.8	0.62	0.00	75.84	
325.0	0.90	259.80	325.0	-1.6	-0.9	-0.4	0.60	0.44	34.67	
417.0	1.30	279.40	417.0	-1.6	-2.7	1.0	0.59	0.43	21.30	
508.0	1.50	299.20	507.9	-0.8	-4.7	3.0	0.57	0.22	21.76	
600.0	2.20	291.60	599.9	0.4	-7.4	5.9	0.80	0.76	-8.26	
692.0	1.90	299.80	691.8	1.8	-10.4	9.0	0.46	-0.33	8.91	
787.0	3.10	318.40	786.7	4.5	-13.5	13.1	1.51	1.26	19.58	
882.0	4.10	322.60	881.6	9.1	-17.2	19.0	1.09	1.05	4.42	
945.0	4.90	318.50	944.4	12.9	-20.4	23.9	1.37	1.27	-6.51	
1,050.0	5.50	311.70	1,048.9	19.6	-27.1	33.4	0.82	0.57	-6.48	
1,145.0	7.40	317.30	1,143.3	27.2	-34.7	44.0	2.10	2.00	5.89	

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Site Cottonwood 12-33 Pad Sec. 33-T2N-R66W
Project:	SEC.33-T2N-R66W	TVD Reference:	WELL @ 4964.0ft (Original Well Elev)
Site:	Cottonwood 12-33 Pad Sec. 33-T2N-R66W	MD Reference:	WELL @ 4964.0ft (Original Well Elev)
Well:	Cottonwood 12-33	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
1,241.0	8.70	321.50	1,238.4	37.4	-43.4	57.3	1.49	1.35	4.38
1,336.0	9.10	319.20	1,332.2	48.7	-52.8	71.8	0.56	0.42	-2.42
1,431.0	10.00	315.10	1,425.9	60.2	-63.5	87.5	1.19	0.95	-4.32
1,526.0	9.80	312.70	1,519.5	71.6	-75.3	103.8	0.48	-0.21	-2.53
1,621.0	9.50	312.40	1,613.2	82.3	-87.0	119.7	0.32	-0.32	-0.32
1,717.0	8.40	310.60	1,708.0	92.2	-98.2	134.6	1.18	-1.15	-1.88
1,812.0	7.20	310.10	1,802.1	100.6	-108.0	147.5	1.27	-1.26	-0.53
1,907.0	6.70	308.70	1,896.4	107.9	-116.9	159.0	0.56	-0.53	-1.47
2,003.0	6.40	302.40	1,991.8	114.3	-125.8	169.9	0.81	-0.31	-6.56
2,099.0	4.00	277.90	2,087.4	117.6	-133.6	178.0	3.35	-2.50	-25.52
2,195.0	4.60	280.00	2,183.1	118.7	-140.7	184.1	0.65	0.63	2.19
2,290.0	4.10	281.40	2,277.9	120.0	-147.8	190.3	0.54	-0.53	1.47
2,385.0	5.00	290.40	2,372.6	122.2	-155.0	197.1	1.21	0.95	9.47
2,480.0	6.40	299.10	2,467.1	126.2	-163.5	206.1	1.73	1.47	9.16
2,576.0	6.20	312.40	2,562.5	132.3	-172.0	216.5	1.53	-0.21	13.85
2,671.0	4.90	305.90	2,657.1	138.1	-179.1	225.7	1.52	-1.37	-6.84
2,766.0	6.10	318.20	2,751.6	144.3	-185.7	234.7	1.76	1.26	12.95
2,861.0	4.90	323.00	2,846.2	151.3	-191.5	243.7	1.35	-1.26	5.05
2,956.0	5.80	330.80	2,940.8	158.7	-196.3	252.2	1.22	0.95	8.21
3,051.0	5.00	324.10	3,035.4	166.2	-201.1	260.8	1.07	-0.84	-7.05
3,147.0	4.40	321.00	3,131.0	172.5	-205.9	268.5	0.68	-0.63	-3.23
3,242.0	3.20	320.20	3,225.8	177.4	-209.9	274.7	1.26	-1.26	-0.84
3,337.0	3.20	302.90	3,320.7	180.8	-213.8	280.0	1.01	0.00	-18.21
3,432.0	3.10	292.60	3,415.5	183.3	-218.4	285.0	0.60	-0.11	-10.84
3,527.0	2.90	269.30	3,510.4	184.2	-223.1	289.2	1.29	-0.21	-24.53
3,622.0	2.80	268.10	3,605.3	184.1	-227.9	292.7	0.12	-0.11	-1.26
3,717.0	2.10	276.60	3,700.2	184.2	-231.9	295.8	0.83	-0.74	8.95
3,812.0	2.10	308.60	3,795.1	185.5	-235.0	299.0	1.22	0.00	33.68
3,816.6	2.03	309.21	3,799.7	185.6	-235.1	299.2	1.71	-1.64	13.29
TARGET BHL 1980'FSL, 660'FWL									
3,907.0	0.70	348.20	3,890.1	187.2	-236.5	301.2	1.71	-1.47	43.11
4,003.0	1.10	310.80	3,986.1	188.4	-237.3	302.6	0.72	0.42	-38.96
4,098.0	1.40	173.60	4,081.1	187.8	-237.9	302.6	2.45	0.32	-144.42
4,193.0	0.70	123.00	4,176.1	186.3	-237.3	301.2	1.16	-0.74	-53.26
4,288.0	1.20	73.40	4,271.1	186.3	-235.8	300.1	0.97	0.53	-52.21
4,383.0	1.60	82.60	4,366.0	186.7	-233.5	298.7	0.48	0.42	9.68
4,479.0	1.20	67.00	4,462.0	187.3	-231.3	297.4	0.57	-0.42	-16.25
4,574.0	1.40	61.90	4,557.0	188.2	-229.3	296.5	0.24	0.21	-5.37
4,669.0	0.70	77.30	4,652.0	188.9	-227.8	295.8	0.79	-0.74	16.21
4,764.0	1.20	105.00	4,747.0	188.8	-226.2	294.6	0.70	0.53	29.16
4,859.0	1.50	110.60	4,841.9	188.1	-224.1	292.5	0.34	0.32	5.89
4,954.0	1.20	79.20	4,936.9	187.8	-222.0	290.7	0.83	-0.32	-33.05
5,049.0	1.10	105.50	5,031.9	187.8	-220.1	289.3	0.56	-0.11	27.68
5,144.0	0.80	50.90	5,126.9	188.0	-218.7	288.4	0.96	-0.32	-57.47
5,239.0	0.70	26.10	5,221.9	188.9	-217.9	288.4	0.35	-0.11	-26.11
5,334.0	0.30	223.00	5,316.9	189.2	-217.9	288.6	1.04	-0.42	-171.68
5,429.0	0.60	345.20	5,411.9	189.5	-218.2	289.0	0.84	0.32	128.63
5,525.0	1.10	127.90	5,507.9	189.5	-217.6	288.5	1.69	0.52	148.65
5,620.0	1.10	92.60	5,602.8	188.9	-215.9	286.9	0.70	0.00	-37.16
5,715.0	0.90	61.10	5,697.8	189.2	-214.4	285.9	0.61	-0.21	-33.16
5,810.0	1.10	55.40	5,792.8	190.1	-213.0	285.4	0.23	0.21	-6.00
5,905.0	1.10	27.90	5,887.8	191.4	-211.8	285.4	0.55	0.00	-28.95
6,000.0	0.30	359.80	5,982.8	192.4	-211.4	285.8	0.89	-0.84	-29.58
6,096.0	0.90	282.50	6,078.8	192.9	-212.1	286.6	0.92	0.63	-80.52

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Well:	Cottonwood 12-33	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
6,191.0	1.40	267.30	6,173.8	193.0	-214.0	288.1	0.61	0.53	-16.00
6,286.0	1.30	297.00	6,268.7	193.4	-216.1	290.0	0.74	-0.11	31.26
6,381.0	0.90	304.10	6,363.7	194.3	-217.7	291.8	0.44	-0.42	7.47
6,476.0	0.50	282.50	6,458.7	194.8	-218.7	292.9	0.50	-0.42	-22.74
6,571.0	0.70	214.00	6,553.7	194.4	-219.4	293.2	0.73	0.21	-72.11
6,667.0	0.80	226.60	6,649.7	193.5	-220.2	293.2	0.20	0.10	13.13
6,762.0	0.40	277.70	6,744.7	193.1	-221.1	293.5	0.66	-0.42	53.79
6,857.0	0.30	355.30	6,839.7	193.4	-221.4	294.0	0.47	-0.11	81.68
6,952.0	0.80	76.70	6,934.7	193.8	-220.8	293.7	0.85	0.53	85.68
7,047.0	0.80	142.30	7,029.7	193.4	-219.7	292.7	0.91	0.00	69.05
7,142.0	0.80	142.30	7,124.7	192.3	-218.9	291.4	0.00	0.00	0.00
7,173.4	0.50	124.43	7,156.0	192.1	-218.7	291.1	1.15	-0.97	-56.98
TARGET CIRCLE 1980'FSL & 660'FWL									
7,237.0	0.50	29.40	7,219.7	192.2	-218.3	290.8	1.15	0.01	-149.33
7,333.0	0.50	340.20	7,315.7	192.9	-218.2	291.3	0.43	0.00	-51.25
7,428.0	0.70	66.30	7,410.7	193.5	-217.9	291.4	0.88	0.21	90.63
7,523.0	0.70	343.00	7,505.7	194.3	-217.5	291.7	0.98	0.00	-87.68
7,618.0	0.70	108.90	7,600.7	194.7	-217.1	291.6	1.31	0.00	132.53
7,713.0	0.70	152.70	7,695.6	194.0	-216.3	290.5	0.55	0.00	46.11
7,809.0	0.80	170.50	7,791.6	192.8	-215.9	289.5	0.26	0.10	18.54
7,904.0	1.00	150.80	7,886.6	191.4	-215.4	288.2	0.38	0.21	-20.74
8,035.0	1.00	159.30	8,017.6	189.4	-214.4	286.1	0.11	0.00	6.49
8,085.0	1.00	159.30	8,067.6	188.6	-214.1	285.3	0.00	0.00	0.00
LEGAL BOX 400' X 400' 1982'FSL & 661'FWL									
8,108.0	1.00	159.30	8,090.6	188.2	-214.0	285.0	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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