

Well Name: **Cooley 13-16**

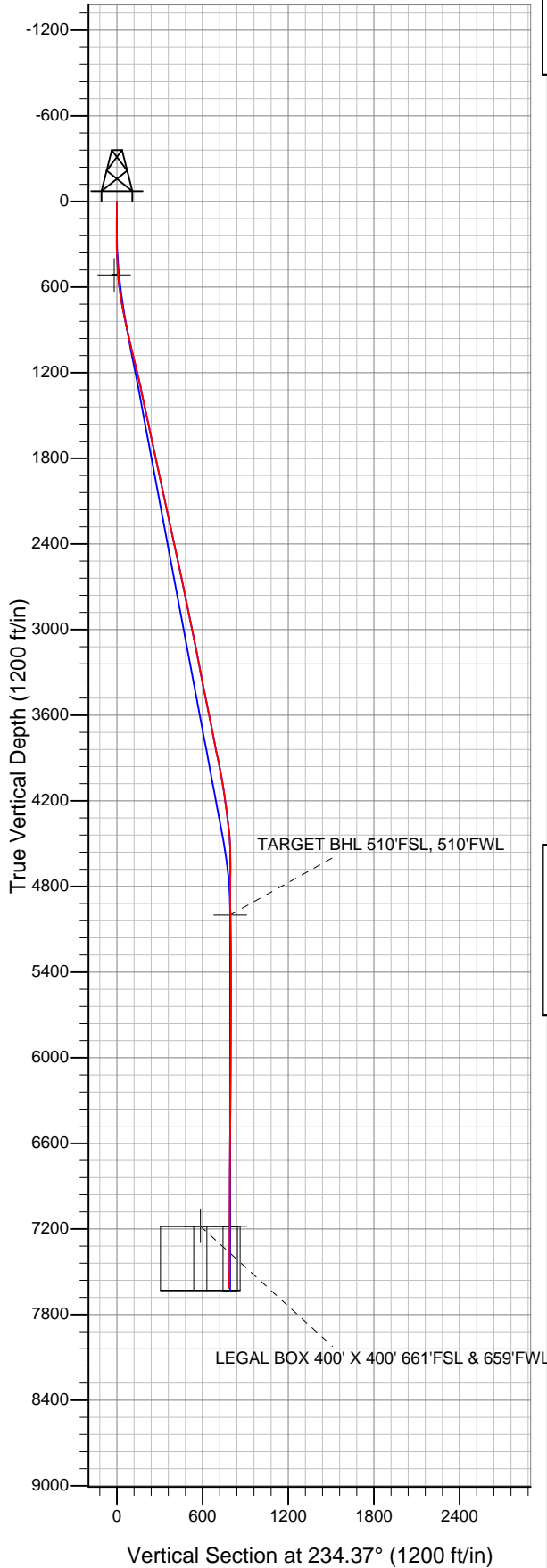
Surface Location: Cooley 19-16 Pad Sec.16-T2N-R68W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4885.0

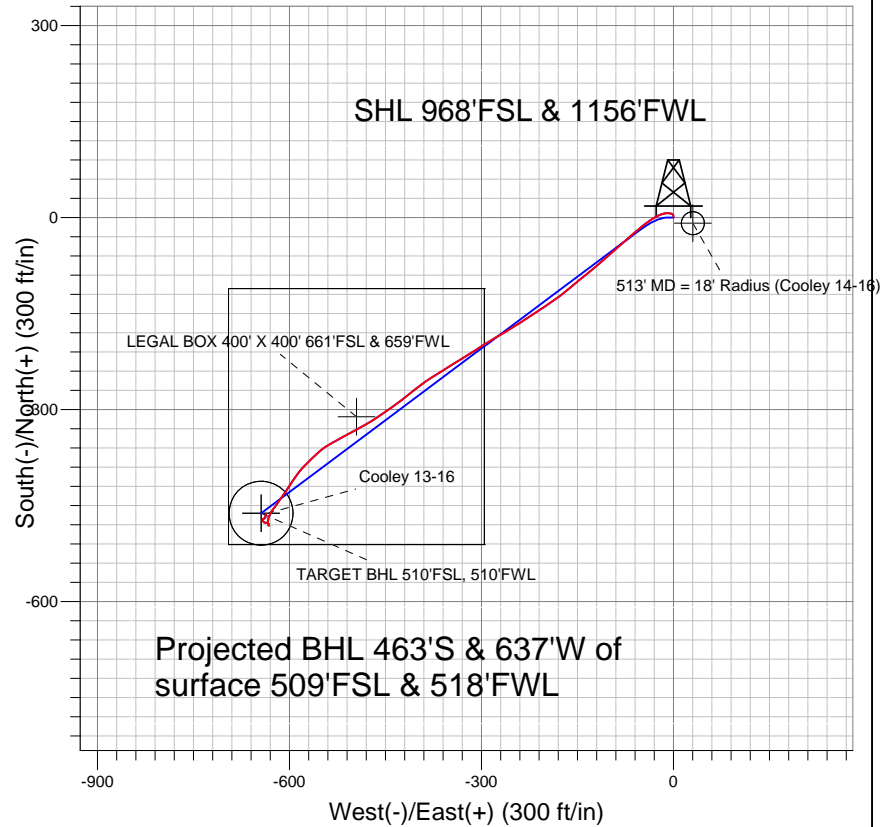
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1292085.45	3136020.91	40.134144	-105.013518

Original Well Elev WELL @ 4900.0ft (Original Well Elev)

Slot



## Anadarko, Weld County CO



### LEGEND

- Cooley 13-16, Wellbore #1, Plan #1 (7-26-11) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
7695'MD & 7614'TVD @ 787'VS  
0.4 deg Inc 6.9 deg AZ

Project: SEC.16-T2N-R68W  
Site: Cooley 19-16 Pad Sec.16-T2N-R68W  
Well: Cooley 13-16  
Plan: Wellbore #1



## **Directional**

### **Anadarko, Weld County CO**

**SEC.16-T2N-R68W**

**Cooley 19-16 Pad Sec.16-T2N-R68W**

**Cooley 13-16**

**Wellbore #1**

**Survey: Survey #1**

### **Standard Survey Report**

**01 September, 2011**

<b>Company:</b>	Anadarko, Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Cooley 13-16
<b>Project:</b>	SEC.16-T2N-R68W	<b>TVD Reference:</b>	WELL @ 4900.0ft (Original Well Elev)
<b>Site:</b>	Cooley 19-16 Pad Sec.16-T2N-R68W	<b>MD Reference:</b>	WELL @ 4900.0ft (Original Well Elev)
<b>Well:</b>	Cooley 13-16	<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.16-T2N-R68W, 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		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Cooley 19-16 Pad Sec.16-T2N-R68W		
<b>Site Position:</b>		<b>Northing:</b>	1,292,055.98 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,136,026.11 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.134063
		<b>Longitude:</b>	-105.013500
		<b>Grid Convergence:</b>	0.31 °

<b>Well</b>	Cooley 13-16		
<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>	40.134144
		<b>Longitude:</b>	-105.013518
		<b>Ground Level:</b>	4,885.0 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	8/2/2011	8.96	66.79	52,950

<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	234.37	

<b>Survey Program</b>	<b>Date</b>	9/1/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
144.0	7,695.0	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	
144.0	1.50	358.80	144.0	1.9	0.0	-1.1	1.04	1.04	0.00	
233.0	1.60	335.40	233.0	4.2	-0.6	-2.0	0.71	0.11	-26.29	
325.0	2.40	292.50	324.9	6.1	-2.9	-1.2	1.78	0.87	-46.63	
415.0	3.10	274.90	414.8	7.0	-7.1	1.7	1.21	0.78	-19.56	
509.0	5.40	261.20	508.5	6.6	-14.0	7.5	2.66	2.45	-14.57	
511.4	5.44	260.65	510.9	6.5	-14.2	7.7	2.83	1.76	-23.43	
<b>513' MD = 18' Radius (Cooley 14-16)</b>										
601.0	7.30	244.90	600.0	3.4	-23.5	17.1	2.83	2.07	-17.57	
693.0	9.20	235.70	691.0	-3.2	-34.9	30.2	2.51	2.07	-10.00	
785.0	11.10	231.90	781.6	-12.8	-48.0	46.4	2.19	2.07	-4.13	
905.0	12.40	228.70	899.1	-28.5	-66.7	70.8	1.21	1.08	-2.67	
980.0	12.90	228.20	972.2	-39.4	-79.0	87.1	0.68	0.67	-0.67	

<b>Company:</b>	Anadarko, Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Cooley 13-16
<b>Project:</b>	SEC.16-T2N-R68W	<b>TVD Reference:</b>	WELL @ 4900.0ft (Original Well Elev)
<b>Site:</b>	Cooley 19-16 Pad Sec.16-T2N-R68W	<b>MD Reference:</b>	WELL @ 4900.0ft (Original Well Elev)
<b>Well:</b>	Cooley 13-16	<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)
1,075.0	14.00	229.00	1,064.6	-54.0	-95.6	109.1	1.17	1.16	0.84
1,170.0	13.20	229.40	1,157.0	-68.6	-112.5	131.4	0.85	-0.84	0.42
1,266.0	13.50	229.70	1,250.4	-82.9	-129.4	153.5	0.32	0.31	0.31
1,360.0	12.20	231.10	1,342.0	-96.3	-145.5	174.3	1.42	-1.38	1.49
1,456.0	12.20	230.10	1,435.9	-109.1	-161.1	194.6	0.22	0.00	-1.04
1,551.0	12.00	232.20	1,528.7	-121.6	-176.6	214.4	0.51	-0.21	2.21
1,646.0	11.60	236.40	1,621.7	-133.0	-192.4	233.9	1.00	-0.42	4.42
1,741.0	11.90	235.90	1,714.7	-143.8	-208.5	253.2	0.33	0.32	-0.53
1,836.0	11.70	236.80	1,807.7	-154.5	-224.6	272.6	0.29	-0.21	0.95
1,932.0	12.60	237.30	1,901.6	-165.5	-241.6	292.8	0.94	0.94	0.52
2,027.0	12.20	240.50	1,994.4	-176.0	-259.1	313.1	0.84	-0.42	3.37
2,122.0	12.70	238.90	2,087.1	-186.4	-276.7	333.5	0.64	0.53	-1.68
2,217.0	12.60	237.50	2,179.8	-197.3	-294.4	354.3	0.34	-0.11	-1.47
2,313.0	12.20	236.20	2,273.6	-208.6	-311.7	374.9	0.51	-0.42	-1.35
2,409.0	11.80	239.60	2,367.5	-219.2	-328.6	394.8	0.85	-0.42	3.54
2,505.0	11.90	237.70	2,461.4	-229.5	-345.4	414.4	0.42	0.10	-1.98
2,600.0	12.00	237.70	2,554.4	-240.0	-362.0	434.1	0.11	0.11	0.00
2,695.0	12.20	238.20	2,647.3	-250.6	-378.9	453.9	0.24	0.21	0.53
2,790.0	11.80	233.30	2,740.2	-261.7	-395.2	473.7	1.15	-0.42	-5.16
2,886.0	11.70	230.80	2,834.2	-273.7	-410.6	493.2	0.54	-0.10	-2.60
2,981.0	10.90	233.40	2,927.4	-285.1	-425.3	511.8	1.00	-0.84	2.74
3,076.0	11.00	233.40	3,020.6	-295.9	-439.8	529.8	0.11	0.11	0.00
3,171.0	10.70	235.40	3,113.9	-306.3	-454.3	547.7	0.51	-0.32	2.11
3,266.0	11.10	236.40	3,207.2	-316.4	-469.2	565.7	0.47	0.42	1.05
3,362.0	11.60	243.60	3,301.3	-325.8	-485.6	584.4	1.56	0.52	7.50
3,457.0	12.00	239.80	3,394.3	-335.0	-502.7	603.7	0.92	0.42	-4.00
3,552.0	11.70	243.10	3,487.3	-344.3	-519.8	623.0	0.78	-0.32	3.47
3,647.0	11.60	239.40	3,580.4	-353.5	-536.6	642.1	0.79	-0.11	-3.89
3,742.0	10.80	230.60	3,673.6	-364.0	-551.7	660.5	1.98	-0.84	-9.26
3,837.0	11.10	226.00	3,766.8	-376.0	-565.1	678.4	0.97	0.32	-4.84
3,932.0	11.90	223.20	3,859.9	-389.5	-578.4	697.1	1.03	0.84	-2.95
4,027.0	12.50	213.70	3,952.8	-405.2	-590.8	716.3	2.20	0.63	-10.00
4,123.0	10.80	214.10	4,046.8	-421.3	-601.7	734.5	1.77	-1.77	0.42
4,218.0	9.10	214.60	4,140.4	-434.9	-610.9	749.9	1.79	-1.79	0.53
4,313.0	7.90	215.70	4,234.3	-446.4	-619.0	763.1	1.27	-1.26	1.16
4,408.0	7.30	216.20	4,328.5	-456.5	-626.4	775.1	0.64	-0.63	0.53
4,503.0	6.40	201.30	4,422.8	-466.3	-631.8	785.2	2.09	-0.95	-15.68
4,598.0	4.40	180.20	4,517.4	-474.9	-633.8	791.8	2.93	-2.11	-22.21
4,693.0	2.30	161.00	4,612.2	-480.4	-633.2	794.5	2.48	-2.21	-20.21
4,789.0	1.80	8.60	4,708.2	-480.7	-632.3	794.0	4.15	-0.52	-158.75
4,884.0	1.00	312.00	4,803.2	-478.7	-632.7	793.1	1.58	-0.84	-59.58
4,979.0	1.00	305.00	4,898.2	-477.6	-634.0	793.6	0.13	0.00	-7.37
5,074.0	0.90	284.80	4,993.2	-477.0	-635.4	794.3	0.37	-0.11	-21.26
5,081.0	0.91	283.63	5,000.2	-476.9	-635.5	794.4	0.32	0.18	-16.67
<b>TARGET BHL 510'FSL, 510'FWL</b>									
5,170.0	1.10	271.40	5,089.1	-476.8	-637.1	795.5	0.32	0.21	-13.74
5,264.0	0.90	284.60	5,183.1	-476.5	-638.7	796.7	0.32	-0.21	14.04
5,359.0	0.80	309.00	5,278.1	-475.9	-639.9	797.4	0.39	-0.11	25.68
5,454.0	0.50	313.10	5,373.1	-475.2	-640.7	797.6	0.32	-0.32	4.32
5,549.0	0.50	319.20	5,468.1	-474.6	-641.3	797.8	0.06	0.00	6.42
5,645.0	0.40	316.40	5,564.1	-474.1	-641.8	797.8	0.11	-0.10	-2.92
5,740.0	0.00	142.90	5,659.1	-473.8	-642.0	797.9	0.42	-0.42	0.00
5,835.0	0.40	9.50	5,754.1	-473.5	-642.0	797.6	0.42	0.42	0.00
5,930.0	0.50	341.90	5,849.1	-472.8	-642.1	797.3	0.25	0.11	-29.05

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<b>Well:</b>	Cooley 13-16	<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)
6,025.0	0.50	4.70	5,944.1	-472.0	-642.2	796.9	0.21	0.00	24.00
6,120.0	0.50	41.10	6,039.1	-471.3	-641.8	796.2	0.33	0.00	38.32
6,215.0	0.40	54.80	6,134.1	-470.8	-641.3	795.5	0.15	-0.11	14.42
6,311.0	0.40	68.20	6,230.1	-470.4	-640.7	794.8	0.10	0.00	13.96
6,406.0	0.40	71.50	6,325.1	-470.2	-640.1	794.2	0.02	0.00	3.47
6,501.0	0.40	69.30	6,420.1	-470.0	-639.5	793.5	0.02	0.00	-2.32
6,596.0	0.40	58.90	6,515.1	-469.7	-638.9	792.9	0.08	0.00	-10.95
6,687.0	0.40	43.40	6,606.1	-469.3	-638.4	792.3	0.12	0.00	-17.03
6,782.0	0.40	43.20	6,701.1	-468.8	-637.9	791.6	0.00	0.00	-0.21
6,877.0	0.30	8.80	6,796.1	-468.3	-637.7	791.1	0.24	-0.11	-36.21
6,972.0	0.30	351.60	6,891.1	-467.8	-637.7	790.8	0.09	0.00	-18.11
7,067.0	0.30	345.40	6,986.1	-467.4	-637.8	790.6	0.03	0.00	-6.53
7,162.0	0.40	343.60	7,081.1	-466.8	-637.9	790.4	0.11	0.11	-1.89
7,258.0	0.40	4.40	7,177.1	-466.1	-638.0	790.1	0.15	0.00	21.67
7,261.0	0.41	4.38	7,180.0	-466.1	-638.0	790.1	0.21	0.21	-0.62
<b>TARGET CIRCLE 510'FSL, 510'FWL</b>									
7,262.4	0.41	4.37	7,181.4	-466.1	-638.0	790.1	0.21	0.21	-0.61
<b>LEGAL BOX 400' X 400' 661'FSL &amp; 659'FWL</b>									
7,353.0	0.60	4.00	7,272.1	-465.3	-637.9	789.6	0.21	0.21	-0.41
7,448.0	0.70	61.00	7,367.1	-464.5	-637.4	788.7	0.66	0.11	60.00
7,543.0	0.60	4.60	7,462.1	-463.8	-636.8	787.8	0.65	-0.11	-59.37
7,645.0	0.40	6.90	7,564.0	-462.9	-636.8	787.2	0.20	-0.20	2.25
7,695.0	0.40	6.90	7,614.0	-462.5	-636.7	787.0	0.00	0.00	0.00

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