

Well Name: **Cottonwood 13-33**

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

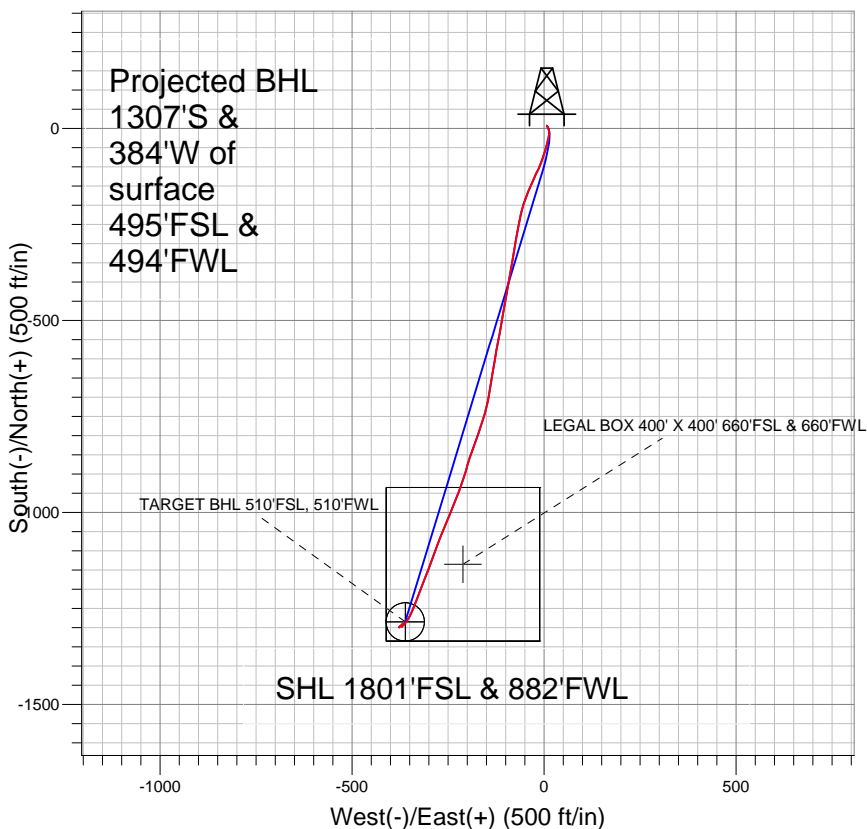
Ground Elevation: 4949.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
6.9	7.0	1277270.71	3199071.05	40° 5' 32.305 N	104° 47' 18.424 W

Original Well Elev WELL @ 4964.0ft (Original Well Elev)

Slot

Anadarko, Weld County CO

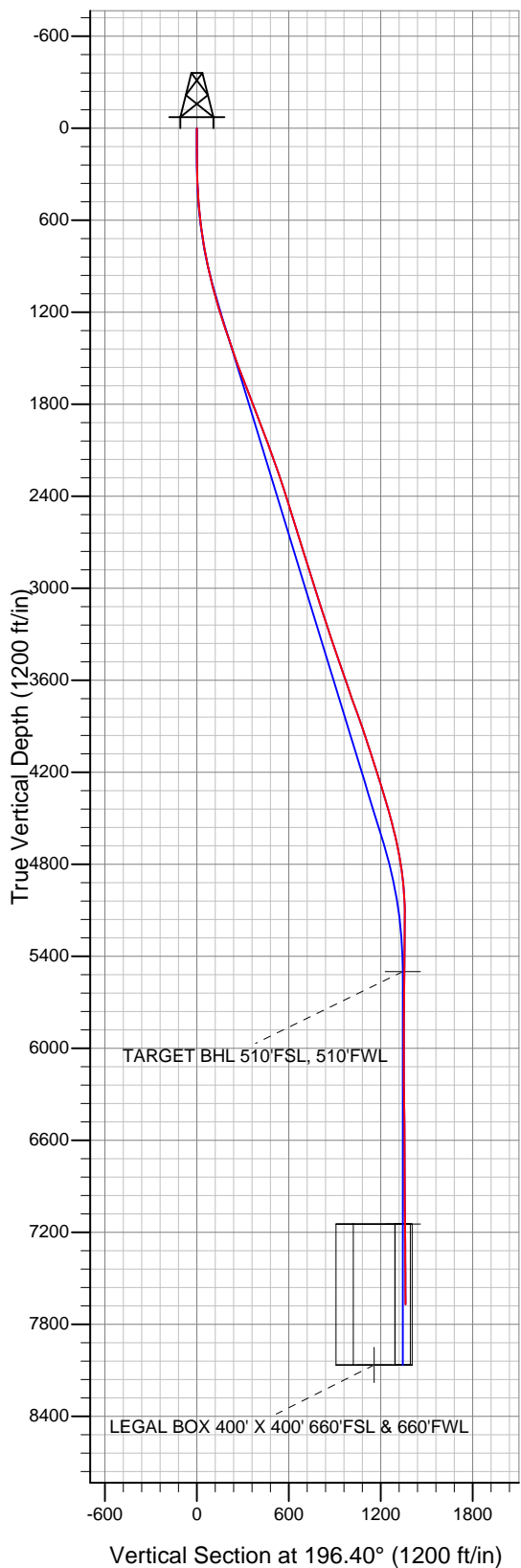


LEGEND

- ✕ Cottonwood 13-33, Wellbore #1, Plan #1 (11-08-10) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7880'MD & 7670'TVD @ 1362' VS
0.4 deg Inc 191.6 deg AZ



Project: SEC.33-T2N-R66W
Site: Cottonwood 12-33 Pad Sec. 33-T2N-R66W
Well: Cottonwood 13-33
Plan: Wellbore #1



Directional

Anadarko, Weld County CO

SEC.33-T2N-R66W

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

Cottonwood 13-33

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 13-33	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 13-33		
Well Position	+N-S	6.9 ft	Northing:
	+E-W	7.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			ft
			Latitude:
			40° 5' 32.305 N
			Longitude:
			104° 47' 18.424 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	6.9	7.0	196.40	

Survey Program	Date	1/6/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
146.0	7,880.0	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	6.9	7.0	0.0	0.00	0.00	0.00	
146.0	0.70	152.80	146.0	6.1	7.4	0.6	0.48	0.48	0.00	
235.0	1.50	147.80	235.0	4.6	8.3	1.8	0.90	0.90	-5.62	
325.0	2.70	152.10	324.9	1.8	9.9	4.1	1.34	1.33	4.78	
417.0	3.60	162.00	416.8	-2.9	11.8	8.0	1.14	0.98	10.76	
508.0	4.60	176.40	507.5	-9.2	12.9	13.8	1.57	1.10	15.82	
600.0	6.70	187.40	599.1	-18.3	12.5	22.6	2.56	2.28	11.96	
692.0	8.00	194.60	690.3	-29.8	10.1	34.3	1.73	1.41	7.83	
787.0	9.90	196.10	784.2	-44.0	6.2	49.1	2.01	2.00	1.58	
882.0	11.80	196.40	877.5	-61.2	1.2	67.0	2.00	2.00	0.32	
951.0	13.10	196.60	944.9	-75.4	-3.0	81.8	1.89	1.88	0.29	
1,019.0	14.10	202.00	1,010.9	-90.5	-8.3	97.8	2.38	1.47	7.94	
1,114.0	16.10	206.30	1,102.7	-113.0	-18.5	122.3	2.41	2.11	4.53	

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 13-33	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)
1,209.0	18.10	202.50	1,193.5	-138.5	-30.0	149.9	2.41	2.11	-4.00
1,304.0	18.10	204.80	1,283.8	-165.5	-41.8	179.2	0.75	0.00	2.42
1,399.0	18.20	197.20	1,374.1	-193.1	-52.4	208.6	2.49	0.11	-8.00
1,494.0	19.00	192.90	1,464.1	-222.3	-60.2	238.9	1.67	0.84	-4.53
1,590.0	20.60	190.90	1,554.4	-254.2	-66.9	271.3	1.81	1.67	-2.08
1,685.0	21.20	189.90	1,643.2	-287.5	-73.0	305.0	0.73	0.63	-1.05
1,780.0	21.60	189.70	1,731.6	-321.7	-78.9	339.5	0.43	0.42	-0.21
1,875.0	21.10	189.70	1,820.1	-355.7	-84.8	373.8	0.53	-0.53	0.00
1,970.0	21.10	189.40	1,908.7	-389.5	-90.4	407.8	0.11	0.00	-0.32
2,067.0	20.90	190.60	1,999.3	-423.7	-96.5	442.3	0.49	-0.21	1.24
2,163.0	20.40	189.80	2,089.1	-457.0	-102.5	476.0	0.60	-0.52	-0.83
2,258.0	19.80	189.70	2,178.3	-489.2	-108.0	508.4	0.63	-0.63	-0.11
2,353.0	18.90	189.80	2,268.0	-520.2	-113.3	539.7	0.95	-0.95	0.11
2,448.0	17.60	192.10	2,358.2	-549.4	-119.0	569.3	1.56	-1.37	2.42
2,544.0	17.40	189.90	2,449.7	-577.8	-124.5	598.0	0.72	-0.21	-2.29
2,639.0	17.80	189.30	2,540.3	-606.1	-129.3	626.5	0.46	0.42	-0.63
2,734.0	17.60	189.00	2,630.8	-634.6	-133.8	655.2	0.23	-0.21	-0.32
2,829.0	17.30	189.60	2,721.4	-662.7	-138.5	683.4	0.37	-0.32	0.63
2,924.0	17.30	188.80	2,812.1	-690.6	-143.0	711.5	0.25	0.00	-0.84
3,020.0	17.20	194.00	2,903.8	-718.5	-148.6	739.8	1.61	-0.10	5.42
3,115.0	17.50	194.50	2,994.5	-745.9	-155.6	768.1	0.35	0.32	0.53
3,210.0	17.80	200.20	3,085.0	-773.4	-164.2	796.9	1.85	0.32	6.00
3,305.0	18.90	199.40	3,175.2	-801.5	-174.3	826.7	1.19	1.16	-0.84
3,400.0	18.20	199.30	3,265.3	-830.0	-184.3	856.9	0.74	-0.74	-0.11
3,495.0	18.50	198.90	3,355.4	-858.3	-194.1	886.8	0.34	0.32	-0.42
3,590.0	19.30	195.40	3,445.3	-887.7	-203.1	917.5	1.46	0.84	-3.68
3,685.0	19.20	198.40	3,535.0	-917.7	-212.2	948.9	1.05	-0.11	3.16
3,781.0	18.90	200.20	3,625.7	-947.2	-222.6	980.1	0.69	-0.31	1.88
3,876.0	19.40	201.70	3,715.5	-976.3	-233.7	1,011.2	0.74	0.53	1.58
3,971.0	19.70	203.90	3,805.0	-1,005.6	-246.0	1,042.8	0.84	0.32	2.32
4,066.0	20.20	202.20	3,894.3	-1,035.5	-258.7	1,075.0	0.81	0.53	-1.79
4,161.0	17.80	200.60	3,984.1	-1,064.2	-270.0	1,105.8	2.58	-2.53	-1.68
4,257.0	17.80	200.80	4,075.5	-1,091.7	-280.4	1,135.1	0.06	0.00	0.21
4,351.0	17.40	199.30	4,165.1	-1,118.4	-290.2	1,163.4	0.64	-0.43	-1.60
4,447.0	17.90	200.50	4,256.6	-1,145.8	-300.1	1,192.5	0.64	0.52	1.25
4,542.0	17.30	202.20	4,347.2	-1,172.5	-310.5	1,221.1	0.83	-0.63	1.79
4,637.0	16.00	201.80	4,438.2	-1,197.7	-320.7	1,248.2	1.37	-1.37	-0.42
4,732.0	14.60	200.40	4,529.8	-1,221.1	-329.8	1,273.2	1.52	-1.47	-1.47
4,827.0	13.20	201.00	4,622.0	-1,242.5	-337.8	1,295.9	1.48	-1.47	0.63
4,922.0	11.10	204.80	4,714.9	-1,260.9	-345.5	1,315.8	2.36	-2.21	4.00
5,017.0	9.00	210.90	4,808.4	-1,275.6	-353.2	1,332.0	2.48	-2.21	6.42
5,112.0	6.50	216.70	4,902.6	-1,286.3	-360.2	1,344.3	2.75	-2.63	6.11
5,207.0	4.50	228.90	4,997.1	-1,293.0	-366.2	1,352.4	2.43	-2.11	12.84
5,303.0	1.80	225.70	5,093.0	-1,296.6	-370.2	1,356.9	2.82	-2.81	-3.33
5,398.0	1.10	41.50	5,188.0	-1,296.9	-370.6	1,357.4	3.05	-0.74	185.05
5,493.0	0.70	32.90	5,282.9	-1,295.8	-369.7	1,356.0	0.44	-0.42	-9.05
5,588.0	0.50	23.80	5,377.9	-1,294.9	-369.2	1,355.1	0.23	-0.21	-9.58
5,683.0	0.40	4.40	5,472.9	-1,294.2	-369.0	1,354.3	0.19	-0.11	-20.42
5,710.1	0.39	10.19	5,500.1	-1,294.0	-369.0	1,354.1	0.15	-0.02	21.33
TARGET BHL 510'FSL, 510'FWL									
5,778.0	0.40	24.80	5,567.9	-1,293.5	-368.9	1,353.7	0.15	0.01	21.53
5,873.0	0.50	355.90	5,662.9	-1,292.8	-368.8	1,353.0	0.26	0.11	-30.42
5,969.0	0.50	8.40	5,758.9	-1,292.0	-368.7	1,352.1	0.11	0.00	13.02
6,064.0	0.40	10.70	5,853.9	-1,291.3	-368.6	1,351.4	0.11	-0.11	2.42

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 13-33	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)
6,159.0	0.10	12.90	5,948.9	-1,290.9	-368.5	1,351.0	0.32	-0.32	2.32
6,254.0	0.10	138.70	6,043.9	-1,290.8	-368.5	1,351.0	0.19	0.00	132.42
6,349.0	0.10	267.40	6,138.9	-1,290.9	-368.5	1,351.0	0.19	0.00	135.47
6,444.0	0.70	228.90	6,233.9	-1,291.3	-369.0	1,351.5	0.66	0.63	-40.53
6,540.0	0.70	223.40	6,329.9	-1,292.1	-369.8	1,352.6	0.07	0.00	-5.73
6,635.0	0.80	233.90	6,424.9	-1,292.9	-370.8	1,353.6	0.18	0.11	11.05
6,730.0	0.80	250.20	6,519.9	-1,293.5	-371.9	1,354.5	0.24	0.00	17.16
6,825.0	0.40	226.50	6,614.9	-1,294.0	-372.8	1,355.2	0.49	-0.42	-24.95
6,920.0	0.50	232.40	6,709.9	-1,294.5	-373.4	1,355.8	0.12	0.11	6.21
7,015.0	0.40	201.10	6,804.9	-1,295.0	-373.8	1,356.5	0.27	-0.11	-32.95
7,111.0	0.60	222.10	6,900.9	-1,295.7	-374.3	1,357.3	0.28	0.21	21.88
7,206.0	0.40	232.50	6,995.9	-1,296.3	-374.9	1,358.0	0.23	-0.21	10.95
7,301.0	0.50	233.60	7,090.9	-1,296.7	-375.5	1,358.6	0.11	0.11	1.16
7,356.0	0.38	233.01	7,145.9	-1,297.0	-375.8	1,358.9	0.21	-0.21	-1.07
TARGET CIRCLE 510'FSL & 510'FWL									
7,396.0	0.30	232.30	7,185.9	-1,297.1	-376.0	1,359.1	0.21	-0.21	-1.78
7,491.0	0.30	232.30	7,280.9	-1,297.4	-376.4	1,359.5	0.00	0.00	0.00
7,586.0	0.40	225.00	7,375.9	-1,297.8	-376.8	1,360.0	0.12	0.11	-7.68
7,682.0	0.40	196.40	7,471.9	-1,298.4	-377.2	1,360.6	0.21	0.00	-29.79
7,777.0	0.40	191.60	7,566.9	-1,299.0	-377.3	1,361.3	0.04	0.00	-5.05
7,880.0	0.40	191.60	7,669.9	-1,299.7	-377.5	1,362.0	0.00	0.00	0.00
LEGAL BOX 400' X 400' 660'FSL & 660'FWL									

Checked By: _____ Approved By: _____ Date: _____